The syntax and semantics of additivity in Finnish

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Contents

Abstract

In this dissertation, I provide a syntax and a semantics for the unbound additives *myös* and *myöskään* as well as the bound additives *–kin* and *–kAAn* in Finnish. While all four of these additives may behave much like the English *too* and *either*, the bound additives also have a number of distinct uses that are not available for unbound additives in either Finnish or English. I argue that this difference in distribution is rooted in the involvement of three operators with distinct semantic properties: ADD (unbound forms), BADD (bound forms), and CADD (bound forms). Specifically, I propose that the division between unbound and bound additives is partly due to the fact that in contrast to ADD, BADD is type-flexible in terms of its arguments, source-flexible in terms of the antecedent, and lacks a distinctness requirement, and partly due to the fact that CADD corresponds to a quantificational closure operator with (mostly) a truth-conditional effect on the semantics of its prejacent. In contrast, the second major division – between *–kin* and *myös* on the one hand, and *–kAAn* and *myöskään* on the other – is proposed to be syntactic in nature. Instead of relying on sentence polarity, I argue for an analysis in terms of a topicality feature. This analysis makes better predictions in terms of scope not only for *–kAAn* and *myöskään*, which are traditionally argued to be polarity-sensitive), but also for *–kin* when the whole distribution is taken into account.

The meaning that additive operators contribute is analysed as a speaker presupposition in this dissertation. In particular, I propose that the relevant presupposition is a metaproposition about the context: it states that there is – in some part of the context – an antecedent for the prejacent. In addition to providing the freedom that the analysis of additivity in Finnish requires, the proposed analysis represents a fruitful compromise between existential an anaphoric approaches to additivity, and sheds new light on a number of old issues in the investigation of additivity.

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I dedicate this dissertation to Anne.

Abbreviations

ACC	accusative case
ADE	adessive case
ABL	ablative case
ALL	allative case
COND	conditional mood
CONN	connegative form
ELA	elative case
EMPH	emphatic particle
ESS	essive case
GEN	genitive case
ILL	illative case
IMP	imperative mood
INE	inessive case
INF	infinitival form
NOM	nominative case
NEG	negation
PAR	partitive case
PASS	passive
PAST	past tense
PASTPART	past participle
PL	plural
PRES	present tense
PRESPART	present participle
PX	possessive suffix
SG	singular
TRA	translative case

Chapter 1

Introduction

1.1 Research questions

This dissertation is about additivity. Additives belong to the larger class of focus-sensitive expressions (König, 1991), and can be generally described as signals of pre-established information in the discourse context. For example, when (1) is pronounced with main stress on the subject *Mary* (signaled with underlining), it is typically used felicitously in a context where it has been previously established or it is somehow otherwise evident and relevant that someone else – say, John – is happy.

(1) Mary is happy, too

As semantic entities, additives impose specific requirements on the contexts in which they may be used. This requirement – the semantic contribution associated with an additive – is standardly classified as a presupposition (Karttunen and Karttunen, 1976; Karttunen and Peters, 1979; Kripke, 1990/2009; Heim, 1990, 1992).

In this dissertation, I approach the domain of additivity through a case study on Finnish (Finno-Ugric). In Finnish, additivity can be expressed with the unbound expressions *myös* and *myöskään* as well as the bound clitics *–kin* and *–kAAn*, as shown in (2) and (3).

(2) **Unbound additives *myös* and *myöskään***

a. *Myös Mari o-n iloinen*
ADD Mari.NOM be-PRES.3SG happy.NOM
'Mari is happy, too'

b. *Myöskään* *Mari* *e-i* *ole* *iloinen*
ADD Mari.NOM NEG-3SG be.CONN happy.NOM
'Mari is not happy, either'

(3) **Bound additives *–kin* and *–kAAn***

a. *Mari-kin* *o-n* *iloinen*
Mari.NOM-ADD be-PRES.3SG happy.NOM
'Mari is happy, too'

b. *Mari-kaan* *e-i* *ole* *iloinen*
Mari.NOM-ADD NEG-3SG be.CONN happy.NOM
'Mari is not happy, either'

The a- and b-sentences of (2) and (3) respectively convey the same meaning; informally, the presupposition can be paraphrased as the requirement that someone else besides Mari is happy (a) or that someone else besides Mari is not happy (b). However, it is not always the case that unbound and bound additives may be used in exactly the same contexts, with no difference in meaning. One the one hand, this is because bound additives are sometimes additionally interpreted as *scalar*, i.e. as involving a comparison in terms of likelihood (cf. *even* in English; Karttunen and Peters, 1979). On the other hand, bound additives simply have a wider distribution than unbound additives. One of the main goals of this dissertation is to explain why this is the case.

The distribution of the bound and unbound additives that I cover in this dissertation is briefly presented below. On a terminological note, when talking about specific parts of the distribution of additives, I refer to their different *uses*. Out of the eight uses listed below, only the basic use is common to both unbound and bound additives in Finnish. All other uses are only available with bound additives.

1. **Basic use**: Both bound and unbound additives appear in sentences where they express plain vanilla additivity involving lexical alternatives (cf. *also*, *too* and *either* in English)

2. **Polar use**: Bound additives appear in sentences where the relevant alternative is the polar opposite of their prejacent, and where that alternative corresponds to a belief or wish of the speaker

3. **Reactive use**: Bound additives appear in reactive replies, where the relevant alternative is non-distinct from the prejacent, and corresponds to a public discourse commitment of another discourse participant

4. **Concessive uses**: Bound additives appear in two types of concessive structures, of which one is restricted to concessive subordinate clauses and can be reduced to either the reactive or the polar use, and the other involves existential closure

5. **Recurring-issue use**: Bound additives appear in recurring-issue questions where the relevant alternative is the non-distinct from the prejacent (itself a question), and can be found in the stack of QUDs (Question Under Discussion) associated with the conversation

6. **Double contrast use**: Bound additives appear attached to contrastive topics and make reference to an alternative that differs not only in terms of the contrastive topic, but also in terms of a focus

7. **Multiple-*wh* use**: Bound additives appear in interrogative, relative, and declarative multiple *wh*-structures, and lead to existential closure

8. **Quantifier use**: Bound additives appear as parts of quantifiers, and lead to either existential or universal closure

Given their wide distribution, it is unsurprising that the bound additives *–kin* and *–kAAn* appear very frequently in spoken and written Finnish. However, surprisingly little formal research has been conducted in order to describe and explain their behaviour and distribution. The main focus of most work is on the basic use (Karttunen and Karttunen, 1976; Vilkuna, 1984; Vilppula, 1984), and there is some work on the double contrast use (Vilkuna, 1984). For the most part, however, the distribution of bound and unbound additives in Finnish has not been accounted for.

The goal of this dissertation is to fill this void by proposing a modern and comprehensive analysis of additivity in Finnish. By modern, I refer to the framework of Alternative Semantics (Rooth, 1985, 1992), which is now standardly used in the study of focus-sensitive expressions. By comprehensive, I refer to the empirical coverage that is aimed: in particular, the proposed analysis should cover the different uses of additives identified above. Thus, with respect to Finnish, the research questions addressed in this dissertation are:

(4) **Research questions for Finnish**
How should the syntax and semantics of unbound and bound additivity in Finnish be analysed?

   a. What distinguishes unbound and bound additives?

   b. What distinguishes *–kin* from *–kAAn* on the one hand, and and *myös* from *myöskään* on the other?

   c. What distinguishes the different uses of additives in Finnish?

The analysis of additivity in Finnish will then serve as a new window into long-standing issues in the investigation of additivity in general:

(5) **General research questions**
What do the syntax and semantics of additivity in Finnish tell us about additivity in general?

a. **Focus-sensitivity question**: How do additives interact with focus, i.e. how is their focus-sensitivity modelled?

b. **Antecedency question**: Do additives make reference to antecedents? If yes, what types of antecedents do felicitous additives refer to? In particular, what kinds of antecedents are allowed and where can they be located within the discourse model?

c. **Distinctness question**: Do additives impose a distinctness requirement on the antecedent and the prejacent?

d. **Form alternation question**: What explains the form alternation of additives in languages where it occurs?

e. **Derivation question**: How are the syntax and semantics of additives related? Do the additives we see in surface syntax lexicalise additive operators, or do they simply mark their presence?

f. **Obligatoriness question**: What determines whether an additive is optional or obligatory?

g. **Variation question**: How can the cross- and intralinguistic variation in the availability of different uses of additives be explained?

In the next section, I present a brief summary of the main claims and novelties of the proposal put forth in this dissertation.

1.2 Proposal

1.2.1 Syntax

In this dissertation, I follow previous syntactic work in assuming that unbound additives are particles, while bound additives are clitics (e.g. Nevis, 1985). I give both types of additives an adjunctive syntax. However, while unbound additives are themselves the lexical realisation of an additive operator, I propose that bound additives mark the presence of an additive operator in their immediate syntactic vicinity (cf. Lee, 2004; Bruening, 2017). Thus, under the proposed analysis, the host of the additive marker is also always the associate of the additive operator.

The main novelty of the syntactic proposal put forth in this dissertation is that in addition to an uninterpretable focus feature [uF] (Holmberg, 2014), I propose that both unbound and bound additives may carry an uninterpretable topicality feature, [$uTop$]. It is this topicality feature that is responsible for the interpretation of *–kAAn* and *myöskään* above negation. The analysis of the quantifier, *wh*-concessive, and multiple-*wh* uses of the bound additives also brings another se-

mantically meaningful feature into the picture; I propose that on these uses, the syntactic features of the host (or the larger context) determine the quantificational force of the closure operation that the additive operator performs.

1.2.2 Semantics

The core proposal that I put forth for the semantics of additivity in Finnish involves three distinct operators: ADD (unbound additives), BADD (*bound* additives), and CADD (*closure* additives). The main differences between ADD and CADD are that in contrast to ADD, BADD is (i) type-flexible, (ii) source-flexible, and (iii) encodes no distinctness requirement. The first property lets BADD operate on arguments that have a more complex semantic type than on the basic use. The second allows flexibility in where the antecedent can be found within the discourse model. And finally, the third property means that the antecedent may be non-distinct from the prejacent. These three properties explain why the double contrast, polar, reactive, concessive, and recurring-issue uses are available with bound additives, but not unbound ones.

The rest of the uses that are only available with bound additives – the quantifier, *wh*-concessive, and multiple-*wh* uses – involve either $\text{CADD}_{\exists}$ (leading to existential closure of the focus alternative set) or $\text{CADD}_{\forall}$ (leading to universal closure of this set). I argue that in cases where the structure would not have a well-defined ordinary semantic value otherwise, CADD provides one. When the structure does have a well-defined ordinary semantic value – as in the case of multiple-*wh* questions – CADD reverts back to its additive role, and imposes a restriction on the context of its use.

Besides the introduction of BADD and CADD, the semantic proposal also includes other novel ingredients; for example, many of the uses involving BADD also involve polar focus alternatives, or even alternatives that correspond to questions. In addition, I establish a systematic way to build examples that lead to accommodation from additives – a process that has been previously outruled – and propose a tentative analysis for these uses. Most importantly, however, the proposal I make takes additive meaning to be a speaker presupposition (Stalnaker, 1973, 1974, a.o.) whose content is a metaproposition about the content (cf. Heim, 1990; Kapitonov, 2012). This view on additivity is not only suitable for the analysis of many of the uses of the Finnish bound additives, but it also sheds new light on the conditions in which additives are perceived to be infelicitous.

1.3 The structure of this dissertation

This dissertation is structured as follows.

Chapter 2. Background. In Chapter 2, I provide the theoretical background on which the dissertation builds, beginning with the fundamental assumptions I make concerning the architecture of grammar. I introduce both the basic syntactic and semantic representations and operations.

Some domains that are especially relevant for this dissertation – i.e. focus semantics and the syntax and semantics of interrogativity – are discussed in detail. Given that additivity is a semantic phenomenon that interacts in various ways with context, I also introduce notions that are relevant for understanding the pragmatics of additivity. Finally, I end chapter 2 with a presentation of some relevant properties of Finnish.

Chapter 3. Additivity. Chapter 3 is reserved for a in-depth discussion of additivity. I begin with a description of the general issues discussed within work on additivity and presented in (5). I then proceed to present previous existential and anaphoric approaches to the semantics of additivity. I conclude with a closer look at some previous work on additivity in Finnish specifically.

Chapter 4. Case study: Finnish. Chapter 4 presents the bulk of the data that is analysed in chapters 5-7. It begins with the basic use – available with both unbound and bound additives – and continues with a one-by-one presentation of the polar, reactive, concessive, recurring-issue, double contrast, multiple-*wh*, and quantifier uses of the bound additives *–kin* and *–kAAn*. This chapter also contains some early analytical elements.

Chapter 5. Introducing ADD. In chapter 5, I present the basic syntactic proposal for both unbound and bound additives. I also address the form alternation question in detail. I then present my proposal for the semantics of the additive operator ADD, which I assume is relevant for all sentences that involve unbound additives.

Chapter 6. Introducing BADD. In chapter 6, I propose that the analysis of a number of uses of bound additives involve the operator BADD. I argue that this operator covers a superset of the cases covered by ADD because it is (i) type-flexible, (ii) source-flexible, and (iii) does not encode a distinctness requirement. Besides the basic use discussed in chapter 5, BADD is shown to be involved in the double contrast, polar, reactive, concessive, and recurring-issue uses. Chapter 6 also contains a discussion of cases of accommodating use that are not counted as a separate use within this dissertation, but show particular properties that are related to the presence of e.g. contrastive topics.

Chapter 7. Introducing CADD. Finally, in chapter 7, I argue that three uses of bound additives – the quantifier, *wh*-concessive, and multiple-*wh* uses – involve the operator CADD. In contrast to ADD and BADD, which are simply presuppositional, CADD has a truth-conditional effect in all but one case (multiple-*wh* questions). In essence, CADD functions as an existential or universal closure operator, yielding a well-defined propositional meaning where otherwise there would be none. I propose that the quantificational force of the closure operator is revealed not by the form the bound additive clitic itself takes, but by the context in which it appears. As a result, the form of the additive clitic and the quantificational force of the closure operator are not in a one-to-one mapping.

Chapter 8. Conclusion. Chapter 8 concludes this dissertation. It includes a presentation of the main syntactic and semantic features of the proposal, and discusses the implications of the investigation of Finnish additivity for the study of additivity in general.

Chapter 2

Background

In this chapter, I introduce the basic assumptions that this dissertation builds on. I begin by discussing the terms and definitions relevant to the syntax-semantics interface (section 2.1) and to the semantics-pragmatics interface (section 2.2). I then provide a short introduction to relevant aspects of Finnish (section 2.3).

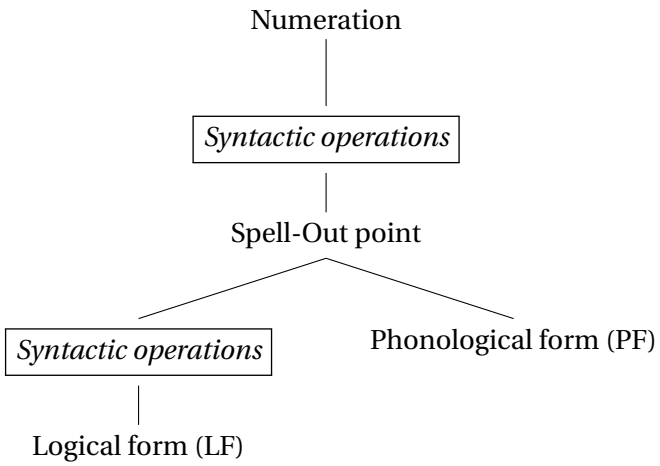
2.1 Syntax-semantics

2.1.1 General architectural assumptions and basic syntactic operations

2.1.1.1 Architecture: Syntax as a 'linker' between form and meaning

In generative linguistics, it is standardly assumed that the human cognition contains a linguistic module responsible for the computational task of generating language. Indeed, due to the recursive nature of the operations that it has access to, this module is in principle able to produce any number of infinitely long grammatical sentences. As a cognitive module, the linguistic module interfaces with module(s) that deal with meaning and thought, and module(s) that deal with the production and perception of sounds and/or signs. In the currently prevalent generativist framework, i.e. Minimalism (Chomsky, 1993, 1995, 2000), the role of syntax as a 'linker' between form and meaning is encoded in the T-model (or Y-model) of grammar:

(6) **The T/Y-model of grammar**



In the model shown in (6), the direction of information flow is top-down. Essentially, core syntax combines and recombines elements from an initial set (the *numeration*) using a restricted set of operations available to it. This happens until a *Spell-Out* point, where the produced expression is sent to two interfaces, the sensory-motor interface, i.e. *Phonological form* (PF), and the conceptual-intentional interface, i.e. *Logical form* (LF). Under the T/Y-model of grammar, there is no communication between LF and PF that is not syntactically mediated. This entails for example that although it is possible for syntactic operations to be applied after Spell-Out but before LF, as (6) indicates, the effects of such operations will be invisible at PF.

In what follows, I introduce the core syntactic operations and assumptions made in Minimalism.

2.1.1.2 Numeration, syntactic operations, and Spell-Out

As mentioned above, minimalist derivations begin with a *numeration* (N). A numeration is a set of pairs of lexical or functional items and indexes representing the number of times the item has to be used. Any member of a numeration may be retrieved via the operation *Select*; when an item is Selected, its index is reduced by one. At the end of the derivation, N must be empty.

(7) **Numeration**
$N = \{\langle \text{item}_1, \text{index}_1\rangle, \langle \text{item}_2, \text{index}_2\rangle, \langle \text{item}_3, \text{index}_3\rangle, ...\}$

(8) **Select**
Select retrieves a lexical item n from N and reduces the index of n by one

The members of N serve as building blocks for hierarchical syntactic structures. The main structure-building operation is *Merge*, which takes two syntactic objects α and β, and produces a new syntactic object γ that is equivalent to the unordered set of α and γ. When Merge is applied, one of

the two objects α and β determines how γ will behave syntactically. Often, this determination is referred to as *projection* or *labeling* (Chomsky, 2013; Rizzi, 2014). Crucially, an object γ built out of two items from N through Merge can be fed to the same operation again; this is why Merge is the computational heart of syntactic combinatorics, and the source of recursivity in language.

(9) **Merge** (Chomsky, 1995, p. 396, 399)

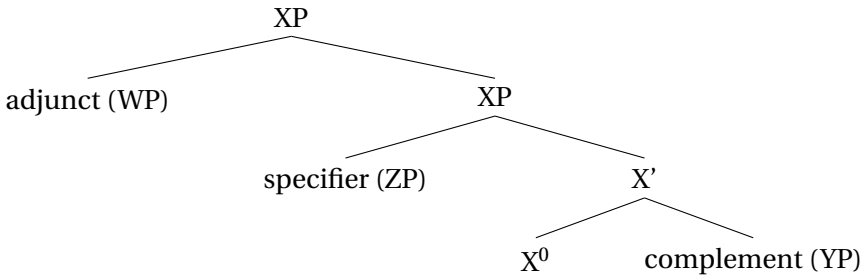
Applied to two objects α and β, *Merge* forms a new object γ such that

a. γ is the set $\{\alpha, \beta\}$

b. γ inherits the relevant properties of either α or β (i.e. α or β projects)

Merge is often visualised using hierarchical tree diagrams where the node labels correspond to the projection structure. In Government and Binding (GB) theory (Chomsky, 1981), a predecessor of Minimalism, structure-building was essentially representational, and meant "filling in" the slots provided by a general structural schema – the X'-schema – via the process of lexical insertion. In the X'-schema, a head X^0 projects an intermediate projection (X') and a maximal projection (XP), where selected internal arguments are in the *complement* position under X', external arguments are in the *specifier* position under XP, and *adjuncts* are adjoined to additional maximal XP layers, as in (10):

(10) **The X'-schema**



In Minimalism, the X'-schema is abandoned as a theoretical primitive, and the specific structural positions that the X'-schema identified are redefined as referring to different projection types: for example, the complement position is under an indermediate projection (X'), while the specifier is under the lowest maximal projection (XP).

(11) **Projections in Minimalism** (e.g. Hornstein et al., 2005, p. 197):

a. *Minimal projection*: X^0
A minimal projection is an item selected from N

b. *Maximal projection*: XP
A maximal projection is a syntactic object that does not project

c. *Intermediate projection*: X'
An intermediate projection is a syntactic object that is neither an X^0 nor an XP

In Minimalism, Merge is used to model another fundamental syntactic operation: *Move*. Move (or the syntactic operation that subsumes its work) is necessary for accounting for apparent cases of mismatch between form and meaning. For example, while the direct object of a transitive verb must combine with the verb to satisfy its requirements in terms of argument structure, the same direct object may nevertheless be pronounced in a position that is far away from the argument position. In many (but not all) languages, this happens for example in *wh*-questions: while the argumental position is filled with *cheese* in (12a), in (12b) this same position is empty on the surface, and the object *wh*-phrase is pronounced at the beginning of the sentence. This type of movement is generally called *wh*-movement or *wh*-fronting.

(12) **Illustration of Move**

a. John likes cheese

b. What does John like t?

Move can be reduced to Merge if Merge is allowed to reaccess an already-Merged term α, and then (re-)merge a *copy* of α into the structure higher up (Chomsky, 1995; Kitahara, 1995; Epstein, 1995). The two terms – α and its copy – are related to each other, and are said to form a *chain*. The *head* of the chain is the higher copy, and the *tail* is the lower copy.

(13) **Move = Copy + Merge** (cf. Chomsky, 1995, p. 399)
Given the phrase marker Σ with terms K and α, *Move* creates a copy of α, and Merges the copy of α with K to form a new object γ with the constituents α, K

This way of modelling movement is called the *copy theory of movement*. In order to account for pronunciation patterns, the copy theory of movement relies on pronunciation rules such as "Pronounce the head of the chain" or "Pronounce the tail of the chain". This approach contrasts with earlier accounts of movement, where moved phrases left behind a special empty category called a *trace* (see (12), where the position of the trace is signalled with t). In the syntactic analysis presented in this dissertation, I retain the older trace-based approach.[1]

The application of syntactic operations in Minimalism is restricted by considerations of *economy*. This means essentially that operations only take place when required to, and concern the smallest possible portion of the derivation. Ideally, in Minimalist syntax, syntactic operations are driven by the needs of the interfaces. In other words, a syntactic operation takes place in order for the syntactic object to be a valid, legible interface product. The modelisation of such

[1] Semantically, movement is still mostly modelled as involving a trace that is interpreted as a variable (Heim and Kratzer, 1998).

requirements makes use of different kinds of features and a specific syntactic operation, *Agree*, that manipulates them. We now turn our attention to this part of the minimalist framework.

2.1.1.3 Features and Agree

As mentioned above, at a certain point in the syntactic derivation, the procedure of *Spell-Out* takes place, and the result of the syntactic derivation is sent to two interfaces: (i) the interface with the sensory-motor system, or phonological form (PF), and (ii) the interface with the conceptual-intentional system, or logical form (LF). For a syntactic derivation to *converge*, i.e. not to crash, the result of the derivation must be *readable* at both PF and LF. On the PF side, an obvious constraint is that the end result of the derivation must be pronounceable.[2] On the LF-side, one prominent constraint on readability is imposed by the status of *features* that are present in the syntactic object. In this section, I introduce features and the syntactic operation of *Agree*, and show how they are involved in motivating syntactic movement.

In Minimalism, features are syntactic entities of different types. For example, they can be *inflectional* (referring to e.g. person, number, gender, tense, and case features), *selectional* (determining which types of objects, if any, are selected by the head), *interpretational* (requiring that some phrase with a specific interpretational feature such as focus must be present), or purely "attractive" (signalling that some phrase must move to the specifier of the element carrying the triggering feature; in Minimalism, this amounts to the Extended Projection Principle (EPP) feature).

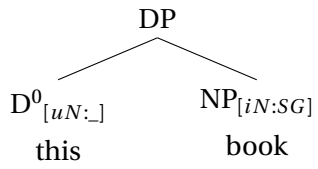
One important property of features in Minimalism is that an instance of a given feature F may be *(un)valued* and/or *(un)interpretable*. The two notions are distinct: while valuedness involves the inherent value that a specific feature type may have, interpretable features are those that can be linked to a meaningful semantic contribution. Crucially, uninterpretable features must be *deleted* so as to avoid an interface crash at LF. Unvalued features need to be valued.[3] To illustrate the valuation-deletion process, consider a simple English toy DP where the only relevant feature is number (N). Because number is intuitively an interpretable property of the noun, N is valued and interpretable on the head noun of the DP. The determiner D^0 also carries a number feature, but this instance of N is unvalued and uninterpretable. Crucially, the determiner's N-feature is valued and consequently deleted because it enters in a syntactic relationship with the head noun:

[2] This is, of course, a gross simplification of PF issues. However, as the main focus of this dissertation is on LF, I will not discuss PF-constraints any further.

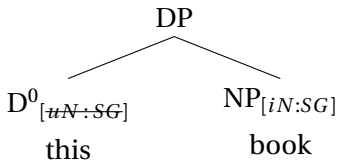
[3] Chomsky (2001, p. 5) assumes that (un)valuedness and (un)interpretability are intrinsically related to each other; uninterpretable features are also always unvalued. This conjecture has, however, been criticised (Pesetsky and Torrego, 2007).

(14) **Valuation and deletion of an inflectional feature**

a. **Before valuation and deletion**

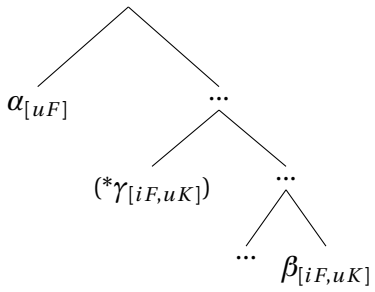


b. **After valuation and deletion**



The syntactic operation that links uninterpretable/unvalued features to their interpretable/valued counterparts, thus allowing both feature valuation and feature deletion, is called *Agree*. Formally, Agree establishes a connection between a *probe* and a *goal*. Although the examples above are very local, Agree may also hold between a probe and a goal that are further apart from one another (with certain restrictions, as (15) shows). Usually, Agree is assumed to work *downwards*: the probe α has an uninterpretable instance of F (i.e. $[uF]$), and searches its c-command domain for a suitable goal β with an interpretable instance of F (i.e. $[iF]$)(Chomsky, 2000, 2001).[4] The establishment of a relation of Agree between a probe and a goal licenses the valuation of unvalued features and the deletion of uninterpretable features, contributing to making the syntactic object readable at LF.

(15) **Agree (Zeiljstra, 2012, p. 2 based on Chomsky, 2000, 2001)**
A probe α may Agree with a goal β iff



a. α c-commands β

b. α carries an *uninterpretable* instance of a feature F and β carries a matching *interpretable* instance of F

[4]Recently, it has been proposed that Agree works *upwards*, instead (Zeiljstra, 2012; Zeiljstra and Bjorkman, To appear). In this case, the probe is c-commanded by the goal.

c. β is the *closest*[5] goal to α

d. β is an *active* goal, i.e. it carries an *uninterpretable* instance of some feature K

The idea that Move (or re-Merge) is motivated by feature deletion led to the suggestion that some probes also carry an $[EPP]$ feature. The job of this feature is to force its carrier to project a specifier to which the goal then moves to (Chomsky, 2001)[6]. However, it has later been argued that if Agree is unidirectional, syntactic movement can be driven simply by the activity condition (15d). In particular, in the configuration shown in (15), the F-goal $\beta_{[uK]}$ must move in order for its instance of K to be valued and/or deleted (Bošković, 2007; Zeiljstra, 2012; Zeiljstra and Bjorkman, To appear). The relevant movement step has to target a syntactic position that makes β a well-formed K-probe (i.e. it must c-command some phrase γ with $[iK]$), but there is no agreement as to whether the relevant K-goal has to be the original F-probe α. If it does, and Agree is only established between α and β when α and β both carry F and K, but with opposite interpretability status, Agree is essentially a *quid pro quo* relationship (16a). On the opposite view, any phrase β should be able to move above any other phrase γ in order to Agree with it (independently of the other features of γ) (16b). In this dissertation, movement-based downward Agree will turn out to be useful, and therefore this theoretical option will not be ruled out, although such configurations of Agree have been previously deemed unattested (Zeiljstra and Bjorkman, To appear).[7]

(16) a. ***Quid pro quo* downward Agree**

(i) $\alpha_{[\sout{uF},iK]}$ $\beta_{[iF,uK]}$

(ii) $\beta_{[iF,\sout{uK}]}$ $\alpha_{[\sout{uF},iK]}$ t_β

b. **Movement-based downward Agree**

(i) $\gamma_{[iK]}$ $\beta_{[uK]}$

(ii) $\beta_{[\sout{uK}]}$ $\gamma_{[iK]}$ t_β

2.1.2 From LF to semantics: Basic definitions and operations

Thus far, I have introduced the basic syntactic assumptions that I adopt in this dissertation. In this section, I spell out the basic semantic assumptions. Two subsequent sections (2.1.3 and 2.1.4) conclude the introduction of the syntax-semantics interface with a more detailed discussion of two domains of semantics that are of great importance for this thesis: focus and questions.

In this dissertation, I adopt a model-theoretic semantics that is standardly adopted in generative work. Under this approach, it is assumed that the LF of a linguistic object produced by syntax

[5]Closeness is defined in terms of c-command: γ is closer to α than β if γ asymmetrically c-commands β, which amounts to the requirement that there be no *intervenors* (Rizzi, 1990; Pesetsky and Torrego, 2001).

[6]Originally, EPP, i.e. the extended projection principle, was proposed to ensure that all sentences have a subject (Chomsky, 1981).

[7]Although they present this argument in the context of defending an analysis of Agree as *upward*-oriented, it also applies to downward Agree.

is the input to semantic interpretation (see for example Heim and Kratzer 1998). This means that LF is a format that is readable by semantics, and that LF allows the semantics to determine the proposition expressed by the sentence. Fundamentally, this approach is guided by the Fregean principle of compositionality:

(17) **The principle of compositionality**
The meaning of a complex expression is a function of the meanings of its parts and the way those parts are put together

The principle of compositionality states that we may know the meaning of for example a sentence by knowing what its parts mean, and by knowing how those parts are put together. By knowing these things, we derive the *truth conditions* for the sentence: famously, the sentence *Snow is white* is true if and only if snow is white in the evaluation world. The implementation of this approach to semantics is often couched within Montague grammar (Montague, 1970a,b, 1973), where semantic interpretation takes place within a model M. M itself is a tuple $\langle D, W, [\![\cdot]\!] \rangle$, where D is the domain of all entities in the model, W is the set of all possible worlds w, and $[\![\cdot]\!]$ is the interpretation function.[8]

Crucially, within this framework, 'putting parts together' – i.e. combining expressions with each other – is constrained by the *semantic type* of those expressions. There are three basic types: e (for entities like people and objects), t (for truth-values, i.e. 1 and 0), and s (for possible worlds). There are also complex types: a complex type $\langle a, b \rangle$ is a type iff a and b are types. For example, a function of type $\langle e, t \rangle$ is a function from entities to truth values. Moreover, $\langle s, a \rangle$ is an intensional type for any a that is a type (i.e. the type of a function from possible worlds to things of type a). In other words, D in M has many subdomains:

(18) **The domains in M** (Partee, 2009)

a. $D_e = \{\text{Max}, \text{Alex}, ...\}$

b. $D_t = \{1, 0\}$

c. $D_{\langle a,b \rangle} = \{f | f : D_a \rightarrow D_b\}$ [all functions f from D_a to D_b]

d. $D_{\langle s,a \rangle} = \{f | f : W \rightarrow D_a\}$ [all functions f from W to D_a]

The interpretation function takes an expression as its input, and outputs something that is part of M. For example, the interpretation function maps the proper name *Max* to the referent of the proper name in D_e. If, however, the input is a variable (e.g. a trace or a pronoun), it will be interpreted by using what is called an *assignment function*. These functions interpret variables by mapping an index i carried by the variable to some entity in the domain of the assignment function (19a). By assumption, constants (which proper nouns can be analysed as) are interpreted in the same way by any given assignment function (19b).

[8] The (temporal) relation $\leq$ on W is omitted from the model we use.

(19) **Assignment-dependent interpretation** (Heim and Kratzer, 1998, p. 111)
If α is a pronoun or a trace, g is an assignment function, and $i \in \text{domain}(a)$, then $[\![\alpha_i]\!]^g = g(i)$.

(20) **Assignment-independent interpretation** (Heim and Kratzer, 1998, p. 94)
For any tree α, α is in the domain of $[\![\cdot]\!]$ iff for all assignment functions g' and g'', $[\![\alpha]\!]^{g'} = [\![\alpha]\!]^{g''}$. If α is in the domain of $[\![\cdot]\!]$, then for all assignment functions g, $[\![\alpha]\!] = [\![\alpha]\!]^g$.

Within a semantic structure presented in the form of a tree diagram, proper nouns are always terminal nodes. This means that the entity within M to which these expressions are mapped is specified in the *lexicon*, which keeps track of the mapping between simple, non-decomposable expressions and their corresponding meanings within M (21a). All non-branching nodes that dominate a terminal node inherit their meaning from the terminal node (21b).

(21) **Terminal and non-branching nodes** (Heim and Kratzer, 1998, p. 95)

a. *Terminal nodes* (TN):
If α is a terminal node occupied by a lexical item, then $[\![\alpha]\!]$ is specified in the lexicon

b. *Non-branching nodes* (NN):
If α is a non-branching node, and β is its daughter node, then $[\![\alpha]\!]^g = [\![\beta]\!]^g$

In contrast, the interpretation of branching nodes requires compositional rules. Here, the importance of semantic type compatibility becomes evident. The fundamental Fregean idea according to which semantic composition consists in "saturating the unsaturated" is embodied by the compositional rule of *functional application* (FA) (22a). In FA, one of the two combined expressions must be a function that takes the other as its input argument. For example, a function of type $\langle e, t \rangle$ requires an argument of type e (or t), and if this condition is not satisfied, composition via FA fails. Besides FA, two expressions may combine via *predicate abstraction* (PA) (also often referred to as λ-abstraction), used whenever movement happens, and *predicate modification* (PM), used for modifying an expression without changing its type (22b-c).

(22) **Composition rules** (Heim and Kratzer, 1998, p. 95, 186):

a. *Functional application* (FA):
If α is a branching node and $\{\beta, \gamma\}$ is a set of α's daughters, then, for any assignment g, if $[\![\beta]\!]^g$ is a function whose domain contains $[\![\gamma]\!]^g$, then $[\![\alpha]\!]^g = [\![\beta]\!]^g\big([\![\gamma]\!]^g\big)$

b. *Predicate abstraction* (PA):
If α is a branching node, $\{\beta, \gamma\}$ is a set of α's daughters, and β dominates only a numerical index i, then, for any assignment g, $[\![\alpha]\!]^g = \lambda x \in D.\ [\![\gamma]\!]^{g^{x/i}}$

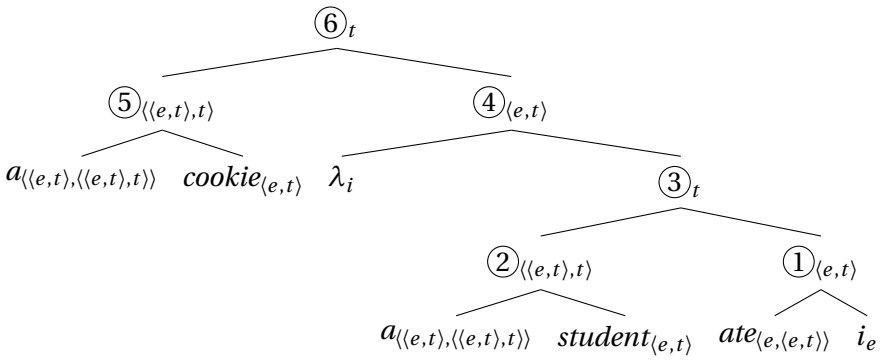
c. *Predicate modification* (PM):
If α is a branching node and $\{\beta, \gamma\}$ is a set of α's daughters, then, for any assignment g, $[\![\beta]\!]^g$ and $[\![\gamma]\!]^g$ are both in $D_{\langle e,t\rangle}$, then $[\![\alpha]\!]^g = \lambda x \in D_e . [\![\beta]\!]^g(x) = [\![\gamma]\!]^g(x) = 1$

With compositional rules and our model M in place, we are already able to derive the truth conditions of complex expressions. However, given that our model contains possible worlds, we now also distinguish between *extensions* and *intensions* (Carnap, 1947; Montague, 1970a,b, 1973). While extensions map expressions to entities within M, the corresponding intensions are functions from possible worlds to entities within M: examples include functions from possible worlds to truth values (or *propositions*), from possible worlds to sets of entities (or *properties*), and from possible worlds to entities (or *individual concepts*) (Partee, 1988). Thus, to be precise, the compositional rules shown in (22) involve the evaluation function $[\![\cdot]\!]^{w,g}$, where a world variable w has been supplied. The definition in (23) spells out the compositional rule of *intensional functional application* (IFA).

(23) **Intensional functional application (IFA)** (Heim and Kratzer, 1998, p. 308):
If α is a branching node and $\{\beta, \gamma\}$ is a set of α's daughters, then, for any possible world w and any assignment g, if $[\![\beta]\!]^{w,g}$ is a function whose domain contains $\lambda w'.[\![\gamma]\!]^{w',g}$, then $[\![\alpha]\!]^{w,g} = [\![\beta]\!]^{w,g}\left(\lambda w'.[\![\gamma]\!]^{w',g}\right)$

To conclude this section, I illustrate semantic composition with an example derivation in (24). The chosen example moreover shows one standard way of resolving *type mismatch*. Type mismatch happens in many different contexts, but the most famous is that of quantificational objects of type $\langle\langle e, t\rangle, t\rangle$. The problem with these objects is that they cannot combine with transitive verbs of type $\langle e, \langle e, t\rangle\rangle$: neither is a function that has the other in its domain. To solve the type mismatch, the object is assumed to move via *quantifier raising* (QR) to a higher position. This movement is accompanied by a predicate abstraction step, signalled by the adjunction of a λ-binder that is identified with the index of the trace of the moved QP. This allows for the moved quantifier phrase *a cookie* to take its sister node as its argument, and to output a truth value (extensionally).

(24) **Example of composition with QR: *A student ate a cookie***



a. $[\![ate]\!]^{g,w} = \lambda x \lambda y[\text{ate}(x)(y)]$ (terminal node)
$[\![student]\!]^{g,w} = \lambda x[\text{student}(x)]$ (terminal node)
$[\![a]\!]^{g,w} = \lambda P \lambda Q \exists x[P(x) \wedge Q(x)]$ (terminal node)

b. $[\![①]\!]^{g,w} = \lambda y[\text{ate}(i)(y)]$ (by FA)

c. $[\![②]\!]^{g,w} = \lambda Q \exists x[\text{student}(x) \wedge Q(x)]$ (by FA)

d. $[\![③]\!]^{g,w} = \exists x[\text{student}(x) \wedge \text{ate}(i)(x)]$ (by FA)

e. $[\![④]\!]^{g,w} = \lambda y \exists x[\text{student}(x) \wedge \text{ate}(y)(x)]$ (by PA)

f. $[\![⑤]\!]^{g,w} = \lambda Q \exists y[\text{cookie}(y) \wedge Q(y)]$ (by FA)

g. $[\![⑥]\!]^{g,w} = \exists y \exists x[\text{student}(x) \wedge \text{ate}(y)(x) \wedge \text{cookie}(y)]$ (FA)
$= 1$ iff there is a student x and a cookie y in w such that x ate y in w

In most semantic derivations in the dissertation, I adopt the practice of omitting reference to the assignment function g; this is in order to declutter the interpretation function and make distinctions more salient. However, the assignment function is always at play when there are assignment-dependent expressions in the derivation (i.e. variables). The world variable w given to the interpretation function in (24) also appears only infrequently, given that most of the semantic operations relevant for this dissertation target propositions, i.e. functions from possible worlds to truth values. Finally, for reasons of space, the semantic contribution of tense is also ignored in the derivations presented in this dissertation.

2.1.3 Focus and contrastive topics

The syntax and semantics of focus are an important part of this dissertation. On the one hand, focus plays an essential role in the the syntactic and semantic analysis of additivity. On the other hand, the semantics of focus also connect with the semantics of questions (section 2.1.4) and therefore the analysis of discourse in terms of Questions Under Discussion (section 2.2.1). In what follows, I present the approach to focus that I adopt in this dissertation, i.e. that proposed within Alternative Semantics (Hamblin, 1973; Rooth, 1985, 1992).[9]

In Alternative Semantics, the interpretation of focus determined by syntactic F(ocus)-marking (Jackendoff, 1972). Syntax not only provides information to the PF about what (at least) should be prosodically marked as focused in the sentence[10], but also informs the semantic module about which parts of the whole expression should be interpreted in an adequate, F-sensitive way. It can therefore be assumed that F-marking is correlated with the presence of an interpretable focus feature in syntax.

The basic idea behind Rooth's (1985; 1992) focus semantics is that meaning is two-dimensional. One dimension of meaning constitutes the *ordinary* semantic value of an expression α, denoted

[9] Alternative approaches to focus semantics exist; see, for example, Krifka, 1999, 2001.
[10] See the discussion on *focus projection* at the end of this section.

by $[\![\alpha]\!]^o$, and the second dimension constitutes the *focus* semantic value of α, denoted by $[\![\alpha]\!]^f$ (Rooth, 1985). The focus semantic value can be intuitively described as a set of alternatives to α such that the F-marked part of α has been substituted with something of the same semantic type. For example, the ordinary semantic value of *Max*, when F-marked, is still whatever entity the interpretation function maps the expression *Max* to in M (25b). The focus semantic value, however, is a set of entities of the same type (25d). If the expression is not F-marked, the focus semantic value corresponds to the singleton set of the ordinary semantic value (25c). In this example and throughout the dissertation, F-marking is signalled with simple underlining.

(25) **Ordinary and focus semantic values**

a. $[\![\textit{Max}]\!]^o = \text{Max}$

b. $[\![\underline{\textit{Max}}]\!]^o = \text{Max}$

c. $[\![\textit{Max}]\!]^f = \{\text{Max}\}$

d. $[\![\underline{\textit{Max}}]\!]^f = \{x \mid x \in D_e\}$

The meaning of a complex expression that contains F-marking is computed using *pointwise functional application* (PFA) (Hamblin, 1973; Rooth, 1985, 1992). The reason why FA does not work for e.g. combining $[\![\underline{\textit{Max}}]\!]^f$ with $[\![\textit{laugh}]\!]^o$ is that there are no *sets* of e-type objects (such as the focus semantic value of *Max*) in the domain of the function denoted by the intransitive *laugh*, i.e. a function of type $\langle e, t\rangle$.

(26) **Pointwise functional application (PFA)**
If α is a branching node, $\{\beta, \gamma\}$ is a set of α's daughters, and the type of β is $\langle\sigma, \tau\rangle$ and the type of γ is $\langle\sigma, t\rangle$, then, for any possible world w and any assignment g, the type of α is $\langle\tau, t\rangle$, and
$[\![\alpha]\!]^{w,g} = \{f(x) \mid f \in [\![\beta]\!]^{w,g} \wedge x \in [\![\gamma]\!]^{w,g}\}$

The following example illustrates the simultaneous use of $[\![\cdot]\!]^o$ and $[\![\cdot]\!]^f$.

(27) **An example derivation with F-marking: *Alex loves <u>Max</u>***

a. $[\![\textit{Alex}]\!]^o = \text{Alex}$
$[\![\textit{Alex}]\!]^f = \{\text{Alex}\}$

b. $[\![\underline{\textit{Max}}]\!]^o = \text{Max}$
$[\![\underline{\textit{Max}}]\!]^f = \{x \mid x \in D_e\}$

c. $[\![\textit{loves}]\!]^o = \lambda y \lambda x[\text{loves}(y)(x)]$
$[\![\textit{loves}]\!]^f = \{\lambda y \lambda x[\text{loves}(y)(x)]\}$

d. $[\![\textit{loves}]\!]^o\big([\![\underline{\textit{Max}}]\!]^o\big) = \lambda x[\text{loves}(\text{Max})(x)]$ (by FA)

$[\![\textit{loves}]\!]^f\big([\![\underline{\textit{Max}}]\!]^f\big)$ $= \{\lambda x[\text{loves}(y)(x)] \mid y \in D_e\}$ (by PFA)

e. $[\![\textit{loves}\ \underline{\textit{Max}}]\!]^o\big([\![\textit{Alex}]\!]^o\big)$ $= \text{loves(Max)(Alex)}$ (by FA)

$[\![\textit{loves}\ \underline{\textit{Max}}]\!]^f\big([\![\textit{Alex}]\!]^f\big)$ $= \{\text{loves}(y)(\text{Alex}) \mid y \in D_e\}$ (by PFA)

The ordinary semantic value of *Alex loves Max* in (27e) is of type t. By abstracting over the world variable w (which does not appear in the notation, as announced at the end of section 2.1.2), we get its intension, i.e. the proposition $\lambda w[\text{loves(Max)(Alex)}(w)]$. However, as (27e) shows, the (intensionalised) focus semantic value of *Alex loves Max* is a set of propositions. The members of this set are called *alternatives* (ALT) (note that (28a) is a member of its own alternative set in (28b):[11]

(28) **Alternative sets**

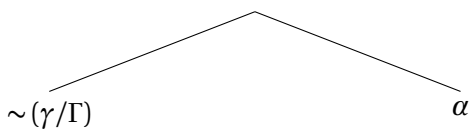
a. $p = \lambda w[\text{loves(Max)(Alex)}(w)]$

b. $ALT(p) = \{\lambda w[\text{loves(Max)(Alex)}(w)], \lambda w[\text{loves(Casey)(Alex)}(w)], ...\}$

As (28) and (27) make clear, the content of the alternative set is determined by what the alternatives of the F-marked expression are. This set is restricted contextually. For example, if *Alex loves Max* (27) is uttered in a context c, its interpretation does not make reference to the whole domain D_e, but only a subset of it, perhaps the set containing Alex, Max, Casey, and someone else. To implement this restriction, Rooth (1992) proposes that focus interpretation proceeds by picking up a contextual variable C whose denotation must stand in a specific relationship with the unrestricted focus value of p. For Rooth, this restriction (modelled as a presupposition: see section 2.2.2) is introduced by the squiggle operator ($\sim$). The squiggle first combines with a contextual variable, of which there are two kinds: individual (γ) and set (Γ). It then combines with the *prejacent* (α), which is a proposition. The presuppositional semantics of the squiggle are given below in (29). Note that the squiggle has the truth-conditional semantics of an identity function, meaning that it passes on the ordinary semantic value of the prejacent as is.

(29) **The presuppositional semantics of the squiggle operator** (Rooth, 1992, p. 19)

a.



(Squiggle(Contextual variable)) (Prejacent)

b. Set case: Γ $\sim(\Gamma)(\alpha)$ presupposes that

(i) $\Gamma \subseteq [\![\alpha]\!]^f$

(ii) $[\![\alpha]\!]^o \in \Gamma$

[11] Rooth (1992) and other authors propose that alternatives may be non-propositional (e.g. e-type entities or properties). I retain a propositional semantics throughout this dissertation.

(iii) $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![\alpha]\!]^o]$

c. Individual case: γ $\sim(\gamma)(\alpha)$ presupposes that
(i) $\gamma \in [\![\alpha]\!]^f$
(ii) $\gamma \neq [\![\alpha]\!]^o$

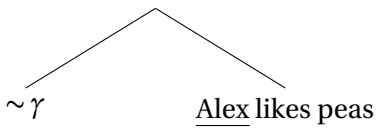
The semantics in (29) state that the contextually retrieved value for γ/Γ must either be a subset of the focus semantic value of α (set case), or a member of it (individual case). Moreover, the set and the individual case semantics include a distinctness constraint between α and some focus alternative of α that either is γ or is in Γ. This allows Rooth to analyse question-answer congruence and contrastive focus with the same formalism. The set case and its relation to question semantics will be discussed in the next section. Here, we will illustrate the workings of the squiggle through a brief look at the individual case.

Consider the exchange in (30a). The interpretation of focus in B's reaction requires the identification of an individual alternative γ. In the context at hand, γ can be resolved to *Max likes peas*. The presupposition of the squiggle is satisfied as long as γ is a member of the focus semantic value of α, i.e. *Alex likes peas*, and distinct from it. This is the case, and therefore the use of focus in (30a) is felicitous.

(30) **Contrastive focus**

a. A: Max likes peas
B: No, Alex likes peas

b.



c. $\alpha = [\![\textit{Alex likes peas}]\!]^f = \{\lambda w[\text{likes}(\text{peas})(x)(w)] \mid x \in D_e\}$

d. $\gamma = [\![\textit{Max likes peas}]\!]^o = \lambda w[\text{likes}(\text{peas})(\text{Max})(w)]$

e. $\gamma \in \{\lambda w[\text{likes}(\text{peas})(x)(w)] \mid x \in D_e\} \wedge \gamma \neq \alpha$

At this point, it should be noted that the squiggle, once it has used the focus semantic value of α in order to verify its presupposition, neutralises the semantic effect of F-marking within α. It does so by resetting the focus semantic value of α to the singleton set of its ordinary semantic value, as shown in (31). One of the main implications of the focus-neutralising property of the squiggle operator is that it leads to what have been dubbed *focus intervention effects* (Beck, 2006; Kotek, 2014). I postpone the discussion of focus intervention until section 2.1.4, where the semantics of *wh*-questions – i.e. the prime example of a focus intervention context – is introduced.

(31) **The focus-neutralising effect of the squiggle**

a. $[\![\sim(\Gamma)(\alpha)]\!]^o = [\![\alpha]\!]^o$

b. $[\![\sim(\Gamma)(\alpha)]\!]^f = \{[\![\alpha]\!]^o\}$

Now that we have seen how focus is interpreted semantically, it is time to introduce *focus-sensitive operators* into the picture. Formally, focus-sensitive operators can be analysed as propositional operators that quantify over Γ, i.e. a contextually restricted set of propositional focus alternatives. Examples of such operators are *only*, *even*, and *too* in English. As focus-sensitive operators are dependent on Γ, the placement of F-marking within the prejacent α determines what the contributed meaning is. The F-marked expression within the prejacent (for example, *Max* in *Alex loves Max*) is called the *associate* of the focus-sensitive operator.

Interestingly, a given focus-sensitive operator may affect either the truth-conditions of its host sentence – as is assumed to be the case for the exclusive *only* (Horn, 1969) – or its presuppositions, as is assumed to be the case for the scalar *even* and the additive *too* (Karttunen and Peters, 1979). The truth-conditional effect of the exclusive focus operator *only* is illustrated in (32). This example also highlights the importance of the placement of F-marking: because the associate of *only* in (32a) is *Alex*, the sentence is true iff Max gave books to nobody that is not Alex, but the change of associate to *books* in (32b) means that the sentence is true iff Max gave nothing to Alex that was not books (i.e. Max gave nothing besides books to Alex).

(32) **The focus-sensitivity of *only***

a. Max only gave books to Alex [→ Max gave books to nobody else]

b. Max only gave books to Alex [→ Max gave nothing else to Alex]

Formally, the exclusive *only* presupposes the truth of its argument proposition α in the evaluation world, and asserts that all alternatives β of α that are not entailed by α – i.e. all β that are logically stronger than α – are false at the evaluation world. The truth of α itself is assumed to be presupposed (Horn, 1969, a.o.). In contrast, scalar (*even*) and non-scalar (*too*) additives are standardly assumed to not affect the truth-conditions of the structure in which they appear. In short, additives have been argued to presuppose that some focus alternative of α in Γ that is distinct from α is true in addition to α (Karttunen and Karttunen, 1976; Karttunen and Peters, 1979).[12] In addition, scalar additives have been assumed to presuppose that the prejacent and the alternatives are ranked in a specific way with respect to their likelihood or probability (Karttunen and Peters, 1979). The semantics of scalar and exclusive focus particles will not be discussed further in this dissertation. Given that additive focus-sensitive operators are the topic of this dissertation, additivity as a phenomenon will be discussed in close detail separately in chapter 3.

[12] In some sense, exclusives and additives have opposite meanings under the traditional approach: while additives require that some alternative besides α is true, exclusives require that no alternative besides α (within a given (sub)set of alternatives) is true. See chapter 3 for an in-depth presentation of additivity.

A section on focus semantics would not be complete without the mention of contrastive topicality (Büring, 1997, 2003; Wagner, 2012; Büring, 2014). Just like F-marked foci, contrastive topics (or CTs) have been analysed as contributing alternatives to the semantic computation. In languages such as English, CTs are associated with a specific intonational contour (Jackendoff, 1972), a 'rise-fall-rise' contour (L*+H L-L% in ToBI-notation; this is Jackendoff's B-accent), whereas foci are associated with high pitch accent and a following low tone (H* L-; this is Jackendoff's A-accent) (Büring, 2003). An example is given in (33), where the contrastive topic is marked with the subscript CT, and the focused new information with F.

(33) **Contrastive topics**
[Who is eating what?]
Mary$_{CT}$ is eating spaghetti$_F$, and John is eating pizza$_F$

While the presence of F-marking on *spaghetti* evokes other alternative foods, and the simple focus semantic value of the first conjunct in (33) is a set of propositions, the presence of CT-marking adds another layer to this meaning. For Büring (2003), the *topic* semantic value of (33) is a set of sets of propositions such that each subset of the set is determined by some contrastive topic. In (33), for example, the topic semantic value consists of a set of propositions such that Mary ate x (where x is the F-marked focus) and a set of propositions such that John ate x. Büring (2014) proposes that the contrastive topic value of (33) should indeed be directly conceived of as a set of alternative *questions*, one for each contrastive topic, as in (34).[13] We will refer to this set as the CT-value of the sentence.

(34) **Contrastive topic values as questions**
{What is Mary eating?, What is John eating?, ...}
= {{Mary is eating spaghetti, Mary is eating pizza, ...},
{John is eating spaghetti, John is eating pizza, ...}, ... }

For Büring (2014, p. 4), the felicity of a sentence S with a contrastive topic and a focus, ie. S^{CT+F}, requires that there be at least one member in the CT-value of S^{CT+F} that is (i) currently pertinent, (ii) logically independent of the ordinary semantic value of S^{CT+F}, and (iii) identifiable. In other words, the CT-marking on *Mary* in (33) is felicitous because we can identify the pertinent and independent question *What is John eating?* in the CT-value of the first conjunct.[14] As will become clear in the next section, the idea of contrastive topics as determining 'superquestions' is also clearly present in many analyses of multiple-*wh* questions. In fact, the analysis of additivity frequently makes reference to contrastive topics too (Krifka, 1998; Rullmann, 2003; Zimmermann, 2015). Given the intimate relationship between focus and contrastive topics, this is not surprising.

[13] See Wagner (2012) for arguments for a 'flat', $\langle s\,t, t\rangle$-type denotation for sentences with a contrastive topic and a focus.

[14] By independent, Büring means that S^{CT+F} itself does not resolve the relevant question.

Before concluding, I want to briefly address two issues related to focus. The first is a question that was alluded to at the very beginning of this section, i.e. the question of what kind of relations are possible between prosodic prominence (i.e. pitch accent) and syntactic F-marking. There are two things to note. The first is that although pitch accent might fall on a particular phrase, the syntactic F-marking associated with it may expand or *project* beyond the limits of the accented phrase (Selkirk, 1996; Schwarzschild, 1999). This is illustrated in (35) (example cited from Beaver and Clark, 2008, p. 15). For clarity, I show the prosodically prominent phrase in capitals, and mark the projection of syntactic F-marking with single underlining (as usual).

(35) **Focus projection** (Partee, 1999, p. 544)

Mary bought a book about BATS

a. (What did Mary buy a book about?) Mary bought a book about BATS

b. (What kind of book did Mary?) Mary bought a book about BATS

c. (What did Mary buy?) Mary bought a book about BATS

d. (What did Mary do?) Mary bought a book about BATS

e. (What's been happening?) Mary bought a book about BATS

As (35) shows, the same way to pronounce the same string of words may be interpreted as being connected to a multitude of different background questions (given in parantheses). If one assumes that the semantics of focus and questions are tightly connected – as is the case in the general approach to question semantics adopted in this dissertation (see section 2.1.4) – then achieving question-answer congruence in (35) is impossible, unless the syntactic F-marking projects in the structure, so as to cover as much as the whole sentence when answering the question in (35e).

F-projection is not a fully free process. In general, it can be said that F-projection cannot extend beyond the limits of 'newness', meaning that constituents that are emphGiven cannot be F-marked (Selkirk, 1996; Schwarzschild, 1999). Schwarzschild defines Given constituents α as those that have a salient antecedent β, where β is the existential closure of α after all F-marked entities within α have been replaced with variables. Schwarzschild moreover proposes that F-marking is subject to an economy principle, so that it extends as minimally as is possible (Schwarzschild, 1999).

The second related issue concerns the phenomenon of *second occurrence focus* (Partee, 1999). In this case, what should be F-marked in syntax – which translates into a non-singleton focus semantic value of the phrase in the semantics – is not prosodically prominent. This happens when the associate of a focus-sensitive expression occurs for a second time, i.e. when it is Given. This is the case in (36), which is read as a dialogue between A and B. The crucial thing about (36) is that the prosodic marking on the associate *vegetables* is 'downgraded' from prominent (first occurrence in A's comment) to non-prominent (second occurrence in B's reaction):

(36) **Second occurrence focus** (Partee, 1999, p. 215)

A: Everyone knew that Mary only eats vegetables

B: If even Paul knew that Mary only eats vegetables, then he should have suggested a different restaurant

The conceptual problem with second occurrence focus is that it weakens the proposal that non-singleton focus semantic values are related to prosodic prominence through syntactic F-marking. If the associate in B's comment in (36) is not prosodically prominent, assuming that it is F-marked amounts to assuming that focus can be realised 'invisibly' (Partee, 1999). Partee argues that postulating the existence of prosodically invisible F-marking is undesirable, as it leads to multiple notions of focus. However, there is empirical evidence suggesting that second occurrence focus is *not* prosodically unmarked, and can be perceived by hearers (Jaeger, 2004; Beaver et al., 2007; Beaver and Clark, 2008). Therefore, in some cases, what seem like prosodically non-prominent associates may, in fact, be prosodically marked, and the relationship between prosodic prominence, syntactic F-marking, and non-singleton focus semantic values may be maintained. I refer the reader to Beaver et al., 2007 for more details on the acoustic correlates of second-occurrence focus.

To conclude, the analysis of focus (and of contrastive topics) within the framework of Alternative Semantics is now the standard way to approach the phenomenon. In this section, I introduced the basic compositional semantics of focus, the semantics of the squiggle operator, and the analysis of contrastive topics within this framework. Moreover, I discussed the relationship between actual prosodic prominence and syntactic F-marking, as well as the phenomenon of second-occurrence focus. All of these notions will be present in the analysis of additivity developed from chapter 4 onwards.

2.1.4 Interrogatives

As mentioned in section 2.1.1, the syntax of interrogativity involves – in many languages of the world – an overt long-distance dependency. Understandably, there is a substantial literature on the syntax of and semantics of interrogativity (Hamblin, 1973; Karttunen, 1977; see Dayal, 2016, and references therein). In this dissertation, interrogative syntax and semantics are relevant for the analysis of multiple uses of the bound additives *–kin* and *–kAAn*. The goal of this section is to present the basic assumptions concerning both the syntax and the semantics of interrogatives that will be adopted the analysis. Before discussing the specific analyses of single- and multiple-*wh* questions, I give a brief outlook of the properties of the approach I adopt.

In this dissertation, I model the syntax and semantics of interrogatives using the Q-particle approach of Kotek (2014) (which in turn is based on the work of Cable (2010) and Hagstrom (1998)). Under this analysis, overt movement of *wh*-phrases to the left periphery of the clause (the complementizer phrase, or CP) is driven by an uninterpretable $[uQ]$-feature present on a

functional head within the CP. The interpretable counterpart, $[iQ]$, is carried by a Q-particle that adjoins to a *wh*-DP. Following Cable (2010), Kotek (2014) assumes that within a given language, the syntactic projection property of the Q-particle determines whether the *wh*-DP overtly moves to the CP, or stays in situ. If the Q-particle projects (a QP), it moves with its *wh*-DP complement (if it moves); if it does not project, it may move alone, stranding the *wh*-DP in surface syntax.

Semantically, the Q-particle approach instantiates the propositional view of interrogative semantics. On this view, the meaning of an interrogative is a set of propositions, i.e. a function of type $\langle\langle s, t\rangle, t\rangle$. This set corresponds to a set of answers. For Hamblin (1973), all possible answers to the question, true or false, are contained in the denotation. For Karttunen (1977), only the true answers are. In this dissertation, I assume the former approach following Kotek (2014).[15]

There are essentially two main ways to get to the proposed question meaning under the propositional approach. The first, due to Hamblin (1973), is to take *wh*-phrases to denote sets of entities which compose with the rest of the structure using PFA, which was introduced in (26) in the context of focus semantics. Thus, under Hamblin's approach, question and focus semantics are two sides of the same coin: both F-marked phrases and *wh*-phrases denote sets of entities. The second way to derive sets-of-propositions question meanings is due to Karttunen (1977). Under Karttunen's approach, the *wh*-phrase is an existential quantifier phrase that always moves to the CP (at least in the semantics). In its high position, the existential quantifier scopes over a propositional variable, which leads to the creation of a set of propositions that vary in the value assigned to the variable that is bound by the *wh*-operator.

On the Q-particle approach that I adopt in this dissertation, *wh*-DPs denote sets of alternatives, as in Hamblin, 1973. However, *wh*-DPs are semantically deficient, in that they do not have a well-defined ordinary semantic value (Beck, 2006). The presence of a Q-particle is semantically obligatory, as the semantics of Q allow the whole structure to regain a well-defined ordinary semantic value (Beck, 2006; Kotek, 2014). However, both movement and in situ composition are possible (Kotek, 2014): the main difference is in the position at which the alternatives are introduced. Thus, the Q-particle approach is similar to both Hamblin- and Karttunen-semantics of interrogatives.

In what follows, I go through examples illustrating the syntax and semantics of interrogatives under the Q-particle approach. I begin with single-*wh* questions, and then move on to multiple-*wh* questions.

2.1.4.1 Single-*wh* questions

The most obvious surface difference in the syntax of single-*wh* questions from one language to another is the presence or absence of overt *wh*-movement targeting the CP. In Finnish, for ex-

[15] Again, there are other alternatives; for example, questions may be thought of as partitions of the logical space (Groenendijk and Stokhof, 1984), or as functions that map the short fragment answer to a proposition, as in the structured meaning approach (von Stechow, 1982; Krifka, 2001). As I only use the propositional approach in this dissertation, I will not discuss other approaches to interrogative semantics any further.

ample, the only wh-phrase of a single-wh question has to move overtly (Huhmarniemi, 2012); in Mandarin, the wh-phrase has to stay in situ (Huang, 1982); and finally, in French, the wh-phrase can either front or stay in situ (e.g. Cheng and Rooryck, 2000; Boeckx, 2000).

(37) ***Wh*-movement**

a. *Mi-tä Max ost-i t ?* [Finnish]
what-PAR Max.NOM buy-PAST.3SG
'What did Max buy?'

b. *Max maile shenme (-ne)?* [Mandarin]
Max buy what Q
'What did Max buy?'

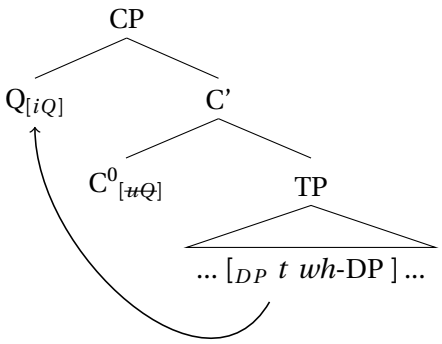
c. *Qu' est-ce que Max a acheté t ?* [French]
what Q Max AUX.PRES.3SG buy.PASTPART
'What did Max buy?'

d. *Max a acheté quoi?* [French]
Max AUX.PRES.3SG buy.PASTPART what
'What did Max buy?'

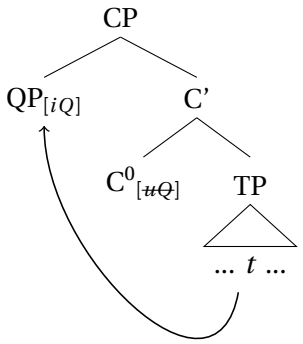
On the Q-particle approach, such differences in the overt syntax of *wh*-questions can be argued to be due to the projection or non-projection of Q; as mentioned above, when a projecting Q-particle is attracted to the CP, it takes the *wh*-DP with it, while a non-projecting Q-particle does not. The two types of movement – Q alone, or whole QP – are illustrated below in (38). They could be taken to represent for example Mandarin Chinese (38a) and Finnish (38b).

(38) **Q vs. QP movement**

a.



b.



Syntactically, the movement of Q or QP to the CP is due to the establishment of Agree between $[uQ]$ on C^0 – or, more traditionally, Foc^0 (Rizzi, 1997) – and $[iQ]$ on the Q-particle.

As mentioned above, Q-particles have an important semantic task. While the focus semantic value of a *wh*-DP is a set of entities, its ordinary semantic value is undefined (Beck, 2006). The presence of a Q-particle ensures that a structure that embeds a *wh*-DP comes to have a well-defined ordinary semantic value. Specifically, a Q-particle takes the focus semantic value of its sister α, i.e. the prejacent, and elevates it to be the new ordinary semantic value of the resulting node β, and sets the focus semantic value of the resulting node β to correspond to the singleton set of the ordinary semantic value of the resulting node β (Kotek, 2014). This is shown in (39). In single-*wh* questions, the focus semantic value of α is a set of propositions (type $\langle s\,t, t\rangle$). In multiple-*wh* questions with multiple Q-particles, the type of α may be more complex. For this reason, Kotek (2014, p. 66) provides a type-flexible denotation for Q.

(39) **The semantics of Q: α has no well-defined ordinary semantic value**

a. $[\![\mathrm{Q}(\alpha_\sigma)]\!]^o = [\![\alpha_\sigma]\!]^f$

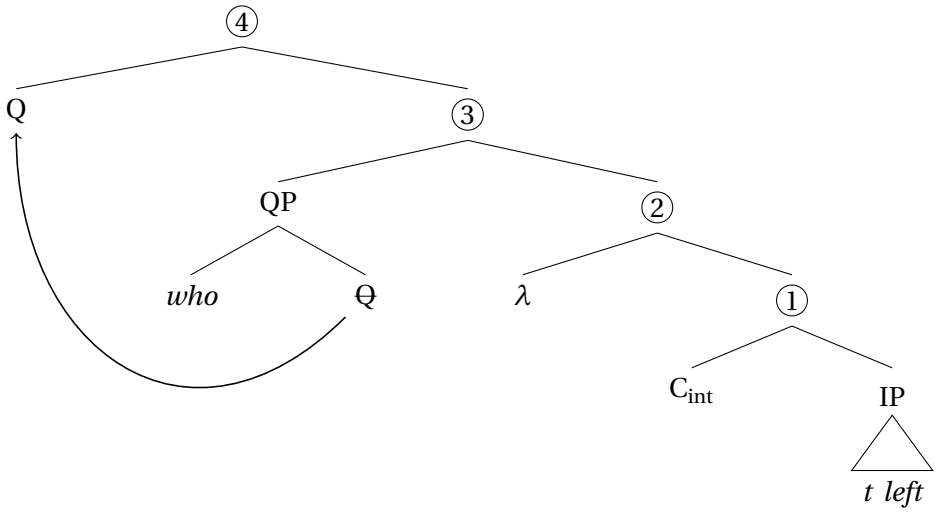
b. $[\![\mathrm{Q}(\alpha_\sigma)]\!]^f = \{[\![\alpha_\sigma]\!]^f\}$ (where $\sigma \in \{s\,t, \langle s\,t, t\rangle, \langle\langle s\,t, t\rangle, t\rangle, ...\}$)

In (40), I show an example derivation of a single-*wh* question involving a projecting Q-particle (Cable, 2010; Kotek, 2014). Due to the type-theoretic requirements of the Q-particle, Kotek proposes that at the latest at LF, the Q-particle adjoins to the clausal spine to be interpretable. Following Kotek, I assume that the denotation of the interrogative C^0 is an identity function. In (40), only the movement of Q is represented with an arrow. The movement of the QP triggers λ-abstraction at node ②.

(40) **Single-*wh* question derivation with movement of QP (Cable-Kotek)**

a. Who left?

b.



c. $[\![C_{\text{int}}]\!] = \lambda p[p]$
$[\![\textit{who}]\!]^o = \text{undefined}$
$[\![\textit{who}]\!]^f = \lambda x[\text{person}(x)]$

d. $[\![①]\!]^o = \lambda w[\text{left}(t)(w)]$
$[\![①]\!]^f = \{\lambda w[\text{left}(t)(w)]\}$

e. $[\![②]\!]^o = \lambda x \lambda w[\text{left}(x)(w)]$
$[\![②]\!]^f = \{\lambda x \lambda w[\text{left}(x)(w)]\}$

f. $[\![③]\!]^o = \text{undefined (because of } \textit{who})$
$[\![③]\!]^f = \{\lambda w[\text{left}(x)(w)] \mid \text{person}(x)\}$

g. $[\![④]\!]^o = \{\lambda w[\text{left}(x)(w)] \mid \text{person}(x)\}$
$[\![④]\!]^f = \{\{\lambda w[\text{left}(x)(w)] \mid \text{person}(x)\}\}$

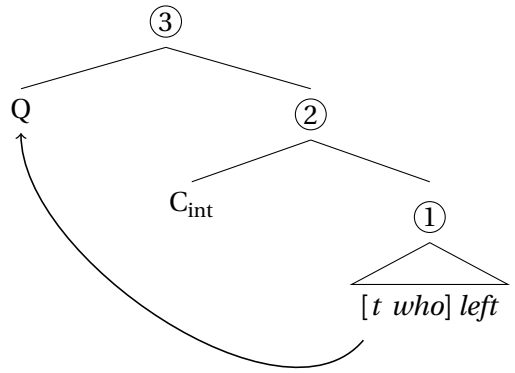
In (40), the question denotation is a set of propositions (type $\langle s\,t, t\rangle$) of the form *that x left*, where x is a person. The very close parallel with focus semantics should be apparent.

In (40), the whole QP moves to the CP. As mentioned above, the Q-particle approach also allows for a derivation where the *wh*-DP stays in situ. In this case, either the Q-particle is merged with the DP and moves alone to CP, or it is base-generated within the CP. In the latter case, either C^0 does not carry $[uQ]$, or its deletion via Agree is able to take place from the base-generation position. Crucially, when the *wh*-DP stays in situ, the ordinary semantic value of the structure is undefined for all nodes between the *wh*-DP and the Q-particle, as shown in (41).

(41) **Single-*wh* question derivation with movement of Q (Cable-Kotek)**

a. Who left?

b.



c. $[\![C_{int}]\!] = \lambda p[p]$
$[\![who]\!]^o$ = undefined
$[\![who]\!]^f = \lambda x[\text{person}(x)]$

d. $[\![①]\!]^o$ = undefined
$[\![①]\!]^f = \{\lambda w[\text{left}(x)(w)] \mid \text{person}(x)\}$

e. $[\![②]\!]^o$ = undefined
$[\![②]\!]^f = \{\lambda w[\text{left}(x)(w)] \mid \text{person}(x)\}$

f. $[\![②]\!]^o = \{\lambda w[\text{left}(x)(w)] \mid \text{person}(x)\}$
$[\![②]\!]^f = \{\{\lambda w[\text{left}(x)(w)] \mid \text{person}(x)\}\}$

Kotek (2014) argues that the type of in-situ composition shown in (41) is vulnerable to focus intervention effects (Beck, 2006). Recall that the semantics of focus involves the squiggle operator, which neutralises the effect of focus in its prejacent. If a squiggle intervenes between the *wh*-DP and Q, the focus semantic value of the structure will be set to the singleton set of the undefined ordinary semantic value. This means that both the ordinary and the focus semantic value of the structure will be undefined, and even Q will not be able to salvage the structure (cf. Beck, 2006).

As an example of focus intervention, consider (42) from Korean (Beck, 2006, p. 3):

(42) **Example of focus intervention in Korean**

a. **Minsu-man nuku-lûl po-ss-ni?*
Minsu-only who-ACC see-PAST-Q
Intended: 'Who did only Minsu see?'

b. *[Q ... [... only ~ ... [Minsu saw who]]]

Korean *wh*-phrases stay in situ in overt syntax. In (42), the *wh*-phrase is the object, while the F-marked associate of the exclusive focus particle *man* is the subject. Given that subjects c-command objects, the resulting configuration is one of focus intervention, as shown in (42b). If, however, the *wh*-phrase is scrambled left, as in (43a), no focus intervention effects arise, and the result is grammatical.

(43) **Avoiding focus intervention by scrambling**

a. *Nuku-lûl Minsu-man po-ss-ni?*
who-ACC Minsu-only see-PAST-Q
'Who did only Minsu see?'

b. [Q ... [who [... only ~ ... [Minsu saw t_{who}]]]

Focus intervention will not play a major role in this dissertation. However, it will come up especially in the discussion of the multiple-*wh* use of bound additives in chapters 4 and 7.

Let us now take a look at the syntax and semantics of multiple-*wh* questions.

2.1.4.2 Multiple-*wh* questions

In multiple-*wh* questions, it is generally the case that if only one *wh*-phrase undergoes *wh*-movement to the CP, it is the *wh*-phrase (or, more precisely, QP) closest to the interrogative C^0 that does. This closeness requirement has been encoded as the principle of *Attract Closest*:[16]

(44) **Attract Closest** (Chomsky, 1995)
α can raise to target K only if there is no legitimate operation *Move* β targeting K such that β is *closer* to K

If Agree is defined as in (15), Attract Closest can be thought of as an inherent condition on Agree. For Q-based movement, the principle in (44) then states that even if many QPs carry $[iQ]$ and are in principle able to Agree with C^0, it must be the closest agreeing goal (Q or QP) that moves to the specifier of the probe (C^0). For the purposes of Attract Closest, closeness is defined as asymmetric c-command between β and α: β is closer to K than α if K c-commands β and β c-commands α (Pesetsky and Torrego, 2001).

In *wh*-questions, the effects of Attract Closest are often called *Superiority effects* (Chomsky, 1973). Due to Attract Closest, the initial c-command relations between the QPs determine to a large extent which QP is fronted in languages where only one QP fronts, or in which order QPs are fronted in languages where more than one QP fronts (e.g. in Slavic: Rudin, 1988; Richards, 1997; Bošković, 2002a). In (45), I illustrate Superiority with Finnish, where only one *wh*-phrase is fronted in multiple-*wh* questions. As (45) shows, the subject-*wh* can undergo *wh*-movement,

[16] Attract Closest is closely related to other locality principles such as Relativised Minimality (Rizzi, 1990) and the Minimal Link Condition (Chomsky, 1995).

but due to to Attract Closest, fronting the object-*wh* over the structurally higher subject-*wh* leads to ungrammaticality (i.e. a Superiority effect).

(45) **Superiority in Finnish**

a. *Kuka t näk-i kene-t?*
who.NOM see-PRES.3SG who-ACC
'Who saw whom?'

b. **Kene-t kuka näk-i t?*
who-ACC who.NOM see-PRES.3SG

In Bulgarian, multiple *wh*-phrases move to the CP (Rudin, 1988). As (46) shows, only one surface order of the QPs is allowed in Bulgarian; the subject-*wh* must precede the object-*wh*.

(46) **Superiority in Bulgarian** (Rudin, 1988, p. 472)

a. *Koj kogo vižda?*
who what saw
'Who saw what?'

b. **Kogo koj vižda?*
what who saw

The grammatical order of Bulgarian *wh*-phrases can be explained if we assume that after the first CP-targeting *wh*-movement, further movements targeting the same projection must 'tuck in' under the landing position of the first *wh*-phrase. Richards (1997) proposes that the tucking-in effect is due to the economy principle *Shortest*, shown in (47). In essence, Shortest requires that the chain created by movement be as short as possible (i.e. it spans as few nodes as possible). As targeting a specifier that is underneath the first-moved *wh*-phrase leads to a well-formed chain that is shorter than what would be derived by targeting a position that is above the first-moved *wh*-phrase, the tucking-in option is enforced in Bulgarian.

(47) **Shortest** (Richards, 1997)
A pair P of elements $\{\alpha,\beta\}$ obeys Shortest iff there is no well-formed pair P' which can be created by substituting γ for either α or β, and the set of nodes c-commanded by one element of P' and dominating the other is *smaller* than than the set of nodes c-commanded by one element of P and dominating the other

Thus, generally, if all other things are equal, Attract Closest forces the structurally highest *wh*-phrase to move first (if any *wh*-phrase is to move at all). Moving structurally lower *wh*-phrases across higher *wh*-phrases leads to Superiority effects. Moreover, if other, lower *wh*-phrases undergo *wh*-movement – be it overtly or covertly – they do so in respect of Shortest, and tuck in.

However, all other things are not always equal; it is well-known that there are ways to escape Superiority. In English, for example, discourse-linked (or D-linked) *wh*-phrases can be fronted in either order (Pesetsky, 1987).[17]

(48) **No Superiority with D-linked *wh*-phrases in English**

a. Which student t read which book?

b. Which book did which student read t?

Pesetsky (2000) proposes that Superiority-violating multiple-*wh* questions involve *feature movement*. Under this analysis, the *wh*-phrase that is in situ in surface syntax stays in situ at LF, and only the relevant feature moves. In a related vein, Kotek (2014) proposes that the surface structures of the two examples in (48) may correspond to two different derivations. First, it is possible exactly one projecting Q-particle is present in the structures (respectively). This particle is adjoined to either the hierarchically higher subject (48a) or the hierarchically lower object (48b), and that QP then moves overtly to the CP. As there is only one Q-particle, there can be no other, closer goal for C^0 to Agree with; hence, there are no Superiority effets. The second option involves two Q-particles. Of these two particles, only one projects, and the movement of that QP (subject in (48a), object in (48b)) to CP is therefore visible. In sum, for Kotek (2014), the structure in (48b) does not violate Attract Closest: even if there is a subject-adjoined Q present in the structure, it can well have been covertly attracted to the CP before the object-QP. The object-QP is then predicted to tuck in under it (by Shortest), but will nevertheless appear to be higher in linear surface syntax.

This brings us to the meaning of multiple-*wh* questions. As was mentioned above, the propositional view of question semantics assumes that the meaning of a question is the set of its possible answers (Hamblin, 1973). When an interrogative contains two *wh*-phrases, two types of answers are possible: single-pair (49a) and pair-list (or multiple-pair) (49b).

(49) **Single-pair and pair-list answers**
Who read what?

a. Alex read *Anna Karenina*

b. Alex read *Anna Karenina*, and Max read *War and Peace*

In the literature, these two types of answers have been linked to two types of question denotations: (i) sets of propositions, or (ii) sets of sets of propositions. The former – shared with single-

[17] Moreover, in e.g. Serbo-Croatian, which is a multiple-*wh*-moving language like Bulgarian, both subject-object and object-subject orders are possible (Rudin, 1988). Bošković (2002a) argues that this pattern is not an exception to Shortest, because the overt movements of *wh*-phrases take place for different syntactic reasons: in particular, both *wh*- and focus-movement are at play. According to Rudin (1988), the difference between Bulgarian and Serbo-Croatian (and other languages that behave like them) is instead that in Bulgarian, all wh-phrases target the CP, while in Serbo-Croatian, only one *wh*-phrase does, and the rest are adjoined to the IP.

wh questions – corresponds to a set of propositions which each differ from one another at least on the value of one *wh*-phrase. Let us call this a *multiple focus* question interpretation. The latter denotation corresponds to a *family of questions*, where one of the *wh*-phrases acts as a 'sorting key' (see below).

To take an example, imagine a context where two individuals make up the domain of *who* (say, a and b), and two cakes make up the domain of *which cake* (say, c_1 and c_2). The difference between the two types of multiple-*wh* question denotations can then be illustrated informally as in (50).

(50) **Possible denotations for *Which person tasted which cake?***

a. Multiple focus: $\{a$ tasted c_1, b tasted c_1, a tasted c_2, b tasted $c_2, ...\}$

b. Family of questions: $\{\{a$ tasted c_1, a tasted $c_2, ...\}, \{b$ tasted c_1, b tasted $c_2, ...\}\}$

The two structures in (50) represent two readings of multiple-*wh* questions: the single-pair reading (a) and the multiple-pair reading (b). Now, it is generally assumed that every question has a unique true answer. This requirement can be introduced as a presupposition via an answerhood operator (Dayal, 1996, 2002; Kotek, 2014)). A single-pair answer then singles out that one true proposition from the set of propositions that makes up the denotation of the question. A multiple-pair answer, however, specifies more than one pair of values for the *wh*-phrases. As the structure of the family of questions in (50b) shows, the hierarchically higher *wh*-phrase – in this case, *who* – is the sorting key, which means that the multiple-*wh* question evokes two *subquestions* that pertain to the values of *who*, namely *Which cake did a taste?* and *Which cake did b taste?*. With a family of questions denotation, the answer is presupposed to select the unique true answer to each subquestion within the family of questions.

Under the Q-particle approach, English multiple-*wh* questions that allow (or require) a single-pair answer may be derived in at least two different ways (for details, see Kotek 2014). First, we may assume that only one *wh*-DP appears with a Q-particle. That Q-particle projects, and the QP moves to the CP. At LF, the Q-particle exits the QP to adjoin to the clausal spine. Because both *wh*-DPs are incorporated in the structure before Q is interpreted, the focus semantic value of the structure before Q is a set of propositions where the values of the two *wh*-DPs vary. Q takes this set and makes it the ordinary semantic value of the structure. This first option yields a multiple focus denotation.

The second option is to merge both *wh*-DPs with a projecting Q-particle, have both QPs move to SpecCP at the latest at LF, and have both Q-particles adjoin to positions that are higher than both *wh*-DPs. In this case, the denotation of the question is a family of questions due to the the presence of two Qs. However, given that no Q-particle intervenes between the *wh*-DPs, the answerhood operator applies to a singleton set, and requires that there be a unique, maximally informative answer to the only subquestion the family contains (Kotek, 2014). In other words, technically the denotation of the question is a family of questions on this second option, but the

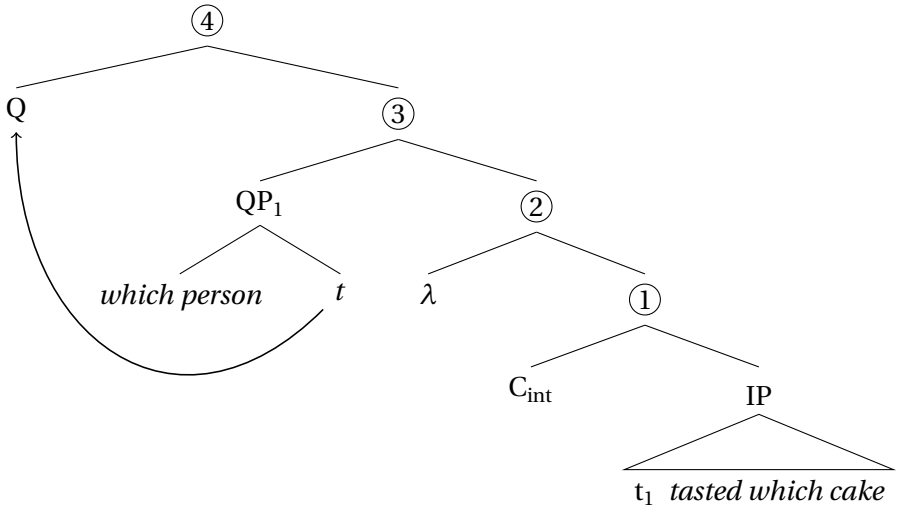
answer must nevertheless be single-pair.

In (51), I illustrate the first option, where only one Q-particle is present.

(51) **Multiple-*wh* question derivation: Multiple focus/single-pair (Cable-Kotek)**

a. Which person tasted which cake?

b.



c. $[\![C_{int}]\!] = \lambda p[p]$
$[\![\textit{which person}]\!]^o$ = undefined
$[\![\textit{which person}]\!]^f = \lambda x[\text{person}(x)]$
$[\![\textit{which cake}]\!]^o$ = undefined
$[\![\textit{which cake}]\!]^f = \lambda x[\text{cake}(x)]$

d. $[\![①]\!]^o$ = undefined (because of *which cake*)
$[\![①]\!]^f = \{\lambda w[\text{tasted}(x)(t)(w) \mid \text{cake}(x)\}$

e. $[\![②]\!]^o$ = undefined (because of *which cake*)
$[\![②]\!]^f = \lambda y\{\lambda w[\text{tasted}(x)(y)(w)] \mid \text{cake}(x)\}$

f. $[\![③]\!]^o$ = undefined (because of *which cake* and *which person*)
$[\![③]\!]^f = \{\lambda w[\text{tasted}(x)(y)(w)] \mid \text{cake}(x), \text{person}(y)\}$

g. $[\![④]\!]^o = \{\lambda w[\text{tasted}(x)(y)(w) \mid \text{cake}(x), \text{person}(y)\}$
$[\![④]\!]^f = \{\{\lambda w[\text{tasted}(x)(y)(w) \mid \text{cake}(x), \text{person}(y)\}\}$

In (51g), the denotation of the one-Q multiple-*wh* question is a set of propositions of the form *that y tasted x*, where y ranges over people, and x over cakes. Therefore, a question derived in this way receives a single-pair answer.

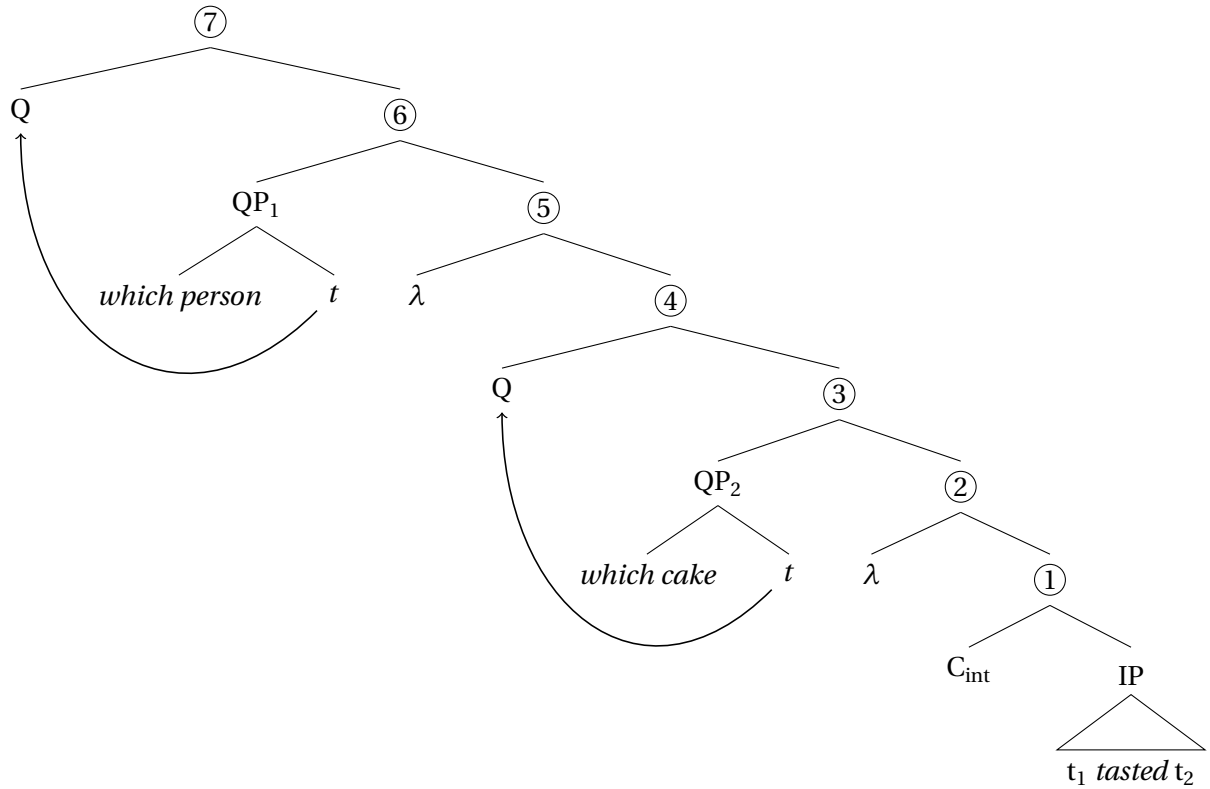
In multiple-pair questions, there are two Q-particles. Crucially, the *wh*-DPs are interpreted "sandwiched" in between them, regardless of whether the *wh*-DPs is in situ or in SpecCP. In (52), I show the derivation of a Superiority-obeying multiple-*wh* question with two QPs (Kotek, 2014).

The denotations of *which cake* and *which person* are as in (51). The end result, i.e. the family of questions in (52i), contains subquestions that ask, for each person y, which cake x was eaten by y.

(52) **Multiple-*wh* question derivation: Family of questions/multiple-pair (Cable-Kotek)**

a. Which person tasted which cake?

b.



c. $[\![①]\!]^o = \lambda w[\text{tasted}(t_2)(t_1)(w)]$
$[\![①]\!]^f = \{\lambda w[\text{tasted}(t_2)(t_1)(w)]\}$

d. $[\![②]\!]^o = \lambda x \lambda w[\text{tasted}(x)(t_1)(w)]$
$[\![②]\!]^f = \lambda x\{\lambda w[\text{tasted}(x)(t_1)(w)]\}$

e. $[\![③]\!]^o =$ undefined (because of *which cake*)
$[\![③]\!]^f = \{\lambda w[\text{tasted}(x)(t_1)(w)] \mid \text{cake}(x)\}$

f. $[\![④]\!]^o = \{\lambda w[\text{tasted}(x)(t_1)(w)] \mid \text{cake}(x)\}$
$[\![④]\!]^f = \{\{\lambda w[\text{tasted}(x)(t_1)(w)] \mid \text{cake}(x)\}\}$

g. $[\![⑤]\!]^o = \lambda y\{\lambda w[\text{tasted}(x)(y)(w)] \mid \text{cake}(x)\}$
$[\![⑤]\!]^f = \lambda y\{\{\lambda w[\text{tasted}(x)(y)(w)] \mid \text{cake}(x)\}\}$

h. $[\![⑥]\!]^o$ = undefined (because of *which person*)
$[\![⑥]\!]^f = \{\{\lambda w[\text{tasted}(x)(y)(w)] \mid \text{cake}(x)\} \mid \text{person}(y)\}$

i. $[\![⑦]\!]^o = \{\{\lambda w[\text{tasted}(x)(y)(w)] \mid \text{cake}(x)\} \mid \text{person}(y)\}$
$[\![⑦]\!]^f = \{\{\{\lambda w[\text{tasted}(x)(y)(w)] \mid \text{cake}(x)\} \mid \text{person}(y)\}\}$

2.1.4.3 Summary

In sum, under the Q-particle approach, the syntax of *wh*-questions (i) involves Agree between the $[iQ]$-feature on the Q-particle and the $[uQ]$-particle on C^0 (or whichever functional head is at play), and (ii) links overt movement to the CP to the projection properties of the Q-particle on the one hand, and to general principles like Shortest on the other. Semantically, the Q-particle is responsible for the well-formedness of any structure that contains a *wh*-phrase: its role is to elevate the focus semantic value of its sister node to be the new ordinary semantic value. In multiple *wh*-questions, the relative positions of Q-particles and *wh*-phrases determine whether the denotation is a multiple focus structure (single-pair answers), or a family of questions (multiple-pair answers). Moreover, the area between Q-particles and the *wh*-phrase is vulnerable to focus intervention by e.g. the squiggle operator (Rooth, 1992; Beck, 2006; Kotek, 2014).

2.2 Semantics-pragmatics

Section 2.1 was concerned with the basic syntactic and semantic assumptions that are made in this dissertation. In the two previous subsections, we discussed the domains of focus and questions in more detail, and noted that there is a clear formal parallel between the two. In this section, we will see how these two notions are connected to pragmatics and discourse. I begin by introducing the components of discourse that I make use of in the analysis of additivity. I then give a brief review of a type of meaning – namely, *presupposition* – which is often assumed to refer to the discourse model, and which features prominently in the semantic analysis of additivity.

2.2.1 Discourse components

One way to think about the purpose of discourse is in terms of acquiring, negociating, and simply exchanging information. The goal of discourse can then be considered to consist in answering one very important question: *How is the world?* (cf. Roberts, 1996). If we model discourse in this way, it is important that we have a means for keeping track of which pieces of information have been established thus far.

A standard way to model the acquired information is through the notions of *common ground* (cg) and *context set* (cs) (Stalnaker, 1973). The common ground is a set of propositions that all discourse participants accept as true of the world of their actual world: for example, a banal cg could contain *that snow is white*. Crucially, the information contained in the common ground

is *shared* by all discourse participants. The context set, in turn, is simply the intersection of the common ground (i.e. the set of all worlds that are viable options for being the actual world). Formally, the goal of any discourse is to reduce the context set cs to a singleton set, i.e. the set that consists only of the actual world. As each proposition in the common ground encodes some information about the actual world, adding more and more propositions to the common ground leads to stricter conditions on belonging to the context set, and hence, the restriction of the context.

In this dissertation, I adopt the modelisation of context structure proposed by Farkas and Bruce (2010), who rely on foundational work by Hamblin (1971), Stalnaker (1973, 1978) and Carlson (1983), and incorporate features from earlier work by Ginzburg (1996), Gunlogson (2001) and Asher and Lascarides (2003). Crucially, while the main idea remains the same – discourse is thought of as an incremental process of acquiring and negotiating information – Farkas and Bruce' model includes not only a common ground and a context set, but also different types of components that allow for a more fine-grained classification of different types of information.

First, if the goal of discourse is to find out what the world is like, this question is only answered through answering smaller, easier-to-answer questions. These questions are called Questions Under Discussion (QUDs) (Roberts, 1996). By answering QUDs, discourse participants provide new information incrementally, getting closer and closer to the answer of the big question. In the model proposed by Farkas and Bruce (2010), QUDs are stored on the $Table$. The $Table$ has a push-down stack structure, and stores items that correspond to pairs of syntactic objects and their denotations. Besides QUDs, Farkas and Bruce propose that discourse participants may also use the $Table$ to propose additions to the cg, i.e. to make specific update proposals that then can be reacted upon by other discourse participants. In this model, the immediate goal of the conversation is to empty the $Table$. This is done by answering the QUDs in the stack, and agreeing or disagreeing with the update proposals – or more generally, by settling the issues on the Table (cf. Roberts, 1996).

As we saw in section 2.1, there is a clear theoretical connection between questions on the one hand, and F-marking-containing assertions on the other. On a QUD-based approach, this correspondance makes it easy to model certain model-internal dependencies. For example, although the QUD might not be explicitly given in the context, the F-pattern of an assertion indicates which QUDs it can address. Within such a model, an assertion that targets the QUD that is on the top of the $Table$, i.e. first in line to be solved, is called *at-issue* (Simons et al., 2010), and corresponds intuitively to the 'main point' of the utterance. The F-based fit between a QUD and an assertion allows discourse participants to identify the QUD that is being addressed, or to accommodate QUDs that are otherwise implicit (Beaver and Clark, 2008).[18]

As mentioned above, the common ground is assumed to only contain propositions on whose

[18]Inversely, semantic content that does not address the immediate QUD has been classified as *non-at-issue*. This type of content, which is represented for example by appositive relative clauses (AnderBois et al., 2015), is sometimes argued to be directly added to the common ground, without passing through a propositional phase at the $Table$.

truth all discourse participants agree. However, the participants do not always agree. In Farkas and Bruce's model, a separate component tracks the participants' individual public discourse commitments: DC_X (where X is a variable for discourse participant). The separation of the common ground and the individual public discourse commitments allows the conversation to be in a state where discourse participants A and B publicly express their disagreement on an issue p: in this case, neither p nor $\neg p$ is in cg, but the participants' public discourse commitment sets contain p and $\neg p$, respectively.

Finally, the model that Farkas and Bruce propose contains one more component that plays an important role in their analysis of canonical and uncanonical expressions of (dis)agreement with assertions, and canonical and uncanonical ways of addressing questions. This component, the *projected set* (ps), tracks canonical future common grounds. These common grounds are supersets of the current cg, and correspond to a canonical output cg after the most pressing issue or QUD has been settled. For example, the canonical way to remove a proposal to update the cg with an assertive item is for the discourse participants to agree to add the proposition to the cg. As the authors put it, "an assertion projects confirmation in that it projects a future common ground that includes the asserted proposition" (p. 88). When the $Table$-item is a question, the ps consists in a set of common grounds, each including a possible answer to the question.

In this dissertation, I will make extensive use of the components cg, $Table$, and DC_x, and leave ps aside. A schematic representation of Farkas and Bruce's (2010) discourse model is shown in Figure 2.1.

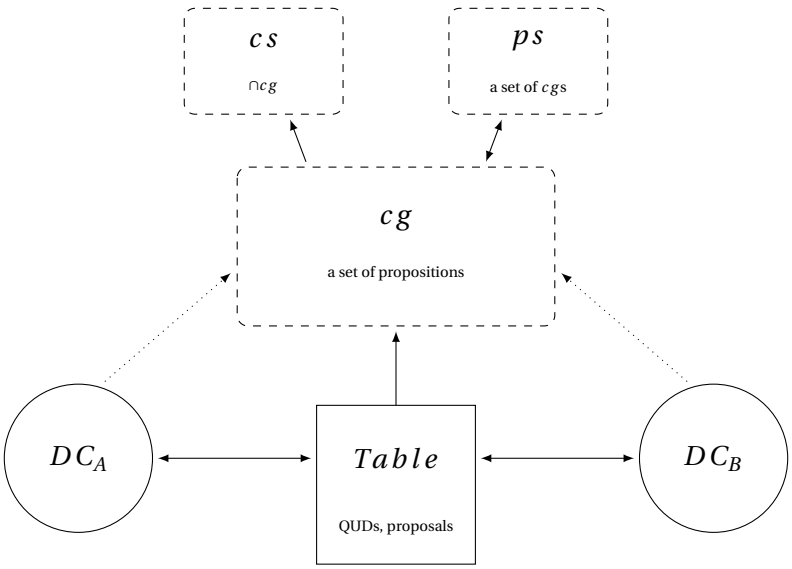


Figure 2.1: Discourse components in Farkas and Bruce 2010

As we have seen, all information stored in the cg is public, i.e. shared by all discourse participants. However, a lot of information may also be stored privately. For instance, discourse participants have access to sets of propositions that describe what they might believe, know, and wish for; while these propositions may not be public, or even true of the actual world, they are nevertheless

accessible to them.

Since Kratzer's seminal work on modality (Kratzer, 1977, 1981, 1991), such sets of propositions have been analysed using the notion of *conversational backgrounds*. A conversational background is a function from an evaluation world to a set of propositions. The use of different conversational backgrounds results in different "flavours" of modality, a phenomenon that is easy to illustrate with examples containing modal auxiliaries. To begin, in (53), both *may* and *must* are naturally interpreted as relating a permission and an obligation, respectively. The conversational background is deontic: it yields a set of propositions describing rules and/or duties in the evaluation world. In (53), *may* is read as expressing deontic possibility, and *must*, deontic necessity. To make the contribution of the deontic conversational background explicit, both examples could be preceded by the phrase *In view of what the rules in w are* (Kratzer, 1977).

(53) **Modal auxiliaries *may* and *must*: deontic flavour**

a. Casey may dance with Andy

b. Casey must dance with Andy

In (54), however, where only tense has been modified with respect to (53), we naturally interpret *may* and *must* as evoking epistemic possibility and necessity. In other words, instead of referring to what the rules or duties are in w, we refer to what is known in w. Here, the examples could be preceded by the phrase *In view of what is known in w*.

(54) **Modal auxiliaries *may* and *must*: epistemic flavour**

a. Casey may have danced with Andy

b. Casey must have danced with Andy

Thus, modal expressions are existential or universal quantifiers over sets of worlds. Under Kratzer's analysis, the set of worlds they quantify over is in fact determined by two conversational backgrounds: a *modal base* (f), which is circumstantial or epistemic, and an *ordering source* (g), which is stereotypical (referring to what is *normal*), deontic (referring to what the *rules* or *laws* are), bouletic (referring to what is *wanted*), or teleological (referring to *goals*). The intersection of the output of a modal base (i.e. a set of possible worlds) consists of those worlds that are either circumstantially or epistemically equivalent with the evaluation world (depending on which modal base is used). An ordering source is used to further restrict this set so that it corresponds to a set of worlds that is closest to an *ideal* determined by the contents of the ordering source.

In other words, modals are interpreted through the use of a conversational background, but they do not quantify over all worlds that are in the intersection of the set of propositions that the conversational background outputs, but only those that are ideal according to some ordering source.[19] So far, I have not mentioned discourse-participants in any way. They come in play

[19]In modal semantics, it is often assumed that there is a unique set of worlds that are ideal according to a given

when we take into account that modals are interpreted not only relative to conversational backgrounds, but also an *individual* (a subject, an attitude holder, or a speaker) and a *time* (of an event, an attitude event, or a speech event) (Hacquard, 2006). Thus, we can say that the epistemic assessment of the situation in (55) is *anchored* to the speaker, i.e. a discourse participant; the preceding sentence could now be *In view of what Alex knows now, Casey must have been home at a past time.*

(55) (Alex:) Casey must have been home

In the proposal put forth in this dissertation, conversational backgrounds play an important role in the semantic analysis of the polar use of bound additives. Moreover, the contextual determination of the relevant conversational backgrounds can be seen as a direct source of inspiration for the general analysis of additives as being 'flexible' in a number of discourse-sensitive ways.[20]

In conclusion, the formal model of discourse contexts adopted in this dissertation contains a number of different sets of propositions (the common ground cg, the public discourse commitments of a discourse participant DC_X, sets of propositions that are derived through conversational backgrounds $f(w)$ and $g(w)$), and a stack of QUDs (the $Table$). All of these components will be shown to be relevant for the analysis of the meaning of bound additives in Finnish in the later chapters of this book.

2.2.2 Presupposition and implicatures

We now turn our attention to two types of meaning that are often characterised as pragmatic, beginning with presuppositions.

Presuppositions are often analysed as definedness or admittance conditions (Frege, 1892; Strawson, 1950; Heim, 1983; Beaver, 2001; Heim and Kratzer, 1998). As such, they impose constraints on the contexts in which the sentences from which they arise can be used. Technically, the admittance condition view requires the context to entail the content of the presupposition for the sentence carrying the presupposition to be admitted as an update of the context (Heim,

ordering source g, i.e. that the *Limit Assumption* holds (Lewis, 1973; Stalnaker, 1987). The semantics of the ordering relation is shown below in (55) (Kratzer, 1981; Portner, 2009). What (a) states is that a world w will be better or at least as good as a world z with respect to an ordering source X iff all propositions of X that are true at z are also true at w (and perhaps more). The operator *Best* in (b) returns the set of worlds w where the most propositions of the ordering source X are true (Portner, 2009).

(i) Ordering
For any set of propositions X and any worlds $w, z \in W$:

a. $w \leq_X z$ (w is at least as good as z) iff $\{p|p \in X \wedge z \in p\} \subseteq \{p|p \in X \wedge w \in p\}$

b. $Best_{g(w)}(\cap f(w)) = \lambda w'.w' \leq_{g(w)} w$

[20]Warm thanks to David Beaver for suggesting this connection.

1983).[21] If this requirement is not satisfied, the update process is halted; in this case, either the update is simply discarded, or the presupposition is *accommodated*, i.e. spontaneously added to the common ground (Lewis, 1979; Heim, 1983, 1990), so that the attempted update can proceed normally. For example, consider the sentence *My dog is furry*. Under the definedness condition view, if I utter *My dog is furry*, the truth-value of the sentence will be defined only if I have a dog. However, I can use *my dog* naturally even when the context does not yet entail that I have a dog. In this case, my hearer has to accommodate the required piece of information, and proceed to interpret my utterance in a new, 'repaired' context.

Another way to view presupposition is due to Stalnaker (1973, 1974, 1978, 1999, 2002), for whom presupposition is a property of the speaker, and not a sentence. Under this view, speaker presuppositions correspond to those propositions whose truth the speaker takes for granted (Stalnaker, 1973). In other words, presupposing can be conceived of as a propositional attitude that holds between a speaker and a proposition. At best, propositions have *presupposition requirements*, which dictate the presuppositional conditions under which utterances may be used appropriately. Under this view, a speaker who utters sentence *My dog is furry* presupposes the proposition $p =$ *that I have a dog* "just in case he is disposed to act, in his linguistic behaviour, as if he takes the truth of p for granted, and as if he assumes that his audience recognises that he is doing so" (Stalnaker, 1973, p. 448). The 'acting as if' allows the speaker to actually communicate presuppositions that they take to be false.[22] More interestingly for our purposes, as a result of a speaker acting as if the truth of p can be taken for granted – i.e. that it is common ground between the discourse participants that p is true – p in fact becomes common ground, unless the other discourse participants have reason to doubt the speaker's authority on p. This means that speakers may introduce new information to the common ground by essentially forcing other discourse participants into an accommodation process. This type of presupposition is sometimes called *informative presupposition*; indeed, for Stalnaker (1973, p. 449), "the central [informative] purpose of making a statement may be to communicate a presupposition which is required by a statement". Thus, under Stalnaker's view, accommodation can be seen a process of adjusting the common ground so as to get the presuppositions of all discourse participants to align.

A third way of viewing presuppositions is in terms of anaphora and binding (Sandt, 1992; Geurts, 1999). The detailed discussion of this approach is left for section 3.3.1, where some analyses of additivity that rely on this view are presented. Indeed, all three types of approaches to presupposition are used in the analysis of additivity: while additive presuppositions are in most cases analysed as definedness or admittance conditions, analyses based on the binding approach (van der Sandt and Geurts, 2001; Geurts and van der Sandt, 2004) and the speaker presupposi-

[21] On the dynamic semantics view, the meaning of a sentence consists in its *context change potential*. The context (or more precisely, the common ground) is a body of information, and that body of information can be potentially changed by each incoming update. Formally, a context change potential is thus a function from contexts to contexts (Heim, 1983).

[22] This means that technically, the common ground may contain information that some discourse participants only pretend to accept as true.

tion view (Kapitonov, 2012) also exist. The proposal that is put forth in this dissertation is couched within the speaker presupposition approach. While additives themselves carry no presuppositions on this view (at best, they impose a presupposition requirement, as mentioned above), I will nevertheless sometimes talk as if they did (especially in chapters that precede the actual analysis in 5). This way of talking about additives is also used when discussing analyses that do not rely on a Stalnakerian approach to presupposition in chapter 3.

Generally, presuppositions – regardless of how they are analysed specificallycally – are set apart from other types of meaning, such as truth-conditional meaning and conversational implicatures (Grice, 1975), by the use of *projection tests* (Karttunen, 1973; Beaver, 2001; Simons et al., 2010). For example, presuppositions are unaffected by negation (i.e. they *project* past it unchanged): thus, (the use of) the negative (56a) still presupposes that the speaker has a dog. Accordingly, Karttunen classifies negation a *presupposition hole*. Modals, antecedents of conditionals, and questions also function as presupposition holes, and all examples in (56) thus share the same presupposition: that the speaker has a dog.

(56) **Presupposition projection**

a. *My dog* is not furry

b. *My dog* might be sick

c. If *my dog* is sick, I need to take it to the vet

d. Is *my dog* sick?

Presuppositions are also, to a large extent, uncancellable – although they may be filtered out in contexts where their content is *entailed* (e.g. within a conjunction) (Karttunen, 1973). Some presuppositions do, however, seem to differ from each other in whether they may be defeated or not. Abusch (2010) classifies expressions that trigger presuppositions into *hard* and *soft* triggers, where presuppositions from the former are impossible to defeat, and those arising from the latter may be defeated in some contexts. For example, it has been argued that the additive presupposition of non-scalar additive focus particles such as *too* is hard, while the additive presupposition that often accompanies scalar focus particles such as *even* is soft:

(57) **Soft vs. hard triggers: Additive presupposition**

a. I'm not sure if Laura is here. # If Susanna is here, too, then...

b. I'm not sure if Laura is here. If even Susanna is here, then...

In (57a), the additive *too* triggers roughly the presupposition that it must be the case that someone else besides Susanna is there. Given that no such piece of knowledge has been established (as is explicitly stated in the preceding sentence), the use of *too* is supposedly infelicitous. With *even*, however, the additive inference seems to be defeatable: the use of *even* is felicitous in (57b).

In contrast to presuppositions, which are tied to specific lexical elements and typically (but not universally, as we have seen above) refer to information that is backgrounded and taken for granted, implicatures may or may not be tied to a lexical element, and typically provide new information. The general Gricean tradition (Grice, 1975) distinguishes between conventional and conversational implicatures, where the former are always associated with a linguistic convention – i.e. a specific form – and the latter are either generalised, and therefore also associated with a linguistic form, or particularised, in which case they arise simply from context-based reasoning concerning the speaker's communicative intentions.[23] A paradigmatic example of conventional implicature is the sense of contrast or incompatibility expressed by the connective *but* in (58): the truth-conditional meaning of the sentence is that Mary is rich and Mary is unhappy, and the part of the meaning that indicates that richness and unhappiness usually do not go together is brought in via the use of *but* (as can be shown by observing the disappearance of this inference when *but* in (58) is replaced with *and*). Conventional implicatures are thus tied to specific lexical elements.

(58) **Conventional implicature: *but***
Mary is rich but unhappy [⇝ Richness and unhappiness contrast]

Conventional implicatures and generalised conversational implicatures both arise from the use of specific lexical expressions. However, conventional implicatures may never be cancelled, whereas generalised conversational implicatures may. One example of generalised conversational implicature comes from the quantifier *some* (Horn, 1972; Grice, 1975; Levinson, 2000; Geurts, 2010). When *some* is used, it is mostly understood as implying the falsity of a corresponding universal statement; in other words, *some* is interpreted as *some but not all*. This inference is standardly called a *scalar implicature*. On the Gricean view, the scalar implicature (*not all*) arises from the hearer's reasoning on the speakers intentions: the speaker could have used the logically stronger *all*, but did not. Hence, there is probably some reason that they did not; perhaps, for example, using *all* would have lead to a false statement. In (59), for example, the scalar implicature of the sentence is that not all students have red hats. Crucially, in some contexts, this implicature does not arise (cf. conventional implicatures, which are always present). This is the case when the speaker can be assumed to not be able to know whether all students have red hats, for example. Moreover, as mentioned above, the scalar implicature may be overtly contradicted or cancelled by a continuation such as *In fact, all students have red hats* for (59).

(59) **Generalised conversational implicature (scalar implicature): *some***
Some students have red hats [⇝ Not all students have red hats]

[23] Note that conventional implicatures may also project. Simons et al. (2010) propose that projection is a property of non-at-issue meaning, which encompasses both presupposition and conventional implicature.

Finally, particularised conversational implicatures are detached from specific lexical expressions, and arise through general reasoning about the intentions and mental states of a speaker. Thus, upon hearing (60) at midnight at a bar, a conversationally competent hearer will be able to infer that the intent of the speaker who utters (60) is to propose that it is time to go home.

(60) **Particularised conversational implicature**
I have a really early morning tomorrow [⇝ It is time to go home]

In this dissertation, implicatures play a much smaller role than presupposition. However, implicatures do make an appearance in e.g. the description of some peripheral properties of additivity, and in some earlier analyses of the phenomenon. In addition, as will be shown in chapter 3, some current approaches to additivity use the grammatical process of exhaustification, which is also used for deriving scalar implicatures within the grammar (Chierchia, 2006; Chierchia et al., 2011; Chierchia, 2013). Thus, the meaning of additivity, while predominantly couched within a presuppositional semantics, is also connected to the domain of implicature.

2.3 Finnish

I begin this section by giving a brief typological and diachronic presentation of Finnish. I then proceed to discuss the syntax of finite clauses in Finnish (section 2.3.2), and conclude with a section devoted to CP-related phenomena (section 2.3.3).

2.3.1 A brief typological and diachronic note

Finnish (Finnic, Finno-Ugric, Uralic) is spoken by approximately 5.4 million people, most of which reside in Finland.[24] Other Finnic languages are spoken across the Gulf of Finland (Estonian, with approximately 1.1 million speakers[25]) and to the east and southeast of Finland (e.g. Karelian, Livvi-Karelian and Ludian, with approximately 36 000 speakers in total[26]).

Inside the Uralic language family, Finnic languages are most closely related to the Sami languages and the Mordvinic languages. Finland is home to three Sami languages: Northern Sami (with approximately 2000 speakers in Finland, and 25 700 speakers in total[27]), and the smaller Inari and Kolt Samis (approximately 300 speakers each[28]), which are only spoken in Finland (Northern Sami and some other Sami languages are also spoken in the states of Norway, Sweden, and Russia). The Mordvinic languages of Erzya and Moksha are spoken in Western Russia and have

[24] Source: https://www.ethnologue.com/language/fin, consulted on September 11, 2017.
[25] Source: https://www.ethnologue.com/language/ekk, consulted on September 11, 2017.
[26] Source: https://www.ethnologue.com/language/krl, consulted on September 11, 2017.
[27] Source: https://www.ethnologue.com/language/sme, consulted on September 11, 2017.
[28] Sources: https://www.ethnologue.com/language/smn and https://www.ethnologue.com/language/sms, consulted on September 11, 2017.

approximately 115 000 and 5000 speakers, respectively.[29] The most widely spoken language in the Finno-Ugric and Uralic group is Hungarian, with approximately 13 million speakers.[30]

According to current estimates, approximately 4000 years separate modern Finnish from the expansion of Proto-Uralic in the Volga river and Ural mountains area (Kallio, 2006; Häkkinen, 2009). One of the western varieties of Proto-Uralic then further expanded into Proto-Finnic, Proto-Sami, and Proto-Mordvinic. This happened south of the Gulf of Finland at the earliest around 1000 BCE (Kallio, 2006). Proto-Finnic was spoken until around the beginning of the Common Era, and by 500 CE, Proto-Finnic had expanded into separate dialects and languages (Kulonen, 2002; Lehtinen, 2007). For a long time, Finnish was only used for spoken communication. The first attempts to standardise it were made by bishop Mikael Agricola in the 16th century Agricola published the first books written in Finnish: *Abckiria* 'Abc book' in 1543, and *Se Wsi Testamenti* 'The new testament' in 1548.

2.3.2 *v*P- and IP-related phenomena

Like other Uralic languages, Finnish is agglutinative, and makes use of 16 morphological cases. Instead of the standard DP-structure, I adopt the common assumption that the highest projection over noun phrases in Finnish is KP (for *Kase*) (Reime, 1992, 1993). In this dissertation, case does not play an important role, and it will therefore not be discussed further here (see e.g. Holmberg and Nikanne, 1993).

It is standardly assumed that the syntax of finite clauses in Finnish is as shown in (61a) (Vainikka, 1989; Mitchell, 1991; Holmberg et al., 1993; Holmberg, 2001; Holmberg and Nikanne, 2002).

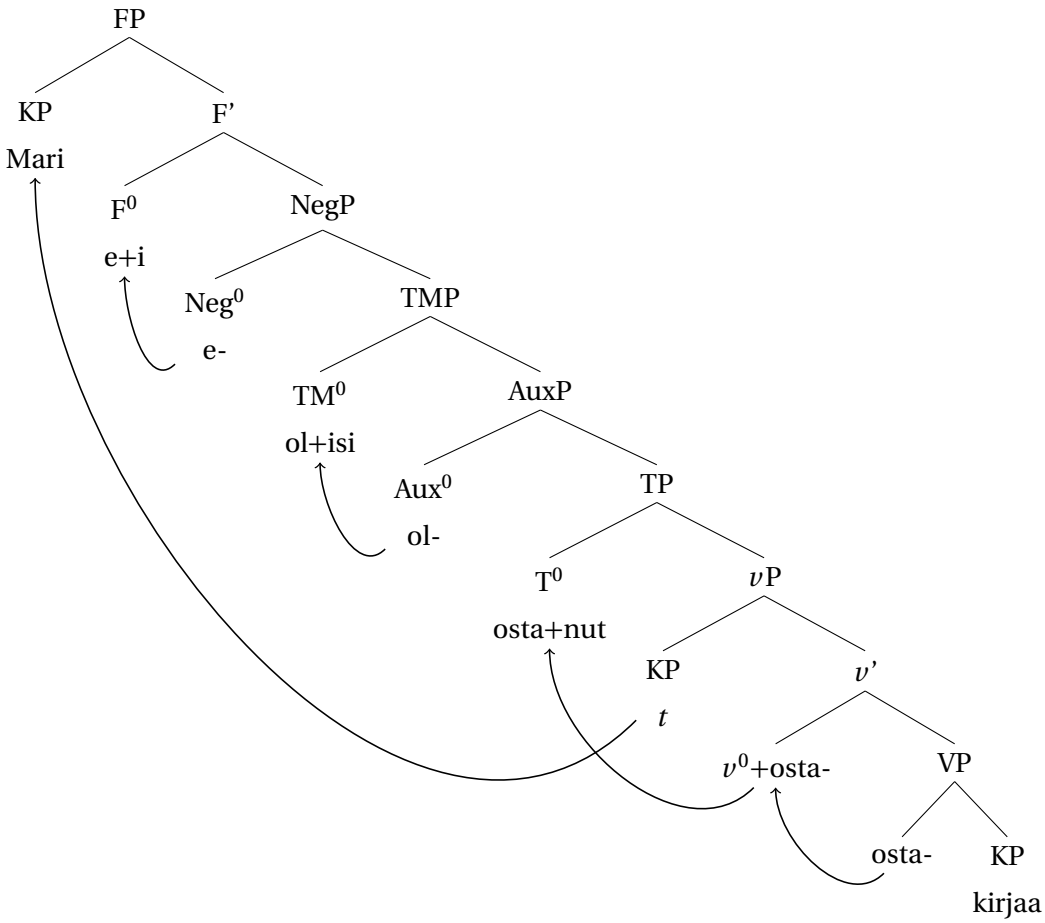
(61) a. F(inite)P > Neg(ation)P > T(ense)M(ood)P > Aux(iliary)P > T(ense)P > *v*P > VP

b. *Mari* *e-i* *ol-isi* *osta-nut* *tä-tä* *kirja-a*
Mari.NOM NEG-3SG be-COND buy-PASTPTC this-PAR book-PAR
'Mari would not have bought this book'

c.

[29] Sources: https://www.ethnologue.com/language/myv/20 and https://www.ethnologue.com/language/mdf/20, consulted on September 11, 2017

[30] Source: https://www.ethnologue.com/language/hun, consulted on September 11, 2017.



From bottom up, the finite clause contains a standard vP-shell, housing the subject in spec,vP and the VP as a complement. Just above vP is a T-projection where present and past participle morphemes are housed; the VP-externality of this projection is argued for by Holmberg and Nikanne (2002) based on adverb positioning. In (61), the lexical verb moves through v^0 to T^0, collecting the past participle morpheme. The next projection upwards is where the Finnish (non-negative) auxiliary *olla* 'to be' is generated. If present, it moves to the next projection, TMP (for TenseMood, Holmberg and Nikanne 2002), to pick up the conditional suffix –*isi*– in (61). Finnish negation is an auxiliary marked for person and number but not tense, and hence it is arguably generated in a NegP just above TMP. From there, it moves to FP (for FiniteP, Holmberg and Nikanne 2002) in order to be marked for ϕ-features. SpecFP is the position that houses subjects and/or objects interpreted as topics. Usually, it is proposed that due to an $[EPP]$ feature in FP, some category must move to SpecFP in Finnish, but it must not necessarily be the subject, and movement to SpecFP is hence uncoupled from ϕ-agreement and case-feature-checking.

2.3.3 CP-related phenomena

In this section, I introduce a number of CP-related phenomena that will be useful in the analysis developed in this dissertation.

2.3.3.1 Word order

I begin the review of CP phenomena by considering the possible orderings of the subject, verb, and object in Finnish. A syntactic analysis of these orders is given below in section 2.3.3.2.

While the basic word order in Finnish is SVO, almost all other permutations are also possible. However, each permutation is linked to a specific information-structural configuration. First, the canonical order SVO is used when both subject and object are discourse- old, when both are discourse-new, and when the subject is discourse-old and the object is discourse-new (Vilkuna, 1989, 1995).

(62) **SVO: [$\mathbf{s}_{old}$ **v** $\mathbf{o}_{old}$, $\mathbf{s}_{new}$ **v** $\mathbf{o}_{new}$, $\mathbf{s}_{old}$ **v** $\mathbf{o}_{new}$]**
Mari *luk-i* *Soda-n* *ja* *rauha-n*
Mari.NOM read-PAST.3SG war-ACC and peace-ACC
'Mari read *War and Peace*'

The other subject-initial word order, SOV, is used when the subject is stressed and interpreted as contrastive (signalled with capital letters) (Hakulinen and Karlsson, 1979).

(63) **SOV: [$\mathbf{S}_{contr}$ $\mathbf{o}_{old}$ **v**]**
MARI *Soda-n* *ja* *rauha-n* *luk-i* *(e-i-kä* *Joni)*
Mari.NOM war-ACC and peace-ACC read-PAST.3SG NEG-3SG-and Joni.NOM
'It was Mari who read *War and Peace* (not Joni)'

The first object-initial OVS order is used when the object is discourse-old and the subject is discourse-new (Hiirikoski, 1995).

(64) **OVS: [$\mathbf{o}_{old}$ **v** $\mathbf{s}_{new}$]**
Soda-n *ja* *rauha-n* *luk-i* *Mari*
war-ACC and peace-ACC read-PAST.3SG Mari.NOM
'Mari read *War and Peace*'

In the second object-initial order, OSV, when the subject precedes the verb, the object must be stressed and is interpreted as contrastive (Hakulinen and Karlsson, 1979).

(65) **OSV: [$\mathbf{O}_{contr}$ $\mathbf{s}_{old}$ **v**]**
SODA-N *JA* *RAUHA-N* *Mari* *luk-i* *(e-i-kä* *Anna Karenina-a)*
war-ACC and peace-ACC Mari.NOM read-PAST.3SG NEG-3SG-and Anna.Karenina-PAR
'It was *War and Peace* that Mari read (not *Anna Karenina*)'

Finally, verb-initial orders (VSO, VOS) are not as usual as the other orders, but VSO can be felicitously used to emphasise or insist on the truth of the sentence (Välimaa-Blum, 1988; Vilkuna, 1995).

(66) **VSO: [$\mathbf{V}_{contr}$ $\mathbf{s}_{old}$ $\mathbf{o}_{old}$]**
LUK-I *Mari* *Soda-n* *ja* *rauha-n*
read-PAST.3SG Mari.NOM war-ACC and peace-ACC
'Mari did read War and Peace'

Most examples in this dissertation involve the basic SVO order. The OVS order makes an appearance in the description of the double contrast use in section 4.6.

2.3.3.2 The left periphery

According to Vilkuna (1995), the Finnish left periphery contains at least two positions: one for topics and topic-like constituents, and another above it for contrastive constituents ('kontrastive' constituents in Vallduví and Vilkuna 1998). In the word orders reviewed before, fronted contrastive constituents move to the CP overtly.

In Finnish, contrastive expressions evoke alternatives (cf. Rooth 1985), but they might be *discourse-new* (rhematic) or *discourse-old* (thematic). While contrastive constituents are either very high in the structure (SpecCP in Vilkuna 1995) or in situ, non-contrastive thematic and rhematic constituents occupy lower positions. In Vallduví and Vilkuna 1998, thematic constituents are situated in the IP (more specifically, in SpecIP) and rhematic constituents stay in the VP. As we saw above, the relevant IP position is called FP in Holmberg et al. 1993 and Holmberg and Nikanne 2002. Holmberg and Nikanne argue that this position is the highest position of the finite clause, and hosts both subjects and topics (for example, the discourse-old objects of the OVS order).

(67) **The distribution of Kontrastive (K) and Rhematic (Rh) phrases**
$[_{\text{CP}}$ [+K, ±Rh] ... $[_{\text{FP}}$ [−K, −Rh] ... $[_{v\text{P}}$ [−K, +Rh]]]]

In her discussion of the Finnish left periphery, Kaiser (2006) notes that Finnish also allows topics to precede kontrastive constituents in restricted contexts, namely, in the presence of preposed negation:

(68) **Kontrastive phrases may be preceded by topics in some contexts**

a. **Jussi* *HEVOSE-N* *ost-i*
Jussi.NOM horse-ACC buy-PAST.3SG
Int. 'Jussi bought a HORSE'

b. *E-i* *Jussi* *HEVOS-TA* *osta-nut*
NEG-3SG Jussi.NOM horse-PAR buy-PASTPART
'It wasn't a horse that Jussi bought'

Kaiser proposes that preposed negation lands in a PolP (for *polarity*), evoking a TopP just above the position hosting contrastive elements. Brattico et al. (2013) propose that the full CP also contains a projection of Force (Rizzi, 1997), housing the complementizer *että*, as in (69). As the example shows, the complementizer and the preposed negation may either appear as separate words, or the preposed negation may cliticise onto the complementiser.

(69) **Complementizer *että* and preposed negation**
Mari *tietä-ä* { *että* *e-i* / *ett-e-i* } *Jussi* *HEVOS-TA*
Mari.NOM know-PRES.3SG that NEG-3SG that-NEG-3SG Jussi.NOM horse-PAR
osta-nut
buy-PASTPART
'Mari knows that it was not a horse that Jussi bought'

In sum, the Finnish left periphery, at its fullest, is as shown in (70). Here and throughout the rest of this dissertation, I follow common practice and use the label Foc(us)P for KontrastiveP. Because it houses topics, FP is included in (70) although it is strictly speaking not part of the left periphery.

(70) **The left periphery of Finnish**
ForceP > PolP > TopP > FocP > FP

2.3.3.3 *Wh*-interrogatives

In this section, I discuss the syntax and semantics of *wh*-interrogatives in Finnish. The discussion is based on the presentation of the Q-particle approach in section 2.1.4. The reason why single- and multiple-*wh* interrogatives are discussed both from a general and a Finnish perspective is that their syntax and semantics are highly relevant for parts of the distribution of bound additives (see e.g. sections 4.5 and 4.7).

As in English, Finnish *wh*-interrogatives are formed syntactically by fronting one *wh*-phrase to the CP. It has been argued that the landing position of *wh*-movement is the same position that is targeted by fronted contrastively focused phrases (Vilkuna, 1995; Huhmarniemi, 2012). In (71), I give examples of both a matrix and an embedded single-*wh* interrogative in Finnish.

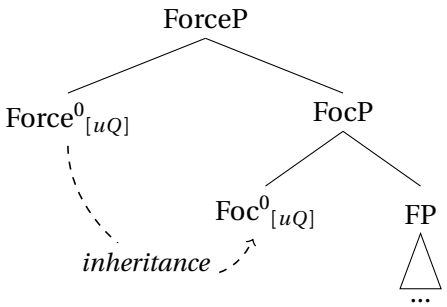
(71) **Matrix and embedded single-*wh* interrogatives**

a. *[$_{FocP}$ Minkä kirja-n [$_{FP}$ Mari luk-i t]]?*
which.ACC book-ACC Mari.NOM read-PAST.3SG
'Which book did Mari read?'

b. *Halua-n tietä-ä [$_{ForceP}$ (että)*
want-PRES.1SG know-INF that
[$_{FocP}$ minkä kirja-n [$_{FP}$ Mari luk-i t]]]
which.ACC book-ACC Mari.NOM read-PAST.3SG
'I want to know which book Mari read'

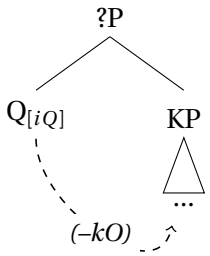
Brattico et al. (2013) propose that FocP attracts *wh*-phrases in *wh*-interrogatives due to a feature that it inherits from interrogative Force^0. Following Kotek (2014) (and Cable, 2010), I assume that the relevant feature that is passed from Force^0 to Foc^0 is $[uQ]$. This feature is deleted through Agree with $[iQ]$ on the Q-particle. Note that as (71b) shows, embedded *wh*-interrogatives may contain the overt complementiser *että*, which is situated in Force^0 (Brattico et al., 2013). The same complementiser also heads embedded declarative clauses. As the embedded clause in (71b) is typed as interrogative, I conclude that *että* does not encode clause type, and that it is semantically inert.

(72) **Feature inheritance from Force^0 to Foc^0 in *wh*-interrogatives (Brattico et al., 2013)**



I furthermore assume that when they appear within an interrogative clause, Finnish *wh*-phrases are always merged with a Q-particle carrying an interpretable feature $[iQ]$, which acts as a goal for Foc^0 and thus contributes to driving *wh*-movement in Finnish (Cable, 2010; Kotek, 2014). This analysis is supported by the fact that in Finnish, there is an overt morpheme that arguably marks the presence of the Q-particle, i.e. *–kO* (Holmberg, 2014), and this particle may sometimes be cliticised directly to the *wh*-phrase. (An example of such a structure will be given below.) The internal structure of Finnish *wh*-phrases therefore resembles the structure shown in (73), where the dashed arrow indicates some type of marking process (this process will be discussed briefly).

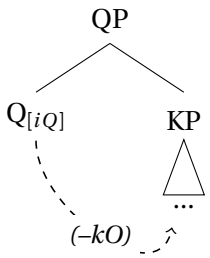
(73) **Internal structure of *wh*-phrases in interrogative clauses (non-final)**



In (73), the highest node is unlabeled. Given that I assume that Q-particles directly adjoin to *wh*-KPs in *wh*-interrogatives, and given that Finnish shows overt *wh*-movement, a Kotek-style syntax-semantics for Finnish *wh*-interrogatives should involve a syntactically projecting Q-particle. This is because Kotek follows Cable (2010) in assuming that overtly fronted *wh*-phrases necessarily involve the movement of a maximal projection of Q. Non-projecting Q-particles move to the CP alone (after agreeing with the $[uQ]$-carrying head) (see section 2.1.4).

When the Q-particle is overtly realised in Finnish, it is realised as a clitic (see section 2.3.3.5). The status of Q as a clitic independently excludes syntactic movement of the clitic without the host (e.g. Kayne, 1994). Therefore, the overt movement of QP in Finnish does not necessarily entail that Q projects. I nevertheless follow Cable (2007, 2010) and Kotek (2014) and propose that Q projects. Not much hinges on this choice.[31]

(74) **Internal structure of *wh*-phrases in interrogative clauses (final)**



In (74), a dashed arrow connects the Q-clitic and its host KP; when *–kO* is realised, it is realised as an enclitic. I will not discuss or develop the exact mechanism or process that "lowers" the morphological marker *–kO* onto the KP any further; I simply note that such processes are implicitly assumed in e.g. some accounts of Finnish case marking (Nikanne, 1993). The main reasons for why I opt for a left-adjoining Q that morphologically marks its host with *–kO* are that this

[31] In chapter 7, I propose a more detailed syntax for *wh*-phrases.

choice (i) allows me to maintain a LCA-compliant structure (Kayne, 1994), and (ii) it leaves the Q-particle free to move without its host at LF. Indeed, I follow Kotek (2014) in assuming that at LF, the Q-particle adjoins to the clausal spine (i.e. to FocP) in order to resolve a type-mismatch.

The LF of a matrix single-*wh* interrogative is shown in (75). In (75), the focus semantic value of *minkä kirjan* 'which book' is a set of books $\{x \mid \text{book}(x)\}$, or equivalently, $\{b_1, b_2, ...b_n\}$, where b is a book.

(75) **An example derivation of a single-*wh* interrogative**

a. **Surface syntax of FocP**

[$_{FocP}$ Minkä kirja-n [$_{FP}$ Mari luk-i t]]?

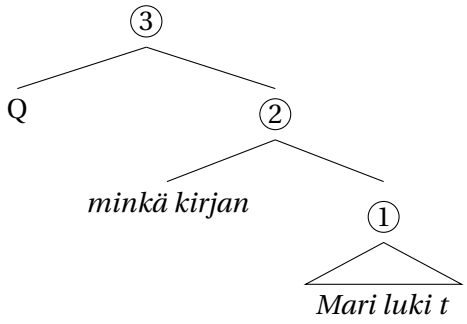
which.ACC book-ACC Mari.NOM read-PAST.3SG

'Which book did Mari read?'

b. **LF of FocP**

[$_{FocP}$ Q *minkä kirjan* λ [$_{FP}$ *Mari luki t*]]

c.



d. $[\![①]\!]^o = \lambda w[\text{read}(t)(\text{Mari})(w)]$

$[\![①]\!]^f = \{\lambda w[\text{read}(t)(\text{Mari})(w)]\}$

e. (λ-abstraction over t)

$[\![②]\!]^o =$ undefined because of *minkä kirjan*

$[\![②]\!]^f = \{\lambda w[\text{read}(b_1)(\text{Mari})(w)], \lambda w[\text{read}(b_2)(\text{Mari})(w)], ...\}$

$= \{\lambda w[\text{read}(x)(\text{Mari})(w)] \mid \text{book}(x)\}$

f. $[\![③]\!]^o = \{\lambda w[\text{read}(b_1)(\text{Mari})(w)], \lambda w[\text{read}(b_2)(\text{Mari})(w)], ...\}$

$= \{\lambda w[\text{read}(x)(\text{Mari})(w)] \mid \text{book}(x)\}$

$[\![③]\!]^f = \{\{\lambda w[\text{read}(x)(\text{Mari})(w)] \mid \text{book}(x)\}\}$

As mentioned above, the idea that *wh*-phrases come with an adjoined Q-particle in *wh*-interrogatives is supported by the fact that *wh*-phrases may be overtly marked with *–kO*, especially when followed by another discourse particle *–hAn*, as in (76a) (see section 2.3.3.5 for discussion on discourse particles). As *–hAn* resists embedding, only matrix questions involving the clitic combination *–kOhAn* on the *wh*-phrase are acceptable.

(76) **Matrix and embedded single-*wh* interrogatives with *–kOhAn***

a. *[$_{FocP}$ Minkä-kö-hän kirja-n [$_{FP}$ Mari luk-i t]]?*
which.ACC-Q-HAN book-ACC Mari.NOM read-PAST.3SG
'Which book did Mari read (I wonder)?'

b. *# Halua-n tietä-ä [$_{ForceP}$ että*
want-PRES.1SG know-INF that
[$_{FocP}$ minkä-kö-hän kirja-n [$_{FP}$ Mari luk-i t]]]
which.ACC-Q-HAN book-ACC Mari.NOM read-PAST.3SG
Int. 'I want to know which book Mari read (I wonder)'

As was noted in section 2.1.4.2, Finnish multiple-*wh* interrogatives involve only one instance of overt *wh*-movement; the second *wh*-phrase stays in situ in surface syntax (Huhmarniemi and Vainikka, 2011).

(77) **Multiple-*wh* interrogative**
[$_{FocP}$ Minkä kirja-n [$_{FP}$ Mari luk-i t milloin]]?
which.ACC book-ACC Mari.NOM read-PAST.3SG when
'Which book did Mari read when?'

In this dissertation, multiple-*wh* interrogatives feature heavily in sections 4.7 and 7.3, where the multiple-*wh* use of the bound additive *–kin* is discussed and analysed. I therefore postpone the detailed discussion of Finnish multiple-*wh* interrogatives until then.

2.3.3.4 Polar interrogatives

In Finnish, the syntax of polar interrogatives always involves the attachment of the Q-marking enclitic *–kO* to a fronted tensed verb (Holmberg, 2014).[32] This is shown in (78), which also shows that the landing position fo the fronted verb is standardly assumed to be FocP (as with *wh*-phrases).

(78) **Matrix and embedded polar interrogatives**

a. *[$_{FocP}$ Läht-i-kö [$_{FP}$ Mari t]]?*
leave-PAST.3SG-Q Mari.NOM
'Did Mari leave?'

[32] Hagstrom (1998, p. 15–16) notes that in Japanese, the same Q-particle *ka* is used in both *wh*- and polar interrogatives. Cable (2010, n. 21, p. 214) notes that this is not always the case; in Tlingit, the former type is formed using *sá*, and the latter using *gé*. Finnish is different from both Japanese and Tlingit in that it does not require *–kO* in *wh*-questions, but it does require *–kO* in polar interrogatives.

b. *Halua-n* *tietä-ä* $[_{ForceP}$ *(että)*
want-PRES.1SG know-INF that

$[_{FocP}$ *läht-i-kö* $[_{FP}$ *Mari* *t*]]]
leave-PAST.3SG-Q Mari.NOM

'I want to know whether Mari left'

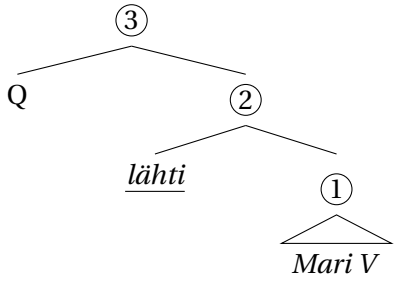
Semantically, polar interrogatives are often assumed to have a set-of-propositions denotation that is equivalent to $\{p, \neg p\}$(Hamblin, 1973). Contrary to *wh*-questions, I assume that p has a well-defined ordinary semantic value regardless of the presence of Q in polar interrogatives. However, the presence of Q does have an impact on the semantics of a polar question: it substitutes the ordinary semantic value of p with the focus semantic value of p, i.e. the polar set $\{p, \neg p\}$. As it is the tensed verb that is F-marked in polar interrogatives, I assume that it is also the verb that contributes the polar alternative for p.[33] Thus, the LF and semantics of a simple polar interrogative are as in (79) (where the trace of the moved verb is notated as V).

(79) **Example derivation of a polar interrogative**

a. **Surface syntax of FocP**
$[_{FocP}$ *Läht-i--kö* $[_{FP}$ *Mari* *t*]]
leave-PAST.3SG-Q Mari.NOM
'Did Mari leave?'

b. **LF of FocP**
$[_{FocP}$ Q *lähti* λ $[_{FP}$ *Mari V*]]

c.



d. $[\![①]\!]^o = \lambda w[V(\text{Mari})(w)]$
$[\![①]\!]^f = \{\lambda w[V(\text{Mari})(w)]\}$

e. (λ-abstraction over V)
$[\![②]\!]^o = \lambda w[\text{left}(\text{Mari})(w)]$
$[\![②]\!]^f = \{\lambda w[\text{left}(\text{Mari})(w)], \lambda w[\neg\text{left}(\text{Mari})(w)]\}$

[33] Later on, I will propose that F-marked verbs are also the source of polar alternatives when polar alternatives are relevant in the semantics of additivity.

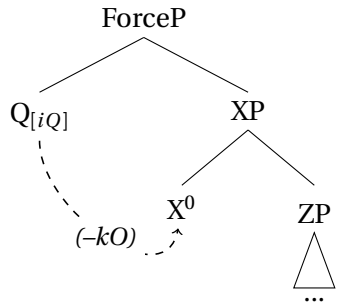
f. $[\![③]\!]^o = \{\lambda w[\text{left(Mari)}(w)], \lambda w[\neg\text{left(Mari)}(w)]\}$
$[\![③]\!]^f = \{\{\lambda w[\text{left(Mari)}(w)], \lambda w[\neg\text{left(Mari)}(w)]\}\}$

Note that in (79), the Q-particle is base-generated in a high position. In section 2.1.4, I argued that in *wh*-interrogatives, a Q-particle adjoins to each *wh*-phrase, and the highest *wh*-phrase is attracted to SpecFocP. Although I present no further arguments for this position, I assume that the relevant difference between *wh*-phrases and F-marked verbs is that the former but not the latter lack a well-defined ordinary semantic value. Thus, for a reason that I leave unexplored here, the Q-particle is not directly adjoined to the tensed verb in polar interrogatives. Instead, it is base-generated in Force^0, where it may delete $[uQ]$ on Force^0 directly.

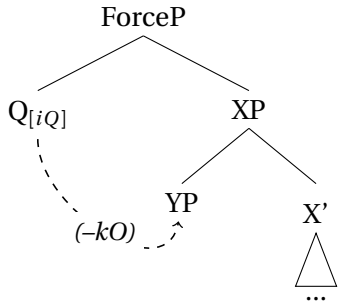
Moreover, the Q-particle residing in Force^0 morphologically marks the head that is closest to it with *–kO* (in parallel with what was suggested for Q and *wh*-phrases that may be marked with *–kO*). This explains why *–kO* is a stable second-position clitic, i.e. it never appears on constituents that are lower than "next one down" from Force^0. As *–kO* may attach to both heads and phrases – i.e. to the finite verb or to a fronted KP, of which we will see examples right below – I specify two configurations for *–kO*-marking by Q from Force^0 in (80).

(80) **Q-particle and *–kO*-marking in polar interrogatives (final)**

a. **Head case**



b. **Specifier case**



Previously, it has been proposed that *–kO* is merged within the IP, where it attracts a host and then moves upwards to a sentence-initial position, or PolP (Holmberg, 2001, 2003). Recently, however, Holmberg (2014, 2015) has rejected approaches where the Q-particle is not merged directly with its host, based mainly on cases where the position of *–kO* is within a fronted constituent, and not its edge. One consequence of Holmberg's direct-adjunction approach is that the host of *–kO* is predicted to always be the F-marked, "questioned" constituent, be it in terms of polarity (with finite verbs) or in terms of alternatives in the Roothian sense (with other phrases). In what follows, I will show that this prediction does not hold.

Consider (81) first. In (81), the finite verb has moved to Foc^0, and it is marked with *–kO*, being the first head down from interrogative Force^0. This question is a polar question, may be answered affirmatively with either an answer particle such as *kyllä* 'yes', or with the finite verb, as in (81a) (Holmberg, 2003). An answer that repeats the subject of the sentence is not felicitous.

(81) **–*kO*-interrogatives with fronted or focused finite verb**

[$_{ForceP}$ Q [$_{FocP}$ Luk-i-ko [$_{FP}$ Mari t Soda-n ja rauha-n]]]?
read-PAST.3SG-Q Mari.NOM war-ACC and peace-ACC

– *Luk-i.*
read-PAST.3SG

– *#Mari.*
Mari.NOM

'Did Mari read *War and Peace*? – She did.'

In (82), the same answerhood conditions pertain. However, the word order of the question is different: now, *–kO* appears on an unfocused but fronted subject, and the verb has to be focused. Given that the subject and the verb are in their base order, we could either assume that the subject is in TopP and the verb in FocP or in its FP-position, as in (82a), or that both the subject and the verb are in their FP-positions, and there are no projections between ForceP and FP, as in (82b).

(82) **–*kO*-interrogatives with fronted or focused finite verb**

a. *[$_{ForceP}$ Q [$_{TopP}$ Mari-ko [$_{FocP}$ luk-i [$_{FP}$ t t Soda-n ja rauha-n*
Mari.NOM-Q read-PAST.3SG war-ACC and peace-ACC
]]]]?

b. *[$_{ForceP}$ Q [$_{FP}$ Mari-ko luk-i Soda-n ja rauha-n]]]]?*
Mari.NOM-Q read-PAST.3SG war-ACC and peace-ACC

– *Luk-i.*
read-PAST.3SG

– *#Mari.*
Mari.NOM

'So Mari read *War and Peace*? – She did.'

What is crucial to note about (82) is that although the subject *Mari* carries *–kO*, the denotation of the question is still that of a polar question, as attested by the answerhood conditions. In other words, it is not the case that the host of *–kO* is necessarily interpreted as the "questioned" constituent. It can, of course, be questioned, and unsurprisingly, in this case, the constituent answer – but not the finite verb answer – is felicitous, as shown in the narrow focus cleft question in (83). In both (83a) and (83b), I let the subject raise to FocP. This choice is independently justified for (83b), which instantiates the S$_{contr}$ov word order familiar from section 2.3.3.1. For (83a), the choice to raise the subject to FocP is justified by (i) the parallel with (83b), and (ii) the parallel with verb-fronting (81).

(83) **–*kO*-interrogatives with fronted or focused subject**

a. *[$_{ForceP}$ Q [$_{FocP}$ Mari-ko [$_{FP}$ t luk-i Soda-n ja rauha-n]]]?*
Mari.NOM-Q read-PAST.3SG war-ACC and peace-ACC

b. *[$_{ForceP}$ Q [$_{FocP}$ Mari-ko [$_{FP}$ Soda-n ja rauha-n luk-i t]]]?*
Mari.NOM-Q war-ACC and peace-ACC read-PAST.3SG

– *#Luk-i.*
read-PAST.3SG

– *Mari.*
Mari.NOM

'Was it Mari who read *War and Peace*? – It was.'

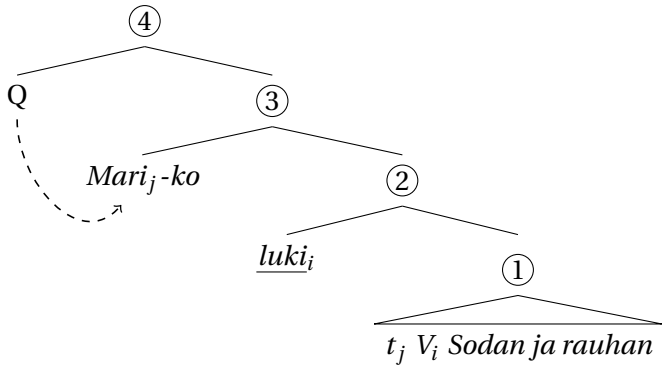
In (84) and (85), I present the LFs and semantic derivations of two *–kO*-involving questions with the same word order – and carrier of *–kO* – but different denotations. In (84), the denotation is that of a polar question (with polar alternatives). In (85), however, the denotation is that of a *wh*-question (see section 2.3.3.4; Holmberg, 2015).

(84) **Example derivation with non-F-marked host of *–kO*: Polar question interpretation**

a. *[$_{ForceP}$ Q [$_{TopP}$ Mari-ko [$_{FocP}$ luk-i [$_{FP}$ t t Soda-n ja rauha-n*
Mari.NOM-Q read-PAST.3SG war-ACC and peace-ACC
]]?

'So Mari read *War and Peace*?'

b.



c. $[\![①]\!]^o = \lambda w[V_i(\text{WP})(t_j)(w)]$
$[\![①]\!]^f = \{\lambda w[V_i(\text{WP})(t_j)(w)]\}$

d. (λ-abstraction over V_i)
$[\![②]\!]^o = \lambda w[\text{read}(\text{WP})(t_j)(w)]$
$[\![②]\!]^f = \{\lambda w[\text{read}(\text{WP})(t_j)(w)], \lambda w[\neg\text{read}(\text{WP})(t_j)(w)]\}$

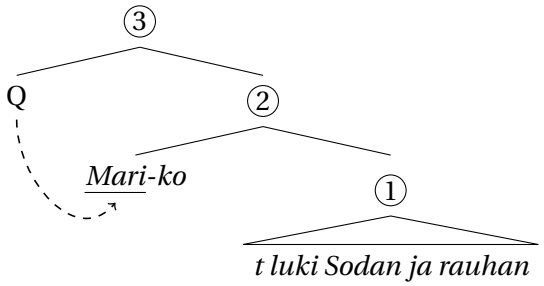
e. (λ-abstraction over t_j)
$[\![③]\!]^o = \lambda w[\text{read}(\text{WP})(\text{Mari})(w)]$
$[\![③]\!]^f = \{\lambda w[\text{read}(\text{WP})(\text{Mari})(w)], \lambda w[\neg\text{read}(\text{WP})(\text{Mari})(w)]\}$

f. $[\![④]\!]^o = \{\lambda w[\text{read}(\text{WP})(\text{Mari})(w)], \lambda w[\neg\text{read}(\text{WP})(\text{Mari})(w)]\}$
$[\![④]\!]^f = \{\{\lambda w[\text{read}(\text{WP})(\text{Mari})(w)], \lambda w[\neg\text{read}(\text{WP})(\text{Mari})(w)]\}\}$

(85) **Example derivation with F-marked host of *–kO*: *Wh*-question interpretation**

a. *[$_{ForceP}$ Q [$_{FocP}$ Mari-ko [$_{FP}$ t luk-i Soda-n ja rauha-n]]]?*
Mari.NOM read-PAST.3SG war-ACC and peace-ACC
'Was it Mari who read War and Peace?'

b.



c. $[\![①]\!]^o = \lambda w[\text{read(WP)}(t)(w)]$
$[\![①]\!]^f = \{\lambda w[\text{read(WP)}(t)(w)]\}$

d. (λ-abstraction over t)
$[\![②]\!]^o = \lambda w[\text{read(WP)(Mari)}(w)]$
$[\![②]\!]^f = \{\lambda w[\text{read(WP)(Mari)}(w)], \lambda w[\text{read(WP)(Joni)}(w)], ...\}$

e. $[\![③]\!]^o = \{\lambda w[\text{read(WP)(Mari)}(w)], \lambda w[\text{read(WP)(Joni)}(w)], ...\}$
$[\![③]\!]^f = \{\{\lambda w[\text{read(WP)(Mari)}(w)], \lambda w[\text{read(WP)(Joni)}(w)], ...\}\}$

Based on the data above, I conclude that in *–kO*-questions, the denotation of the question is determined by the expression that is F-marked. This expression may or may not carry *–kO*: this property depends rather on whether there is another overt head or phrase above it. The fact that the "questioned" expression and the *–kO*-carrying expression may be different – as in (82) – indicates that in non-*wh*-interrogatives, *–kO* is the surface realisation of a well-behaved second position clitic. The data presented above, and in particular the example in (84), are hard to account for in a system where *–kO* is required directly to merge with the F-marked constituent that is responsible for the question denotation (Holmberg, 2014, 2015).

2.3.3.5 Discourse particles

There are a number of discourse particles in Finnish (Karttunen, 1975a,b; Nevis, 1985, a.o.). Nevis (1985) provides an insightful summary of the core group of discourse particles, and shows that in terms of their grammatical status, discourse particles may be analysed as clitics (Zwicky and Pullum, 1983, 1984). This means that Finnish discourse clitics show properties of both affixes and of words. In what follows, I will first present the different discourse particles based on Nevis's (1985) summary. I then discuss the general morphosyntax of discourse particles, and introduce two arguments that Nevis discusses supporting the classification of discourse particles as clitics.

I begin with the so-called second position clitics *–hAn*, *–pAs*, and *-kO*, which attach at the end of the first constituent of the sentence (or, in some cases, within the first constituent) (Nevis, 1985). *–hAn* functions as a mark of appealing (86a), mitigating (86b-c), or explaining something that was said before (86d) (Penttilä, 1957, p. 120). It may also mark amelioration or "softening"

(86e), contradiction (86f), and new discovery (86g) (Karttunen, 1975a).[34]

(86) **Different uses of *–hAn***

a. *Ole-t-han itse-kin sama-a miel-tä*
be-PRES.2SG-HAN self-ADD same-PAR mind-PAR
'You are yourself of the same opinion, you know'

b. *Mitä-hän tuolla tehdä-än?*
what-HAN there do-PASS
'What's being done there, I wonder?'

c. *O-n-ko-han moise-ssa perä-ä?*
be-PRES.3SG-Q.HAN such-INE truth-PAR
'Is there any truth in something like that, I wonder?'

d. *Hän tunte-e minu-t, o-n-han hän opettaja-ni*
(s)he.NOM know-PRES.3SG I-ACC be-PRES.3SG-HAN (s)he.NOM teacher-NOM.POSS/1SG
'(S)he knows me; (s)he is my teacher, after all'

e. *Puhu-han asia-sta isä-lle*
talk.IMP-HAN matter-ELA father-ALL
'Talk to father about it, why don't you'

f. *Hän e-i ole kotona. – O-n-han!*
(s)he.NOM NEG-3SG be-CONN home be-PRES.3SGH-HAN
'(S)he is not home. – (S)he is too!'

g. *Suomi-han o-n pieni maa*
Finland-NOM.HAN be-PRES.3SG small.NOM country.NOM
'Finland is a small country, by golly. (I just found it on the map.)'

Both Karttunen (1975a) and Hakulinen (1976) provide a general meaning for *–hAn* in an attempt to capture all its uses. Karttunen proposes that the general function of *–hAn* is to mark the authority of the speaker, i.e. that *–hAn* signals that the speaker is in a position to say something to the addressee, that position being due to different factors (and giving rise to different readings). Hakulinen, on the other hand, argues that when attached to a verb, *–hAn* "softens" questions, assertions, and commands; when attached to the first constituent of a sentence, it marks old information of current relevance, objections, and newly occurred thoughts.

The second discourse particle that we will discuss, *–pA*, is often analysed as a marker of em-

[34] In this section, I summarise the *functions* that have been attributed to the discourse clitics in the literature. These functions are descriptive in nature; they only describe the effect that their presence has. There is very little formal research on discourse particles in general (however, see Karttunen and Karttunen, 1976 and section 3.2.1) for the additives *–kin* and *–kAAn*).

phasis (87a). Hakulinen (1984a) shows that *–pA* also marks contrastiveness (87b), and softens orders (87c). To this list, Karttunen (1975b) adds marking certainty (87d), immediate observation (87e), appeal to common knowledge in rhetorical questions (87f), wishing (87g), concessivity (87h), and contradiction (87i). This particle will relevant when we discuss the possibility of expressing agreement and disagreement with another discourse participant using bound additives in sections 4.2 and 4.3.

(87) **Different uses of *–pA***

a. *O-n-pa täällä kuuma!*
be-PRES.3SG-PA here hot.NOM
'It sure is hot here!'

b. *Minä-pä siellä käv-i-n*
I.NOM-PA there visit-PAST-1SG
'It was I who went there'

c. *Tule-pa tänne*
come.IMP-PA here
'Come here a bit'

d. *Kyllä-pä ol-i hauska*
sure-PA be-PAST.3SG fun.NOM
'It sure was fun'

e. *Antti-pa se o-n*
Antti.NOM-PA it.NOM be-PRES.3SG
'Why, it's Antti'

f. *Kuka-pa e-i muista-isi kuinka...*
who.NOM-PA NEG-3SG remember-COND how
'Who wouldn't remember how...'

g. *Ol-isi-n-pa rikas!*
be-COND-1SG-PA rich.NOM
'I wish I were rich!'

h. *Ol-i-pa miten ol-i...*
be-PAST.3SG-PA how be-PAST.3SG
'It was as it was...', 'Be it as it may...'

i. *E-t saa. – Saa-n-pa!*
NEG-2SG may-CONN may-PRES.1SG-PA
'You may not. – Yes I may!'

Finally, the third second position clitic is the question particle *–kO* (Holmberg, 2014) (see also section 2.3.3.4). As we have seen in previous sections, *–kO* is always involved in the syntax of polar interrogatives, attaching in the most typical case to the finite verb that is sentence-initial (88a). However, *–kO* may also attach to a "topicalised" constituent (88b) (Nevis, 1985, p. 10) – i.e. to what I referred to as narrow focus clefting in section 2.3.3.4 – or even to a *wh*-word in a *wh*-question, especially when combined with the discourse particle *–hAn*:

(88) a. *Luk-i-ko Mari tämä-n kirja-n?*
read-PAST.3SG-Q Mari.NOM this-ACC book-SG.ACC
'Did Mari read this book?'

b. *Tämä-n-kö kirja-n Mari luk-i?*
this-ACC-Q book-ACC Mari.NOM read-PAST.3SG
'Was it this book that Mari read?'

c. *Minkä-kö-hän kirja-n Mari luk-i?*
which.ACC-Q-HAN book-ACC Mari.NOM read-PAST.3SG
'Which book did Mari read (I wonder)?'

The bound additives *–kin* and *–kAAn* are also included in the class of discourse particles (Nevis, 1985). They differ from the rest of the clitics in that they are not restricted to appearing in second position. In addition, the particle *–s* is also sometimes classified as a discourse particle. It has a more restricted distribution, however, which is why Nevis (1985) does not classify it as a clitic but as an affix. *–s* can be generally analysed as a marker of informality (Karttunen, 1975a,b; Hakulinen and Karlsson, 1979).

Morphosyntactically, all discourse particles – regardless of whether they are second position clitics or not – attach after all case-endings and inflectional endings, as shown in (89).

(89) **Position of discourse clitics within a word**

a. *oliive-i-sta-ko*
olive-PL-ELA-Q
'of the olives?'

b. *naura-isi-vat-ko*
laugh-COND-3PL-Q
'would they laugh?'

As (88c) shows, it is also possible for more than one discourse clitic to attach to the same host. Some clitic combinations are possible only in one order (i.e. they are not reversible), and some combinations are ruled out altogether. Of the first type, let us mention *–pA* and *–s* (*–pA-s* but *–*s-pA*), and of the second type, *–kin*/*–kAAn* and *–s* (*–*s-kin* and *–*kin-s*). In addition, some clitic

combinations are reversible, with no immediate consequence for the meaning. This is the case for the combinations of *–kin* (and *–kAAn*) and the question particle *–kO* (90) or the discourse particle *–hAn* (91):

(90) **Relative order of *–kO* and *–kin***

a. *oliive-j-a-ko-kin*
olive-PL-PAR-Q-ADD
'olives, too?'

b. *oliive-j-a-kin-ko*
olive-PL-PAR-ADD-Q
'olives, too?'

(91) **Relative order of *–hAn* and *–kin***

a. *oliive-j-a-han-kin*
olive-PL-PAR-HAN-ADD
'olives, too, as you know'

b. *oliive-j-a-kin-han*
olive-PL-PAR-ADD-HAN
'olives, too, as you know'

To end this section, I will briefly discuss the status of discourse particles as clitics. Nevis (1985, p. 26) uses the tests proposed by Zwicky and Pullum (1984) to argue that discourse particles have properties of both words and of affixes. This is typical of clitics. Instead of presenting the whole list of arguments, I will now discuss two of the tests and the results. Given that the topic of this dissertation is additivity, I will only discuss the tests from the perspective of the additive *–kin*. However, the presented arguments also apply to the question particle *–kO*.

First, *–kin* and other discourse particles are word-like (and not affix-like) in that they are subject to external sandhi phonological rules. Nevis (1985) discusses two such sandhi rules in Finnish: word-initial gemination, and *t*-assimilation. We will discuss the former here.

In Finnish, word-initial gemination takes place between independent words, but not between a stem and an affix. This phonological process affects words that end with a certain morpheme or morpheme type – e.g. the imperative morpheme – and requires the initial consonant of the following word to be geminated. Often, the application of the gemination rule is indicated with a superscripted X at the end of the word. For example, *tule*^{X} *tänne* 'come-IMP here' is pronounced as [tulet:ænne]. Many words that are written with a final 'e' in Modern Finnish contain an X, and thus the gemination process is also visible in many compound words, such as *hernekeitto* 'pea soup', pronounced [hernek:eitto]. Now, if *–kin* (or *–kAAn*) appears at the end of *herne*^{X}, the initial

consonant of the additive is geminated, producing *hernekin* 'pea, too' [herne:kin]. Hence, the results of the external sandhi test suggest that discourse particles are not affixes, but words.

(92) **External sandhi test: discourse particles are words**

a. *herne-keitto* 'pea soup', pronounced with initial gemination of /k/: [hernek:eitto]

b. *herne-kin* 'pea, too', pronounced with initial gemination of /k/: [herne:kin]

However, Nevis also shows that another phonological – or more precisely, prosodic – test suggests that discourse particles are affixes, not words. This test concerns the application of vowel harmony. In Finnish, all word stems are vowel-harmonic, and only contain front or back vowels (with the exception of /i/ and /e/, which may combine with both front and back vowels). Any case and inflectional suffixes that attach to a stem must be harmonic with the stem: hence, the inessive case marker *–ssA* surfaces as [ssa] (written as *–ssa*) or [ssæ] (written as *–ssä*) depending on the stem it attaches to. Crucially, vowel harmony does not reach beyond word boundaries, and it therefore does not apply to e.g. compounds. As the realisation of the additive *–kAAn* is vowel-harmonic (as is the realisation of *–hAn*, *–kO*, and *–pA*), the vowel harmony test suggests that discourse particles are affixes, not words.

(93) **Vowel harmony test: discourse particles are affixes**

a. *talo-ssa* 'in the house', *peili-ssä* 'in the mirror': *–ssA* is vowel-harmonic

b. *talo-kaan* 'the house, either', *peili-kään* 'the mirror, either': *–kAAn* is vowel-harmonic

In conclusion, Finnish discourse particles are clitics that can be further divided into two groups depending on whether they are second position clitics – as is the case with *–hAn*, *–pA*, and *–kO* – or not – as is the case with the additive *–kin* and *–kAAn*. In general, discourse particles fulfil a myriad of functions that are essentially non-truth-conditional. In the remainder of this dissertation, the discourse clitic *–kO* will pop up regularly in the analysis of the different uses of the bound additives and discourse clitics *–kin* and *–kAAn*. The rest of the discourse clitics will not be discussed further.

2.4 Summary

The purpose of this chapter was to set the stage for the rest of the dissertation in terms of theoretical background. The chapter was organised into three main sections dealing with matters concerning the syntax-semantics interface (section 2.1), the semantics-pragmatics interface (section 2.2), and specific properties of Finnish, the language from which all new data in this dissertation is from (section 2.3). Within these sections, a relatively important amount of time was spent discussing the syntax and semantics of focus and interrogativity, two closely related domains that

involve alternatives. Alternatives and focus also play a leading role in the next chapter, in which I present a review of the literature on additivity.

Chapter 3

Additivity

This chapter serves as an in-depth introduction and literature review on the topic of additivity. I begin with a brief presentation of the main issues that arise in the investigation of additivity. I then review previous analyses of additivity in three groups: analyses based on an existential presupposition, analyses based on an anaphoric presupposition, and analyses that specifically concern additivity in Finnish. A summary section concludes the chapter.

3.1 Review of the main issues concerning additivity

In this section, I present eight general issues that are discussed in the literature on additivity. While the focus of these sections is on introducing the issues, some theoretical solutions and approaches are also mentioned in the context of each issue or topic. The brief presentations within this section serve as a backdrop for the more detailed presentation of different formal approaches to additivity from section 3.2 onwards.

3.1.1 Focus-sensitivity

One of the most important – and perhaps most obvious – things to note about additives is that they are focus-sensitive (Karttunen and Karttunen, 1976; Karttunen and Peters, 1979; Rooth, 1985, a.o.). This property can be illustrated easily by constructing two example sentences that differ only in where F-marking lies, as in (94) (where simple underlining signals F-marking).

(94) **Focus-sensitivity of additive *too***

a. Mary ate olives, too

b. Mary ate olives, too

Clearly, the meaning contributed by the additive in (94) is affected by the placement of F-marking, i.e. the choice of associate for the focus-sensitive *too* (see section 2.1.3): while (94a) can be felicitously used in a context where someone other than Mary ate olives, (94b) requires a different context, namely, one where Mary ate something else than olives.

Most current approaches to additivity model the focus-sensitivity of additives within the framework of Alternative Semantics (Rooth, 1985, 1992), where F-marking affects the focus semantic value of the structure from the moment it is introduced (see again section 2.1.3).[1] Within this framework, the focus-sensitivity of additives raises the question of what exactly the semantics of the additive operator does with the focus alternatives and the contextual variable Γ (whose denotation the squiggle operator restricts presuppositionally with respect to the focus semantic value of the prejacent).

3.1.2 Antecedency

Additives can be said to be signals of pre-established information in the context. As such, additives are generally not felicitous when presented completely out of the blue (Kripke, 1990/2009; Heim, 1990). Kripke proposes that additives require the presence of an *antecedent* in the context. The form of this antecedent is assumed to be determined by the focus semantic value of the prejacent; hence, the issues of antecedency and focus-sensitivity are intimately linked.

The most cited example demonstrating the requirement for an antecedent is shown in (95) (Kripke, 1990/2009). What is noteworthy is that although on any given night, quite a few people in New York have dinner, the sentence *John is having dinner in New York tonight, too* seems to be infelicitous in an empty context that does not make a specific antecedent salient, as shown in (95).

(95) **Antecedency requirement of *too***

a. [Context: Tom and Tim are talking about John and Mary. Tom says: "Mary is having dinner in New York tonight". Tim says:]
John is having dinner in New York tonight, too

[1] Krifka (1998) proposes that at least in some languages – e.g. German and English – the F-marked associate is a contrastive topic, and not a focus, at least when the additive particle appears postposed (linearly to the right of its associate) and is itself F-marked. As contrastive topics contribute alternatives in the same way that foci do (see section 2.1.3: Büring, 1997, 2003), additives that associate with contrastive topics may be said to be focus-sensitive.

(i) Association with contrastive topics (Krifka, 1998: (16))
[I know that Pia visited the exhibition. But what did Peter do?]
Peter hat die Austellung auch besucht
Peter has the exhibition ADD visited
'Peter visited the exhibition, too'

b. [Empty context:]
#John is having dinner in New York tonight, too

While most approaches to additivity take a very similar stance with respect to the focus-sensitivity question, the antecedency question is more divisive. In general, approaches that do not incorporate an antecedency requirement represent existential approaches to additivity (Karttunen and Karttunen, 1976; Karttunen and Peters, 1979; see section 3.2). If the issue of antecedency is touched upon in existential analyses, it is deemed to be a matter of contextual relevance (Rullmann, 2003). In contrast, anaphoric approaches (Kripke, 1990/2009; Heim, 1990, 1992) consider antecedency to be a fundamental property of additivity (see section 3.3). These analyses rely on an anaphoric connection between the host sentence of the additive and an antecedent, and attempt to answer questions concerning the nature of this link, how it is established, and where the relevant antecedent may be located. It has been shown, for example, that world knowledge (Kapitonov, 2012) and linguistic antecedents that are presuppositions, conventional implicatures, and conversational implicatures (Winterstein, 2011) may in fact function as antecedents for additives, contrary to what (95) may suggest.

Besides the focus-sensitivity question, the antecedency question is closely related to the the classification of additive meaning as a presupposition (and especially to the issue of accommodation; see section 3.1.7.2) and the obligatoriness question, where specific conditions concerning the parallelism between the prejacent and the antecedent are essential (section 3.1.8).

3.1.3 Distinctness

Since Karttunen and Peters (1979), it has been customary to include a distinctness requirement in the additive presupposition. Formally, this means that the prejacent and the antecedent cannot be identical. In (96), for example, distinctness requires the additive inference to apply to some x that is distinct from *Max*.[2]

(96) **Distinctness requirement of *too***
Max ate olives, too [Someone distinct from Max ate olives]

The distinctness requirement is not often disputed in the literature, and its semantic source is often simply assumed. In fact, on some approaches, distinctness is the only distinctive property of additive presuppositions (van der Sandt and Geurts, 2001; Geurts and van der Sandt, 2004) or at least at the very core of additivity (Szabolcsi, 2017) (see sections 3.2.1 and 3.4.1 for more details). However, some authors have also suggested that distinctness arises as an implicature due to general pragmatic conversational principles. For example, Beaver (2001, p. 98, fn. 14) notes that each conversational move should be optimally informative, and therefore the use of

[2]Recall that Rooth (1992) assumes distinctness to also be part of the semantics of the squiggle operator, which means that it is part of the semantics of focus interpretation in general (see section 2.1.3).

an additive such as *too* while restating information that is already known is informationally suboptimal (cf. Grice, 1975). Therefore, at least minimal distinctness between the prejacent and the antecedent is required to ensure informativity. In conclusion, the question of whether distinctness is a semantic property associated with additivity or a pragmatic property associated with general conversational principles is still open.

3.1.4 Form alternation

Some languages make use of not one but multiple additives, and those additives may be in complementary distribution (at least to some extent). This is exemplified by the English *too/either/also* triplet in (97) (Rullmann, 2003, p. 329–330):

(97) **Form alternation: English**

a. (Ian cooked the food.) He washed the dishes *too*/**either*
He also washed the dishes

b. (Ian didn't cook the food.) He did not wash the dishes *either*/??*too*
He also did not wash the dishes

Answering the form alternation question amounts to determining which factors determine the surface realisation of an additive in languages where there is a choice to be made, as in English (and also in Finnish). The main question is, do the different lexical items have different semantics, or is the semantics the same, and the surface realisation of the additive depends on something else? In the so-called *scope approaches* (Karttunen and Peters, 1979), the presuppositions of the 'polar pair' *too* and *either* are the same, but the syntactic rule that introduces them is sensitive to the presence of negation in the structure that has already been built. Modern scope approaches rely on LF movement to derive the different meanings of *too* and *either*. In the so-called *polarity approaches*, the presuppositions of *too* and *either* are distinct but related, and in addition, *either* is a negative polarity item (Rullmann, 2003; Ahn, 2015) (see section 3.2.1 for the presentation of both types of approaches). The two approaches have both merits and disadvantages, and the question remains: which – if either – is better?

3.1.5 Derivation

The derivation question concerns the way in which the content of the additive meaning component is determined formally. This question is therefore naturally connected to the form alternation question that was just introduced. Specifically, the first question that we might ask is: are the lexical items we see in surface syntax additive operators themselves, or are they markers of the presence of a (covert) operator in the structure? The second question is: what types of arguments do additives accept?

It is possible that the answers to both of these questions vary both cross-linguistically and within a given language for different focus-sensitive particles. For example, Lee (2004) proposes that the Korean exclusive focus particle *–man* is an agreement morpheme, signalling the presence of a covert *only*-like (exhaustifying) operator.[3] In contrast, each overt additive particle *–to* contributes an abstract additive operator to the structure. Hence, Lee (2004) concludes that in Korean, exclusive focus particles are agreement markers, while additive focus particles are themselves the lexical realisation of a focus operator. Schematically, the two options can be illustrated as in (98). In (98a), the surface realisation of the additive itself is the operator. This operator may be required to move covertly at LF in order to take an argument of the appropriate type. In (98b), the additive operator is silent, and it is connected to an overt marker. (Note that the base order of the associate and the operator/marker is not restricted to the one shown in (98).)

(98) **Additives as operators and agreement markers**

a. [OP ... [... associate ... t_{OP} ...]] [operator]

b. [OP_i ... [... associate ... $marker_i$ ...]] [marker]

The second part of the derivation question – namely, what type of arguments additives take – has both a semantic and a syntactic side to it. First, as was mentioned in section 2.1.3, focus-sensitive operators can be analysed as taking two arguments of different types (e.g. entities or predicates), or as being strictly propositional. The choice of the latter over the former in this dissertation is justified by the simplicity that it introduces in the analysis of the different uses of Finnish bound additives. Regardless of which analysis is chosen, the syntactic position of additives, and in particular additive clitics in e.g. Finnish and Korean, raises the important question of whether the syntactic host of the additive is also always its semantic associate (or at least a part of it). Specifically, we might ask whether an additive operator must always merge with an $[F]$-carrying phrase, or whether it merely has to c-command one from the position in which it ends up in syntax and at LF. If

As Korean shows us, operator- and an agreement-marker-based analyses of focus-sensitive operators may both be useful even within the same language. It therefore seems that the syntactic and semantic analysis of additivity must allow for some freedom in how additivity is realised formally.

3.1.6 Variation

Most of the formal work on additivity is focused on what is called the 'basic use' in this dissertation. The basic use refers to cases where the additive presupposition can be paraphrased roughly with "this predication holds of something else besides x", where x is the associate of the additive.

[3] Lee (2004) proposes that this explains how multiple occurrences of *–man* may appear in surface syntax while the semantics only involves one *only*-operator.

However, it is cross-linguistically common for additives to express meanings that go beyond the basic use. This point is made forcefully by Forker (2016), who proposes a list of seven core functions for additives based on a sample of 42 languages. According to Forker, the core functions of additives are to mark

1. additivity (cf. the basic use);
2. scalar additivity (cf. *even*);
3. contrastive topics and topic switch;
4. indefiniteness;
5. concessivity;
6. conjunctional adverbs meaning 'and then'; and
7. constituent coordination.[4]

Forker also discusses some "semantic extensions" of the core functions that are only present in a minority of the languages of the sample. These include using additives for forcing a collective interpretation of numerally modified noun phrases, for clausal coordination, as a building block of adverbial clauses (*as soon as, after, when*), for derivational purposes, for marking surprise or disappointment, and for softening or emphasising a part of the host assertion.[5]

The variation question essentially calls for an explanation of the general distribution of additives. Indeed, the data described by Forker (2016) (see also Szabolcsi, 2015, Zimmermann, 2012, 2015 raises the question of how the different 'uses' of additives are related to each other, and whether a single semantics is able to cover the whole distribution. Thus, the variation question is very intimately connected to the question of what additives mean.

3.1.7 Presuppositionality

3.1.7.1 Presuppositional status of additive meaning

In most – but not all, as this chapter will show – of current work on additivity, the nature of the meaning contributed by additives is assumed to be presuppositional. Two arguments for this classification come from the non-cancellability and the non-deniability of additive meaning. The first property is illustrated in (99). As (99a) shows, the scalar implicature triggered by *some* may be explicitly cancelled. The same remark does not apply to the additive presupposition in (99b).

[4]Not all languages in Forker's sample make use of additives for all of the core functions. Forker proposes an implicational map that relates the presence of one function to the presence of others in a given language.

[5]In chapter 4, I show that in Finnish, bound additives have all of Forker's main functions except for the ones listed under 6 and 7 (although scalar additivity is not discussed in this dissertation); moreover, they have the "extended" function of expressing surprise and/or disappointment.

(99) **Cancellation**

a. Some chess players are good [⇝ not all chess players are good]
... in fact, all of them are

b. Mary plays chess too [⇝ someone distinct from Mary plays chess]
... in fact, no one besides Mary plays chess

Presuppositions are not at-issue, and may therefore not be directly denied or rejected (Beaver et al., 2009). This is illustrated in (100), where only the at-issue content of the sentence falls into the scope of the negative operator: the non-at-issue additive presupposition cannot be targeted by *no*. Indeed, as (100c) shows, only indirect denial of the additive meaning (here, the antecedent is assumed to be roughly *that Mary likes cheese*) using *Hey! Wait a minute...* is possible.

(100) **Direct denial**

Mary likes olives, too

a. No, she doesn't (like olives)!

b. #No, she doesn't (like cheese)!

c. Wait a minute... she never said she likes cheese!

Further support for the presuppositionality (or, more widely speaking, non-at-issueness) of additive meaning comes from its projection properties (Roberts et al., 2009; Simons et al., 2010). Additive meaning projects through presupposition holes such as modal operators and negation without being modified (Karttunen, 1973). Thus, in (101a), the presupposition remains the same regardless of whether the host sentence is modalised or not; the same comment applies to (101b).[6]

[6]Note that with respect to projection, additive presuppositions behave in a way that is partly unlike other presuppositions. For example, additive presuppositions that arise from complement clauses of non-factive attitude verbs such as *believe* or *think* do not project in the expected way. The expected way, in this case, is projection to the attitude holder, but not to the speaker (Karttunen, 1974). For this reason, non-factive attitude verbs have been termed *presupposition plugs*. That presuppositions fail to reach the level of the speaker is illustrated in (i), where the presupposition due to *my* – that there is a cat that the speaker owns – does not have to hold of the common ground, and specifically, the speaker may well not have a cat, and know it. The presupposition of *my* must instead hold of the belief context anchored to the attitude holder *Mary*.

(i) Projection under attitude verbs
Mary thinks that my cat is sick

As (ii) shows, this projection pattern does not apply to additive presuppositions under attitude verbs (Heim, 1992; van der Sandt and Geurts, 2001); the felicity of Mary's remark does not require that her parents think that someone else besides herself is in bed.

(ii) Projection under attitude verbs (van der Sandt and Geurts, 2001)
[John and Mary are on the phone]
John: I am already in bed
Mary: My parents think that I am in bed too

In sum, the projection properties of additive presuppositions are partly as expected, and partly unexpected.

(101) **Projection through presupposition holes**

a. Mary might like chess too [⇝ Someone distinct from Mary likes chess]

b. Mary does not like chess too [⇝ Mary likes something distinct from chess]

In some recent approaches, additives have been argued to contribute both at the level of at-issue meaning and presupposition (Abrusán, 2014), and even essentially only at the level of at-issue meaning (Ahn, 2015; Gajić, 2016). The question of whether additive meaning is (only) presuppositional is thus still debated in the literature. Moreover, as this chapter will show, analyses of additivity differ in which approach to presupposition they take: while the majority assume that presuppositions are definedness or admittance conditions, some also use the binding and speaker presupposition approaches (see section 2.2.2).

3.1.7.2 Accommodation

Under the view that presuppositions impose certain requirements on the context – or more specifically, the common ground – it is also possible to maintain that when those requirements are not met on the get-go, they may be *accommodated*. Accommodation consists in 'repairing' the context by spontaneously adding the required piece of information or proposition to the common ground, so as to satisfy the presupposition (cf. section 2.2.1) (Lewis, 1979). As was noted in the section concerning the antecedency question (section 3.1.2), additive presuppositions are notorious for resisting accommodation (Heim, 1990; Kripke, 1990/2009; Beaver and Zeevat, 2007).

Besides explaining why accommodation from additives is generally not possible, it must also be explained why and how some contexts in fact productively allow accommodation. The relevant examples are not recognised as cases of accommodation in the previous literature (Kaplan, 1984; Krifka, 1998). For example, Kaplan (1984) notes that in (102a), the additive *too* is infelicitous, because interpreting the example leads to "a feverish attempt to re-interpret the sentence with Jo equaling Mo, or fish equaling soup; anything to reduce the two differences into one" (p. 511). What is interesting is that when the sentence receives a different intonational pattern – one where the subject is a (contrastive) topic (signalled with double-underlining) and the object is focused – the use of *too* is in fact felicitous. As a whole, the conjunction presupposes that Mo had fish (in addition to soup, as the assertion states). Crucially, the proposition *that Mo had fish* need not be part of the common ground at the time of utterance of (102b) for *too* to be felicitous. In fact, it seems to be introduced as new information into the common ground. In other words, this proposition is accommodated.[7]

[7] The accommodation process only takes place in the presence of the additive, as (i-a) without *too* illustrates. The projection test shown in (i-b) further supports the argument that the inference is indeed a presupposition; in contrast to (i-a), (i-b) presupposes that Mo had fish.

(i) a. Jo had fish, and Mo had soup

b. Jo had fish, and Mo might have had soup too

(102) a. Jo had fish, and Mo had soup #too

b. Jo had fish, and Mo had soup too [⇝ Mo had fish]

In sum, theories of additivity should address the question of when additive presuppositions can and cannot be accommodated. It seems clear that the surrounding context plays an important role in making the accommodation process possible for additive presuppositions.

3.1.7.3 Suspension

As was mentioned in section 2.2.2, additives are *hard* presupposition triggers in the terminology of Abusch (2010). As such, they contrast with *soft* presupposition triggers. This difference – whatever lies at its root – can be illustrated by the pair of examples in (103). The verb *win* presupposes that a preparatory phase of participation preceeds the winning (Abusch, 2010). In (103a), the first discourse segment explicitly expresses ignorance as to whether this presupposition holds. Nevertheless, *win* can be used felicitously. The same has been argued not to apply to additive *too* (103b): when the first segment expresses ignorance as to whether the presupposition is satisfied, the use of *too* is judged infelicitous. In both examples below, the presupposition trigger is in bold.

(103) **Soft (a) and hard (b) presupposition triggers (Abusch, 2010)**

a. I have no idea whether John ended up participating in the Road Race yesterday. But if he **won** it, then he has more victories than anyone else in history

b.??I have no idea whether John read that proposal. But if Bill read it **too**, let's ask them to confer and simply give us a yes-no response

The question of whether additive presuppositions are soft or hard is closely related to the questions of of what kind of antecedents additives may refer to (if they are assumed to do so), and where those antecedents may be found, i.e. the antecedency question.

3.1.8 Obligatoriness

In some cases, the use of additives such as *too* is optional[8] , while in others, it is obligatory. In the following examples, for example, the omission of *too* results in infelicity (Green, 1968; Kaplan,

[8]That optionality exists is shown by the corpus annotation study conducted by Amsili et al. (2016). Amsili et al. note that in (i), the presence or absence of *too* seems to be a stylistic choice, with no effect on meaning or discourse structure.

(i) Optional *too* (Winterstein and Zeevat, 2012)
Hartmann's joy was apparent in his beautifully cut hair, his expensive suit, his manicured hands, the faint aura of cologne that heralded his approach; in his mild and habitually smiling face, (too,) his expressive walk, in which the body, leaning slightly forward, seemed to indicate amiability.

1984; Krifka, 1999; Sæbø, 2004; Winterstein and Zeevat, 2012; Amsili et al., 2016):

(104) **Obligatory *too*** (Green, 1968; Kaplan, 1984)

a. Jo had fish, and Mo had fish (#too)

b. Jo had fish, and Mo did (#too)

Most proposed answers to the obligatoriness question – i.e. the question of why, in some cases, additives are obligatory – relate the obligatoriness of additives to a requirement of parallelism or co-orientation of the prejacent and the antecedent (Kaplan, 1984; Asher, 1993; Winterstein, 2011; Winterstein and Zeevat, 2012; Amsili et al., 2016). In essence, the presence of an additive is taken to signal some type of similarity. When the additive is *not* present, the inference is that the condition for similarity is *not* fulfilled. This type of "blocking" can be formally analysed as an *antipresupposition* (Percus, 2006) arising from the principle of *Maximize presupposition!* (Singh, 2008).

In sum, the obligatoriness of additives has been attributed to the interaction of the additive presupposition and the discourse function of additives, i.e. their role of emphasising similarity in contexts of contrast. Thus, the question of whether additives are obligatory or not seems to require a theory of additivity that does not rely solely on semantics, but also takes in consideration its function as a marker of similarity within discourse.

3.1.9 Summary

The goal of section 3.1 was to briefly introduce the general issues that arise in the study of additivity. These questions are summarised in Table 3.1.

As Table 3.1 shows, the questions of antecedency and form alternation are special in that the answers to these questions divide the proposals in four camps. Generally speaking, the answer to the antecedency question separates existential approaches from anaphoric ones. The answer to the form alternation question then further divides these camps into representatives of the scope- and polarity based approaches. While both divisions are important in this dissertation, the main dividing line that we will follow in the literature review will be the existential vs. anaphoric one. The next two sections thus present a review of specific proposals from the literature that fall into two groups based on this division. In each case, the proposals are also discussed from the perspective of the other issues identified in this section. Work that focuses specifically on additivity in Finnish is presented separately in the final section of this chapter.

Label	Question
Focus-sensitivity	How is the focus-sensitivity of additives modeled?
Antecedency	Do additives require antecedents? If yes, how and where is the antecedent found? [⇒ Existential vs. anaphoric approaches]
Distinctness	Are the prejacent and the antecedent required to be distinct?
Form alternation	What determines the distribution of the different lexical realisations of additives within a given language? [⇒ Scope vs. polarity approaches]
Derivation	Do additive lexical items correspond to additive operators, or do they mark the presence of one? What type of arguments do additive operators take?
Variation	How can the wide distribution of additives across different 'uses' be explained formally?
Presuppositionality	Is additive meaning presuppositional? If yes, within which framework should this presupposition be analysed? What determines when additive meaning can be accommodated? Can additive meaning be suspended?
Obligatoriness	Why is the presence of additives sometimes obligatory?

Table 3.1: A summary of general issues in the study of additivity

3.2 Existential approaches

In this section, I present a number of analyses of additivity that can be qualified as existential. I begin by presenting the classic existential approaches in section 3.2.1. I then discuss some recent defences of the existential approach in section 3.2.2. And finally, I end with a brief discussion of recent additions to the group of existential approaches in section 3.2.3.

3.2.1 The classics within the family of existential approaches

The first formal analysis of additivity is due to Karttunen and Karttunen (1976), whose analysis focuses on the Finnish bound additive pair *–kin* and *–kAAn*. The more-cited analyses of *even* and *also* in English that appear in Karttunen and Peters 1979 in many ways apply the ideas of Karttunen and Karttunen 1976 to a new language.

The label 'existential' is due to the fact that on these approaches, the semantics of an additive involves existential quantification.[9] The content of the additive presupposition – or conventional implicature, as Karttunen and Karttunen (1976) in fact classify it – can be formulated as in (105).

[9]It is also logically possible to model additive presuppositions as involving universal force; such an approach must simply describe a way in which the set over which the additive quantifies over can be restricted so as to contain only the host sentence and its antecedent (c.f. Crnič, 2011).

An illustration will follow shortly.

(105) **Existential presupposition of additives**
There is a y distinct from the F-marked x (the *focus*) such that the open formula derived by replacing x with a variable (the *scope*) is true of y

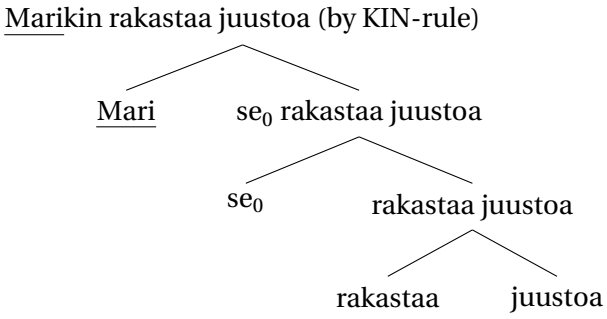
The analysis of additivity in Karttunen and Karttunen 1976 and Karttunen and Peters 1979 is formulated within Montague grammar, and involves both a syntactic rule and a semantic rule. Syntactically, the introduction of the additive marker happens through the application of a quantification rule. This rule takes an affirmative scope – which contains an unbound pronoun, i.e. a free variable – and replaces the unbound pronoun with the focus, to which an additive marker is adjoined. The semantic rule also refers to the focus and the scope arguments: it states that there is some y distinct from the focus x such that the predicate constituted by the scope holds of y (105). As mentioned above, Karttunen and Karttunen classify the additive component as a conventional implicature. In a lot of later work, this classification has not been retained, and it will also not be retained in this dissertation.

But let us return to the formal details of the analysis. In (106), I present a simplified version of Karttunen and Karttunen's analysis of the bound additive *–kin* for the sentence given in (106a). In (106b), se_0 'it' stands for the unbound pronoun that is substituted with the focus *Mari* at the highest node via the application of the KIN-rule. The conventional implicature that Karttunen and Karttunen give for the sentence is shown in (106c). It states that there must be some y distinct from Mari (i.e. the focus) such that y eats cheese (i.e. the scope applies to y).

(106) **Syntax and semantics of *–kin*** (cf. Karttunen and Karttunen, 1976, p. 98–100)

a. *Mari-kin* *rakasta-a* *juusto-a*
Mari.NOM-ADD love-PRES.3SG cheese-PAR
'Mari loves cheese, too'

b.



c. KIN $(\lambda x[\text{loves-cheese}(x)])(\text{Mari})$
Conventional implicature: $\exists y[y \neq \text{Mari} \wedge \text{loves-cheese}(y)]$

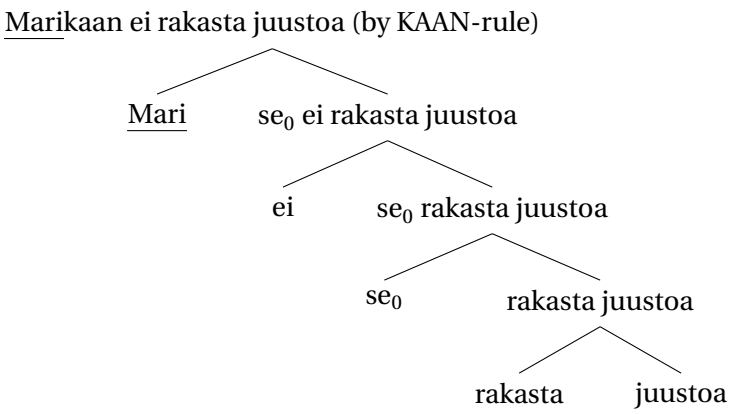
Example (106) shows how the Montague-approach answers the derivation question: the additive is adjoined to its host by way of a syntactic quantificational rule, and the form of the additive presupposition is determined by the identities of the scope and focus arguments. The distinctness question is resolved by incorporating a distinctness clause directly into the conventional implicature associated with the additive. As is typical of existential approaches in general, the antecedent question does not arise; the conventional implicature simply requires there to be some e-type entity y distinct from the focus of which the scope predicate holds.

Importantly, Karttunen and Karttunen (1976) pioneer what is now often referred to as the scope-approach to the form alternation question. They propose that sentences with *–kin* (which on its basic use resembles *too* and *also* in English) and *–kAAn* (which on its basic use resembles *either* in English) are derived using different syntactic quantificational rules. In other words, there are separate KIN- and KAAN-rules in the grammar. The difference is that the KIN-rule requires the scope to be affirmative, while the KAAN-rule requires the scope to be negative. Crucially, however, the semantic rule associated with these two syntactic rules is exactly the same: the only difference between the two rules lies in the polarity of the scope argument. This is illustrated in (107).

(107) **Syntax and semantics of *–kAAn*** (cf. Karttunen and Karttunen, 1976, p. 104–105)

a. *Mari-kaan e-i rakasta juusto-a*
Mari.NOM-ADD NEG-3SG love.CONN cheese-PAR
'Mari does not love cheese, either'

b.



c. KAAN (λx[does-not-love-cheese(x)])(Mari)
Conventional implicature: $\exists y[y \neq \text{Mari} \wedge \text{does-not-love-cheese}(y)]$

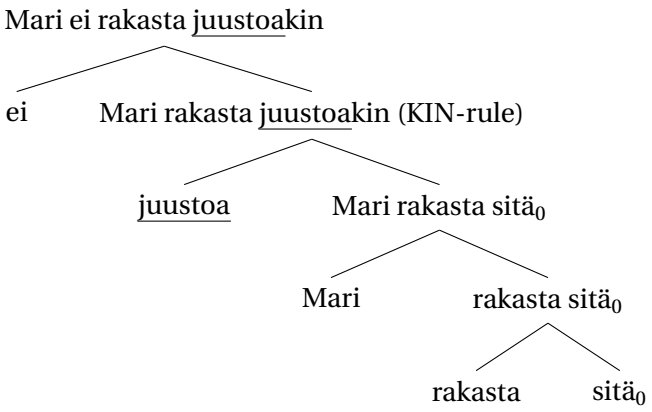
One advantage of the analysis of Karttunen and Karttunen (1976) is that the possibility of *–kin* to appear in the scope of negation directly follows from the syntactic KIN-rule: if negation is to apply, it must apply *after* the KIN-rule. Hence, it is possible to derive examples such as (108), where

the additive conventional implicature involves a positive-polarity scope argument, although the assertion itself is negative.

(108) ***–kin* in the scope of negation** (cf. Karttunen and Karttunen, 1976, p. 106)

a. *Mari e-i rakasta juusto-a-kin*
Mari.NOM NEG-3SG love.CONN cheese-PAR-ADD
'Mari does not love cheese, too'

b.



c. KIN (λx[Mari-loves(x)])(cheese)
Presupposition : $\exists y[y \neq \text{cheese} \wedge \text{Mari-loves}(y)]$

In sum, for Karttunen and Karttunen (1976), the presence of the bound additives *–kin* and *–kAAn* always leads to the same conventional implicature, which moreover is restricted to always taking the host of the additive as its focus (i.e. associate). Their proposal is therefore syntactically and semantically transparent, in that additive marking consistently appears on the associate. This property will be retained in the syntax and semantics that I propose for bound additives from chapter 5 onwards. Moreover, in chapters 4 and 5, I argue that at least one version of the scope approach that Karttunen and Karttunen represent is empirically superior to the polarity-approach in Finnish.

One problem faced by Karttunen and Karttunen's approach is shared by another important existential analysis of additivity due to Rullmann (2003). I postpone the discussion of this issue until Rullmann's proposal has been presented below.

Following Rooth's (1985) analysis of the scalar additive *even*, Rullmann (2003) proposes to abandon the scope approach to the form alternation question in favour of the polarity approach. This means that the English additives *too* and *either* have different semantics. In addition, Rullmann argues that *either* is a negative polarity item, which means that its distribution is partly determined by a licensing condition. Therefore, the main conceptual difference between the existential approaches of Karttunen and Karttunen (1976) and Rullmann (2003) is that on the former

analysis, 'negative' additives such as *–kAAn* and *either* must scope *above* negation, while on the latter, they must scope *under* negation.[10]

Rullmann's analysis of the additives *too* and *either* is couched within the framework of Alternative Semantics (Rooth, 1985, 1992; see section 2.1.3). As we have just seen what the meaning of *either* could be based on Karttunen and Karttunen's analysis of *–kAAn*, let us begin our review of Rullmann's analysis with *either* as well. The relevant entry for *either* is given in (109).

(109) **The semantics of *either*** (Rullmann, 2003, p. 361–362)

a. Ordinary semantic value: $[\![\alpha \text{ either}]\!]^o = [\![\alpha]\!]^o$

b. Focus semantic value: $[\![\alpha \text{ either}]\!]^f = \{[\![\alpha]\!]^o\}$

c. Presupposition: [α either] presupposes that there is at least one contextually salient proposition $p \in [\![\alpha]\!]^f - [\![\alpha]\!]^o$ such that p is *false*

d. Licensing condition: [α either] must be contained within a constituent which implies (i.e. entails or implicates) that $[\![\alpha]\!]^o$ is false

As the entry shows, Rullmann assumes that additives are propositional operators, taking as their only argument the prejacent α (cf. Karttunen and Karttunen, 1976). A distinctness requirement is incorporated in the semantics of *either* by locating p in the relative complement of $[\![\alpha]\!]^o$ in $[\![\alpha]\!]^f$ – notated as $[\![\alpha]\!]^f - [\![\alpha]\!]^o$) – which corresponds to the set of propositions that are in the focus semantic value of α but are not $[\![\alpha]\!]^o$. As the entry in (110) shows, both of these remarks also apply to Rullmann's *too*. However, the licensing requirement in (110d) is specific to *either*, which Rullmann assumes to be a negative polarity item.[11] And, crucially, the presupposition of *too* requires the *truth* of the alternative proposition (110c), while that of *either* requires its *falsity* (109c).

(110) **The semantics of *too*** (Rullmann, 2003, p. 339)

a. Ordinary semantic value: $[\![\alpha \text{ too}]\!]^o = [\![\alpha]\!]^o$

b. Focus semantic value: $[\![\alpha \text{ too}]\!]^f = \{[\![\alpha]\!]^o\}$

c. Presupposition: [α too] presupposes that there is at least one contextually salient proposition $p \in [\![\alpha]\!]^f - [\![\alpha]\!]^o$ such that p is *true*

It should also be noted that Rullmann does not in fact assume that the additive presuppositions of *too* and *either* are purely existential: a restriction to "contextually salient" alternative propositions

[10] Although *too* is in principle capable of scoping over negation, Rullmann (2003) argues that due to a strong and general low-attachment preference, it never does. This explains the additive presupposition of examples such as (108).

[11] The formulation of the licensing condition allows Rullmann (2003) to explain the possibility of *either* to appear not only in negative polarity declarative, but also in e.g. negatively biased polar questions that do not involve overt negative elements.

is incorporated in the semantics of both. To some extent, then, Rullmann's account is between existential and anaphoric.

In terms of their syntax, Rullmann assumes that English additives are VP-adjuncts. This position is natural given that English additives are adverbs. However, when combined with the licensing condition of *either*, this structural assumption leads to an apparent scope paradox. To see why this is, consider (111), where *either* associates with *Italians* within the existential quantifier phrase. By a standard assumption, this means that *either* must scope over *Italians* at LF. Now, given that the associate quantifier phrase takes scope *above* negation, but *either* must scope *under* negation in order to be licensed, the required c-command relation between the additive and its associate appears impossible to satisfy.

(111) **Scope paradox with *either*** (Rullmann, 2003, p. 369, 379)

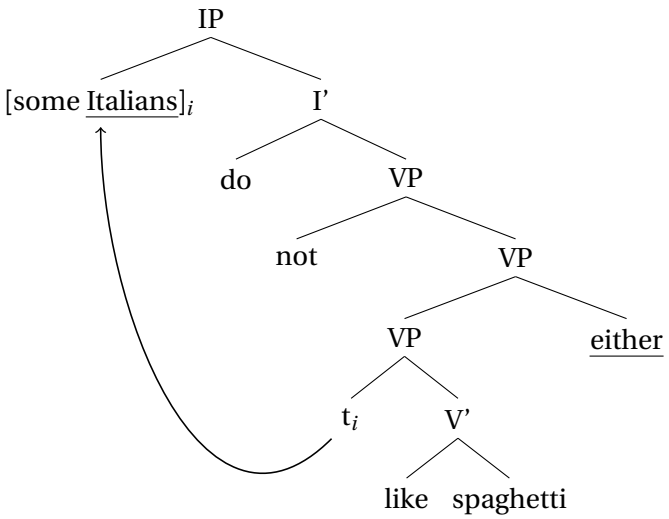
a. Some Italians do not like spaghetti either

b. SOME > NEG
NEG > *either*
⇒ **either* > SOME

Rullmann proposes to solve the scope paradox by letting additives associate with the trace of a *contrastive* topic (or more specifically, its focus feature), as shown in (112).[12] As can be verified, in (112), *either* scopes over the trace of *some Italians*, while being itself in the scope of negation, and *some Italians* takes scope above negation.

[12] Rullmann (2003, p. 380) notes that deriving the presupposition at the level of VP requires some tricks to ensure that the presupposition is not assignment-dependent. If the associate is a subject, e.g. *John*, the presupposition must 'know' that the trace of *John* within the VP refers to *John* before *John* has been re-merged in the structure (assuming that subjects move out of the VP). One solution for this problem is to assume that the trace is converted into a definite description that is no longer assignment-dependent (cf. Erlewine, 2014). In section 6.1.2, I propose that at least in Finnish, additive presuppositions in CT-F configurations may indeed involve assignment-dependency, but that the semantic effect of such configurations is accommodation, and not a plain vanilla additive presupposition, as in (112).

(112) **Structure of a scope paradox sentence (Rullmann, 2003, p. 379)**



In proposing that additives associate with (the trace of) a contrastive topic, Rullmann follows Krifka (1999). For Krifka, stressed, postposed additives are themselves F-marked, and the contrastive topic and the additive together form a topic-comment structure. [13] The additive presupposition, however, is determined as if the associate were simply F-marked; in other words, the small modification introduced by Rullmann (2003) is not supposed to have a semantic effect.[14]

Now that we have discussed the basics of the existential approaches of Karttunen and Karttunen (1976) and Rullmann (2003), it is time to discuss some issues that arise for them. I begin with a general criticism that existential approaches face: the answer – or more specifically, the lack of an answer – to the antecedency question. Recall that the antecedency question asks what types of antecedents are referred to by felicitous additives, and where those antecedents can be found in the discourse context. The existential approach of Karttunen and Karttunen (1976) does not provide an answer to the question, as the question does not even arise: on this analysis, the conventional implicature simply requires there to be some x distinct from y (the focus) such that the scope predicate holds of it. Rullmann (2003) proposes that the additive presupposition requires there to be some "contextually salient" p such that p is true or false (depending on the lexical item used) (Rullmann, 2003). This formulation is slightly more sensitive to the antecedency question, but does not formally define what contextual saliency amounts to, and how that property may be verified.

[13] For Krifka (1999), the focus semantic value of an additive consists in the identity function $\lambda p[p]$ and *negation*, i.e. $\lambda p[\neg p]$.

[14] Rullmann (2003) proposes that the CT-F (contrastive topic-focus) structure formed by the associate of the additive and the additive itself is interpreted in two 'layers'. The layer that is relevant for the additive presupposition is the layer where the contrastive topic acts as the associate of the additive, determining the form of the additive presupposition. On the second level, the contrastive topic and additive topic together form a CT-F structure that is comparable to that of usual CT-F structures (Büring, 2003). Therefore, the focus semantic value of the additive itself does not have an effect on the additive presupposition.

As was shown in sections 3.1.2 and 3.1.7.2, the antecedency question has to be answered especially because additives are generally not felicitous in out-of-the-blue contexts which satisfy the pure existential presupposition (Kripke, 1990/2009; Heim, 1990), as shown in the infelicitous (113). While on Rullmann's approach, one could assume that the infelicity of (113) follows from the absence of a contextually relevant alternative whose truth has been asserted, on Karttunen and Karttunen's approach, it is less clear how this issue could be handled.

(113) **Infelicity of additives without antecedent**
#John is having dinner in New York tonight, too

Another antecedency-related issue that arises for existential approaches is the prediction that the antecedent must always have an established truth value. This is particularly bothersome for explaining some of the Finnish data that will be presented in chapter 4. For example, on the polar use of bound additives in Finnish, the antecedent is the polar opposite of the prejacent. As asserting p and presupposing (the truth of) $\neg p$ is contradictory, an existential analysis of the polar use would need to involve a special presupposition that does not encode a set truth value for the antecedent. This in turn would separate the polar use from the basic use, and lead to a non-unified analysis.

The approaches of Karttunen and Karttunen and Rullmann also face some issues when it comes to the form alternation question. First, Rullmann's approach inherits all questions and issues that arise in the analysis of polarity-sensitivity: for example, one must explain why some additives are polarity-sensitive while others are not.[15] Modern scope approaches, which derive the different presuppositions of e.g. *too* and *either* through the manipulation of scope, and not through a difference in their presuppositions, face a conceptual problem as well. Recall that the standard T-model of generative grammar does not allow information flow between LF and PF (see section 2.1.1). In modern scope-approaches, focus-sensitive operators such as *even* move at LF in order to take a position from which their presupposition is satisfied, be it above or below negation (e.g. Lahiri, 1998; Crnič, 2011). If we apply the same logic to additives, which – in contrast to *even* – have a different surface form depending on where they scope with respect to negation, we are faced with a problem: the PF-form of the additive must now be determined by a relation that only holds at LF. Within the T/Y-model of grammar, it is by definition impossible for the two interfaces to interact. Thus, assuming that only LF-scope differentiates *too* from *either*, or *–kin* from *–kAAn*, is an untenable position in this model of grammar.

To conclude, the classic existential approach of Karttunen and Karttunen (1976) (as well as the analysis proposed in Karttunen and Peters, 1979) is particularly interesting for this dissertation as it defines both a syntax and a semantics for the Finnish bound additives *–kin* and *–kAAn*. While the proposal is couched within Montague semantics, it is easily translatable into Alternative Semantics, and it has many attractive features, such as the simple association between the additive

[15] One answer to this question is provided by Ahn (2015) within a truth-conditional approach to additivity; see section 3.4.1)

and its associate. A downside of the semantics defined in the paper is that it is hard to understand how it could cover e.g. the polar use of *–kin* and *–kAAn*, where the truth of the polar alternative is not presupposed. Moreover, as we just saw, explaining the form alternation between e.g. *too* and *either* is troublesome if the modern LF-movement idea is used in the T/Y-model of grammar. While the approach of Rullmann (2003) is more modern and incorporates insights from the study of focus-sensitivity within Alternative Semantics, it also runs into trouble when applied to the polar use of bound additives in Finnish. In addition, the inclusion of polarity-sensitivity in the semantics of additivity brings with it the questions and issues of polarity-sensitivity in general.

In the next section, I present some recent defences of the existential approach against anaphoric approaches.

3.2.2 Recent defences of the existential approach

The existential approach to additivity has recently been defended against anaphoric approaches by Kapitonov (2012) and Ruys (2015). In what follows, I will present the main ideas of these analyses.

The analysis of Kapitonov (2012) is based on the idea that the existential presupposition that additives bring with them requires the presence of some discourse referent – or *mental representation*, a term covers representations of any entities that discourse participants might have in mind – to which the predication of the host sentence of the additive applies. Kapitonov implements the semantic part of the proposal in dynamic predicate logic (Groenendijk and Stokhof, 1991), and argues that additive meaning should be analysed as a Stalnakerian pragmatic presupposition (Stalnaker, 1999). Without going into the formal details of the analysis, for Kapitonov, the presence of an additive essentially leads to the appearance of an existentially bound variable y in the semantics. In other words, the proposition that the speaker presupposes is an existential statement. The hearer, upon hearing an utterance that contains an additive, accommodates the existential statement without any trouble. However, if the hearer is not able to resolve the identity of the variable y introduced in the presupposition (i.e. to couple it with an appropriate mental representation), the utterance containing the additive will be perceived as infelicitous. The reasoning that Kapitonov attributes to the hearer is that if the speaker uses an additive, they are 'making a parallel reference' to some mental representation, and probably for good reason (i.e. the information is relevant). Thus, the hearer must try to uncover what the parallel reference targets. If this search fails, the utterance is pragmatically odd.

The main advantage of Kapitonov's approach is that establishing the identity of y, i.e. linking it with a referent, may reach further than beyond classical discourse referents, and that the anaphoric feeling of additivity is explained without the involvement of actual anaphora. The first point is especially important because Kapitonov shows that additives may, at least marginally, be felicitous in the presence of world-knowledge referents for the variable (*contra* Kripke, 1990/2009). In (114), for example, the associate is *I*, and the relevant mental representation for the variable is

people in the Netherlands. Crucially, as the follow-up sentence shows, *people in the Netherlands* is not available for anaphora after the *too*-sentence. This is unproblematic for Kapitonov's analysis, where pronominal anaphora has no role in the semantics of additivity (cf. the anaphoric approaches to be presented in section 3.3).

(114) **Shared world knowledge antecedent** (Kapitonov, 2012, p. 71)
[Context: Ann and Jack share a stereotype that people in the Netherlands ice skate a lot, and they both know they share it. Jack tells Ann:]
I'm going to the Netherlands this Christmas. I'll be ice skating, too! *I can't wait to meet them!

Kapitonov argues that the saliency and context-relevance of the mental representation that is identified with the variable introduced by the additive plays an important role in determining the degree of acceptability or felicity associated with additives: the more salient a mental representation, the easier it is to resolve the variable to it. Although Kapitonov's entry of *too* and the examples discussed in the paper only involve mental representations that range over individuals, the approach can in principle be extended to cover other types of mental representations, e.g. propositions. (This is indeed what will be proposed in the analytical part of this dissertation.)

Another recent defence of the existential approach against the anaphoric approach appears in Ruys 2015. Ruys proposes that the presupposition of *too* is as in (115) (cf. Karttunen and Karttunen, 1976; Karttunen and Peters, 1979; Heim, 1990, 1992). In (115), α stands for the F-marked associate of *too*, and ϕ for the scope predicate. (Like Kapitonov, Ruys does not discuss *either*.)

(115) **Presupposition of *too* (Ruys, 2015, p. 358, fn. 23)**
$\phi[\alpha_F]too$ presupposes $\exists x[x \neq \alpha \wedge \phi(x)]$

Ruys's main argument for the existential approach and against the need for an anaphoric approach is based on the observation that in sentences with additives, the associate of the additive is F-marked, while the rest is discourse-old and de-accented, i.e. *Given*, and must therefore have an antecedent A. Ruys makes use of the definition of givenness proposed by Schwarzschild (1999):

(116) **Givenness (after Schwarzschild 1999)** (Ruys, 2015, p. 351)

(i) A constituent C that is not F-marked must be Given

(ii) A constituent C is given iff it has an antecedent A that entails it after replacing all F-marked constituents in C with variables, raising both C and A to type t by filling any open argument positions with variables, and applying existential closure

(iii) Exception: Referential expressions are Given iff they have coreferential antecedents

In Kripke's (1990/2009) classic example *John is having dinner in New York tonight, too*, the focus is *John*, and the scope *is having dinner in New York tonight* is not F-marked; by (116), the scope is Given, and its existential closure comes out as $\exists x$[is-having-dinner-in-New-York-tonight(x)]. By (116), this statement must have an antecedent A that entails it. In an empty context, this is not the case, and the dinner example is therefore predicted to be infelicitous, just as it is on anaphoric approaches. In other words, Ruys argues that once independent properties of focus and Givenness are taken into account, existential analyses of additivity also predict Kripke's example to be infelicitous, and therefore, this example does not adjudicate between the two types of approaches.

To show that an existential approach that makes reference to Givenness is superior to anaphoric approaches, Ruys proposes to manipulate the F-marking of the host sentence so that Givenness is not violated. In (117), which is apparently felicitous in the absence of any mention of anything else passing (i.e. there is no salient antecedent that an anaphor could pick up), the associate of *too* is F-marked (the associate is coindexed with the additive, as in Ruys's examples), but so is the verb. Ruys argues that the extra F-marking on the verb alleviates the Givenness-violation that would otherwise ensue, and renders the example felicitous.

(117) **Manipulation of F-marking to avoid Givenness violation** (Ruys, 2015, p. 356)
This^i, too^i, shall pass

Ruys proposes that with additivity, there are two existential presuppositions at play: one is due to Givenness, and one to the additive itself. The latter presupposition, Ruys argues, does not involve any anaphoric link between the host sentence and an antecedent. In addition to (117), Ruys provides other examples that seem felicitous in the absence of a linguistic (or non-linguistic) antecedent for an anaphor, and that are therefore hard to explain for an anaphoric account. In (118), for example, as long as the existential presuppositions generated by Givenness and the additive are entailed in the context, the results are felicitous.

(118) **Felicity of *too* in the absence of overt antecedent** (Ruys, 2015, p. 359)

a. Guard: I'm sorry, small children are not allowed to enter the garden.
Child: That's not fair! I deserve the right to enter the garden, too.

b. Dean of students: Do PhD students even have families to take care of?
Student representative: Yes, PhD students have families, too

In sum, Ruys argues that the infelicity of additives in out-of-the-blue contexts may be explained without resorting to an anaphoric treatment of additivity. Both Kapitonov (2012) and Ruys (2015) underline the observation that if additivity did involve covert pronominal anaphora, the unavailability of the antecedents for overt pronominal anaphora would be unexpected. The solutions that the two authors provide for this problem are different, however. Kapitonov proposes an analysis of additives where the additive presupposition is existential, but the felicitous use of an additive also requires that the pragmatic component be able to determine the identity of the mental

representation corresponding to a variable introduced by the additive. Kapitonov's approach will be brought up again in section 3.3.1, where I discuss anaphoric approaches to additivity. Note that although I do not adopt the formalism proposed by Kapitonov and formulate the presupposition differently (for example, it will not involve first-order quantification over individuals), the proposal presented in this dissertation will stand very close to it.

In a different vein, Ruys proposes that some properties associated with additives should simply be derived from the semantics of focus and Givenness (cf. Geurts and van der Sandt, 2004), and that the infelicity of the Kripke-example that is used to argue for an anaphoric approach is in fact due to a violation of Givenness. For Ruys, the fact that non-linguistic but contextually entailed propositions may license additives follows from the purely existential view of the additive presupposition.

3.2.3 Other existential approaches

I conclude the presentation of the general existential approach to additivity with a discussion of three proposals: one due to Zimmermann (2015), and two to Szabolcsi (2015, 2017). Both (Zimmermann, 2015) and (Szabolcsi, 2015) are special in that they target non-basic uses of additives, and therefore speak particularly to the variation issue (section 3.1.6). The analysis presented in (Szabolcsi, 2017), on the other hand, is different from the earlier analyses in that it relies on the grammatical process of exhaustification. All three of these proposals are discussed here and not in section 3.3 because they involve no reference to an anaphoric component.

Let us begin with a brief discussion of Zimmermann's (2015) proposal, one of the few that is geared towards a non-basic use of additivity: the double contrast use. Following Rullmann (2003), Zimmermann proposes that additives take scope at the level of the vP.[16] The novel ingredient in the analysis is that additives function as unselective existential binders, binding the trace or traces of moved expressions – such as the focus and, when there is one, the contrastive topic – in their domain.[17] In essence, the result is an existential presupposition which requires the context to entail that there is some x_i (and possibly x_j) such that the predication of the vP holds of x_i (and x_n), and x (and x_n) is distinct from the entity that appears in the same position within the prejacent (119b).

(119) **Additivity as existential unselective binding** (Zimmermann, 2015, p. 143)

a. $[\![\text{ADD } v\text{P}]\!]^g = [\![v\text{P}]\!]^g$; defined iff (b) holds

b. Context $\subset \exists x_i ... x_n$ $[[\lambda y_i ... \lambda y_n . [\![v\text{P}]\!]^{g[i \rightarrow_y i, ... n \rightarrow_y n]}](x_i)...(x_n)]$

[16] As we saw in section 3.2.1, Rullmann assumes that additives take scope at the level of VP. However, Rullmann's analysis would remain essentially the same with vP-adjunction, so this difference will be set aside here.

[17] If the focused element does not move, Zimmermann (2015, p. 145) proposes that the existential operator binds its designated focus index, with the same end result (cf. Erlewine, 2014).

Zimmermann's approach is designed to be suitable for modeling double-contrast additivity (section 3.1.6; sections 4.6 and 6.1.1 for Finnish), which involves both a contrastive topic and a focus. As was mentioned in section 3.1.6, double contrast additivity is not available in all languages. Two languages in which it is used productively include Finnish (Vilkuna, 1984) and Turkish (Göksel and Özsoy, 2003; Kamali and Karvovskaya, 2013). The example in (120a) is from Kamali and Karvovskaya 2013, and (120b) is its Finnish translation. In both examples, the additive is adjacent to a contrastive topic (the double-underlined *Meltem* or *Matti*). The focus in these examples is on the location.[18,19] Crucially, in neither language does the additive require that Meltem or Matti be going to some other location or event besides the concert, or that someone distinct from Meltem or Matti be going to the concert.

(120) **Double contrast additivity**

a. *Leyla sinemaya gidiyor, Meltem de konsere (gidiyor)* [Turkish]
Leyla cinema-DAT go-PRES Meltem ADD concert-DAT go-PRES
'Leyla is going to the movies and Meltem is going to a concert'

b. *Laila o-n meno-ssa elokuvi-in, ja* [Finnish]
Laila.NOM be-PRES.3SG going-INE cinema-ILL and
Matti-kin o-n meno-ssa konsertti-in
Matti.NOM-ADD be-PRES.3SG going-INE concert-ILL
'Laila is going to the movies, and Matti is going to a concert'

Zimmermann (2012, 2015) is the first author to discuss double contrast additivity in formal terms. In the earlier 2012 paper, Zimmermann notes that some additives are able to "reach further" when they search for an antecedent: instead of being restricted to antecedents that answer the same immediate Question Under Discussion, they are able to take antecedents that answer a higher Question Under Discussion (see section 2.2.1 for QUDs, cf. Beaver and Clark, 2008; see also section 3.3.1). In (120), for example, the higher question *Where are L. and M. going?* has two subquestions, *Where is L. going?* and *Where is M. going?*. If the additive in the second conjunct could only refer to an antecedent that answers the immediate QUD *Where is M. going?*, the predicted additive presupposition would be that Matti or Meltem went somewhere else besides a concert. However, this is not the case in (120): rather, the additive refers back to a proposition that answers

[18] In Finnish – but not in Turkish – double contrast additivity in fact requires some 'extra context' to be felicitous (Vilkuna, 1984). This point is discussed in detail in section 4.6.

[19] Note that technically, the associates of the additives in (120) are only contrastive topics if there is still some open question concerning a third person at the moment when the sentences in (120) are uttered (see section 2.1.3; Büring, 2014). In Finnish, *–kin* may indeed attach to such a contrastive topic on a double contrast reading. For simplicity, I assume that in the second conjuncts of (120), we may still assume that the associate is in some sense a contrastive topic. It could be, for example, that it is the relevant intonational contour that is sensitive to the 'openness' of some remaining question concerning a third person, and that the 'correlate' of the contrastive topic in the first conjunct nevertheless has the semantic properties of a contrastive topic (i.e. it gives rise to alternatives). I leave this issue for future research.

the other subquestion of the higher QUD, i.e. *Where is L. going?*. An analysis in terms of QUDs therefore makes it possible to account for the felicity of the additives in (120) in a way that still parallels basic uses.

The main issue with Zimmermann's approach to double contrast additivity comes from its lack of predictiveness. Given that there is cross-linguistic variation in whether double contrast additivity is available, this variation should be traceable to some property of grammar. On Zimmermann's approach, the source of variation must be related to the number of traces (i.e. variables) that can be bound by the additive within the *v*P (i.e. a difference in the selectiveness of the binding process). This means that cross-linguistic variation must be due to stipulated differences between additives. In Hungarian, for example, double contrast additivity is not allowed; therefore, Hungarian additives are not unselective binders. Now, while judgments are clear in some languages (e.g. Finnish, Turkish, and Hungarian), in other languages, such as English (121) and German (122), double contrast additivity is not fully productive, but not fully unproductive either (Krifka, 1998; Zimmermann, 2012). The problem of an analysis that relies on disallowing unselective binding with some additive operators, but not others, is that it is hard to make sense of the "gradability" of the acceptability of double contrast additivity in a given language: how can the same additive accept double contrast in some contexts, but reject it in others?

(121) **Double contrast additivity in English** (Zimmermann, 2012, p. 23)

a. [What properties do the Blacks have? What property does Bernie have? What property does Don have? ...]

b. Then there was Bernie Black$_{CT}$, who had a view of Gramercy Park$_F$, but not a key to it, which he said was worse than looking at a brick wall. Chelsea Black$_{CT}$ had a tan line around her ring finger$_F$, because she got divorced right after she got back from her honeymoon, and Don Black$_{CT}$ was **also** an animal-rights activist$_F$, and Eugene Black$_{CT}$ **also** had a coin collection$_F$.
(Jonathan Safran Foer, *Extremely Loud and Incredibly Close*)

(122) **Double contrast additivity in German** (Zimmermann, 2012, p. 23)

a. Did the twins misbehave again? [What$_F$ did the twins$_{CT}$ do? What$_F$ did Randy$_{CT}$ do? What$_F$ did Sandy$_{CT}$ do?]

b. ?*RANdy$_{CT}$ hat geTRUNken$_F$, und SANdy$_{CT}$ hat auch geRAUCHT$_F$*
Randy has drunk and Sandy has ADD smoked
'Randy drank and Sandy smoked'

In sum, the proposal put forth by Zimmermann (2015) allows double-contrast additivity, but requires a stipulation to explain its distribution. Moreover, as hinted at in section 3.1.7.2, it will later be proposed that in cases where the host sentence of the additive contains both a contrastive

topic and a focus, two distinct interpretations are possible: in one case, we have double contrast additivity, while in the other, an accommodating process takes over (section 6.1.2).[20] Therefore, fixing the position of additives to *v*P-adjuncts limits the space of manoeuvreing in an undesirable way when it comes to accounting for the different readings that additives give rise to.

I now proceed to discuss the first of two recent proposals by Szabolcsi (2015, 2017). The main idea that Szabolcsi defends in the 2015 paper is that additives – or in general, MO-particles, after the additive *mo* in Japanese – are not themselves additive operators, but appear when a specific semantic requirement concerning the host sentence of the additive and the immediate context in which the host sentence appears is satisfied. For Szabolcsi, the essential requirement of MO-particles is that the immediate context is interpreted as the meet (i.e. roughly, an intersection or conjunction[21]) of two propositions: the host proposition, and a parallel proposition (cf. Asher, 1993).[22] When this is the case, the 'context proposition' Y entails the host proposition X, and this satisfies the requirement of the MO-particle:

(123) **The requirement of MO-particles** (Szabolcsi, 2015, p. 12)

a. My "host proposition" X is entailed by an "immediate context proposition" Y

b. Y is the meet of X and a parallel proposition Z

This analysis is classified as existential here for the simple reason that the semantics of MO-particles do not require the 'identification' of a parallel proposition Z, which means that there is no anaphora involved. Under (123), as long as the context entails some parallel proposition Z, the requirement of MO is satisfied.

Whereas Zimmermann (2015) aims to account for the double-contrast use of additives, Szabolcsi (2015) aims to cover the use of additives as conjunctive or coordinating elements. Indeed, in Szabolcsi's system, the use of the same lexical items for additivity and coordination is natural. This is because the requirement imposed by MO-particles can be satisfied in a 'delayed' fashion (cf. postsuppositions; Brasoveanu, 2013): in (124), each conjunct may be used to satisfy the MO-requirement of the other conjunct (see also Brasoveanu and Szabolcsi, 2013).[23] Roughly, for

[20] This effect can also be seen in German by placing the additive *auch* in (122) sentence-finally and changing the tense specification to simple past, as in (123), where the second conjunct means that Sandy both smoked and drunk (p.c., Malte Zimmermann):

(i) *RANdy*$_{CT}$ *TRANK*$_{F}$ *und SANdy*$_{CT}$ *RAUCHte*$_{F}$ *auch*
Randy drank and Sandy smoked ADD
'Randy smoked, and Sandy smoked (and drank)'

[21] Szabolcsi's (2015) analysis is couched within the framework of Inquisitive Semantics (Ciardelli et al., 2013, 2015), where conjunction is analysed as Heyting-algebraic meet. For the level of discussion that is relevant here, the exact technical difference between a meet (a lattice-theoretic notion) and a conjunction does not matter.

[22] The relevant requirement of parallelism states that the host and parallel propositions have a common theme, but also differ, at least minimally. In alternative semantics, this can be formulated through a condition on the membership of the parallel proposition in the focus alternative value of the prejacent (and a distinctness requirement).

[23] The idea of postsuppositions will be relevant for the treatment of accommodated additive presuppositions pre-

both conjuncts in (124), the context proposition Y is the meet (or conjunction) of *János danced* and *Mari danced*; as Y entails both of its conjuncts, the requirements of the MO-particles are satisfied. On the basic use, the MO-requirement would simply be satisfied in virtue of some Z entailed by the context.

(124) **Conjunctive MO-particles** (Szabolcsi, 2015, p. 7)
János is Mari is táncolt
János ADD Mari ADD danced
'János danced and Mari danced'

In sum, Szabolcsi (2015) associates additives with a general semantic requirement that must be satisfied by the immediate context for the additive to be usable. For Szabolcsi, the appearance of an additive therefore does not signal the presence of any covert operator per se (cf. Lee, 2004); in fact, as Szabolcsi puts it, "KA and MO are not looking for particular expressions or abstract operators in their environment. They simply check whether a certain kind of semantic relation holds between the interpretation of the host and that of the larger context. They do not care how that relation might have come about" (p. 13) (where KA refers to another type of quantifier particle associated with lattice-theoretic join, existential quantification, and disjunction). While this is conceptually attractive, it remains to be explained how the form of Z and hence Y are constrained within this analysis. In other words, the contribution of focus must be factored in. Whether or not this can be done without assuming that MO-particles are themselves focus-sensitive operators or mark the presence of such operators is not a question that is addressed by Szabolcsi (2015).

In a later paper, Szabolcsi (2017) proposes a different analysis of additivity. As the process of exhaustification figures prominently in the analysis, we will begin by an overview of its properties. Very shortly, exhaustification is a grammatical process wherein an exhaustification operator – often simply notated as O (for *only*) – applies to a prejacent and a set of alternatives of the prejacent, and negates some of the alternatives (Krifka, 1995; Lahiri, 1998; Chierchia, 2006; Fox, 2007; Chierchia, 2013). Specifically, the exhaustification operator O asserts the conjunction of the prejacent and the negations of all alternatives that are not entailed by the prejacent and whose negation is consistent with the assertion. These alternatives are *innocently excludable* (IE; Fox, 2007). Formally, an IE-alternative is included in each possible set of alternatives that contains as many alternatives as possible that can be negated without contradicting the assertion.

To see what this means in practice, consider the case of disjunction.[24] With disjunction, the

sented in section 6.1.2.

[24] Exhaustification has been used to explain the derivation of e.g. scalar implicatures (Chierchia, 2006; Chierchia et al., 2011; Chierchia, 2013):

(i) Scalar implicature of *some* and O
O[*Some* cakes are good] = ¬[*All* cakes are good]

The *scalar alternative* of a sentence involving *some* is the same sentence where *some* has been replaced with *all*. Let us refer to these sentences as ϕ (prejacent) and ψ (alternative). In the case of scalar implicature, ψ entails ϕ, but

relevant set of alternatives is assumed to contain a scalar alternative – $[p \wedge q]$ – as well as the individual disjuncts, which are also called the *(sub)domain alternatives* (Sauerland, 2004).

(125) **Alternatives of** $\alpha = [p \vee q]$

a. Scalar : $\{p \wedge q, p \vee q\}$

b. Domain : $\{p, q\}$

Given these alternatives, it can be shown that the exhaustification of α gives rise to an exclusive interpretation of the disjunction. Consider (126).

(126) **Exhaustification of** $\alpha = [p \vee q]$

a. Assertion $= [q \vee p]$

b. Alternatives $= \{[q \vee p], [q \wedge p], q, p\}$

c. $O(\alpha)$ $= [q \vee p] \wedge \neg[q \wedge p]$

In the alternative set shown in (126b), only the scalar alternative $[p \wedge q]$ is innocently excludable. This is because only the sets $\{\neg p, \neg[p \wedge q]\}$ and $\{\neg q, \neg[p \wedge q]\}$ are consistent with the assertion – notably, negating both disjuncts is inconsistent with the truth of the disjunction – and only the conjunctive alternative appears in both of these sets. O thus negates the scalar alternative, and the end result is the conjunction of $[p \vee q]$ and $\neg[p \wedge q]$, i.e. exclusive disjunction.

In Szabolcsi's (2017) analysis, the semantics of additivity involves the exhaustification of focus alternatives. Moreover, Szabolcsi assumes that the focus alternatives that participate in the exhaustification process must be contextually relevant, and uses this property to explain the infelicity of Kripke-examples (i.e. cases where there is no contextually relevant focus alternative to the prejacent) without making reference to anaphora.

Instead of picking up an antecedent in the context, the main semantic role of additives under Szabolcsi's proposal is to *bifurcate* the set of focus alternatives: the result of this process is a set that contains the prejacent on the one hand, and a set of other, contextually relevant alternatives on the other. What lies at the core of additivity under this analysis is the property of distinctness: the bifurcation process effectively separates the prejacent (p) from the other alternatives (e.g. q and r). Szabolcsi calls the resulting alternative set BI-ALT (for *bifurcated alternative set*), noting that as sets are equivalent to joins, BI-ALT may be expressed either as a set (127a) or as the join (i.e. roughly, disjunction) shown in (127b).

the reverse is not true. Hence, if O is applied to ϕ, O asserts ϕ and negates ψ; the conjunction of ϕ and ψ, then, corresponds to the *some but not all* meaning that *some* has in contexts where scalar implicatures arise.

Note that scalar implicatures do not arise in every context; for example, if the stronger alternative is irrelevant for the purposes of discussion, the scalar implicature might not be triggered. In other cases, however, the application of O is obligatory (Chierchia, 2013). This is the case with negative polarity items such as *any*. Their alternative sets are always active, and must be incorporated into the meaning of the sentence through the use of an exhaustification operator.

(127) **Bifurcation for prejacent p with alternatives q, r** (Szabolcsi, 2017, p. 462)

a. BI-ALT $= \{\{p\},\{q,r\}\}$

b. BI-ALT $= \{p\} \cup \{\{q\} \cup \{r\}\}$

Szabolcsi's main claim is that additives do not encode a presupposition requiring the truth of a distinct focus alternative.[25] Instead, this meaning component is the indirect result of another semantic operation that targets BI-ALT, and results in the meaning given in (128), i.e. the conjunction of the prejacent p with the disjunction of the distinct focus alternatives q and r (if only those alternatives are contextually relevant).

(128) **Goal of double-exhaustification** (Szabolcsi, 2017)
$p \wedge [q \vee r]$

To derive (128), Szabolcsi uses the recursive exhaustification technique that has been used to turn disjunctions into conjunctions in the context of e.g. free choice items (Fox, 2007; Bar-Lev and Margulis, 2014).[26] In (129), I show how a disjunction of two propositions p and q may be turned into a conjunction with double exhaustification.

First, in (129a), A stands for the assertion, which in this case is again the disjunction of two propositions, p and q. The alternatives of A are shown in (129b): this set includes the disjunction itself and the two disjuncts (the domain alternatives), but crucially not the scalar conjunctive alternative. When the exhaustification operator O applies to this set, it asserts the prejacent (or A) and conjoins to it the negation of all other members of Alt(A) that are innocently excludable. As neither disjunct is innocently excludable, O has no effect on the first round. However, for the second round of exhaustification – based on the exhaustified $O[p \vee q]$ – the alternative set is different; it now contains $O(p)$ and $O(q)$. These alternatives correspond to *only p* and *only q*, i.e. $[p \wedge \neg q]$ and $[q \wedge \neg p]$. Now, these alternatives *are* innocently excludable: they are both included in every – or, more specifically, the only – way of excluding as many alternatives as possible without contradicting the assertion. This is because stating that it is not the case that only p is true and that it is not the case that only q is true is perfectly compatible with the disjunction of p and q. From there, then, it can be deduced that the conjunction of p and q actually must hold, as shown in (129e).

[25] Much like Ruys (2015), Szabolcsi argues that due to their focus-sensitivity, and the consequent focus-background partitioning of the sentence, additives are always accompanied by an existential presupposition (Geurts and van der Sandt, 2004; Abusch, 2010; see (136) in section 3.3.1).

[26] Both Ahn (2015) (see section 3.3.2) and Szabolcsi (2017) link additives to polarity-sensitivity, a domain of semantics where exhaustification-based analyses are very popular. The connection between additives and polarity-sensitivity is in some sense desirable given the cross-linguistic tendency of superficially similar or identical morphemes to appear both as additives and as building blocks of negative polarity items and free choice items (section cf. Szabolcsi, 2015; 3.4.1). In chapter 4, we will see that in Finnish, too, bound additives are part of the morphological make-up of some quantifiers. However, their analysis will not make use of exhaustification, nor assume any kind of formal polarity-sensitivity.

(129) **Recursive exhaustification of a disjunction (domain alternatives only)**

a. A $= [p \vee q]$

b. ALT(A) $= \{[p \vee q], p, q\}$ [p and q are not IE]

c. $O(\text{ALT}(A))$ $= [p \vee q]$ [p and q not negated]

d. $\text{ALT}(O(\text{ALT}(A)))$ $= \{O[p \vee q], O(p), O(q)\}$ [O(p) and O(q) are IE]

e. $O(\text{ALT}(O(\text{ALT}(A))))$ $= [[p \vee q] \wedge \neg[p \wedge \neg q] \wedge \neg[q \wedge \neg p]]$ [$O(p)$ and $O(q)$ negated]
$= [p \wedge q]$

Recall that under Szabolcsi's analysis, additives such as *too* bifurcate the set of alternatives as shown in (127). Szabolcsi argues that without exhaustification, a sentence that contains an additive ends up requiring that the prejacent (p) **or** some alternative (q or r) is true. However, through recursive exhaustification, the disjunction becomes a conjunction, just like in (129): as a result, the requirement is that the prejacent (p) **and** some alternative (q or r) is true, satisfying the goal set in (128).

There are two things to note about Szabolcsi's analysis. The first is that while the paper itself only discusses *too*, it is natural to assume that if the essence of additivity lies in the bifurcation of the set of alternatives, both *too* and *either* should lead to the same bifurcation (cf. the form alternation question). The interesting question is whether in this case the additive should scope above (cf. scope approaches) or under (cf. polarity approaches) negation. Let us now consider these two options in turn.

If the additive scopes above negation, the alternatives should contain negation. Take a sentence such as *Bill did not yawn, either.* Let p stand for the proposition expressed by this sentence, i.e. λw[yawned(Bill)(w)], and q and r for two focus alternatives where *Bill* has been replaced with *Mark* and *Ken.* If we now bring over the goal of recursive exhaustification from (128), the result should be (130c), which indeed corresponds to the intuitive meaning that is associated with the *either*-sentence.

(130) **Bifurcating approach to *either*: *either* scopes over negation**

a. Assertion $= \neg p = \lambda w[\neg\text{yawned(Bill)}(w)]$

b. BI-ALT $= \{\{\neg p\}, \{\neg q, \neg r\}\}$

c. $O(\text{ALT}(O(\text{BI-ALT})))$ $= [\neg p \wedge [\neg q \vee \neg r]]$

If the additive scopes under negation, there are at least two options. The first is to assume that both *too* and *either* have a bifurcating semantics, and what is negated is the result of recursively exhaustifying BI-ALT. This leads to in the result shown in (131d), which is logically stronger than that shown in (130c): *all* contextually relevant alternatives have to be false (by De Morgan's law, the negation of the disjunction is equivalent to the conjunction of the negated disjuncts). This

analysis is compatible with the intuitive meaning of the *either*-sentence as long as the set of focus alternatives is very restricted in size. In particular, there cannot be any relevant focus alternatives in the context that could still be true after the recursive exhaustification process has taken place. The plausibility of this explanation will not be evaluated here.

(131) **Bifurcating approach to *either*: *either* scopes under negation**

a. Assertion $= \neg p = \lambda w[\neg\text{yawned(Bill)}(w)]$

b. BI-ALT $= \{\{p\},\{q,r\}\}$

c. $O(\text{ALT}(O(\text{BI-ALT}))) = [p \wedge [q \vee r]]$

d. ¬(131c) $= \neg[p \wedge [q \vee r]]$
$= \neg p \vee \neg[q \vee r]$
$= \neg p \vee [\neg q \wedge \neg r]$

The other option is to assume that the meanings contributed by *too* and *either* are in fact not alike (cf. the polarity approaches). This option seems less compatible with the general uniformity-aiming proposal of Szabolcsi, however. Thus, the extendability of Szabolcsi 2017 from *too* to *either* is not immediately obvious.

The second point to make about Szabolcsi's analysis concerns the result that is attained through the recursive exhaustification of BI-ALT. So far, I have simply assumed that the process works as was shown in (129). We will now go through a derivation step by step and see that it is in fact unclear whether recursive exhaustification can be used to bring about the meaning in (128).

Let us use Szabolcsi's example sentence *Bill yawned, too*. The assertion (or prejacent) p is shown in (132a). The set BI-ALT in (132b) is the same as in (127). In (132c), the exhaustification operator O targets p and BI-ALT (for the first time). It asserts the prejacent p and negates all its innocently excludable alternatives. In this set, there is plausibly only one other alternative: the disjunction of q and r. As p does not entail $[q \vee r]$, and the negation of this disjunction is consistent with p, the disjunctive alternative is innocently excludable, and it is therefore negated by O. The end result is the conjunction of p with the negation of $[q \vee r]$, which corresponds to the conjunction of the negations of q and r (by De Morgan's law). However, this meaning is not what the sentence with *too* conveys, and it does not correspond to the goal set in (128): at least one of the alternatives q and r should be true. Whether a second round of exhaustification happens or not does not matter, because from (132c) onwards, it will not be possible to add conjuncts that contradict $\neg q$ or $\neg r$ into the strengthened meaning of the sentence.

(132) **Reworking through the derivation of *Bill yawned, too*** (cf. Szabolcsi, 2017, p. 462)

a. Assertion $= p = \lambda w[\text{yawned(Bill)}(w)]$

b. BI-ALT $= \{p,\{q,r\}\}$
$= \{p,\{[q \vee r]\}\}$ [$[q \vee r]$ is IE]

c. O(BI-ALT) $= [p \wedge \neg [q \vee r]]$ [$[q \vee r]$ negated]
$= [p \wedge [\neg q \wedge \neg r]]$

The problem with (132) lies in the structure of the alternative set: while the conjunctive interpretations of disjunction involve an alternative set that includes the assertion $[p \vee q]$ and its disjuncts p and q, the alternative set in (132) includes the assertion p and the disjunction $[q \vee r]$. In the conjunctive interpretations of disjunction, the conjunctive meaning arises because the disjunction is true, but $O(p)$ and $O(q)$ are false (see (129)). In (132), however, even if the disjunctive alternative $[q \vee r]$ was pre-exhaustified to $O([q \vee r])$, this would not help, because the first exhaustification round of disjunction always returns the disjunction itself (see above). Thus, it seems hard to escape the unwanted result shown in (132).

To conclude, while Szabolcsi's approach is an interesting move towards bringing the analysis of additives within the reach of exhaustification semantics, it is unclear whether the recursive exhaustification of a bifurcated alternative set produces additive meaning exactly as it is intended to. For another approach to additivity that builds on exhaustification but adds an anaphoric component, see the discussion of Ahn, 2015 in section 3.3.2).

3.2.4 Summary

This section was dedicated to the presentation of existential approaches to additivity. I begun by discussing the technical implementations of Karttunen and Karttunen (1976) (see also Karttunen and Peters, 1979) and Rullmann (2003). While both approaches can be classified as existential, they differ in terms of their answer to the form alternation question: Karttunen and Karttunen pioneer the scope approach, whereby additives such as *either* take scope above negation, while Rullmann defends a polarity approach, letting *either* and its cognates take scope below negation.

I then proceeded to discuss some recent defences of the existential approach against the anaphoric approach. Both Kapitonov (2012) and Ruys (2015) suggest that it is not possible to account for the felicity of additives solely in terms of anaphora. Additives can, for example, be felicitously used when certain pieces of world knowledge that are never overtly asserted are available. Moreover, the infelicity of Kripke-examples (e.g. *John is having dinner in New York tonight, too* uttered in an empty context) may in fact be due a pragmatic reference resolution issue (Kapitonov, 2012) or an independent existential presupposition generated by the focus-background partitioning of the prejacent (Ruys, 2015). The first idea is particularly important for this dissertation, and will be rediscussed in more detail in section 3.3.1. While I will not adopt this idea as is, it and the underlying conception of additive presuppositions as speaker presuppositions (Stalnaker, 1973, 1974, a.o.) play a major role in the proposal I put forth in this dissertation.

I ended this section with a presentation of three recent analyses that can be classified as existential; one by Zimmermann (2015) and two by Szabolcsi (2015, 2017). A major merit of Zimmermann's approach is that it covers not only the basic use of additivity, but also generalises to

the double-contrast use. The variation issue is also present in Szabolcsi's two analyses: in the first, it is the conjunctive or coordinating use that is particularly salient, while in the second, the connection of additives to free choice and polarity elements is stressed. The latter analysis differs from classic existential approaches in that it involves (recursive) exhaustification (e.g. Chierchia, 2013). I argued that while the proposal makes an interesting connection between additivity and e.g. exclusive focus-particles such as *only* (which may also be analysed in terms of exhaustification), some internal problems remain, and it is unclear whether the relevant meanings can be derived in the proposed way.

In this section, I reviewed arguments according to which existential approaches are superior to anaphoric approaches, but also anticipated some issues that the existential approaches face in accounting for the meaning and distribution of additives in Finnish. For example, as existential approaches typically require that some focus alternative of the prejacent has a set, established truth value, it is hard to explain how additives may ever be felicitous when the truth value of the focus alternative is not established. This is the case for e.g. the polar use of additives in Finnish (see section 4.5 for description of the data). Nevertheless, the proposal that I put forth in this dissertation incorporates many ingredients and insights from the approaches described in this section. In chapter 4, I argue that a syntactic version of the scope approach pioneered by Karttunen and Karttunen (1976) is suitable for analysing additivity in Finnish. Moreover, although my analysis is couched within Alternative Semantics (cf. Rullmann, 2003), I retain the tight connection between the morphological host and the semantic associate of bound additives that Karttunen and Karttunen propose for Finnish bound additivity. I also remain sympathetic to the observations of Kapitonov (2012) and Ruys (2015) concerning cases where an anaphoric analysis seems untenable, and, as mentioned above, adopt Kapitonov's idea that additive presuppositions are speaker presuppositions.

3.3 Anaphoric approaches

In this section, I present different anaphoric approaches to additivity. I begin with the classic analyses of Heim (1990, 1992), Kripke (1990/2009), and Asher (1993) (see also Asher and Lascarides, 1998). I then present three recent defenses of the anaphoric approach that appear in the accounts of Geurts and van der Sandt (2004) (see also van der Sandt and Geurts, 2001), Abrusán (2014), Ahn (2015), and Beaver and Clark (2008). A summary concludes this section.

3.3.1 The classics within the family of anaphoric approaches

The anaphoric approach to additivity began with the work of Kripke (1990/2009) and Heim (1990, 1992), and is based on the idea that additive presuppositions are not merely existential, but incorporate an anaphoric element. The by now very familiar, infelicitous Kripke-example in (133a) was the starting point of this line of research (cf. (95), (113)) (Kripke, 1990/2009). Another example is

given in (133b) (Heim, 1990).

(133) **Infelicity of additives without antecedent**

a. #John is having dinner in New York tonight, too

b. #John went to Harvard, too

The point that Kripke (1990/2009) and Heim (1990) make about examples such as (133) is that if the additive presupposition of *too* were simply existential, then the additive presupposition should be satisfied: for (134a) this is because it is common ground that many people distinct from John have dinner in New York every night, and for (134b) because it is common ground that many people have gone to Harvard. As we saw in section 3.2.2, the necessity of invoking anaphora to explain the infelicity of examples such as (133) has been recently questioned by Kapitonov (2012), who proposes that these examples are infelicitous due to a failure in establishing the identity of the existentially bound variable introduced by the additive, and Ruys (2015), who proposes that these examples are infelicitous because of the unsatisfiability of the existential presupposition that arises from the focus structure of the whole sentence, and crucially from the Given part of it. In this section, I do not discuss Ruys's criticism any futher. However, I do come back to Kapitonov's analysis. Before doing so, I first present the gist of two major anaphoric proposals: Heim (1990, 1992) and Kripke (1990/2009).

Although Kripke (1990/2009) does not spell out a formal semantics for additives, it is clear that the proposals of Kripke and Heim differ in a specific way. First, Heim (1990) proposes that additive presuppositions are best analysed as admittance conditions: they state what the context must be like for the content of their host sentence to be added to it (Heim, 1982). Specifically, Heim argues that the admittance conditions of an utterance with an additive are not simply satisfied by a general existential statement such as *someone went to Harvard* for (133b). Instead, as Heim formulates it, (133b) "requires a context that entails, for some particular (individual or group) x that is salient in the context of utterance and presupposed to be distinct from John, that x went to Harvard" (p. 6). Heim goes on to note that any proposition of the form *that x went to Harvard* will do, but that this proposition is not a general existential statement. For Heim, this property of additive presuppositions also explains why they resist accommodation; "the audience, however cooperative and willing to accommodate it may be, doesn't know *which* proposition among the many that would make (133) admissible it is supposed to add [to the common ground]" (p. 7).

In a later paper, Heim (1992) cashes out this idea by introducing an anaphoric link between the additive and an antecedent that must be a salient discourse referent (*dref*) distinct from the associate. The link between the additive and the antecedent is signalled by coindexation. Formally, the additive presupposition that Heim proposes corresponds to (134) (Heim, 1992, p. 189). Using the terms introduced in section 3.2.1, in (134), ϕ is the scope predicate, and the underlined α the focus (i.e. the associate of *too*). As the comparison of (105) and (134) shows, there is considerable overlap between this anaphoric approach and the classic existential approach of

Karttunen and Karttunen (1976) and Karttunen and Peters (1979).

(134) ***dref*-anaphoric presupposition for *too*** (Heim, 1992, p. 189)
[[$\phi(\underline{\alpha})$] too^i] presupposes $x^i \neq \alpha \wedge \phi(x^i)$
There is a salient dref x distinct from the F-marked α (the *focus*) such that the open formula ϕ derived by replacing α with a variable (the *scope*) is true of x

For Kripke (1990/2009), additives point or refer to *parallel information* that is located in the *active* context (i.e. not backgrounded world knowledge; cf. Kapitonov, 2012).[27] As Kripke proposes that the context contains questions and assertions, the antecedent is not in an individual as in Heim's approach, but a proposition (or a more complex discourse entity). Given that sentential anaphora exists, it is possible that the technical implementation of Kripke's analysis could simply involve coindexation of *too* with a dref that refers to a proposition; in fact, such a proposal is explicitly defended by Ahn (2015) (see section 3.3.2).

In the context of Finnish, the anaphoric approaches of Heim and Kripke face some familiar issues that are independent of the involvement of anaphora. For example, Heim's proposal that the context must entail that the scope predicate ϕ holds of some salient dref x does not easily lend itself to an analysis of the polar use of bound additives (where the antecedent is the polar opposite of the prejacent: see section 4.2 for a description of the data). First, if these examples is involve sentence polarity focus, what is the relevant dref for the additive?[28] And second, on the polar use, the truth of the alternative with opposite polarity is neither presupposed or asserted. The proposal of Kripke fares better in this regard: once the 'active context' is given an appropriate modelisation, it becomes possible to say that the relevant antecedent proposition is located not in the common ground (in which case its truth value is settled) but some other component of the discourse model. In this dissertation, this point will turn out to be crucial in explaining the behaviour of bound additives in Finnish.

Let us now consider some criticism that anaphoric approaches have faced, in Kapitonov's work in particular. On the anaphoric approach, the infelicity of the Kripke-examples in (133) is explained if there is no salient individual or salient proposition in the context that would satisfy the relevant requirement. As we saw in section 3.2.2, Kapitonov (2012) proposes that the difficulty with these examples rather stems from the difficulty for the hearer to identify that salient individual (Kapitonov does not discuss additivity from a propositional perspective). Now, recall that

[27] The idea of parallel propositions is also explicitly present in the approach of Asher (1993) (see also Asher and Lascarides, 1998). For Asher, additives "require that there be some proposition in the context that bears the rhetorical relation *Parallel* to the content of the sentence in which *too* occurs" (p. 8) (cf. sections 3.1.2 and 3.1.8). The rhetorical relation of Parallel holds of two constituents of a segmented discourse representation structure (see Asher 1993 for details on this development of DRT) when they share a common theme, and that common theme is as maximal as it may be while keeping both constituents informative. In other words, the prejacent and the antecedent have to have the same form and/or content as far as the theme goes; their only difference guarantees that both constituents are non-redundant with respect to each other (cf. the distinctness question, section 3.1.3).

[28] In general, Heim's (1990; 1992) analysis must be made to allow for other types of associates and antecedents besides proper nouns and other entities that are typically modelled as discourse referents; indeed, verbs and adjectives and all kinds of different categories may function as the associate of an additive (cf. Beaver, 2001, p. 97).

Kapitonov's analysis is couched within the Stalnakerian approach to presupposition. Specifically, for Kapitonov, the use of an additive by a speaker introduces a simple existential presupposition involving a variable x that the hearer can easily accommodate. What is problematic in (133) is that the identity of the variable x cannot be resolved (by the pragmatic module). In other words, although the hearer understands that the speaker is 'making a parallel reference' to some x, there is no way for the hearer to recover the identity of that x, and thus, the utterance is felt to be infelicitous.

There is a simple way to show that additives may in fact be felicitous even when the identity of x is left unresolved. Imagine a context where two people, A and B, are sitting in a room with a screen. Both have a bag with some objects, but cannot see what the other has in their bag. On the screen, a picture of a red square is projected, and A exclaims (135). In this context, (135) is felicitous, although B is not able to figure out the identity of x. What B does know based on A's assertion is that A has some red object in their bag. This inference arises regardless of whether B also has red objects or not.[29]

(135) A: Oh, that square is red, too!

This example shows two things. First, as Kapitonov (2012) claims, the felicitous use of additives seems to require that the *speaker* has in mind some salient alternative mental representation (for this example, let us follow Kapitonov and assume that the alternative is an individual object). If A could not see the contents of their bag, (135) would be infelicitous. Second, *contra* Kapitonov (2012), it is not always necessary for the identity of that individual to be recoverable by the hearer. The latter point is a natural consequence of the pragmatic approach. Specifically, in contexts where the hearer feels that they should or could be able to work out the identify of the individual that the speaker is making parallel reference to, they can attempt to do so by inquiring the speaker about what they are referring to. In some contexts, however, the hearer knows that they are not to ask. For example, if (135) was uttered in the context of a game where it is advantageous to know what objects of what colour the other person has, B would already be quite satisfied with having learned that A has a red object in their bag.

Note that especially in the context of a game, there is a feeling that A makes a mistake by uttering (135): even if A does not presuppose that it is common ground that some alternative to (135) is common ground (i.e. that it is common ground that A has a red object in their bag), by uttering (135) and 'acting as if' it is common ground, this information in fact becomes common ground. In a way, in uttering (135), A makes an *accidental* informative presupposition (Stalnaker, 1973): if B understands (135), B also understands that A could only utter (135) if A had some alternative red object in mind, which effectively makes it common ground that A has a red object in their bag. However, the identity of that red object is again not required to be retrievable for B for (135) to be felicitous.

[29] In other words, even if B also has a red object in their bag, B will nevertheless proceed to reason about A's bag's contents.

In sum, Kapitonov's criticism of the anaphoric approach of Heim (1992) and the shift of perspective from the admittance conditions to speaker presuppositions provides us with some important insights. First, the importance of the saliency of an alternative that anaphoric approaches underline is retained, but the saliency is now thought of as primarily concerning the speaker, as illustrated in (135). Indeed, even the Kripke-examples in (133) can be made less infelicitous if the speaker is allowed to be slightly uncooperative or just oblivious: they do not notice that the identity of the salient individual – which they must have in mind – is not so obvious to everyone else. Second, depending on the context, the hearer may be satisfied with simply accepting the information provided by the speaker's use of *too* – namely, that they have in mind some parallel referent – or they may proceed to inquire about its identity if this information is relevant, and if they believe that they should know it.

To conclude this section, let us note that the way that we have been reasoning about additives and their antecedency requirement is closely connected to Heim's Heim (1990, p. 7) remark concerning 'metapropositions'. Heim proposes that if additive meaning was a conventional implicature, it could correspond to an existential statement concerning the common ground itself: for (133b), that metaproposition would be "that there is, in the current utterance context, some unique contextually salient individual (or group) that is presupposed to be distinct from John and have gone to Harvard" (p. 7). Such a meta-proposition about the context would be entailed by the common ground of that context if and only if the context contained a salient individual x of which it entails that x is not John and x went to Harvard. In the proposal put forth in this dissertation, additive meaning will not refer to individuals and drefs, but to propositions (and more complex discourse entities) as in Kripke (1990/2009). In this case, Heim's metaproposition can be modified to require that in some discourse component, there is a (salient) alternative proposition (or other type of discourse entity) to the prejacent (where focus semantics determines the form of the alternative). This, in turn, is the case if some component of the context contains some alternative proposition to the prejacent. In this dissertation, I propose that this metaproposition is indeed what the speaker presupposition of a speaker using an additives is, and follow Kapitonov (2012) in assuming that the identification of this alternative is secondary.

In the next section, I give a brief presentation of four other anaphoric approaches to additivity. I begin with two analyses that involve individual anaphora (Geurts and van der Sandt, 2004; Abrusán, 2014) and then move onto analyses that either involve sentential anaphora (Ahn, 2015) or do not strictly speaking involve sentential anaphora, but are non-existential in requiring the presence of some salient proposition (Beaver and Clark, 2008) in the discourse model.

3.3.2 Other anaphoric approaches

Adopting Heim's (1992) idea that the semantics of additivity involves an anaphoric component that is very similar to pronouns, Geurts and van der Sandt (2004) propose that sentences with additives involve two presuppositions. The first is specifically due to the lexical semantics of ad-

ditives, while the other is due to the focus structure of the host sentence (see also Ruys 2015, section 3.2.1; Szabolcsi 2017, section 3.2.3). Specifically, Geurts and van der Sandt (2004, p. 23) propose that the additive-specific presupposition corresponds to the requirement that there be some dref y distinct from the focus x in the context (i.e. in the DRS, or discourse representation structure; Kamp, 1981; Kamp and Reyle, 1993). The general focus-related presupposition in turn requires that the scope predicate ϕ applies to y. The latter presupposition is due to the *Background Presupposition Rule* (BPR) (Geurts and van der Sandt, 2004, p. 11):

(136) **Background Presupposition Rule (BPR)**
Whenever focusing gives rise to a background $\lambda x[\phi(x)]$, there is a presupposition to the effect that $\lambda x[\phi(x)]$ holds of some individual

The account of Geurts and van der Sandt (2004) is built on the binding theory of presupposition, itself formulated within discourse representation theory (DRT; Kamp, 1981; Kamp and Reyle, 1993). On this approach, presuppositions are bound much like pronouns; in other words, presuppositions search for an antecedent within the DRS-structure. Without going into the details of DRT, in (137) I show how the two additive presuppositions – each doubly underlined – are bound in Geurts and van der Sandt 2004.

(137) **Binding additive presuppositions (Geurts and van der Sandt, 2004, p. 23)**

a. If Herb comes to the party, the boss comes, too (Kripke, 1990/2009)

b. $[u\text{: Herb}(u),\ v\text{: boss}(v), [\text{: comes}(u)] \Rightarrow [\underline{\underline{x\text{: } x \neq v}},\ \underline{\underline{\text{comes}(x)}},\ \text{comes}(v)]]$

c. $[\underline{u\text{: Herb}(u)},\ v\text{: boss}(v),\ \underline{u \neq v},\ [\text{: comes}(u)] \Rightarrow [\underline{\underline{\text{comes}(x)}},\ \text{comes}(v)]]$

d. $[u\text{: Herb}(u),\ v\text{: boss}(v),\ u \neq v, [\text{: } \underline{\text{comes}(u)}] \Rightarrow [\text{comes}(v)]]$

First, the DRT-translation of the sentence in (137a) is given in (137b), where brackets delimit the DRSs. The main DRS contains two discourse referents, u and v. The embedded DRS encodes the conditional; if u comes, then v comes – with the additive presuppositions shown doubly underlined. The first presupposition to be bound is the distinctness-encoding $\underline{\underline{x\text{: } x \neq v}}$. A suitable antecedent u is found in the main DRS; hence, x is bound there, as shown in (137c) (signaled with dotted underlining). After this step, the second presupposition $\underline{\underline{\text{comes}(x)}}$ is bound by the antecedent that is located in the protasis of the conditional (signaled with dotted underlining). (137d) shows the final DRS where both presuppositions have been bound. The meaning contributed by this DRS is the conditional statement that if Herb comes, then the boss comes, and Herb is not the boss.[30]

The separation of the additive presupposition into two parts – one specific to additives, and another to focus structures in general – allows Geurts and van der Sandt (2004) to argue that the

[30]As the DRT-approach of Geurts and van der Sandt (2004) explicitly assumes that additive presuppositions are bound like pronouns, it becomes important to define when this binding is possible. As Zeevat (2002) notes, additives are generally able to refer back to drefs in positions that are otherwise unreachable for e.g. definite descriptions:

reason why additive presuppositions cannot be accommodated is that they are 'descriptively attenuate', i.e. do not have much semantic content (cf. section 3.1.7.2). Additive presuppositions thus belong to the same natural class with pronouns. Beaver and Zeevat (2007) note that this proposal has at least two weak spots. First, such a proposal is hard to motivate; in essence, saying that descriptively attenuate presuppositions cannot be accommodated amounts to saying that the rescue strategy for securing presupposition satisfaction does not work for presuppositions that do *not* have much content. Intuitively, it should instead be hard to accommodate presuppositions with *rich* content. Indeed, there are other classes of presupposition triggers which resist accommodation (e.g. politeness markers; see Beaver and Zeevat, 2007), but do not have poor descriptive content.

Second, Beaver and Zeevat (2007) argue that Geurts and van der Sandt (2004) make a false prediction: the additive-specific presupposition – the one requiring that some salient dref be accessible in the context for purposes of presupposition binding – should be satisfied whenever such a dref is made salient. This prediction is not borne out, however, as (138) shows:

(138) **False prediction for accommodation**
??Jane, a New Yorker, likes Bill. Bill is having dinner in New York, too

In (138), a salient individual distinct from Bill – *Jane* – is introduced in the context before the host sentence of *too* is uttered. Hence, the additive presupposition that is supposedly not accommodatable is satisfied in (138). Moreover, the focus-related additive presupposition is arguably

(i) **Inaccessible antecedents** (Geurts and van der Sandt, 2004, p. 26)

a. ?The Swiss **may** have a navy. The Swiss navy is stationed on Lake Geneva

b. Fred **may** be staying at the Ritz, and Barney is at the Ritz, too

In (i-a), the antecedent of the definite description *the Swiss navy* – namely, *a navy* – is embedded under a possibility modal, and therefore it is not accessible. In (i-b), however, the same modal embedding seems to have no effect on the felicity of *too*, as the discourse is natural. Geurts and van der Sandt (2004) propose that this is because the DRS of (i-a) is ill-formed due to the occurrence of a free dref x in the final DRS, shown in (ii-c) (after the underlined presupposition is bound within the scope of the modal), while in (i-b), no such ill-formedness arises, as (iii) shows.

(ii) **Ill-formedness of (137a)** (Geurts and van der Sandt, 2004, p. 26)

a. [: ◊ [x: Swiss-navy(x)]] [first part of (137a)]

b. [u: Swiss-navy(u), u is stationed on Lake Geneva] [second part of (137a)]

c. [: ◊ [x: Swiss-navy(x)], x is stationed on Lake Geneva] [resolved presupposition]

(iii) **Well-formedness of (136b)** (Geurts and van der Sandt, 2004, p. 26)

a. [x: Fred(x), ◊[: stay-at-Ritz(x)],
u: Barney(u), stay-at-Ritz(u), v: $v \neq u$, stay-at-Ritz(v)]

b. [x: Fred(x), ◊[: stay-at-Ritz(x)],
u: Barney(u), $x \neq u$, stay-at-Ritz(u), stay-at-Ritz(v)]

c. [x: Fred(x), ◊[: stay-at-Ritz(x)],
u: Barney(u), $x \neq u$, stay-at-Ritz(u)]

satisfied as well, given that there are individuals that dine in New York (for example, we can infer that Jane the New Yorker is such an individual). Nevertheless, the use of *too* is infelicitous in (138). Therefore, the resistance of additives to accommodation remains unexplained under the approach that Geurts and van der Sandt propose.

The second approach that relies on pronominal anaphora that we will discuss here is that of Abrusán (2014). Abrusán proposes that additive presuppositions begin their life as entailments, and they become presupposed (in addition to being entailed; Stalnaker, 1974; Abrusán, 2011) because they fail a specific requirement for being at-issue. In particular, Abrusán argues that the presuppositionality of additive meaning is closely related to its *tense-insensitivity*.

For Abrusán, additives thus *entail* the truth of an alternative q to the prejacent p. Informally, this entailment becomes a presupposition as well because q is never "paid attention to"; in other words, q is always backgrounded (Abrusán, 2011). Formally, Abrusán (2014) proposes that backgrounded information is not necessarily about the *main event* described in p, i.e. the asserted proposition. To avoid problems related to event semantics, Abrusán assumes that presupposed information concerns events whose *runtime* is (unaccidentally) independent from that of the main event.

To see what this means, consider the sentence S in (139). Abrusán notes that among the many entailments of S, there are two – ϕ and ψ – that differ in whether they are independent of the main event in S in (139a), i.e. the knowing event that takes place at t_1. While ϕ in (139b) is about t_1, ψ in (139c) is not (although it could, of course, *accidentally* coincide with it). Thus, as ϕ is necessarily about the event time of the matrix predication in S, ϕ is an entailment of S; as ψ is not necessarily about the same event time, ψ is a presupposition (as well as an entailment) of S.

(139) **Independence of main event** (Abrusán, 2014, p. 7)

a. S = John knows (at t_1) that it was raining (at t_2)

b. ϕ = John believes (at t_1) that it was raining (at t_2)

c. ψ = It was raining (at t_2)

For additives, the simplest cases follow easily. First, Abrusán (2014) proposes to model the additive meaning as in (140). Abrusán follows Heim (1992) and assumes that additivity involves anaphoric pronouns that are resolved in the context.[31] In (140), the anaphoric pronoun is represented as F'_C. In a familiar way, the entry requires that the anaphoric pronoun and the associate F of the additive are distinct (last conjunct). It also states that the predication that is stated to hold of the associate in the host sentence (first conjunct) holds of the anaphorically determined alternative (second conjunct).

[31] Abrusán's approach there faces the same problems as were discussed in section 3.3.1; first, one must explain why the anaphoric pronoun that is introduced in the additive semantics is able to find antecedents that other, normal pronouns cannot, and second, one must explain how things that do not correspond to drefs can function as antecedents (in the case of e.g. focus on a verb).

(140) **Additive semantics** (Abrusán, 2014, p. 14)

$\text{ADD}_1[(\phi(\text{F}_1)] = \phi(\text{F}) \wedge [\phi(\text{F'}_C) \wedge \ \text{F'}_C \neq \text{F}]$

Abrusán argues that additive meaning is presuppositional for the same reason that ψ is a presupposition of S in (139). In (141), the main event in S is about t_1. The focus alternative that satisfies the additive presupposition (i.e. $\phi(\text{F'}_C)$, which corresponds to ψ in (141b)), may be about t_2, which is distinct from t_1. Therefore, ψ is presupposed (and entailed).[32]

(141) **Additive presuppositions may be independent of main event runtime**

a. S = Mary likes spaghetti (at t_1), too

b. ψ = John likes spaghetti (at t_2)

Additionally, Abrusán proposes that entailments that are about the main event time can still avoid becoming presuppositions if they directly address secondary pragmatic main points, introduced in the form of a Question Under Discussion (cf. Beaver, 2010). For example, while *discover* is a factive predicate and as such presupposes the truth of its complement, in (142a), the F-marking pattern connects the assertion to the Question Under Discussion *What will the TA realize?*, and given that the factive complement directly addresses this question, its content is not presupposed (i.e. the addressees work is not presupposed to be plagiarised in (142a)). A small change in F-marking brings back this presupposition in (142b).

(142) **Effect of focus on presupposition** (Beaver, 2010)

a. If the TA discovers that your work is plagiarised, I will be forced to notify the dean

b. If the TA discovers that your work is plagiarised, I will be forced to notify the dean

For additives, Abrusán argues that such a situation never arises, because additive meaning does not directly address QUDs. To illustrate this point, Abrusán proposes the example in (143) (p. 19):

(143) **Additive meaning cannot address QUDs directly**

A: Bill ate the beans. What did John eat?

B: John ate the beans too [$\rightsquigarrow x$ ate beans and $x \neq$ John]

In (143), the QUD is given explicitly in A's assertion. Crucially, the additive component of B's response – where x is resolved to Bill – does not address this question. However, there are examples

[32] Note that although additivity is argued to be tense-insensitive, some tense-pairings are not as felicitous as others, as shown in (i) (with a future-past pairing). Abrusán does not discuss the source of such effects (see Abrusán, 2014, p. 15).

(i) ?John will invite Mary for dinner, and yesterday Peter invited Mary for dinner, too

where additive meaning directly address a QUD. Consider, for example, (144) from Kaplan (1984) (see section 3.1.7):

(144) (Who ate what? What did Jo eat? What did Mo eat?)
Jo had fish, and Mo had soup too [⇝ Mo had fish]

In (144), the presence of the additive leads to the inference that Mo had fish (as well as soup, as is asserted). This piece of information directly addresses both the superquestion *Who ate what?* and the subquestion *What did Mo eat?*. Nevertheless, the timing of the two eating events related to Mo may be different, and therefore the additive component is indeed presupposed under Abrusán's definition of presupposition triggering, which is summarised in (145).[33]

(145) **Presupposition triggering** (Abrusán, 2014, p. 9)
Entailments of a sentence *S* that can be expressed by sentences that are neither necessarily about the event time of the matrix predicate of *S* nor about the event time of the sentence expressing the most direct answer to the (grammatically signalled) background question are presupposed

As the discussion makes clear, Abrusán's main goal is to account for *why* the meaning contributed by additives has a double status as presuppositions and entailments of the host sentence *S*. The main argument for this duality comes from the following example:

(146) **Additive inferences as entailments** (Abrusán, 2014, p. 13)

a. #Mary went to the shop, but it is not the case that somebody went there

b. Mary went to the shop, but it is not the case that somebody went there **as well**

Example (146a) does not contain an additive, and the meaning is contradictory; both conjuncts cannot be true at the same time. In (146b), an additive is added at the end of the second conjunct, and the contradictoriness seemingly disappears. For this reason, Abrusán argues that the semantic import of the additive in (146b) cannot be restricted to being presuppositional; if it were only presuppositional, (146b) should be felt to be as contradictory as (146a).

The contradictoriness of (146a) clearly comes about due to the clash between stating that Mary went to the shop while maintaining that the negation of the existential claim in the second conjunct is true: it cannot be that *that Mary went to the shop* is true if *that no one went to the store* is true as well (Ahn, 2015). The felicity of (146b), on the other hand, seems to involve an interpretation of *somebody* as *somebody else*, and not simply an existential; the latter is interpreted as excluding Mary. Indeed, *that Mary went to the store* and *that no one other than Mary went to the store* can be true at the same time (Abrusán, 2014; Ahn, 2015), and adding the overt *else* in (146b)

[33] For Abrusán (2014), the fact that additives are hard presupposition triggers (which means that additive meaning cannot be suspended) follows from the fact that additive entailments never fail to be presuppositions by (145).

makes the example feel more natural. In (146a), too, adding *else* removes the contradiction. The question, then, is why *somebody* is rather interpreted as a 'normal' indefinite in (146a), and as an *else*-indefinite in (146b). I leave this question open, but note that given that there is an alternative explanation in terms of *else*, (146) does not warrant the claim that the additive meaning must (also) be part of the at-issue content of the second conjunct.

The idea that additive presuppositions are entailments is taken slightly further by Ahn (2015). Ahn proposes that additives denote two-place operators. Of the two arguments, one corresponds to the host sentence of the additive p (the prejacent), and the other is a silent propositional anaphor q which, as usual, requires a contextual or textual antecedent. The additive comes with a presupposition requiring that q is a focus alternative of p, but the two are distinct. In terms of at-issue content, *too* asserts the conjunction of p and q.

Ahn's semantics for *too* are shown in (147a). When applied to a sentence such as (147b), the presuppositional and assertive meanings come out as shown in (147c). The meaning of the host sentence of the additive depends on the identity of q: if q is resolved to *Mary left*, for example, the whole sentence denotes the conjunction of *John left* (prejacent) and *Mary left* (antecedent).

(147) **Conjunctive semantics of *too* (Ahn, 2015, p. 26)**

a. $[\![\text{too}]\!](q)([\![p]\!]_{\sim C}) = \lambda w : q \in C - \{\, [\![p]\!]^o \,\}\,.\, q^w \wedge [\![p]\!]^w$

b. John left too
$[\![p]\!] =$ John left

c. $[\![\text{too}]\!](q)([\![p]\!])$
(i) presupposes that q is a distinct focus alternative of $[\![p]\!]$ and thus has the form *x left*
(ii) asserts $q \wedge [\![p]\!]$

One of the main points of innovation in Ahn's (2015) approach lies in the analysis of *either*: Ahn proposes that *either* is polarity-sensitive (*pace* Rullmann, 2003) and that its polarity-sensitivity is rooted in its lexical semantics and the semantics of exhaustification (e.g. Chierchia, 2013, and references therein), and not in a stipulated licensing condition. Specifically, Ahn (2015) proposes that while *too* asserts the conjunction of p and the anaphor q, *either* asserts their disjunction.

(148) **Disjunctive semantics of *either*** (Ahn, 2015, p. 29)

a. $[\![\text{either}]\!](q)([\![p]\!]_{\sim C}) = \lambda w : q \in C - \{\, [\![p]\!]^o \,\}\,.\, q^w \vee [\![p]\!]^w$

b. John did not leave either
$[\![p]\!] =$ John left

c. $\neg[\![\text{either}]\!](q)([\![p]\!])$
(i) presupposes that q is a distinct focus alternative of $[\![p]\!]$ and thus has the form *x*

left
(ii) asserts $\neg[q \vee [\![p]\!]] = [\neg q \wedge \neg p]$

As (148c) shows, Ahn assumes that *either* takes scope under negation (Rullmann, 2003). Therefore, the prejacent p and the focus alternative q both have positive polarity. The additive presupposition is exactly as with *too* in (147). What changes is the assertion: as (148c) shows, the assertion amounts to the negation of the disjunction of p and q, which by De Morgan's law is equal to the conjunction of the negation of p and the negation of q.

Assuming that the semantics of *either* involves disjunction allows Ahn to argue that the restriction on the distribution of *either* – namely, that it has to occur in the scope of negation, as is assumed in polarity approaches to additivity – follows from general principles related to exhaustification (Krifka, 1995; Lahiri, 1998; Chierchia, 2006; Chierchia et al., 2011; Chierchia, 2013). As Ahn assumes that the semantics of *either* involves disjunction, she takes the relevant alternatives evoked by *either* to be those of disjunction: this set includes the scalar alternative $[p \wedge q]$ as well as the domain alternatives p and q (Sauerland, 2004).[34]

(149) **Alternatives of *either p*, i.e.** $[p \vee q]$ (Ahn, 2015, p. 32)

a. Scalar: $\{p \wedge q, p \vee q\}$

b. Domain: $\{p, q\}$

Ahn proposes that the exhaustification operator O (i) asserts the prejacent p, and (ii) negates all alternatives that p does not entail. Therefore, given the alternatives in (149), the exhaustification of a sentence with *either* is (i) vacuous if O applies to $\neg[p \vee q]$, and (ii) *contradictory* ($\bot$) if O applies to $[p \vee q]$ directly. To see why this is, consider first the following example without negation.

(150) **Exhaustification of **John left either*** (Ahn, 2015, p. 33)

a. Prejacent p = John left

b. Assertion $= q \vee p$

c. Alternatives $= \{q \vee p, q \wedge p, q, p\}$

d. $O(p$ either $) = [q \vee p] \wedge \neg[q \wedge p] \wedge \neg q \wedge \neg p = \bot$

On the exhaustification story, the reason why *either* is unacceptable when it it is not in the scope of a downward entailing operator, such as negation, is that none of the alternatives to the prejacent p are entailed by p, and hence they are all negated. This, however, results in a contradiction: it cannot be that $p \vee q$ is true while neither disjunct is true.

[34] Note that in contrast to Szabolcsi (2017), Ahn (2015) includes the scalar conjunctive alternative $[p \wedge q]$ in the alternative set (see section 3.2.3).

A negated disjunction, however, entails the negation of its two disjuncts (by De Morgan's law), and it also entails the negation of the scalar alternative. Hence, when *O* applies to an *either*-sentence with negation, exhaustification is vacuous: no alternative is negated.

(151) **Exhaustification of *John did not leave either*** (Ahn, 2015, p. 33)

a. Prejacent p = John left

b. Assertion $= \neg[q \vee p]$

c. Alternatives $= \{\neg[q \vee p], \neg[q \wedge p], \neg q, \neg p\}$

d. $O\neg(p$ either $)$ $= \neg[q \vee p]$

Recall from section 3.2.3 that *O* has elsewhere been argued to only negate innocently excludable alternatives, i.e. those alternatives that are included in each maximal set of alternatives that can be negated without contradicting the prejacent (Fox, 2007). If innocent excludability is used to decide which alternatives are negated, the same result ensues: no alternative in (151c) is a member of any set of alternatives that can be negated without contradicting the prejacent (assuming that $\neg\neg[q \wedge p] = [q \wedge p]$).

Although some open questions remain – for example, the question of why *either* is not licensed in all contexts where other negative polarity items such as *any* are, and how this analysis could be extended to cover cases where the truth value of the antecedent is not settled, as in the polar use of bound additives in Finnish (see section 4.2 for a description of the data) – Ahn (2015) proposes, for the first time, an answer to the *why*-question concerning the status of *either* as a negative polarity item (cf. Rullmann, 2003): *either* is a negative polarity item because negation is required for the exhaustification process to not be contradictory. The polarity-insensitivity of *too* also receives an explanation: conjunction is equivalent to universal quantification, and universals tend not to be polarity items cross-linguistically.

To conclude this section, let us discuss one last analysis of additivity that incorporates an anaphor-like contextual dependency, namely, that of Beaver and Clark (2008). In Beaver and Clark's work, the relationship between F-marking and QUDs is particularly important for the analysis of focus-sensitivity (see section 2.2.1). For the authors, different linguistic expressions may associate with focus in different ways. Additives and exclusives, for example, associate with focus conventionally. This means that the operators encode a grammatical dependency to a QUD.

Specifically, for Beaver and Clark, the function of an additive in discourse is to comment on the current QUD (i.e. the question whose resolution has highest priority). The relevant comment is that the current QUD already has a previous salient answer in the common ground (where typically, just-expressed propositions are salient). For example, in the famous Kripke-example *John is having dinner in New York tonight, too*, the additive signals that the QUD *Who is having dinner in New York tonight?* – which is identified based on the F-marking of the assertion – has

been previously answered. This in turn means that some salient proposition of the form *x is having dinner in New York tonight* is in the common ground. Crucially, Beaver and Clark explicitly reject a simple existential analysis of additivity, where the common ground would simply be required to entail the truth of the existential statement $\exists x$.having-dinner-in-NY-tonight(x) (Beaver and Clark, 2008, p. 73). Their analysis is therefore classified as anaphoric in this dissertation, although it does not involve an overt propositional anaphor per se.

This ends the presentation of anaphoric (or at least non-existential) approaches to additivity. In the final section of this chapter – which follows the summary in 3.3.3 – I present three more analyses that deal specifically with Finnish additivity.

3.3.3 Summary

This section presented a number of anaphoric (or at least non-existential) approaches to additivity. First, in section 3.3.1, I reviewed the classic anaphoric approaches of Heim (1990, 1992) and Kripke (1990/2009). These three approaches differ in whether they involve individual-level anaphora (Heim, 1990, 1992) or propositional anaphora (Kripke, 1990/2009; see also Asher, 1993).

Section 3.3.2 then reviewed a number of newer non-existential approaches. I begun with Geurts and van der Sandt's (2004) binding-theoretic approach to additive presuppositions, and noted that although it attempts to answer the question of why additive presuppositions resist accommodation, it is vulnerable to criticism (Beaver and Zeevat, 2007). I then discussed Abrusán's (2014) proposal according to which additive presuppositions live a double life as presuppositions and entailments, and are presupposed simply because of their tense-insensitivity. From this analysis, we moved on to Ahn (2015), who provides an analysis of *too* and *either* that makes use of the grammatical process of exhaustification (see also Szabolcsi, 2017), and that can be classified as instantiating the polarity approach to the form alternation question (cf. Rullmann, 2003). Finally, I ended the section with a presentation of Beaver and Clark's (2008) QUD-based approach to additivity. On this analysis, the discourse function of additives is to comment on the current QUD; specifically, their presence leads to the requirement that the common ground contain a salient previous answer to the current question under discussion.

Section 3.3.1 also returned to Kapitonov's (2012) criticism against anaphoric approaches, and the Stalnakerian speaker presupposition treatment of additivity where infelicity follows from pragmatics. Notably, Kapitonov proposes that hearers must be able to identify the entity to which speakers make parallel reference in using *too* and other additives. We saw that infelicity does not automatically follow if the hearer cannot figure out exactly what parallel entity (individual or proposition, depending on the analysis) the speaker is referring to. In particular, when the identity of the alternative is relevant and assumed to be recoverable, it should be, but in contexts of e.g. games, hearers may be satisfied by less. At the end of section, I also noted that the notion of 'contextual metapropositions' (Heim, 1990) can be very useful for the analysis of additivity: as the game examples show, the use of an additive element by a speaker allows the hearer to re-

cover at least the information that there is some (propositional) antecedent in the context for the prejacent. In chapter 5, I propose that such a metaproposition is the core of additive meaning. This paves way for the analysis of bound additivity in Finnish, where the metaproposition may reference different parts of the context, not just the common ground.

3.4 Previous analyses of Finnish additivity

In the last section of this chapter, I review three previous analyses of Finnish additivity. The cutting-edge proposal put forth by Karttunen and Karttunen (1976) is presented in detail in section 3.2.1, and it is therefore not included in this section. Out of the three approaches discussed in this section, two focus on the semantics and pragmatics of bound and unbound additives (Vilkuna, 1984; Vilppula, 1984), and one is focused entirely on the syntax of the additive *–kin* (Holmberg, 2014).

3.4.1 Vilkuna, 1984

Vilkuna (1984) proposes an analysis of the bound additive *–kin* that is couched within Carlson's (1983; 1984) theory of dialogue games. Vilkuna argues that the common core of all uses of *–kin* lies in its function as signalling the *completion*, *development* or *substitution* of a previous public or private game move (*background*). In what follows, I briefly sketch out what the account looks like, and how Vilkuna's work advanced the analysis of additivity in Finnish.

Let us begin with Carlson's theory of dialogue games. In this framework, discourse participants can be thought of as players involved in a game. Assertions, questions, and orders – in other words, speech acts – function as the moves of the game. Vilkuna (1984) proposes that in such discourse games, the role of the additive *–kin* is to elaborate and complete previous moves, made either by the speaker themself or by another player (i.e. discourse participant). The formalisation of this function of *–kin* is shown in (152). In the example, X–$\underline{A}$–Y represents a sentence schematisation with a background frame (X– ... –Y) and a focalised element $\underline{A}$ in the middle.

(152) **Dialogue game rules for *–kin* (Vilkuna, 1984, p. 395, 400)**

a. When another player has performed a background move of the sentential form X–$\underline{A}$–Y, any player can complete this move with a move of the form X–$\underline{B}$*kin*–Y

b. A player who wishes to make the move X–$\underline{A}$–Y may choose to develop this private move further and make the stronger, more informative move X–$\underline{B}$*kin*–Y instead

The additive inference is derived using (152a). Thus, the use of *–kin* signals that a previous move was incomplete, and provides a completion for it. An example of this use – a basic use, to be precise – is spelled out for (153a) in (153b).[35]

[35]Vilkuna proposes that the elaboration of a private move, derived using (152b), is the essence of scalar additivity;

(153) **Analysis of standard use KIN following Vilkuna 1984**

a. *Joni-kin* *korjas-i* *pyörä-n*
Joni.NOM-ADD fix-PAST.3SG bike-ACC
'Joni fixed a bike (too)'

b. There was a previous public move of the form '*x* fixed a bike'; this move is completed

The perspective adopted in the dialogue theory approach to additivity is very similar to the one adopted by Beaver and Clark (2008) (see section 3.3.2). Clearly, when Vilkuna (1984) discusses "completing" moves, the completion happens with respect to the current QUD, to which the completing move adds another answer.

The main innovation that Vilkuna proposes concerns the interpretation of *–kin* in double contrast contexts (see section 3.2.3; cf. the variation question). Vilkuna's analysis of double contrast additivity relies on the idea that a move can be seen as completing another move if and only if there is some common premise that both moves exemplify or defend. For example, (154) can be analysed as signalling that a previously made move that is an exemplification of a common premise was either incomplete, or not the only possible exemplification. Formally, Vilkuna suggests that this use of *–kin* involves multiple foci (i.e. two alternative-inducing expressions). The shared premise evokes an explanation, which in turn evokes a main question. The main question can be answered by answering two subquestions, which are formed by using the subjects that are implicitly present in the explanation. These subjects – *mother* and *father* in (154) – act as thematic foci, which provide new information in the context of the main question, but are still implicitly present in the context. In (154), they could be considered to be contrastive topics; indeed, the two-level question structure shown in (154) is one of the defining properties of contrastive topicality (Büring, 1997, 2003, 2014; see section 2.1.3). The rhematic foci, i.e. the discourse-new material, which in (154) correspond to VPs, answer the subquestions.

(154) a. *Kukaan* *e-i* *leiki* *kanssa-ni.* *Isä* *nukku-u,* *ja*
nobody NEG-3SG play.CONN with-PX/1SG father.NOM sleep-PRES.3SG and
äiti-kin *pese-e* *ikkuno-i-ta*
mother.NOM-ADD wash-PRES.3SG window-PL-PAR
'Nobody will play with me. Father is sleeping, and mother is washing windows'

in this case, the new move provides information that is more informative than the initial private move. Informativity is inversely correlated with likelihood: the more *p* is likely, the less it is informative – and the less it is surprising. Thus, the inference that results from the use of (i-a) can be spelled out as in (i-b):

(i) a. *Joni-kin* *korjas-i* *pyörä-n*
Joni.NOM-ADD fix-PAST.3SG bike-ACC
'Joni fixed a bike (too)'

b. There was a possible private move of the form '*x* fixed a bike' which is less informative than the chosen, developed move (given that Joni is a very unlikely bike-fixer compared to all *x*)

b. [Premise:] Nobody will play with me
[Explanation:] Everybody is doing something else
[Main question:] What are they doing?

c. [Subquestion 1:] What is father doing?
[Subanswer 1:] Father is sleeping (Father is doing something else)
[Subquestion 2:] What is mother doing?
[Subanswer 2:] Mother is washing windows (Mother is doing something else)

As will be shown in section 4.6, Finnish is particular in that it requires some extra context for double contrast additivity to be felicitous; in Turkish, for example, double contrast additivity seems to be felicitous even in its absence. It is possible, then, that Turkish double contrast additivity is more closely related to the conjunctive or coordinating use of additives, and perhaps involves broad focus. In section 4.6, I argue that Finnish double contrast additivity does not involve broad focus. However, broad focus additivity also exists in Finnish, as the next section will show.

3.4.2 Vilppula, 1984

Within the same issue of the journal *Virittäjä* as Vilkuna's dialogue-game analysis of *–kin*, Vilppula (1984) proposes an analysis of *–kin* that attaches different conventional and conversational implicatures to it (Grice, 1975). The empirical focus of Vilppula's paper is on cases where *–kin* cannot be paraphrased with the unbound *myös*. On a closer look, all of Vilppula's examples illustrate the possibility of broad focus association with Finnish bound additives. In (155), for example, Vilppula argues that the bound additive signals that the leaving of the stork is one among many signs of spring (i.e. the relevant QUD could be *What signs of spring are there?*). Crucially, (155) does not necessarily mean that some x (distinct from the stork) left.

(155) **Broad focus use of *–kin***
Kurki-kin *jo* *läht-i*
stork.NOM-ADD already leave-PAST.3SG
'The stork left'

As mentioned above, the analysis that Vilppula provides of additives involves both conventional and conversational implicatures. Let us begin with the former. Vilppula argues that *–kin* has two conventional implicatures. The first encodes the comparability or parallelity between the host sentence and some other parallel sentence, where the latter could only be known to the speaker. If the possible 'privateness' of the parallel sentence is not considered, this conventional implicature corresponds to what we have seen in previous sections. The second conventional implicature, however, encodes the familiarity of both the speaker and the hearer with the host sentence of the additive. This implicature is related to section 2.3.3.5; as Vilppula notes, it relates

bound additives to the discourse particle *–hAn*, which has been argued to mainly express the familiarity of a proposition among the discourse participants (e.g. Hakulinen, 1976).[36]

The conversational implicatures that Vilppula (1984) discusses include neutrality, temporality, and face-saving. The neutrality implicature arises because the proposition expressed by the host sentence is marked as 'one among many'. Specifically, Vilppula argues that signalling the presence of other alternatives downgrades the importance attributed to the prejacent. The temporality implicature is present in examples with past tense; given that the host sentence is conventionally implicated to be familiar, it is taken to express events that happened longer ago than those that are described by sentences without the familiarity-marking additive. Finally, the face-saving implicature that Vilppula proposes for *–kin* is again related to the familiarity implicature. If a speaker is unsure whether the hearer knows p, it is safer to state p with a familiarity marker: in case the hearer does know p, they could be offended by being assumed to not know p.

While the propositional content of the host sentence of bound additives may indeed be familiar to the speaker and the hearer, as proposed by Vilppula, it must be *discourse-new*; in other words, it may not have been uttered earlier in the discourse. Moreover, the information contained in the host sentence may also be previously unknown to the hearer. One example of such use of broad focus *–kin* is given in (156) (example from Vilkuna, 1984, p. 401).

(156) **Hearer-new host sentence of broad focus *–kin***
Anni says to the Frog Queen:

Rauhoitu.	*Kruunu-si-kin*	*o-n*	*vino-ssa*
calm.down-IMP.2SG	crown.NOM-PX/2SG-ADD	be-PRES.3SG	crooked-INE

'Calm down. Your crown is crooked'

Both Vilkuna (1984) and Vilppula (1984) propose that in cases such as (156), the speaker has multiple signs of unrest in their mind, but decides to make one of them public; the others may or may not be as important (by the neutrality implicature). However, it is not necessary for the Frog Queen to have already noticed that their crown is crooked for (156) to be felicitous.

In sum, Vilppula (1984) provides an insightful discussion of the discourse effects of bound additives, relating their use to another discourse particle, *–hAn*. One important observation that Vilppula makes is that bound additives may be used to express parallelism between what may be *private* propositions and the content of the host sentence; such use of *–kin* then either prompts the hearer to ask what else the speaker had in mind, or to simply note that the speaker did have some parallel alternative in mind (cf. section 3.3.1).

[36]Vilppula notes that the speaker may sometimes take advantage of the familiarity implicature: for example, the speaker might use bound additives as a means to present news that are unfamiliar to the hearer as actually being familiar, in which case the ultimate purpose of the speaker could be to induce surprise or astonishment in the hearer.

3.4.3 Holmberg, 2014

The most recent and modern investigation of the syntax of two focus-related particles in Finnish, i.e. the question particle *–kO* and the additive *–kin*, is due to Holmberg (2014), who adopts a Minimalist perspective on the topic and proposes an analysis that relies on feature-checking (Chomsky, 1995, 2001).

The gist of the proposal that Holmberg puts forth is that the two particles are very much alike in their featural make-up: both have an uninterpretable or unvalued focus feature, $[uF]$[37], which needs to enter in an Agree-relation with an interpretable counterpart, $[iF]$. For this to be possible, Holmberg proposes that *–kin* and *–kO* must both c-command an expression carrying $[iF]$. The main difference between *–kin* and *–kO* is that in addition to the uninterpretable focus feature, *-kO* also has an interpretable interrogative feature, $[iWh]$, which enters in an Agree-relation with a $[uWh]$-carrying interrogative C^0. This head forces the *–kO*-constituent to move to its specifier due to an $[EPP]$ feature (Chomsky, 2000).[38]

In short, Holmberg proposes that *–kin* is able to merge anywhere in the syntactic structure as long as it c-commands an expression that carries $[iF]$ (which we may assume translates into F-marking, at least roughly (Selkirk, 1996)). This constraint is thus in line with the standardly accepted idea that focus-sensitive operators must take scope over their F-marked associate (Jackendoff, 1972; Rooth, 1985; Tancredi, 1990). Holmberg mainly discusses the placement of *–kin* inside complex KPs, although he notes in passing that *–kin* can also attach to other categories, for example to the finite verb.

Holmberg's syntax for *–kin* is shown in (157). The example involves a complex KP (KasePhrase) whose head is the noun *isä* 'father', and a possessor KP *Ollin* sits in its specifier. I have kept Holmberg's original labels in the tree shown in (157b). In this particular example, *–kin* does not directly adjoin to the F-marked associate, but to the more complex KP. It could, of course, adjoin to *Ollin* directly. In both cases, the c-command requirement would be fulfilled.

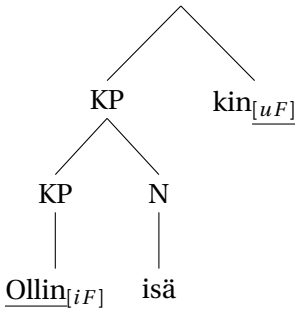
(157) **Syntax of *–kin*** (Holmberg, 2014, (47))

a. *Olli-n* *isä-kin*
Olli-GEN father.NOM-ADD
'Olli's father too'

b.

[37] Holmberg uses the $[Foc]$-variant of the focus feature; for consistency, I retain the earlier $[F]$-notation here.

[38] Holmberg suggests that the two particles also differ slightly in where exactly in the structure they may be adjoined (although the c-command requirement between [uF] and [F] must always be established). As we are here more interested in *–kin* than *–kO*, I refer the reader to Holmberg 2014 for the technical details regarding this difference.



Although Holmberg is not very explicit on the issue, the assumption seems to be that *–kin* is pronounced as attached to the category it finds itself adjacent to (i.e. no movement of F-marked NPs or KPs is assumed). One potential problem with the structure shown in (157b) – which Holmberg acknowledges – is that this structure involves right-adjunction, which is banned under the Linear Correspondence Axiom (Kayne, 1994).

Under Holmberg's analysis, *–kin* is not restricted to adjoining directly to its *F*-marked associate. This gives rise to the following attachment possibilities in complex KPs with narrow focus on one part of the KP (the parantheses indicate possible separate attachment sites for *–kin*, but only one *–kin* can be realised at a time):[39]

(158) **Position of *–kin* in complex KPs** (Holmberg, 2014, (42)–(44))

a. [[[*Olli-n-(kin)*] *isä-n-(kin)*] *auto-lla-(kin)*]
Olli-GEN-ADD father-GEN-ADD car-ALL-ADD
'in Olli's father's car too'

b. [[[*Olli-n-(*kin)*] *isä-n-(kin)*] *auto-lla-(kin)*]
Olli-GEN-ADD father-GEN-ADD car-ALL-ADD
'in Olli's father's car (too)'

[39] One question that these data raise is whether it is possible for F-marking to project in e.g. (158a). For some reason, the answer seems to be negative: as (i) shows, the additive presupposition of *–kin* seems not to be satisfied when the antecedent is "fully" different from the complex KP, unless the whole KP is *F*-marked.

(i) a. *# Voi-mme matkusta-a Lappi-in lentokonee-lla. Itse asiassa voi-mme matkusta-a sinne*
can-PRES.1PL travel-INF Lapland-ILL plane-ADE in fact can-PRES.1PL travel-INF there
Olli-n isä-n auto-lla-kin
Olli-GEN father-GEN car-ADE-ADD
Int. 'We can travel to Lapland by plane. In fact, we can also travel there by Olli's father's car'

b. *Voi-mme matkusta-a Lappi-in lentokonee-lla. Itse asiassa voi-mme matkusta-a sinne*
can-PRES.1PL travel-INF Lapland-ILL plane-ADE in fact can-PRES.1PL travel-INF there
Olli-n isä-n auto-lla-kin
Olli-GEN father-GEN car-ADE-ADD
'We can travel to Lapland by plane. In fact, we can also travel there by Olli's father's car'

c. [[[*Olli-n-(*kin)*] *isä-n-(*kin)*] *auto-lla-(kin)*]
Olli-GEN-ADD father-GEN-ADD car-ALL-ADD
'in Olli's father's car (too)'

Although the constraints on specific placement within complex KPs will not be discussed in detail in the rest of this dissertation, and the exact syntax that Holmberg proposes for bound additives is modified in chapter 5 (in particular, in section 5.1.2, I propose that the surface realisations *–kin* and *–kAAn* do not correspond directly to $[uF]$-carrying operators, but simply mark the presence of such an operator), Holmberg's analysis is nevertheless a clear source of inspiration for the proposal put forth in this dissertation.

3.5 Summary

I began this section by introducing eight issues that are relevant for the investigation of additivity:

1. Additives are *focus-sensitive*, which means that the form/content of an additive presupposition depends on the placement of F-marking within the prejacent (or host sentence). This type of dependency can be captured formally in e.g. Alternative Semantics (Rooth, 1985, 1992).

2. Many approaches to additivity assume that they make reference to an *antecedent*. The debate is not centered around the question of what form of the antecedent has – which is a dependent on F-marking – but what kinds of antecedents are acceptable for the felicitous use of additives, if they indeed are required at all. Analyses vary in whether they simply state the additive presupposition as an existential statement, or whether some salient antecedent (individual or proposition) must be present in the context (which for most authors means the common ground).

3. A standard assumption in the additivity literature is that the antecedent must be *distinct* from the prejacent. The distinctness condition is often hardcoded into the semantics of additivity. However, the distinctness condition may also be a pragmatic implicature based on the expected informativity of utterances.

4. In some languages, the lexicalisation of additives involves *form alternation*. This means that the analysis of additivity in such languages must determine the constraints and reasons behind the distribution of the different lexicalisations. The two main ways to deal with this issue are the scope approach, where e.g. *too* and *either* have the same semantics but *either* scopes over negation, and the polarity approach, where *either* is a polarity item with a semantics distinct from that of *too*, and *either* scopes below negation.

5. More generally, we might ask whether the additives that we see in surface syntax are also the additives that are at work in the semantic representation. While some authors assume

that this is indeed the case, others have proposed that the visible additive is only a marker of a silent operator. This issue was dubbed the *derivation* question in this chapter.

6. Although almost all work on additivity focuses on the basic use of additivity, there is considerable *variation* in the functions that additives can take on, and moreover, that range is subject to cross-linguistic variation. There have only been some formal attempts to connect the less-studied uses of additivity to the basic use.

7. The broad consensus in the literature on additivity is that additives are *presuppositional*. While the standard way to analyse the presupposition is as an definedness or admittance condition, analyses couched within the binding or speaker presupposition approach also exist. In recent years, proposals that take additive meaning be at-issue have emerged, some of them from the exhaustification framework.

8. Finally, although not all approaches discuss this question, the distribution of additives has been argued to be constrained not only by the form and source of the antecedent, but also by their discourse function. As similarity markers, additives seem to be obligatory in some contexts, and optional in others.

After reviewing these issues, I proceeded to present and discuss previous approaches to additivity based on a classification into existential and anaphoric approaches.

I begun in section 3.2.1 by presenting the classic existential approach of Karttunen and Karttunen (1976) and Karttunen and Peters (1979), and the more modern existential approach of Rullmann (2003). While the two approaches are similar in their answer to the antecedency question, they differ in their answer to the form alternation question: the former represents the scope approach, and the latter represents the polarity approach. I then presented two recent defences of the existential approach against the anaphoric approach (Kapitonov, 2012; Ruys, 2015) in section 3.2.2. Of these two approaches, the former is particularly interesting in that it views additive presuppositions not as admittance or definedness conditions, but as speaker presuppositions (Stalnaker, 1973, and subsequent work). Finally, in section 3.2.3, I presented some other new instantiations of the existential approach (Zimmermann, 2015; Szabolcsi, 2015, 2017). I then moved on to the anaphoric approaches, beginning with two classic anaphoric approaches to additivity (Heim, 1990, 1992; Kripke, 1990/2009). This was followed by a presentation of a number of other anaphoric approaches, all couched within a different formalism (Geurts and van der Sandt, 2004; Abrusán, 2014; Ahn, 2015; Beaver and Clark, 2008).

Finally, in section 3.4, I presented previous work on additivity in Finnish (with the exception of the proposal of Karttunen and Karttunen (1976), which was discussed in section 3.1.1). Vilkuna's (1984) dialogue game analysis of the basic use of *–kin* is complemented by an insightful analysis of the double contrast use, while Vilppula (1984) focuses on discussing cases of broad focus and *–kin*. From these semantico-pragmatic proposals, I moved on to the syntactic analysis of *–kin* proposed by Holmberg (2014).

The take-away message of this chapter is the following. While additivity is generally presented as a phenomenon that has a standard analysis – either in existential or anaphoric terms – there is in fact considerable variation in how it is analysed. If one takes additive meaning to be presuppositional, for example, there are analyses relying on admittance conditions (Heim, 1990, 1992), presuppositional binding (van der Sandt and Geurts, 2001; Geurts and van der Sandt, 2004), and speaker presupposition (Kapitonov, 2012). In fact, Karttunen and Karttunen (1976) and Karttunen and Peters (1979) formulate their analysis in terms of conventional implicature, and not presupposition; indeed, the authors identify specific existential statements that they take sentences with additives to convey.[40] Moreover, as this chapter has shown, it is not even universally accepted that additive meaning is presuppositional or non-at-issue: Ahn (2015), for example, explicitly argues for a truth-conditional analysis where the truth of some antecedent for the prejacent is asserted, and not presupposed.

As this chapter has made clear, the literature also disagrees on the right solutions to the issues that were summarised above. Two main topics of dispute are the antecedency question and the form alternation question. Roughly speaking, the former divides the literature into existential and anaphoric approaches, and the latter divides it further into scope and polarity approaches. Thus, there is no agreement on whether the semantics of additives involves an anaphoric element, and whether the presuppositions of lexically distinct additives are identical, or different. A third urgent question that arises is the variation question (cf. Forker, 2016): only a very small number of formal approaches to additivity are concerned with uses that go beyond what is called the basic use in this dissertation (although see Zimmermann, 2015; Szabolcsi, 2015). As the next chapters will show, taking into account the full distribution of additives in a language such as Finnish leads to a more comprehensive analysis of additivity itself.

In the course of this chapter, I presented a few arguments that will be instrumental in deciding what type of analysis to give for bound and unbound additives in Finnish. The first is the argument from polar use. As chapter 4 will show, bound additives are often used in contexts where the truth or falsity of the antecedent is not established. In other words, simple existential approaches do not make the right predictions for Finnish. However, anaphoric approaches also face challenges that seem hard to combat: for instance, one must explain why and how the antecedents of the anaphoric ingredient of an additive presupposition are unavailable for overt anaphors (cf. Kapitonov, 2012), or what exactly functions as the antecedent in examples that involve polar focus and polar alternatives (at least on the non-propositional view, where the relevant antecedent should be an individual). What emerges from the chapter as a whole is that some notion of saliency is almost universally present in both existential and anaphoric approaches to additivity. Saliency does not necessarily require anaphora, however. Indeed, in section 3.3.1, I took Kapitonov's (2012) proposal a step further, and argued that the felicitous use of an additive requires that the speaker has in mind some alternative to the prejacent, where 'having in mind'

[40] Current readings of Karttunen and Peters (1979) usually consider their notion of conventional implicature to correspond to presupposition.

means that alternative is present in the some component of the discourse. This is the information that the hearer minimally recovers from the use of an additive. One way to model this is in terms of speaker presupposition: the speaker, by way of uttering a sentence with an additive, acts as if it is common ground that some alternative can be found in the context. In slight contrast to Kapitonov, I proposed that infelicity is highly context-dependent, in that when hearers do no think that they are able or supposed to identify the relevant antecedent, they may be satisfied with just the information that there is such an antecedent. When they do think that they should be able to identify the antecedent but cannot, they may proceed to inquire the speaker about it. In this case, the perceived infelicity of the famous Kripke-example *John is having dinner in New York tonight, too* is mediated by what the hearer knows and what they think they should know: the hearer will protest if they think they should be able to identify the antecedent, but cannot. In other contexts, they may well be satisfied by just learning the metaproposition about the context that the use of *too* makes common ground.

Chapter 4

Case study: Finnish

The purpose of this chapter is to describe the distribution and uses of the bound additives *–kin* and *–kaan* and the unbound additives *myös* and *myöskään* in Finnish. The discussion also includes some early analytical elements. I begin with the **basic** uses (section 4.1), which are the only uses that are available with both unbound and bound additives; the other uses are only available with bound additives (and some of them only with one of the bound additives). From the basic use, I move on to the **polar** use (section 4.2), which is characterised by the involvement of polar alternatives instead of lexical alternatives. I then discuss the **reactive** use (section 4.3), where bound additives express agreement, and the **concessive** uses (section 4.4) in both concessive subordinate clauses and what I call *wh*-concessives. After that, I move on to the **recurring-issue** use (section 4.5) and the **double contrast** use (section 4.6). And finally, I discuss the **multiple-wh** use (section 4.7) and the **quantifier** use (section 4.8), where bound additives participate in the formation of Finnish *wh*-words and quantifiers.

4.1 Basic uses

4.1.1 Basic: *–kin/-kAAn, myös/myöskään*

In section 2.3.3.5, the bound additives *–kin* and *–kAAn* were classified as discourse particles whose grammatical status is that of a clitic (Nevis, 1985). As clitics, these additives must attach to a host, and they do so after all inflectional suffixes and case markers have been attached. In contrast, the unbound additives *myös* and *myöskään* are not clitics, but independent words. In the reference grammar of Finnish, they are classified as particles (Hakulinen et al., 2004). As unbound additives behave like adverbs in terms of their distribution – much like *only* and *even* in English – unbound

additives may be assumed to be syntactic adjuncts.[1,2]

On the basic use, bound and unbound additives are interchangeable. For example, all three examples in (159) convey the same additive meaning component. As shown in (159a), on the basic use, *–kin* attaches to its F-marked associate. Unbound additives either immediately precede their F-marked associate, as in (159b), or appear clause-finally, as in (159c). When clause-final, unbound additives are stressed (cf. Krifka, 1998), which in Finnish is evident from the intonational marking of the additive; I signal this with a small up-arrow (↑) in order to distinguish the F-marking of the associate and the stress on the additive.[3]

(159) **Positive polarity declarative: *–kin* and *myös***
[Joni pitä-ä oliive-i-sta.]
Joni.NOM like-PRES.3SG olive-PL-ELA
'Joni likes olives.'

a. *Mari-kin pitä-ä oliive-i-sta*
Mari.NOM-ADD like-PRES.3SG olive-PL-ELA
'Mari likes olives, too'

b. *Myös Mari pitä-ä oliive-i-sta*
ADD Mari.NOM like-PRES.3SG olive-PL-ELA
'Mari likes olives, too'

c. *Mari pitä-ä oliive-i-sta ↑myös*
Mari.NOM like-PRES.3SG olive-PL-ELA ADD
'Mari likes olives, too'

Neither *–kAAn* nor *myöskään* is grammatical in declarative sentences with positive polarity. Therefore, it is usually assumed that their distribution is conditioned by sentence polarity (Hakulinen et al., 2004, §1634–1635). Specifically, *–kAAn* and *–myöskään* may be used in the presence of negation (160a) and negative expressions such as *tuskin* 'probably not' (160b), as well as in polar questions (160c).

[1]Note that in colloquial Finnish, it is also possible to attach *–kin* to *myös*, producing *myöskin*. The use of this form is judged pleonastic by prescriptivists, but it is clearly part of spoken Finnish (198 322 hits in the Suomi24 corpus (Aller Media Oy, 2014). In what follows, the remarks that apply to *myös* also apply to *myöskin*.

[2]Additivity may also be expressed with other lexical items in Finnish: for example, the comitative *kanssa* 'with' and its colloquial forms are frequently used in much the same way as *myös* (Hakulinen et al., 2004, §840). In this dissertation, I focus exclusively on *myös(kään)*, *–kin*, and *–kAAn*.

[3]In reality, the intonational contour is more of a rise-fall than a rise. The contour is intuitively very similar to the one that discourse-new sentence-final constituents, which have been argued to be VP-internal, exhibit (see section 2.3.3.1).

(160) **Contexts of appearance of *–kAAn***

a. *Joni-kaan e-i pidä oliive-i-sta*
Joni.NOM-ADD NEG-3SG like.CONN olive-PL-ELA
'Joni does not like olives, either'

b. *Joni-kaan tuskin pitä-ä oliive-i-sta*
Joni.NOM-ADD probably-not like-PRES.3SG olive-PL-ELA
'Joni probably does not like olives, either'

c. *Pitä-ä-kö Joni-kaan oliive-i-sta?*
like-PRES.3SG-Q Joni.NOM-ADD olive-PL-ELA
'Does Joni like olives either?'

(161) **Contexts of appearance of *myöskään***

a. *Myöskään Joni e-i pidä oliive-i-sta*
ADD Joni.NOM NEG-3SG like.CONN olive-PL-ELA
'Joni does not olives, either'

b. *Myöskään Joni tuskin pitä-ä oliive-i-sta*
ADD Joni.NOM probably-not like-PRES.3SG olive-PL-ELA
'Joni probably does not like olives, either'

c. *Pitä-ä-kö myöskään Joni oliive-i-sta?*
like-PRES.3SG-Q ADD Joni.NOM olive-PL-ELA
'Does Joni like olives either?'

On the basic use, *–kin/–kAAn* may attach to virtually any category: possible hosts include determiners, adjectives, nouns, verbs (finite and non-finite), prepositions, and adverbs. In Standard Finnish, the only restriction is that *–kin/–kAAn* cannot be hosted by the negative auxiliary verb, but colloquial Finnish seems to allow that as well (Ranta, 2014). In what follows, we will take a closer look at possible positions of *–kin* and *myös*, and then move on to *–kAAn* and *myöskään*.

As was discussed in section 3.3, Holmberg (2014) proposes that bound additives can be merged wherever they c-command an interpretable focus feature [*iF*]. In general, *–kin* seem to prefer to appear at the "edge" of the F-marked constituent. For example, in (162a), only a part of the complex KP *mustista oliiveista* – the adjective – is F-marked, and *–kin* attaches to the adjectival associate. This leads to a presupposition that pertains to olives of other types. However, if the whole KP is F-marked, as in (162b), *–kin* is naturally attached at the end of the whole KP. In this case, although it is possible that the relevant alternative is another type of olives, it is also possibly that it is a non-olive thing altogether (e.g. cheese). This possibility is not available for (162a), which means that the F-marking on the adjective does not *project* to cover the whole KP in (162a) (cf. section 3.4.3; Selkirk, 1996; Schwarzschild, 1999).

(162) **F-marking and position of *–kin* (1)**

a. *[Mari pitä-ä vihre-i-stä oliive-i-sta.]*
Mari.NOM like-PRES.3SG green-PL-ELA olive-PL-ELA

Hän pitä-ä must-i-stakin oliive-i-sta
she.NOM like-PRES.3SG black-PL-ELA-ADD olive-PL-ELA
'(Mari likes green olives.) She likes black olives, too'

b. *[Mari pitä-ä vahvo-i-sta juusto-i-sta.]*
Mari.NOM like-PRES.3SG strong-PL-ELA cheese-PL-ELA

Hän pitä-ä must-i-sta oliive-i-sta-kin
she.NOM like-PRES.3SG black-PL-ELA olive-PL-ELA-ADD
'(Mari likes strong cheeses.) She likes black olives, too'

The preference for 'local attachment' to the associate is illustrated by the relative oddness of (163a), where the adjective is F-marked but *–kin* is on the head noun of the KP. Moreover, it seems impossible to attach *–kin* to the adjective if it is the head noun of the KP that is F-marked (163b). For Holmberg (2014), this is because *–kin* would not c-command [*i F*] on the head noun *oliiveista* in this case.

(163) **F-marking and position of *–kin* (2)**

a.?? *[Mari pitä-ä vihre-i-stä oliive-i-sta.]*
Mari.NOM like-PRES.3SG green-PL-ELA olive-PL-ELA

Hän pitä-ä must-i-sta oliivei-sta-kin
she.NOM like-PRES.3SG black-PL-ELA olive-PL-ELA-ADD
'(Mari likes green olives.) She likes black olives, too'

b. * *Mari pitä-ä must-i-sta-kin oliive-i-sta*
Mari.NOM like-PRES.3SG black-PL-ELA-ADD olive-PL-ELA

As mentioned above, *myös* has a tendency to immediately precede its associate, but it may also follow it. In both cases, the additive may associate with the adjective (164a), the whole KP (164b), or the head noun of the KP (164c). It may not, however, appear in a position in which it intervenes between the adjective and the head noun within a complex KP, regardless of which of the surrounding constituents is its associate (164d). If *myös* has the distribution of an adverb, this restriction is natural. Note that in (164), the possible positions of *myös* are shown in parantheses, but only one additive can be realised.

(164) **F-marking and position of *myös***

a. *[Mari pitä-ä vihre-i-stä oliive-i-sta.]*
Mari.NOM like-PRES.3SG green-PL-ELA olive-PL-ELA

Hän pitä-ä (myös) must-i-sta oliive-i-sta (↑myös)
she.NOM like-PRES.3SG ADD black-PL-ELA olive-PL-ELA ADD
'(Mari likes green olives.) She likes black olives, too'

b. *[Mari pitä-ä vahvo-i-sta juusto-i-sta.]*
Mari.NOM like-PRES.3SG strong-PL-ELA cheese-PL-ELA

Hän pitä-ä (myös) must-i-sta oliive-i-sta (↑myös)
she.NOM like-PRES.3SG ADD black-PL-ELA olive-PL-ELA ADD
'(Mari likes strong cheeses.) She likes black olives, too'

c. *[Mari pitä-ä italialais-i-sta juusto-i-sta.]*
Mari.NOM like-PRES.3SG Italian-PL-ELA cheese-PL-ELA

Hän pitä-ä (myös) italialais-i-sta oliive-i-sta (↑myös)
she.NOM like-PRES.3SG ADD Italian-PL-ELA olive-PL-ELA ADD
'(Mari likes Italian cheeses. She likes Italian olives, too'

d. **Mari pitää mustista myös oliiveista*
Mari-NOM like-PRES.3SG black-PL.ELA.ADD ADD olive-PL.ELA

The distributive restrictions presented above also apply to *–kAAn* (165) and *myöskään* (166).

(165) **F-marking and position of *–kAAn***

a. *Joni e-i pidä vihre-i-stä-kään oliive-i-sta*
Joni.NOM NEG-3SG like.CONN green-PL-ELA-ADD olive-PL-ELA
'Joni does not like green olives, either'

b. *Joni e-i pidä vihre-i-stä oliivei-sta-kaan*
Joni.NOM NEG-3SG like.CONN green-PL-ELA olive-PL-ELA-ADD
'Joni does not like green olives, either'

c.?? *Joni e-i pidä vihre-i-stä oliive-i-sta-kaan*
Joni.NOM NEG-3SG like.CONN green-PL-ELA olive-PL-ELA-ADD
'Joni does not like green olives, either'

d. **Joni e-i pidä vihre-i-stä-kään oliive-i-sta*
Joni-NOM NEG-3SG like.CONN green-PL-ELA-ADD olive-PL-ELA

(166) **F-marking and position of *myöskään***

a. *Joni* *e-i* *pidä* *(myöskään)* *vihre-i-stä* *oliive-i-sta* *(↑myöskään)*
Joni.NOM NEG-3SG like.CONN ADD green-PL-ELA olive-PL-ELA ADD
'Joni does not like green olives, either'

b. *Joni* *e-i* *pidä* *(myöskään)* *vihre-i-stä oliive-i-sta* *(↑myöskään)*
Joni.NOM NEG-3SG like.CONN ADD green-PL-ELA olive-PL-ELA ADD
'Joni does not like green olives, either'

c. *Joni* *e-i* *pidä* *(myöskään)* *vihre-i-stä* *oliive-i-sta* *(↑myöskään)*
Joni.NOM NEG-3SG like.CONN ADD green-PL-ELA olive-PL-ELA ADD
'Joni does not like green olives, either'

d. **Joni* *e-i* *pidä* *vihre-i-stä* *myöskään* *oliive-i-sta*
Joni.NOM NEG-3SG like.CONN green-PL-ELA ADD olive-PL-ELA

Examples (164) and (166) do not indicate the acceptability of all logically possible positions of unbound additives. As (159) and (161) show, when the associate is a subject, the unbound additives *myös* and *myöskään* may appear clause-initially (167); this position is unavailable if the associate is not the subject (168). In addition, unbound additives may appear between the subject and the finite verb, but only if the verb is focused (168b). Although a stressed (↑) additive may associate with the subject and appear between the auxiliary and the past participle (167), placing it between the past participle and e.g. a locative PP is dispreferred (167), possibly because the additive would then be in the stereotypical position to associate with the PP, as in (168a). The same remark applies to a postposed additive that associates with the finite verb (168b), although the effect is not as strong.

(167) **Subject associate**
[Joni *o-n* *käy-nyt* *Pariisi-ssa.]*
Joni.NOM be-PRES.3G visit-PASTPART Paris-INE

(Myös) *Mari* *(#myös)* *o-n* *(↑myös)* *käy-nyt* *(#myös)* *Pariisi-ssa*
ADD Mari.NOM ADD be-PRES.3SG ADD visit-PASTPART ADD Paris-INE
(↑myös)
ADD

'(Joni has visited Paris.) Mari has visited Paris, too'

(168) **Non-subject associate**

a. *[Joni o-n käy-nyt Pariisi-ssa.]*
Joni.NOM be-PRES.3G visit-PASTPART Paris-INE

(#Myös) hän (#myös) o-n (myös) käy-nyt (myös) Berliini-ssä
ADD he.NOM ADD be-PRES.3SG ADD visit-PASTPART ADD Berlin-INE
(↑myös)
ADD
'(Joni has visited Paris.) He has visited Berlin, too'

b. *[Joni inhos-i Pariisi-a.]*
Joni.NOM hate-PAST.3SG Paris-PAR

Mutta sama-lla (#myös) hän (myös) rakas-ti (??myös) si-tä (↑myös)
but same-ADE ADD he.NOM ADD love-PAST.3SG ADD it-PAR ADD
'(Joni hated Paris.) But at the same time, he loved it too'

That concludes the presentation of the distribution of unbound and bound additives on their basic use. Now, as was mentioned in the beginning of this section, the literature usually presents *–kin* and *–kAAn* (bound) and *myös myöskään* (unbound) as "polar pairs" respectively. Going back to the form alternation question (see section 3.1.4), the existence of these pairs raises the question of whether *–kAAn* and *myöskään* scope above negation, as per the scope approach (Karttunen and Karttunen, 1976; Karttunen and Peters, 1979), or below negation, as per the polarity approach (Rullmann, 2003) (see section 3.2.1). The latter approach is implicitly adopted by e.g. Holmberg (2014) for *–kin* and *–kAAn*.

One way to test whether *–kAAn* and *myöskään* scope above or below negation is to look at the form of the presupposition when an additional scope-taking expression – such as a modal – is involved (cf. Shimoyama, 2011). This way of testing for the relative scope of negation and additives is possible because scope relationships can be assumed to be transitive: if α scopes over β, and β scopes over γ, then α scopes over γ.

In Finnish, the universal deontic modal *tulla* always takes scope above negation, and expresses prohibition (Kangasniemi, 1992, p. 100, 114).

(169) **Deontic modal *tulla* scopes above negation**
Kirurgi-n e-i tule ol-la väsynyt $[\Box_{deont} >$NEG$]$
surgeon-GEN NEG-3SG must.CONN be-INF tired.NOM
'A/the surgeon must not be tired'

On the polarity approach to the form alternation question, *–kAAn* and *myöskään* must scope below negation. Under an existential analysis, they are expected to introduce a presupposition that roughly requires the *falsity* of some antecedent (see section 3.2.1). By transitivity of scope, it

follows that in sentences with the deontic modal *tulla* and *–kAAn/myöskään*, the additive scopes below the modal (170). In this case, the additive presupposition does *not* include the deontic modal.

(170) **Scope prediction of the polarity approach**

$\Box_{deontic} > \text{NEG} > \text{ADD}_{NPI}$

In contrast, on the scope approach, *–kAAn* and *myöskään* scope above negation, and roughly presuppose the *truth* of an antecedent on the existential analysis. On this analysis, the additives may scope above or below the deontic modal *tulla*, which itself still must scope above negation. In this case, the additive presupposition may or may not include the deontic modal, depending on the position of ADD.

(171) **Scope prediction of the scope approach**

$(\text{ADD}) > \Box_{deontic} > (\text{ADD}) > \text{NEG}$

The data support the scope approach. To see this, consider the contrast shown in (172). In both (172a) and (172b), the second sentence clearly implies that there is some property other than being tired that the surgeon *should not* have, meaning that the additive takes scope over the modal and the negation. In (172a), that other unwanted property is being nervous. In contrast, (172b) is only felicitous if one assumes that being focused is a property that a surgeon should not have. This goes against our knowledge of what the work of a surgeon requires. Crucially, the polarity approach predicts (171b) to be fully acceptable: the context establishes that there is some property distinct from being tired (i.e. that of being focused) that does *not* apply to the surgeon.[4]

(172) **Deontic modal included in additive meaning: *myöskään***

[Context: A is about to undergo surgery. A and B talk about the operating surgeon.]

[4]It is also possible for the unbound additive to linearly precede the deontic modal, as in (i). The judgments remain the same.

(i) Deontic modal linearly precedes unbound additive
[Context: A is about to undergo surgery. A and B talk about the operating surgeon.]

a. – *Kirurgi* *e-i* *näytä* *hermostunee-lta.*
surgeon.NOM NEG-3SG seem.CONN nervous-ABL

– *Häne-n* *e-i* *myöskään* *tule* *ol-la* *väsynyt*
(s)he-GEN NEG-3SG ADD must.CONN be-INF tired.NOM
'The surgeon does not seem nervous. – (S)he should also not be tired'

b. #– *Kirurgi* *e-i* *näytä* *keskittynee-ltä.*
surgeon.NOM NEG-3SG seem.CONN focused-ABL

– *Häne-n* *e-i* *myöskään* *tule* *ol-la* *väsynyt*
(s)he-GEN NEG-3SG ADD must.CONN be-INF tired-NOM
'The surgeon does not seem focused. – (S)he should also not be tired'

a. – *Kirurgi* *e-i* *näytä* *hermostunee-lta.*
surgeon.NOM NEG-3SG seem.CONN nervous-ABL

– *Häne-n* *e-i* *tule* *ol-la* *myöskään* *väsynyt*
(s)he-GEN NEG-3SG must.CONN be-INF ADD tired-NOM
'The surgeon does not seem nervous. – (S)he should also not be tired'

b. # – *Kirurgi* *e-i* *näytä* *keskittynee-ltä.*
surgeon.NOM NEG-3SG seem.CONN focused-ABL

– *Häne-n* *e-i* *tule* *ol-la* *myöskään* *väsynyt*
(s)he-GEN NEG-3SG must.CONN be-INF ADD tired-NOM
'The surgeon does not seem focused. – (S)he should also not be tired'

The parallel data with *–kAAn* is shown in (173).

(173) **Deontic modal included in additive meaning: *–kAAn***
[Context: A is about to undergo surgery. A and B talk about the operating surgeon.]

a. – *Kirurgi* *e-i* *näytä* *hermostunee-lta.*
surgeon.NOM NEG-3SG seem.CONN nervous-ABL

– *Häne-n* *e-i* *tule* *oll-a* *väsynyt-kään*
(s)he-GEN NEG-3SG must.CONN be-INF tired.NOM-ADD
'The surgeon does not seem nervous. – (S)he should also not be tired'

b. # – *Kirurgi* *e-i* *näytä* *keskittynee-ltä.*
surgeon.NOM NEG-3SG seem.CONN focused-ABL

– *Häne-n* *e-i* *tule* *ol-la* *väsynyt-kään*
(s)he-GEN NEG-3SG must.CONN be-INF tired.NOM-ADD
'The surgeon does not seem focused. – (S)he should also not be tired'

In sum, (172) and (173) indicate that the additives *myöskään* and *–kAAn* may be interpreted above the deontic modal *tulla*, which itself always takes scope above negation. Therefore, the data supports the scope approach to the form alternation question.[5]

A final remark concerning the basic use is related to Abrusán's (2014) approach to additivity. Recall that Abrusán assumes that additives are tense-insensitive; in other words, the (event described in the) antecedent that satisfies the additive presupposition is allowed to pertain to a different time than the (event described in the) prejacent. Interestingly, the type of examples that Abrusán discusses show a peculiar accommodation effect in Finnish. In particular, it seems as if

[5]If the first sentence explicitly expresses a prohibition, the results are the same as in (172) or (173), as (i) shows. This is natural if the interpretation of (172)) and (173) involves the inference that the first sentence somehow 'satisfies' the deontic requirement explicited in (i):

the explicitly given antecedent in (174) is not sufficient for the satisfaction additive presupposition; instead, the examples show evidence of accommodation. Specifically, the second conjunct in (174a) means not only that Mari will speak slowly on the next day, but that she will speak slowly *and* clearly. In (174b), the temporal order is changed so that the first conjunct is about the future, and the second about the past. Here, too, the additive presupposition is accommodated, so that the second conjunct means that Mari spoke both slowly *and* clearly on the day before. The result is slightly marked when compared to (174a), but still acceptable (cf. Abrusán, 2014).

(174) **Accommodation in case of tense-mismatch**

a. *[Eilen Mari puhui selkeästi.]*
yesterday Mari-NOM speak-PAST.3SG clearly

Huomenna hän puhuu { *myös hitaasti / hitaastikin* }
tomorrow she-NOM speak-PRES.3SG ADD slowly slowly-ADD
'(Yesterday, Mari spoke clearly.) Tomorrow, she will also speak slowly'

b. ?*[Huomenna Mari puhuu selkeästi.]*
tomorrow Mari-NOM speak-PRES.3SG clearly

Eilen hän puhui { *myös hitaasti / hitaastikin* }
yesterday she-NOM speak-PAST.3SG ADD slowly slowly-ADD
'(Tomorrow, Mari will speak clearly.) Yesterday, she also spoke slowly'

The examples in (174) are particularly interesting because in both, the temporal adverbials have moved to the CP in surface syntax – potentially to a (contrastive) topic position – but they are nevertheless part of the additive presupposition, as indicated by the content of the accommodated proposition (which concerns *tomorrow* in the second sentence of (174a), and *yesterday* in the second sentence of (174b)). The relationship between contrastive topicality and accommodation is discussed in detail in section **??**.

In the next section, I describe another basic use that is available with both unbound and bound additives: the confirming use.

(i) Interaction of bound additive and deontic modal

a. *Kirurgi-n e-i tule ol-la hermostunut.*
surgeon-GEN NEG-3SG must.CONN be-INF nervous.NOM

Häne-n e-i tule ol-la väsynyt-kään
(s)he-GEN NEG-3SG must.CONN be-INF tired.NOM-ADD
'The surgeon must not be nervous. (S)he must also not be blue'

b. #*Kirurgi-n e-i tule ol-la keskittynyt.*
surgeon.NOM NEG-3SG must.CONN be-INF focused.NOM

Häne-n e-i tule ol-la väsynyt-kään
(s)he-GEN NEG-3SG must-CONN be-INF tired.NOM-ADD
'The surgeon must not be focused. (S)he must also not be blue'

4.1.2 Confirming: *–kin/–kAAn, myös/myöskään*

The second use classified as basic involves F-marking a verb. On this use, the function of the additive is *confirming*; for example, if something was potentially going to happen, an additive can be used to highlight the fact that it did. The confirming use is available with both unbound and bound additives, as shown in (175) and (176).

(175) **Examples of confirming use with *–kin* and *myös***

a. *Mari sano-i lähte-vä-nsä,*
Mari.NOM say-PAST.3SG leave-PRESPART-PX/3SG

ja (niin) hän läht-i-kin
and so she.NOM leave-PAST.3SG-ADD
'Mari said she would leave, and so she (actually) did'

b. *Mari sano-i lähte-vä-nsä,*
Mari.NOM say-PAST.3SG leave-PRESPART-PX/3SG

ja (niin) hän myös läht-i
and so she.NOM ADD leave-PAST.3SG
'Mari said she would leave, and so she (actually) did'

(176) **Examples of confirming use with *–kAAn* and *myöskään***

a. *Mari sano-i ett-e-i hän läht-isi,*
Mari.NOM say-PAST.3SG that-NEG-3SG (s)he.NOM leave-COND.3SG

e-i-kä hän lähte-nyt-kään
NEG-3SG-and (s)he.NOM left-PASTPART-ADD
'Mari said (s)he would not leave, and (s)he (actually) didn't'

b. *Mari sano-i ett-e-i hän läht-isi,*
Mari.NOM say-PAST.3SG that-NEG-3SG (s)he.NOM leave-COND.3SG

e-i-kä hän myöskään lähte-nyt
NEG-3SG-and (s)he.NOM ADD left-PASTPART
'Mari said she would not leave, and she (actually) didn't'

The confirming use of additives is most natural with antecedents that involve a verb of e.g. saying, as in (175) and (176). The confirming flavour comes from the complement of the verb of saying having to match the prejacent; in (176), for example, both are about Mari's leaving. Thus, (177) is infelicitous.

(177) **Non-matching complement of verb of saying and confirming use of *myös***

#Mari *sano-i* *osallistu-va-nsa,*
Mari.NOM say-PAST.3SG participate-PRESPART-PX/3SG

ja *(niin)* *hän* *myös* *läht-i*
and so she.NOM ADD leave-PAST.3SG

Int. 'Mari said she would participate, and she (actually) did leave'

As mentioned above, what the confirming use seems to require is that it was previously established as possible that some event *e* would take place, and then it is asserted that *e* actually took place. Given the matching requirement illustrated in (177), it is not possible to analyse the confirming use as simply involving VP-focus: VP-focus would be predicted to allow for antecedents that differ in the way shown in (177). Instead, the confirming use seems to involve focus on some *modal* part of the prejacent. In the host sentence of (177), Mary's leaving is actual; in the antecedent, which is given in the local context, Mary's leaving is perhaps simply possible.[6] F-marked modals may indeed function as the associate for additives in both English and Finnish, as shown in (178).

(178) **Modal associate of *too***

a. Mary may eat carrots. In fact, she must eat carrots, too

b. *Mari* *saa* *syö-dä* *porkkano-i-ta.* *Itse asiassa* *häne-n* *myös*
Mari.NOM may.PRES.3SG eat-INF carrot-PL-PAR in fact she-GEN ADD

täyty-y *syö-dä* *porkkano-i-ta*
must-PRES.3SG eat-INF carrot-PL.PAR

'Mari may eat carrots, and in fact, she must eat carrots, too'

Building on the parallel with (178), it is natural to assume that an analysis of the confirming use would use lexical alternatives determined by focus on a modal expression. In Finnish, this modal part may apparently be incorporated in the tensed verb, or it may be expressed separately, as in (178). Although the proposal put forth in this dissertation arguably can be extended to cover this use, no example derivations of confirming use additives will be given in section 5.2, where the

[6] As it is the 'non-actuality' of the antecedent that matters for the felicity of the additive, the placement of negation within the first conjunct of (176) is irrelevant for the felicity of the confirming additive, as long as the end result is the possibility that Mari would not leave. This is shown in (178).

(i) *Mari* *e-i* *sano-nut* *että* *hän* *läht-isi,* *e-i-kä* *hän*
Mari.NOM NEG-3SG say-PASTPART that (s)he.NOM leave-COND.3SG NEG-3SG-and (s)he.NOM

lähte-nyt-kään
left-PASTPART-ADD

'Mari did not say that (s)he would leave, and (s)he (actually) didn't leave'

focus will be on the analysis of the simplest examples of the basic use. The formal extension of the proposal to this use is thus left for another occasion.

Before we conclude, it should be pointed out that it is sometimes claimed that verb-attaching bound additives may be used both when things happen as expected – as in the examples of confirming use above – and when what happens goes against expectations. In other words, it is proposed that bound additives simply require their host sentence to be interpreted with respect to some expectation, but do not indicate the 'direction' of that interpretation (Vilkuna, 1984; Hakulinen et al., 2004, § 842. Formally, Hakulinen and Karlsson (1979, p. 329) propose that such cases always involve broad focus over the whole sentence. This, however, incorrectly clumps together attested broad focus uses with other uses that are more restrictive in what they allow as focus alternatives (see e.g. the polar use presented in section 4.2). What this dissertation shows is that cases where a previous expectation is confirmed and cases where it is disconfirmed do not pattern alike. For example, it has gone previously unnoticed that the confirming use is in fact available with both unbound and bound additives, as was shown in this section. The second type of expectation-related use – that is, the polar use – is only available with bound additives.

4.1.3 Rhetorical use

The third and last basic use that I present here is the rhetorical use. This use has been previously discussed from the perspective of the bound additives *–kin* and *–kAAn* (Karttunen and Karttunen, 1976). However, it seems that this use is also possible with the unbound additives *myös* and *myöskään*. Hence, it is here classified as basic. Like the confirming use presented in the previous section, this use will not be discussed again in section 5.2, where I propose an entry for the additive operator relevant for basic uses, and give example derivations for the simplest examples. Extending the proposal to cover the rhetorical uses is more complex in the case of the rhetorical use than with the confirming use, but I leave this task for another occasion.

In general, rhetorical questions are characterised by uninformativity (Rohde, 2006): their answer is so obvious – to both the speaker and the addressee – that the question itself need not be explicitly answered.[7] In their discussion of the rhetorical use of *–kin* and *–kAAn*, Karttunen and Karttunen (1976) include both polar and *wh*-type rhetorical questions. The authors propose that depending on which rhetorical question formation rule is used, the interpretation of the question includes a (possibly conventional) implicature that the speaker is confident that the root sentence is true (*rhetorical* polar questions (179a)) or that the speaker believes that the universal closure of the scope with its polarity reversed is true (rhetorical *wh*-questions (179b-c)).

In other words, for Karttunen and Karttunen, bound additives contribute their usual basic use additive meaning on the rhetorical use. Thus, (179a) presupposes that someone (distinct from Marja) likes Jussi, and implicates that the speaker is confident about Marja liking Jussi. In

[7] See Rohde, 2006 for a review of different approaches to rhetorical questions (Sadock, 1971; Ladusaw, 1980; van Rooy, 2003). Following van Rooy (2003), Rohde (2006) argues that rhetorical questions have a question denotation, and that they do not denote assertions of the opposite polarity, as has been previously argued.

the same way, (179b) presupposes that there is someone (distinct from Jussi) that *no one* likes (negative-polarity universal implicature), and (179c) presupposes that there is someone (distinct from Jussi) that *everyone* likes (positive-polarity universal implicature).

(179) **Rhetorical questions with *–kin* and *–kAAn*** (Karttunen and Karttunen, 1976, p. 109)

a. *E-i-kö Marja-kin pidä Jussi-sta?* [confidence implicature]
NEG-3SG-Q Marja.NOM-ADD like.CONN Jussi-ELA
'Doesn't Marja like Jussi too?'

b. *Kuka pitä-isi Jussi-sta-kaan?* [negative universal implicature]
who.NOM like-COND.3SG Jussi-ELA-ADD
'Who would like Jussi either?'

c. *Kuka e-i pitä-isi Jussi-sta-kin?* [positive universal implicature]
who.NOM NEG-3SG like-COND Jussi-ELA-ADD
'Who would not like Jussi too?'

The corresponding versions with unbound additives are given in (180). These give rise to the same implicatures (in Karttunen and Karttunen's terms) as the examples in (179).

(180) **Rhetorical questions with *myös* and *myöskään*** (Karttunen and Karttunen, 1976, p. 109)

a. *E-i-kö myös Marja pidä Jussi-sta?* [confidence implicature]
NEG-3SG-Q ADD Marja.NOM like.CONN Jussi-ELA
'Doesn't Marja like Jussi too?'

b. *Kuka pitä-isi myöskään Jussi-sta?* [negative universal implicature]
who.NOM like-COND.3SG ADD Jussi-ELA
'Who would like Jussi either?'

c. *Kuka e-i pitä-isi myös Jussi-sta?* [positive universal implicature]
who.NOM NEG-3SG like-COND ADD Jussi-ELA
'Who would not like Jussi too?'

If the additive presuppositions of rhetorical *wh*-questions are as described by Karttunen and Karttunen (1976), the use of bound additives should be felicitous when the context contains an antecedent with universal quantificational force and the right polarity. This is indeed the case, as shown in (181) (with bound additives).

(181) **Rhetorical questions with universal antecedents: *–kin* and *–kAAn***

a. *Kukaan e-i pidä Trumpi-sta.*
anyone.NOM NEG-3SG like.CONN Trump-ELA

Ja kuka nyt pitä-isi Putini-sta-kaan?
and whoNOM EMPH like-COND.3SG Putin-ELA
'Nobody likes Trump. And who would like Putin either?'

b. *Kaikki pitä-vät Trumpi-sta.*
everyone.NOM like-PRES.3PL Trump-ELA

Ja kuka nyt e-i pitä-isi Putini-sta-kin?
and who.NOM EMPH NEG-3SG like-COND Putin-ELA
'Everyone likes Trump. And who wouldn't like Putin too?'

It is also possible for the antecedent to be another rhetorical question, as in (182). This is expected if the implicature (i.e. the universal statement) that arises from the first rhetorical question may function as an antecedent for the additive in the second rhetorical question.

(182) **Rhetorical questions with rhetorical question antecedents**

a. *Kuka nyt pitä-isi Trumpi-sta?*
who.NOM EMPH like-COND.3SG Trump-ELA

Ja kuka nyt pitä-isi Putini-sta-kaan?
and who.NOM EMPH like-COND.3SG Putin-ELA
'Who would like Trump? And who would like Putin either?'

b. *Kuka nyt e-i pitä-isi Trumpi-sta?*
who.NOM EMPH NEG-3SG like-COND Trump-ELA

Ja kuka nyt e-i pitä-isi Putini-sta-kin?
and who.NOM EMPH NEG-3SG like-COND Putin-ELA
'Who wouldn't like Trump? And who wouldn't like Putin too?'

As expected, the universal nature of Karttunen and Karttunen's presuppositions for the rhetorical use makes antecedents that name a single individual infelicitous, as shown in (183).

(183) **Rhetorical questions with individual-naming antecedents**

a. #*Joni e-i pidä Trumpi-sta.*
Joni.NOM NEG-3SG like.CONN Trump-ELA

Ja kuka nyt pitä-isi Putini-sta-kaan?
and who.NOM EMPH like-COND.3SG Putin-ELA
'Joni does not like Trump. But who would like Putin either?'

b. #*Joni pitä-ä Trumpi-sta.*
Joni.NOM like-PRES.3SG Trump-ELA

Ja kuka nyt e-i pitä-isi Putini-sta-kin?
and who.NOM EMPH NEG-3SG like-COND Putin-ELA
'Joni likes Trump. And who wouldn't like Putin too?'

Karttunen and Karttunen propose that in rhetorical *wh*-questions, the form of the additive is determined by the polarity of the 'input' or 'root' sentence; thus, with *–kin* and *myös*, the input sentence is positive, and with *–kAAn* and *myöskään*, the input sentence is negative. The rhetorical *wh*-question formation rule reverts the surface polarity of the question. Moreover, this rule is responsible for the universal closure implicature, which comes to affect the form of the additive meaning as well (Karttunen and Karttunen, 1976, p. 112).

In conclusion, the rhetorical use of bound additives has been argued to involve a universal closure implicature which also affects the meaning contributed by additives (Karttunen and Karttunen, 1976). Karttunen and Karttunen themselves analyse additive meaning as a conventional implicature, and explicitly state that it corresponds to a universal statement with reversed polarity (with respect to the surface form). This presupposition can be satisfied by both universal antecedents and rhetorical question antecedents. As mentioned at the beginning of this section, although I assume that the same lexical entry that I provide for the additive operator associated with the basic use in this dissertation is also at play in the semantics of the rhetorical use of additives, I will not give a formal extension of the proposal to this use in chapter 5, but leave this work for the future.

4.1.4 Summary

In this section, I discussed basic uses of additives that are available with both the unbound additives *myös* and *myöskään* and the bound additives *–kin* and *–kAAn*. While the latter two always appear as attached to their semantic associate, the former pair has a wider syntactic distribution.

I also presented an argument against the polarity approach to the form alternation question. In particular, polarity approach incorrectly predicts that *myöskään* and *–kAAn* take scope under the deontic modal *tulla* that itself scopes above negation. This prediction was shown not to be borne out. In this dissertation, I adopt the scope approach to the form alternation question (cf.

Karttunen and Karttunen, 1976; Karttunen and Peters, 1979), although, as chapter 4 will show, the driving force behind the movement of any additive operators is not sentence polarity.

Besides the very basic use of unbound and bound additives, I also discussed their confirming and rhetorical uses. The former use involves an F-marked verb, and what seem to be classifiable as modal alternatives. This use has previously been analysed as being closely related to the polar use, although this section has showed that only the former is available with both bound and unbound additives. The rhetorical use is special in that it involves questions – either polar or *wh* – and results in a presupposition that involves universal quantification and a polarity reversal. The in-depth formal analysis of these uses as representatives of the basic use is left for another occasion, and will not be included in chapter 5.

4.2 Polar use

In this section, I describe the polar use of bound additives. I begin with examples that involve only simple F-marking (section 4.2.1), and then move on to examples that involve an additional contrastively focused expression (section 4.2.2).

4.2.1 Without contrastive focus: *–kin/–kAAn*

The name of the polar use of bound additives (and crucially not unbound additives; see the end of the section) comes from the involvement of polar alternatives instead of lexical alternatives. This means that although the host and associate of the additive is always a tensed verb on the polar use, the additive presupposition does not concern alternatives that involve other verbs, but an alternative with the opposite polarity.[8] As such, polar use is connected to the phenomenon of *verum focus*, where focus has been assumed to be on the truth value of the prejacent (Höhle, 1992). In this case, the focus semantic value of the prejacent p (or Γ) can be defined as the set $\{p, \neg p\}$ (Höhle, 1992; Gutzmann et al., 2017).

Given this connection, I will begin by establishing a small but informative difference between verum focus and the polar use of bound additives. In (184), verum focus is expressed with a stressed auxiliary in B's response. The discourse effect is emphasis on the truth value of the proposition *that Joni will win the election*, which is subject to dispute within the mini-discourse.

(184) **Verum focus with F-marked auxiliary: Disputing truth values**

A: John will not win the election.

B. He <u>will</u>!

[8] As noted at the end of section **??**, Hakulinen and Karlsson (1979, p. 329) propose that such cases always involve broad focus over the whole sentence. If this were the case, however, it would have to be explained how the alternative set comes to be restricted to only two alternatives. Given that the availability of polar alternatives is clearly associated with F-marked tensed verbs, I simply assume that in such cases, the alternative set is polar to begin with, and the semantics does not involve broad focus and subsequent restriction of the alternative set.

Crucially, the polar use of bound additives is *not* felicitous in such contexts: both *–kin* in (185a) and *–kAAn* in (185b) are infelicitous.

(185) **Polar use: No disputing truth values**

a. #*Joni* *e-i* *voita* *vaale-j-a.*
Joni.NOM NEG-3SG win.CON election-PL-PAR

– *Voitta-a-kin!*
win-PRES.3SG-ADD

Int. 'Joni won't win the election. – He will! '

b. #*Joni* *voitta-a* *vaal-i-t.*
Joni.NOM win.PRES.3SG election-PL-ACC

– *E-i* *voita-kaan!*
NEG-3SG win-CONN-ADD

Int. 'Joni will win the election. – He will not! '

In Finnish, the discourse particle combination *–pA–s* is specialised in expressing such meanings. The assertions in (185) are naturally contested with the forms in (186a) and (186b) respectively.

(186) a. *Voitta-a-pa-s!*
win-PRES.3SG-PA-S
'He will (win)!'

b. *E-i-pä-s* *voita!*
NEG-3SG-PA-S win.CONN
'He will not (win)!'

Thus, on their polar use, bound additives cannot be used between discourse participants to dispute truth values. Interestingly, this restriction seems inherently interactive: when the bound additive refers to a polar antecedent that is the complement of a non-factive verb, such as *luulla* 'to believe, to think', the polar use of unbound additives becomes available. In (187a), the non-sleeping of of Joni is an 'earlier', false belief attributed to the speaker, and the sleeping of Joni is an 'actual', true belief attributed to the speaker and presented as being common ground. The polarities of the prejacent and antecedent are reversed in (187b), but the same remark applies.

(187) **Polar use: Non-factive complement as antecedent**

a. *Luul-i-n* *että* *Joni* *e-i* *nukku-nut,*
think-PAST-1SG that Joni.NOM NEG-3SG sleep-PASTPART

mutta *hän* *nukku-i-kin*
but he.NOM sleep-PAST.3SG-ADD
'I thought that Joni was not sleeping, but he was (sleeping)'

b. *Luul-i-n* *että* *Joni* *nukku-i,*
think-PAST-1SG that Joni.NOM sleep-PAST.3SG

mutta *hän* *e-i* *nukku-nut-kaan*
but he.NOM NEG-3SG sleep-PASTPART-ADD
'I thought that Joni was sleeping, but he was not (sleeping)'

Note that while the verb that embeds the antecedent has to be non-factive (188a), the conjunctive structure in (187) is not a prerequisite for the polar use: as shown by (188), the antecedent and the prejacent may be separated by linguistic material.

(188) **Polar use: Factive (a) vs. non-factive (b) embedding and intervening material**

a. *# Ties-i-n* *että* *Joni* *e-i* *nukku-nut.* *Katso-i-n* *sisä-än*
know-PAST-1SG that Joni.NOM NEG-3SG sleep-PASTPART look-PAST-1SG inside-ILL

huoneese-en. *Hän* *nukku-i-kin*
room-ILL he.NOM sleep-PAST.3SG-ADD
'I knew that Joni was not sleeping. I looked into the room. He was (sleeping)'

b. *Luul-i-n* *että* *Joni* *e-i* *nukku-nut.* *Katso-i-n* *sisä-än*
think-PAST-1SG that Joni.NOM NEG-3SG sleep-PASTPART look-PAST-1SG inside-ILL

huoneese-en. *Hän* *nukku-i-kin*
room-ILL he.NOM sleep-PAST.3SG-ADD
'I thought that Joni was not sleeping. I looked into the room. He was (sleeping)'

The data shown above suggests that the polar use of bound additives is felicitous when the antecedent is neither asserted (by some discourse participant other than the speaker) or presupposed (by the speaker or some other discourse participant) to be true. While the focus alternatives are the same as in cases of verum focus – and the F-marked associate is a verb, just like is typically the case in verum focus – the polar use is more restricted in its distribution than verum focus: in particular, bound additives cannot be used to dispute truth values among discourse participants. Anticipating the analysis that will be presented in chapter 5, we can say that the polar use seems to make reference to polar antecedents that are *private*: crucially, they may not be part of the common ground.

As the examples presented above show, on the polar use, the associate of the bound additive is an F-marked verb. Now, while there is a slight preference to attach the bound additive to the highest verb of the finite clause on the polar use (except if that verb is the negative auxiliary; see below), it is also possible to attach the bound additive to the second-highest tensed verb (as long as it is F-marked), as shown in (189) for *–kin*.

(189) **Varying the host and associate of *–kin***

a. *Luul-i-n että Joni e-i ol-lut nukku-nut, mutta*
think-PAST-1SG that Joni.NOM NEG-3SG be-PASTPART sleep-PASTPART but
hän ol-i-kin nukku-nut
he.NOM be-PAST.3SG-ADD sleep-PASTPART
'I thought that Joni had not slept, but he had slept'

b. *Luul-i-n että Joni e-i ol-lut nukku-nut, mutta*
think-PAST-1SG that Joni.NOM NEG-3SG be-PASTPART sleep-PASTPART but
hän ol-i nukku-nut-kin
he.NOM be-PAST.3SG sleep-PASTPART-ADD
'I thought that Joni had not slept, but he had slept'

It is not possible for bound additives to attach to a non-finite verb form on the polar use; in (190), for example, the use of *–kin* must be basic, and the alternatives to *nukkua* 'sleep' are other activities (not non-sleeping). The example in question is infelicitous given that no appropriate antecedent is available.

(190) **No polar use with non-finite verbs**

\# *Luul-i-n että Joni e-i aiko-nut nukku-a,*
think-PAST-1SG that Joni.NOM NEG-3SG intend-PASTPART sleep-INF
mutta hän aiko-i nukku-a-kin
but he.NOM intend-PAST.3SG sleep-INF-ADD
Int. 'I thought that Joni did not intend to sleep, but he did'

Just like *–kin*, *–kAAn* may appear on different tensed verbal elements with no change in meaning, as shown in (191a-b). However, note that in Standard Finnish, *–kAAn* cannot attach to negation (191c) (although see Ranta, 2014).[9]

[9]The same remark applies to *–kin*.

(191) **Varying the host and associate of *–kAAn***

a. *Luul-i-n* *että* *Joni* *ol-i* *nukku-nut,*
think-PAST-1SG that Joni.NOM be-PAST.3SG sleep-PASTPART

mutta *hän* *e-i* *ol-lut-kaan* *nukku-nut*
but he.NOM NEG-3SG be-PASTPART-ADD sleep-PASTPART
'I thought that Joni had slept, but he had not slept'

b. *Luul-i-n* *että* *Joni* *ol-i* *nukku-nut,*
think-PAST-1SG that Joni.NOM be-PAST.3SG sleep-PASTPART

mutta *hän* *e-i* *ol-lut* *nukku-nut-kaan*
but he.NOM NEG-3SG be-PASTPART sleep-PASTPART-ADD
'I thought that Joni had slept, but he had not slept'

c. *... *mutta* *hän* *e-i-kään* *ol-lut* *nukku-nut*
but he.NOM NEG-3SG-ADD be-PASTPART sleep-PASTPART-ADD

As mentioned above, the unbound additives *myös* and *myöskään* do not allow a polar use reading. Thus, the examples in (192) may only be interpreted with lexical alternatives; in (192a), for example, *myös* leads to the presupposition that Joni did something else that is not sleeping. In the context of (192a), this presupposition is not satisfied.

(192) **Unbound additives do not allow polar use**

a. #*Luul-i-n* *että* *Joni* *e-i* *nukku-nut,*
think-PAST-1SG that Joni.NOM NEG-3SG sleep-PASTPART

mutta *hän* *myös* *nukku-i*
but he.NOM ADD sleep-PAST.3SG
Int. 'I thought that Joni was not sleeping, but he was (sleeping)'

b. #*Luul-i-n* *että* *Joni* *nukku-i,*
think-PAST-1SG that Joni.NOM sleep-PAST.3SG

mutta *hän* *e-i* *myöskään* *nukku-nut*
but he.NOM NEG-3SG ADD sleep-PASTPART
Int. 'I thought that Joni was sleeping, but he was not (sleeping)'

The question of why the polar use is not available with unbound additives is intriguing. There are at least three ways to answer this question. The first is to assume that the polar use requires polar focus alternatives, and unbound additives are simply not able to operate on such a set. On a propositional view of focus-sensitivity, this option is undesirable, since it would require the focus-sensitive operator distinguish between sets of propositions that are made up of lexical

alternatives and sets of propositions that are made up of polar alternatives. It is unclear why such a distinction would be made by any focus-sensitive operator.

The second option is to assume that the operators associated with bound and unbound additives are not interpreted in the same position, and that unbound additives never c-command the position in which the F-marked associate is on the polar use. In (189) and (191), I showed that the generation of polar alternatives is correlated with finiteness, but it is not correlated with one specific syntactic position: any tensed verb may be the host of the bound additive on the polar use. This means that an analysis where the polar alternatives are syntactically associated with e.g. a high PolP (see section 2.3.3) does not seem like a good idea. If, however, the source of polar alternatives lies within the TP-portion of the syntactic tree, the second option predicts that unbound additives never associate with material that is introduced above tense. This prediction is not borne out: it is perfectly possible for unbound additives to associate with modals that are located within the TP. Notably, epistemic modals, whose tense-specification is related to the speech or attitude event time, and that are therefore interpreted above the tense specification of the event described in the sentence, can be the associates of unbound additives, as shown in (193) (where the host sentence of *myös* is paraphrasable as *In light of what I know now, Joni was at home in the past*). The second option therefore seems undesirable as well.

(193) **Association with universal epistemic modal *täytyä***

Joni *saatto-i* *ol-la* *kotona.*
Joni.NOM may-PAST.3SG be-INF home

Itse asiassa *häne-n* *myös* *täyty-i* *ol-la* *kotona*
in fact he-GEN ADD must-PAST.3SG be-INF home

'Joni could have been home. In fact, he also must have been home'

The third option is to assume that unbound additives lack the polar use because (i) like bound additives, they require the presence of an antecedent, but (ii) they encode specific restrictions on where that antecedent can be retrieved. I proposed above that the polar use is not possible when the antecedent is part of the common ground: in contrast, the antecedent is often *private*, and belongs for example to the set of propositions describing the speaker's beliefs (as in the examples with embedding under *think*). If this is the case, and bound additives but not unbound additives are able to 'reach' antecedents that are not in the common ground, we should find this property to be relevant for other uses that are only available with bound additives as well. As the rest of this chapter shows, this indeed seems to be the case.

In sum, the polar use of bound additives involves polar focus alternatives, but differs from plain verum focus in English in that bound additives cannot be used to dispute truth values between discourse participants. Moreover, the syntactic position of the bound additive is relatively free; as long as the host is tensed and F-marked, the specific position does not seem to make a semantic difference (although high positions are preferred).

4.2.2 With contrastive focus: *–kin/–kAAn*

In the examples of polar use presented in the previous section, the only prosodically prominent part of the prejacent was the host and associate of the bound additive. In some cases, the host is not the most prominent part of the prejacent, however. This happens when both contrastive focus and additivity are present in the same sentence.

Consider (194). The first conjunct establishes the speaker's earlier expectation that Mari will bring green olives. The second conjunct, however, establishes that contrary to that expectation, Mari brought black olives (where the contrastive focus on the adjective is expressed with capital letters). The proposal that the adjective is contrastively focused in (194) is supported by the acceptability of the continuation shown in parentheses.

(194) **Polar use and contrastive focus: *–kin***

Luul-i-n *että* *Mari* *to-isi* *vihre-i-tä* *oliive-j-a,* *mutta*
think-PAST-1SG that Mari.NOM bring-COND.3SG green-PL-PAR olive-PL-PAR but
hän *to-i-kin* *MUST-I-A* *oliive-j-a* *(e-i-kä* *vihre-i-tä)*
she.NOM bring-PAST.3SG-ADD black-PL-PAR olive-PL-PAR NEG-3SG-AND green-PL-PAR
'I thought that Mari would bring green olives, but she brought BLACK ones (and not green ones)'

In (194), the host of the bound additive is prosodically non-prominent, which is signalled with dashed underlining. The same dashed underlining also identified second occurrence foci in section 2.1.3. The parallel is intended, because here, too, the question is: Is the host-associate of the bound additive F-marked? Or does the bound additive associate with the contrastively focused adjective?

I propose that in (194), *–kin* makes use of the polar alternative of *that Mari brings black olives*, and not the lexical alternative *that Mari brings green olives.* The reason is that when the context of such examples is manipulated so that the same contrastive focus marking is no longer possible, this has no effect on the additive presupposition. To see this, consider (195), where the bound additive is *–kAAn* instead of *–kin.* First note that in the second conjunct of (195), the host of *–kAAn* is again prosodically prominent, while the adjective *vihreitä* is Given, and therefore deaccented. Thus, (195) only differs from (194) in that it explicitly states the expectation with which prejacent contrasts. This manipulation has an effect on the accenting pattern of the host sentence of the additive, but it does not change the schematic meaning contributed by the additive, i.e. that Mari was expected to bring green olives (the polar alternative of the prejacent).

(195) **Polar use and contrastive focus: *–kAAn***

Luul-i-n *että* *Mari* *to-isi* *vihre-i-tä* *oliive-j-a,*
think-PRES-1SG that Mari.NOM bring-COND.3SG green-PL-PAR olive-PL-PAR

mutta *hän* *e-i* *tuo-nut-kaan* *vihre-i-tä* *oliive-j-a,* *vaan*
but she.NOM NEG-3SG bring-PASTPART-ADD green-PL-PAR olive-PL-PAR but

MUST-I-A
black-PL-PAR

'I thought that Mari would bring GREEN olives, but she did not bring green olives, but BLACK olives'

The conclusion that I draw from this data is that not only is the realisation of prosodic prominence dependent on what the discourse status of the associate is, but also, it seems dependent on what other types of prosodic prominence are present in the sentence. If this is true, then in both (194) and (195), the bound additive may be assumed to associate with the tensed verb, be it very prominent (as in (195) or not (as in (194). Arguably, assuming that bound additives always associate with their host (or at least a part of it) is conceptually superior to letting them associate with other F-marked phrases in the sentence (see also Karttunen and Karttunen, 1976): it allows retaining a syntactic analysis where the adjunction site of bound additives is determined locally by the presence of a focus feature (section 3.4.3; Holmberg, 2014).

4.2.3 Summary

To sum up, the additive presupposition of unbound additives may involve a polar alternative, in which case the focus semantic value of the prejacent p (as well as Γ) can be defined $\{p, \neg p\}$ (Höhle, 1992; Gutzmann et al., 2017). In contrast to plain verum focus in English, the polar use of bound additives is infelicitous if the polar antecedent is asserted or presupposed to be true, i.e. if it is part of the common ground. Indeed, the polar use is only possible when the antecedent appears correctly embedded under e.g. attitude verbs or modal verbs, or is in some sense *private*.

Morphologically, the polar use is characterised by the attachment of *–kin* and *–kAAn* to tensed F-marked verbs. There is nevertheless some flexibility in where the additive may appear within the TP, which means that the polar use cannot be associated with a single syntactic projection. In some cases – and in particular, in the presence of contrastive focus – the verbal host of the bound additive may be prosodically non-prominent, but it can be shown that it still corresponds to the F-marked associate in the structure.

In the next section, we will discuss the reactive use of bound additives, which also involves verbal host-associates.

4.3 Reactive use

The reactive use of bound additives is an inherently interactive use on which the host of the bound additive is again a tensed F-marked verb. This use is exemplified in (196). In contrast to the polar use, the reactive use is characterised by the appearance of bound additives in agreeing reactions to an assertion made by another speaker. It is natural for the answer to be partly elided, as in (196a), and not fully spelled out, as in (196b). Note that on this use, the presence of the bound additive is not obligatory; a confirming reaction can just as well be expressed without it.

(196) **Reactive use: *–kin***

a. *Joni* *pitä-ä* *oliive-i-sta.*
Joni.NOM like-PRES.3SG olive-PL-ELA

– *Niin* *pitä-ä-(kin).*
so like-PRES.3SG-ADD

'Joni likes olives. – So he does.'

b. ?*Joni* *pitä-ä* *oliive-i-sta.*
Joni.NOM like-PRES.3SG olive-PL-ELA

– *Niin* *Joni* *pitä-ä-(kin)* *oliive-i-sta.*
so Joni.NOM like-PRES.3SG-ADD olive-PL-ELA

'Joni likes olives. – So Joni does like olives.'

When the reaction targets a negative polarity assertion, as in (197), *–kAAn* is used instead of *–kin*. As with *–kin*, both elided (a) and full (b) reactions are possible. While the presence of *–kAAn* is optional, the agreeing reaction is naturally formulated in a slightly different way in its absence, as shown in (197c).

(197) **Reactive use: *–kAAn***

a. *Joni* *e-i* *pidä* *oliive-i-sta.*
Joni.NOM NEG-3SG like.CONN olive-PL-ELA

– *E-i* *pidä-kään.*
NEG-3SG like.CONN-ADD

'Joni does not like olives. – No, he doesn't.'

b. ?*Joni* *e-i* *pidä* *oliive-i-sta.*
Joni.NOM NEG-3SG like.CONN olive-PL-ELA

– *E-i* *Joni* *pidä-kään* *oliive-i-sta.*
NEG-3SG Joni.NOM like.CONN-ADD olive-PL-ELA

'Joni does not like olives. – No, Joni doesn't like olives.'

c. *Joni* *e-i* *pidä* *oliive-i-sta.*
Joni.NOM NEG-3SG like.CONN olive-PL-ELA

– *Ei* *niin.*
NEG-3SG so

'Joni does not like olives. – No, he doesn't.'

The reactive use seems intimately connected to the confirming basic use presented in section 4.1.2; after all, both express agreement with or confirmation of an antecedent that was presented previously. The two uses are nevertheless not fully alike: while the confirming use is possible with unbound and bound additives, the reactive use is only possible with bound additives, as illustrated in (198).

(198) **Reactive use is unavailable with unbound additives**

a. #*Joni* *pitä-ä* *oliive-i-sta.*
Joni.NOM like-PRES.3SG olive-PL-ELA

– *Niin* *myös* *pitä-ä.*
so ADD like-PRES.3SG-ADD

Int. 'Joni likes olives. – So he does.'

b. #*Joni* *e-i* *pidä* *oliive-i-sta.*
Joni.NOM NEG-3SG like.CONN olive-PL-ELA

– *Ei* *myöskään* *pidä.*
NEG-3SG ADD like.CONN

Int. 'Joni does not like olives. – No, he doesn't.'

In addition to agreeing reactions that involve a bound additive and a tensed verb, it is also possible to express agreement by attaching *–kin* to an elative-marked 'opinion holder' phrase, as in (199a). Note that the unbound additive *myös* may also be used in these structures, as shown in (199b). If an overt opinion holder phrase is present, the presence of some additive (bound or unbound) is obligatory, as shown in (199).[10]

[10]The negative polarity equivalents of (199) are shown in (i).

(i) Expressing agreement with unbound and bound additives and an opinion holder phrase

a. *Minu-sta* *Joni* *e-i* *ole* *huono-mpi.* – *E-i* *minu-sta-*(kaan)*
I-ELA Joni.NOM NEG-3SG be.CONN bad-COMP NEG-3SG I-ELA-ADD
'I think Joni is not worse. – Neither do I.'

b. *Minu-sta* *Joni* *e-i* *ole* *huono-mpi.* – *E-i* **(myöskään)* *minu-sta*
I-ELA Joni.NOM NEG-3SG be.CONN bad-COMP NEG-3SG ADD I-ELA
'I think Joni is not worse. – Neither do I.'

(199) **Expressing agreement with unbound and bound additives and an opinion holder phrase**

a. *Minu-sta Joni o-n huono-mpi.*
I-ELA Joni.NOM be-PRES.3SG bad-COMP

– *Niin minu-sta-*(kin)*
so I-ELA-ADD

'I think Joni is worse. – So do I.'

b. *Minu-sta Joni o-n huono-mpi.*
I-ELA Joni.NOM be-PRES.3SG bad-COMP

– *Niin *(myös) minu-sta*
so ADD I-ELA

'I think Joni is worse. – So do I.'

As both unbound and bound additives are available when agreement is expressed through the use of an opinion holder phrase, as in (199), and these examples can quite naturally be analysed as instances of the basic use (where the opinion holder KP is the associate of the additive), it is worthwhile to consider whether the examples where reactive bound additives attach to tensed verbs could also be analysed in this way. In other words, one could assume that when the bound additive attaches to a finite verb, focus is nevertheless on a covert opinion holder, so that what are contrasted are speaker A's statement and speaker B's statement (the contents of which are the same). If this were the case, then it would have to be assumed that the host of the bound additive is *not* necessarily its associate – in contrast to what we have been assuming so far, essentially following Karttunen and Karttunen (1976). Moreover, an analysis where the F-marked associate would somehow be deleted at PF would not fit in well with the general idea that it is Given material that usually undergoes ellipsis, not focused material.

Regardless, this discussion raises an interesting point: on the reactive use, speaker B agrees with something that speaker A has said, and the propositional contents of A and B's statements are non-distinct. In other words, although the bound additive attaches to a tensed verb, the antecedent does not correspond to the polar opposite of the prejacent. If the prejacent and the antecedent can be non-distinct, it must be the case that the distinctness requirement that is usually taken to hold of additives does not hold of all *uses* of bound additives. As we saw in section 3.1.3, it has been proposed before that the distinctness condition is a pragmatic effect that is not hardcoded into the semantics of additivity (Beaver, 2001). If this is the case, then it is possible that only bound additives have a reactive use because operator associated with unbound additives does not accept non-distinct antecedents, while that associated with bound additives does.

Before concluding this section, I would like to note that the reactive use is not restricted to actual conversations, but also appears in other contexts of dialogue, such as texts (where the writer is the speaker, and the reader is the hearer). In (200a), for example, the speaker is signalling their

agreement with the proposition that the addressee noticed that a letter was missing. Interestingly, the prejacent can be discourse-new: there is a distinct feeling of manipulation involved that can be traced back to the hearer presenting the statement as already being amiliar to the addressee. Indeed, the effect of the statements in (200) is to attribute knowledge information to the reader-hearer. As such, this use is related to the familiarity and politeness functions of *–kin* discussed by Vilppula (1984). Crucially, this reading is not available with unbound additives.[11]

(200) **Reacting to implicitly attributed propositions**

a. *Huomas-i-t-kin varmaan että kirjain jä-i uupu-ma-an*
notice-PAST-2SG-ADD surely that letter.NOM remain-PAST.3SG miss-INF-ILL
'Surely you noticed that a letter was missing'

b. *Ymmärrä-t-kin varmaan että akateemisuus e-i ole*
understand-PRES.2SG-ADD surely that being.academic-NOM NEG-3SG be.CONN
mikään suoja työttömyyde-ltä tai köyhyyde-ltä
any.NOM protection.NOM unemployment-ABL or poverty
'Surely you understand that being academic is not a protection against unemployment or poverty'

c. *Muista-t-kin varmaan että näin toimi myös Mozarti-a*
remember-PRES.2SG-ADD surely that so act.PAST.3SG ADD Mozart-PAR
hoita-nut lääkäri
treat-PASTPART doctor.NOM
'Surely you remember that the doctor who treated Mozart also acted in that way'

This concludes the presentation of the reactive use. In sum, the reactive use is only possible with bound additives, which attach to a tensed verb. In contrast to the polar use, the relevant antecedent is not the polar opposite of the prejacent, but the prejacent itself. The reactive use therefore leads to the question of whether the distinctness condition is really part of the semantics of both unbound and bound additives.

4.4 Concessive uses

In this section, I present two concessive uses of the bound additives. First, in section 4.4.1, I discuss concessive clauses headed by a concessive connective. I then present the so-called *wh*-concessives in section 4.4.2.

[11]The attested examples in (200) are from from https://keskustelu.anna.fi/threads/parannusenergiaa.1373939/ (200a), https://keskustelu.suomi24.fi/t/14643814/mentava-leipajonoon-saadaksemme-lapsillemme-ruokaa (200b), and from http://juginbloki.blogspot.com/2014/04/alkemisti-bach-epatieteellinen.html (200c).

4.4.1 Concessive use (with concessive connective): *–kin/-kAAn*

On the first concessive use discussed in this section, the prejacent corresponds to the content of a subordinate concessive clause. Only bound additives allow this use, and they attach to the tensed verb. Again, their presence is optional.

An illustration of the concessive use of *–kin* is given in (201a). To underline the availability of this use with bound additives only, I present the parallel example (201b), where the unbound additive *myös* is interpreted as on the basic use (i.e. Mari did something else besides leaving in (201b)).

(201) **Concessive clause with connective: *–kin* vs. *myös***

a. *Vaikka Mari läht-i-kin, sinu-n e-i tarvitse*
although Mari.NOM leave-PAST.3SG-ADD you-GEN NEG-3SG need.CONN
'Although Mari left, you don't need to'

b. *Vaikka Mari myös läht-i, sinu-n e-i tarvitse*
although Mari.NOM ADD leave-PAST.3SG you-GEN NEG-3SG need.CONN
'Although Mari also left, you don't need to'

In negative polarity concessive clauses, *–kAAn* and *myöskään* mirror the behaviour of *–kin* and *myös*, as shown in (202).

(202) **Concessive use: *–kAAn* vs. *myöskään***

a. *Vaikka Mari e-i lähte-nyt-kään, sinu-n täyty-y*
although Mari.NOM NEG-3SG leave-PASTPART-ADD you-GEN need-PRES.3SG
'Although Mari did not leave, you need to'

b. *Vaikka Mari e-i myöskään lähte-nyt, sinu-n täyty-y*
although Mari.NOM NEG-3SG ADD leave-PASTPART you-GEN need-PRES.3SG
'Although Mari did not leave either, you need to'

The fact that bound additives necessarily attach to a tensed verb on the concessive use implies that it is again the set of polar alternatives that is relevant. Interestingly, the concessive use seems to be closely related to two of the uses that we have discussed previously: the reactive use and the polar use. To see this, first note that on the concessive use, the prejacent – corresponding to the content of the concessive clause – can be either discourse-old or discourse-new. When the prejacent is discourse-old, it has typically been asserted by another discourse participant. This links the concessive use intimately to the reactive use discussed above. When the prejacent is discourse-new, however, it seems to be interpreted as contrasting with a belief or wish of the speaker. In (202), for example, the bound additive could be interpreted as conveying the speaker's

discontent with Mari not leaving. This is type of meaning matches the reluctance that is associated with concessivity in general.

As mentioned above, unbound additives do not have a concessive use. If the concessive use is in fact closely related or even derivable from the polar and reactive uses, which also do not accept unbound additives, the question of why the concessive use is restricted to bound additives is answered if we know why this restriction exists in polar and reactive uses. As was hinted at in sections 4.2 and 4.3, I will propose that this restriction is due to the properties of the additive operators involved; with bound additives, the antecedents may be found outside of the common ground, and they are not required to be distinct from the prejacent.

4.4.2 *Wh*-concessives: *–kin/kAAn*

The second concessive use that bound additives have is the so-called *wh*-concessive use.[12] In the adjunct clauses of *wh*-concessives, bound additives are obligatory[13], and unbound additives are impossible. The unbound additives again attach to a tensed verb, as shown in (203a) and (204a). Interestingly, both *–kin* and *–kAAn* may appear in these structures with no apparent effect on interpretation, as the translations indicate.

(203) ***Wh*-concessive use: *–kin* vs. *myös***

a. *Kene-t valitse-t-*(kin), e-t varmasti pety*
who-ACC choose-PRES.2SG-ADD NEG-2SG surely be.disappointed.CONN
'No matter who/whoever you choose, you will surely not be disappointed'

b. **Kene-t myös valitse-t, e-t varmasti pety*
who-ACC ADD choose-PRES.2SG NEG-2SG surely be.disappointed.CONN

(204) ***Wh*-concessive use: *–kAAn* vs. *myöskään***

a. *Kene-t valitse-t-*(kaan), e-t varmasti pety*
who-ACC choose-PRES.2SG-ADD NEG-2SG surely be.disappointed.CONN
'No matter who/whoever you choose, you will surely not be disappointed'

b. **Kene-t myöskään valitse-t, e-t varmasti pety*
who-ACC ADD choose-PRES.2SG NEG-2SG surely be.disappointed.CONN

Izvorski (2000) proposes that the adjunct clauses of *wh*-concessives are *free adjunct free relatives*. In contrast to *wh-ever* free relatives (205a-b), free adjunct free relatives cannot be substituted with a definite expression or a PP (205c) (Caponigro, 2003). Instead, they are paraphrasable with *no matter*.

[12] In the literature, these structures have been called e.g. universal concessive conditionals (Haspelmath and König, 1998), free adjunct free relatives (Izvorski, 2000), and constituent unconditionals (Rawlins, 2013).

[13] Note that stripping the examples in (203a) and (204a) of the bound additives leads to ungrammaticality, and not mere pragmatic oddity or infelicity (cf. section 3.1.8).

(205) ***Wh-ever* FRs (a,b) vs. free adjunct FRs (c)** (Caponigro, 2003, p. 111-112)

a. I'll marry [$_{FR}$ whoever you choose]
≈ I'll marry [$_{DP}$ any person you choose]

b. You can smoke [$_{FR}$ wherever the kids are not playing]
≈ You can smoke [$_{PP}$ in any place where the kids are not playing]

c. [Whoever you choose], you won't make a bad choice
≈ [No matter who you choose], you won't make a bad choice

Izvorski argues that free adjunct free relatives are full CPs, whereas *wh-ever* relative clauses are DPs, PPs, or other non-sentential projections (Caponigro, 2003). Izvorski furthermore proposes that the concessive interpretation of free adjunct free relatives is due to three ingredients: (i) a set of propositions denotation of the embedded clause, derived through interrogativity or subjunctive mood, (ii) a conditional relation with the matrix clause due to the weak status of the adjunct (Stump, 1985), and (iii) the 'exhaustifying' effect of a focus particle (crosslinguistically either an *–ever*-type particle, an additive particle, or negation). In sum, Izvorski proposes that free adjunct free relatives such as (206a) denote an "exhaustive conjunction of conditionals" (206b) (Haspelmath and König, 1998):

(206) **Free adjunct FRs as exhaustive conjunctions of conditionals** (Izvorski, 2000, p. 234)

a. What*(ever) John cooks, he will win the cooking contest

b. If John cooks x_1, he will win the cooking contest ∧
If John cooks x_2, he will win the cooking contest ∧
... If John cooks x_n, he will win the cooking contest

In (206b), there are as many conjuncts as there are possible values for x in *John cooks* x. The parallel with question meanings is clear. For Izvorski, the effect of the focus particle is related to the exhaustivity of the conjunction of conditionals (i.e. the fact that the conditional antecedents cover all possible values of x). Izvorski does not, however, give an explicit semantic analysis of the structure, and it remains unclear how the denotation in (206b) is derived compositionally, and exactly what semantics different focus particles would need to have.

In more recent work, Rawlins (2013) argues that the adjunct clauses of English *wh*-concessives in fact have the syntax and semantics of a *wh*-question, and not a CP-projecting free relative clause. Rawlins gives a fully compositional analysis of the adjunct clause and its composition with the main clause that relies on pointwise functional application. Specifically, for Rawlins, the adjunct *wh*-question denotes a set of propositional alternatives – which are presupposed to be exhaustive and exclusive – and those alternatives combine pointwise with a modal within the main clause. The result of this process is roughly the conjunction of conditionals given in (206).

As Rawlins focuses on English, there is no mention of additives and their role in the compo-

sition of *wh*-concessives in their analysis. However, for Izvorski (2000), the presence of a focus particle in free adjunct free relatives seems crucial: without it, there is no exhaustivity effect for the alternatives. As we saw above, Finnish *wh*-concessives require a bound additive to be present. This suggests that it plays a role in the compositional semantics of the adjunct clause. If it does, its semantics must be different from that involved in the previous purely presuppositional uses we have discussed; this, indeed, is what I will propose in section 7.2. But what could the role of the additive be? Recall that the host of the bound additive in *wh*-concessives is always a tensed verb. In sections 4.2.2 and 4.3, I proposed that the host of the bound additive is always also its F-marked associate. Thus far, whenever the bound additive has been restricted to appear on tensed F-marked verbs, I have assumed that the F-marked verb gives rise to a set of polar alternatives. What does that mean for *wh*-concessives?

Potentially, this means that the focus semantic value of the *wh*-concessive consists of propositional alternatives that are characterised by variation in the value of the *wh*-phrase *and* polarity. For (206a), for example, this set contains propositions of the form *that John cooks x* and *that John does not cook x* for all possible values of x. The task is to figure out what these focus alternatives are factored into the meaning of the adjunct clause, and how the meaning of the whole *wh*-concessive comes about. In anticipation of section 7.2, note that if this alternative set undergoes existential closure, the result is a disjunctive proposition of the form *that John cooks x or John does not cook x or...* for all values of x (Kratzer and Shimoyama, 2002). In this case, the meaning of a *wh*-concessive may be analysed as a conditional where this disjunctive statement is the antecedent[14], and the main clause is the consequent. By the law of the excluded middle, the consequent will always be guaranteed to be true. To see this, consider the simplified (207). Let us assume that the set of alternatives A consists of propositions that are the cross-product of two individual variables, a and b, and two opposite-polarity predications, P and $\neg P$. In (207), the antecedent of the conditional is always true (by the law of the excluded middle). Hence, the consequent Q is always true.[15,16]

(207) **Existential closure of A as the meaning of a *wh*-concessive**
$[P(a) \vee \neg P(a) \vee P(b) \vee \neg P(b)] \rightarrow Q$

To conclude, the use of bound additives in Finnish *wh*-concessives is unsurprising from a cross-linguistic perspective (Izvorski, 2000). However, the verbal host-associate of the bound additive points to a new ingredient in the analysis of these structures: polar focus alternatives. Indeed, both *wh*-concessives and concessive clauses with concessive connectives require bound additives to attach to tensed verbs. However, only in the former are bound additives obligatory. Hence,

[14]Note the move from a *conjunction* of conditionals (Izvorski, 2000) to a *disjunction* as an antecedent.

[15]With actual *wh*-phrase denotations, the disjunction in the antecedent would of course be much longer, with disjuncts for each member of the *wh*-phrase.

[16]The meaning of (207) contrasts slightly with the proposals of Izvorski (2000) and Rawlins (2013), who both argue that the protasis carries an existential presupposition typical of *wh*-questions: (206), for example, presupposes that John will cook something. This does not follow from the analysis sketched in this section.

these data raise the question of whether some bound additives may be operating at the level of truth-conditional meaning instead of presuppositional meaning.

4.4.3 Summary

The two concessive uses discussed in this section share an important property with the polar and reactive uses: in all four, the host and associate of the additive is a tensed verb, and the relevant focus alternatives were therefore assumed to consist of the prejacent p and its negation $\neg p$. We saw that some examples of the concessive use seem to be closely related or even reducible to the reactive and polar uses of bound additives. However, while bound additives are optional on the concessive use, they are obligatory in *wh*-concessives. Hence, the data in this section could be best analysed as showing two different semantic sides of bound additives: one that is presuppositional, and another that is truth-conditional.

4.5 Recurring-issue use

In this section, I present a use that is specific to the bound additive *–kAAn*, and that has been previously proposed to give rise to a *remind-me* presupposition (Sauerland and Yatsushiro, 2017). For reasons that will become clear below, I refer to this use as *recurring-issue* instead.

On the recurring issue use, the bound additive *–kAAn* is optional, and always attaches to a tensed verb. Intuitively, its presence signals that the issue encoded in the question has been raised previously. In Finnish, this recurring-issue presupposition may also be contributed by the aspectual particle *taas* 'again', or by a combination of *taas* and *–kAAn* (cf. Sauerland and Yatsushiro, 2017). The example shown in (208) shows both a wellformed example with *–kAAn* (208a), wellformed examples with *–kin* and *myös* that do not illustrate the recurring-issue use, but the basic and/or the polar use (208b-c), and an ungrammatical version with the unbound *myöskään* (208c).

(208) **Recurring-issue: *–kAAn* vs. *–kin, myös(kään)***

a. *Mi-ssä sinä (taas) kävi-t-(kään)?*
where-INE you.NOM (again) visit-PAST.3SG-ADD
'Where did you visit again?' (recurring-issue)

b. *Mi-ssä sinä kävi-t-kin?*
where-INE you.NOM (again)
'Where did you visit, too?' (basic) or 'Where did you visit (although you were expected not to)?' (polar)

c. *Mi-ssä sinä myös kävi-t?*
where-INE you.NOM ADD visit-PAST.3SG
'Where did you visit, too?' (basic)

d. **Mi-ssä* *sinä* *myöskään* *kävi-t?*
where-INE you.NOM ADD visit-PAST.3SG

Recurring-issue presuppositions are generally restricted to *wh*-questions in Finnish. Perhaps due to the presence of a *wh*-phrase, the host of the bound additive is not as prominent on the recurring-issue use as it is on the basic use. In (208a), I again use dashed underlining to indicate that the host is prosodically less prominent than what one would expect from the associate of an additive. As was proposed in section 4.2.2, the deaccenting of the host in this and other contexts could be related to the phenomenon of second occurrence focus.[17]

If the tensed verb is the associate of the additive on its recurring-issue use, the focus semantic value of the prejacent should involve two alternative-inducing expressions: the *wh*-phrase, and the F-marked verb. The same came up in the context of *wh*-concessives (section 4.4.2). However, in contrast to *wh*-concessives, recurring-issue questions are indeed interpreted as questions, and the presence of *–kAAn* is not required for the recurring-issue interpretation to arise. Therefore, while the focus semantic value of the prejacent might be the same in the two uses, the semantics of the additive is not. Nevertheless, it is interesting to consider what kind of alternatives the bound additive is working with in recurring-issue questions.

As mentioned above, recurring-issue presuppositions have been previously dubbed remind-me presuppositions (Sauerland and Yatsushiro, 2017). The reason why I opt for the term recurring-issue is that the presupposition does not seem to require – as suggested by the term 'remind-me' – that the speaker ever knew the answer to the question. Moreover, this answer is not even required to have been given previously, contrary to what Sauerland and Yatsushiro (2017) suggest. This point can be illustrated with the following example.

(209) **Recurring-issue presuppositions are felicitous when the answer has not been given**
Context: A, B, and C are playing a card game where knowing how many cards each player has is advantageous, but no one is required to reveal the number of cards they are holding. A asks B how many cards they have. C hears the question, but does not register whether B answers or not. In reality, B does not answer. C asks:
C: *Monta-ko* *kortti-a* *sinu-lla* *ol-i-kaan,* *B?*
how.many-Q card-PAR you-ADE be-PAST.3SG-ADD B
'How many cards do you have again, B?'

In (209), B never answers A's question; nevertheless, C's question is felicitous. What is required is that the issue raised in C's question was raised previously. This does not mean that the same

[17] As was mentioned in section 2.1.3, second occurrence focus (in the literal sense of the word) has been shown to have perceivable acoustic correlates in English (Jaeger, 2004; Beaver et al., 2007). To determine whether the less-prominent verbal hosts of additives are also perceivably F-marked, a proper perception experiment should be conducted. At this point, I simply assume that this is the case, and that verbal hosts are always the associate of the bound additive.

question had to be asked explicitly: for example, in (210), A's remark raises the relevant issue in disjunctive form, and B's recurring-issue *–kAAn* is felicitous.

(210) **Recurring-issue presuppositions are felicitous when the issue has been raised**
Context: A and B are at a big party. A says: "Look at this party. I've met so many new people tonight that I can't remember half of their names. I do remember that the guy standing by the door is called Max. He is from Alabama or Arizona. I forget which. And that's Tom, I think at least... or maybe Tony..."

B: *Hetkinen, mi-stä Max ol-i-kaan kotoisin?*
moment.NOM where-ELA Max.NOM be-PAST.3SG-ADD from

Saata-n ol-la jo tavan-nut häne-t aiemmin...
may-PRES.1SG be-INF already meet-PASTPART he-ACC before

'Wait, where is Max from again? I might have met him before...'

Based on the data shown above, it appears that the recurring-issue involves an antecedent that is not a proposition, but e.g. a set of propositions (i.e. a question). Such antecedents cannot be found within the common ground: in our model of the discourse context (see section 2.2.1), the common ground is a set of propositions, not a set of sets of propositions. If we assume that the antecedent is a question, the unavailability of the recurring-issue use with unbound additives may again be related to their inability to refer back to antecedents that are not in the common ground. However, now it is the inability of *–kin* to convey a recurring-issue presupposition that is surprising. There must be some other property of *–kAAn* and *–kin* that separates them, and results in the availability of recurring-issue use only with the former. Moreover, if the assumption is that the host of the bound additive is also always its associate, we expect both the *wh*-phrase and the F-marked verb to play a role in the determination of the focus semantic value of the the prejacent, and hence the form of the antecedent, as in the *wh*-concessive use. However, in contrast to *wh*-concessives, the use of *–kAAn* in recurring-issue questions is optional, and does not appear to affect the truth-conditional semantics of the question. Moreover, while *wh*-concessives can be built using both *–kin* and *–kAAn*, the recurring-issue use is only possible with *–kAAn*. Therefore, the analysis of recurring-issue requires an analysis of its own.

To conclude, the recurring-issue use is only available with the bound additive *–kAAn*, which necessarily attaches to a tensed verb within a *wh*-question. Notably, the felicity of a recurring-issue question does not require a previous answer to the question. Instead, the same question or issue has to have been raised previously. It therefore appears that the recurring-issue use of bound additives makes reference to an antecedent that is itself an issue (or question).

4.6 Double contrast use: *–kin/–kAAn*

The double contrast use of bound additives involves double contrast between the prejacent and the antecedent. On this use, the bound additive attaches to a contrastive topic, and the sentence additionally contains a focus. The additive presupposition involves an antecedent that differs from the prejacent in the values of both the contrastive topic and the focus.

Before describing the data, a short reminder concerning interpretation of contrastive topics is in order (cf. section 2.1.3). When a sentence contains both a contrastive topic and a focus, the former is interpreted above the latter, and the focus semantic value (or *topic* semantic value) of the sentence is a set of sets of propositions, i.e. a set of questions (Büring, 1997, 2003, 2014). This set is constructed in two steps. First, the F-marked constituent is introduced: this leads to a focus semantic value that is a set of propositions of type $\langle s\,t, t\rangle$. Each member in this set differs from the others in the value that the F-marked constituent takes. Second, the contrastive topic is introduced, so that for each member of the denotation of the contrastive topic, the same question is asked. This results in a set of sets of propositions of type $\langle\langle s\,t, t\rangle, t\rangle$. Both contrastive topicality and focus are exemplified in (211); the contrastive topic is marked with double underlining, and the focus with single underlining.

(211) **Contrastive topics and foci: the topic semantic value**

– Who ate what?

– Fred ate the beans, and Mary ate the spinach

a. $[\![\underline{\underline{\textit{Fred}}}\ \textit{ate the}\ \underline{\textit{beans}}\,]\!]^o = \lambda w[\text{ate}(\text{the beans})(\text{Fred})(w)]$

b. $[\![\underline{\underline{\textit{Fred}}}\ \textit{ate the}\ \underline{\textit{beans}}\,]\!]^{f/t} = \{\{\lambda w[\text{ate}(y)(x)(w)] \mid \text{salient-food}(y)\} \mid \text{salient-person}(x)\}$

In (211c), the focus semantic value of the sentence is a set of questions *What did x eat?* for each salient person x – here, Fred and Mary. In other words, contrastive topicality involves a complex QUD structure; in (211), a higher superquestion asks who ate what, and its subquestions then ask what Fred ate and what Mary ate, respectively.

The ideas of contrastive topicality and superquestions are clearly present in Vilkuna's (1984) treatment of double contrast additivity in Finnish (see section 3.4.1). An example of this use is given in (212a). In (212a), *–kin* is attached to the contrastive topic *Hugo*. Crucially, there is no (basic use) presupposition to the effect that someone distinct from Hugo is reading, or that Hugo is doing something distinct from reading. In fact, the use of *–kin* here presupposes that someone else is doing something else: this presupposition is satisfied by Eino's sleeping. As (212b) shows, the double contrast use is only available with bound additive. Thus, in the same context, the unbound *myös* evokes a basic additive presupposition – that someone else is reading – which is not satisfied in (212b).

(212) **Double contrast: *–kin* vs. *myös***

Mari wants to have a cup of coffee with Joni, who is taking care of little Hugo and Eino.
Mari asks: "Can we have coffee?"
[What are Eino and Hugo doing? What is Eino doing? What is Hugo doing?]
Joni answers:

a. *Eino* *nukku-u,* *ja* *Hugo-kin* *luke-e,* *joten* *juo-daan*
Eino.NOM sleep-PRES.3SG and Hugo.NOM-ADD read-PRES.3SG so drink-PASS
vain *kahvi-t*
only coffee-PL.ACC
'Eino is sleeping, and Hugo is reading, so yes, let's have coffee'

b. #*Eino* *nukku-u,* *ja* *myös* *Hugo* *luke-e,* *joten...*
Eino.NOM sleep-PRES.3SG and ADD Hugo.NOM read-PRES.3SG so

Double contrast additivity is also available with *–kAAn*, as shown in (213a). The unbound *myöskään* is restricted to its basic use, and fails to contribute a satisfiable presupposition in (213b).

(213) **Double contrast: *–kAAn* vs. *myöskään***

Joni has baked a birthday cake for little Eino and Hugo. It has strawberries and chocolate.
Joni wonders: "Will Eino and Hugo like the cake?"
[Which cake ingredients do Eino and Hugo not like? Which cake ingredients does Eino not like? Which cake ingredients does Hugo not like?]
Aino answers:

a. *Eino* *e-i* *pidä* *mansiko-i-sta,*
Eino.NOM NEG-3SG like.CONN strawberry-PL-ELA
e-i-kä *Hugokaan* *pidä* *suklaa-sta,*
NEG-3SG-and Hugo.NOM-ADD like.CONN chocolate-ELA
joten *he* *ei-vät* *varmaan* *pidä* *kaku-sta-si*
so they.NOM NEG-3PL probably like.CONN cake-ELA-PX/2SG
'Eino does not like strawberries, and Hugo does not like chocolate, so they probably will not like your cake'

b. #*Eino* *e-i* *pidä* *mansiko-i-sta,*
Eino.NOM NEG-3SG like.CONN strawberry-PL-ELA
e-i-kä *myöskään* *Hugo* *pidä* *suklaa-sta,* *joten...*
NEG-3SG-and ADD Hugo.NOM like.CONN chocolate-ELA so

The examples in (212) and (213) illustrate one key property of double contrast additivity in Finnish: it requires some 'extra context' to be felicitous (Vilkuna, 1984). In the examples, the *so*-clause

refers to the polar question introduced in the context. With just a *Who is doing what?* -type question in the context, double contrast *–kin* and *–kAAn* seem infelicitous, as shown in (214). In other words, the additive does not function as a simple connector between the two conjuncts or sentences: its presence implies that there is a higher QUD that is being answered with the help of answering the immediate superquestion (i.e. *What are Eino and Hugo doing?* in (214)).

(214) **Double contrast without extra context**
[What are Eino and Hugo doing? What is Eino doing? What is Hugo doing?]
Eino nukku-u, ja Hugo-(#kin) luke-e
Eino.NOM sleep-PRES.3SG and Hugo.NOM-ADD read-PRES.3SG
Int. 'Eino is sleeping, and Hugo is reading'

One could argue that cases that seemingly appear to involve double contrast in fact involve broad focus, i.e. all-new sentences that answer a question such as *What happened?* (cf. the broad focus examples presented in section 3.4.2 from Vilkuna (1984) and Vilppula (1984)). In Finnish, it can be shown that broad focus cannot be used to explain away double contrast additivity. The relevant evidence involves OVS word order. In section 2.3.3.1, OVS word order was shown to necessarily imply that O is discourse-old, while S is discourse-new. Thus, OVS answers are never felicitous when addressing a broad focus question such as *What happened?*. However, felicitous double contrast examples with OVS can be constructed. One example is shown in (215).

(215) **OVS is compatible with double contrast**
Coworkers Heikki and Seppo are working with Machine C, which is showing signs of malfunction. Each component of the machine should have been carefully inspected by someone in their company.
Heikki asks Seppo: "Is there be something wrong with the A- and B-devices? Who inspected them?".
[Who inspected devices A and B? Who inspected device A? Who inspected device B?]
Seppo answers:
A-laitte-en tarkast-i Mari, ja
A-device-ACC inspect-PAST.3SG Mari.NOM and

B-laittee-n-kin tarkast-i Joni,
B-device-ACC-ADD inspect-PAST.3SG Joni.NOM

joten niide-n pitä-isi kyllä ol-la kunno-ssa
so they-GEN must-COND.3SG EMPH be-INF in.shape-INE
'Mari checked the A-device, and Joni checked the B-device, so they should be fine.'

In (215), the use of *–kin* does not presuppose that Joni inspected another device, as would be expected if the host of the additive was also its F-marked associate, or that device B was inspected

twice. Therefore, although broad focus with *–kin* and *–kAAn* is in general possible, the compatibility of OVS word order with double contrast additivity shows that broad focus cannot be evoked to explain away this use.

As was mentioned above, double contrast always involves the attachment of the bound additives *–kin* and *–kAAn* to a contrastive topic. In light of the previous examples, one could argue that in surface syntax, the contrastive topic is in SpecFP. However, the following example shows that it is at least possible for the contrastive topic to occupy a position that is higher than SpecFP. Although I have only included an example with *–kin*, the same remark applies to *–kAAn*.

(216) **Contrastive topic host of bound additive is higher than SpecFP**
Aino has had some shocking news to tell her friends Joni and Mari. Are Joni and Mari still processing the news?
[When did Aino tell her friends the news? When did Aino tell Joni? When did Aino tell Mari?]
Jon-ille Aino kerto-i toissapäivä-nä, ja
Joni-ALL Aino.NOM tell-PAST.3SG day.before.yesterday-ESS and

Mari-lle-kin (hän kerto-i) vasta eilen,
Mari-ALL-ADD she.NOM tell-PAST.3SG only yesterday

joten he varmasti käsittele-vät asia-a vielä
so they.NOM surely process-PRES.3PL issue-PAR still
'Aino told Joni the day before yesterday, and she told Mari only yesterday, so they are surely still processing the news'

In (216), the subjects are in SpecFP, above the finite verb. The indirect objects must therefore be either in SpecFocP, in SpecTopP, or some higher position. In principle, SpecFocP is a possible landing position; after all, it has been shown that SpecFocP houses contrastive constituents which may be either discourse-old or discourse-new (Vallduví and Vilkuna, 1998; section 2.3.3.1). TopP is also an option, although overt movement to TopP has only been shown to be possible with preposed polarity elements (Kaiser, 2006). In section 6.1.2, I adopt an analysis where the contrastive topic lands SpecFocP.

Before concluding this section, I would like to briefly come back to the proposal put forth by Zimmermann (2015). Recall from section 3.2.3 that Zimmermann proposes that additives are *v*P-adverbs that may bind the traces of both a contrastive topic and a focused constituent existentially. While Zimmermann (2012, 2015) stresses the cross-linguistic variation in the availability of double contrast additivity, the proposal that additives are existential binders only predicts variation in the availability of double contrast additivity if some additives are unselective binders, and others are selective binders. While this is a possible hypothesis, the fact that Finnish shows intralinguistic variation – with double contrast only being available with bound additives – remains mysterious under this approach. Why would unselective binding be available for only one kind

of additive, and not the other? In section 6.1, I propose that the availability of double contrast additivity is in fact connected to the distribution of bound additives in general; crucially, it requires a *type-flexible* additive operator.

In conclusion, the double contrast use of bound additives involves sentences with both a contrastive topic and a focused constituent. The antecedent, in this case, must differ from the prejacent in the value of both. By manipulating the word order of the host sentence, I showed that double contrast additivity cannot be reduced to broad focus in Finnish. And finally, I noted that in contrast to e.g. Turkish (Kamali and Karvovskaya, 2013), the felicity of double contrast additivity requires some extra context in Finnish (Vilkuna, 1984).

4.7 Multiple-*wh*

In this section, I discuss the first use that may only be conveyed by the bound additive *–kin*: the multiple-*wh* use. This use comes in three types: the interrogative type (section 4.7.1), the relative type (section 4.7.2), and the declarative type (section 4.7.3). The following sections detail both the differences and the commonalities between the three types.

4.7.1 Interrogative type: *–kin*

The interrogative multiple-*wh* use is characterised by the presence of at least two *wh*-phrases, of which at least one carries *–kin*. I will begin by discussing binary *wh-kin* questions, and come to ternary *wh*-questions at the end of this section. The focus of this section is on three noteworthy observations about binary *wh-kin* questions: the first relates to syntax, and the two others to semantics.

First, in binary *wh-kin* questions, *–kin* always attaches to the non-fronted *wh*-phrase, as shown in (217a)[18]. Only one *–kin* may appear in such questions. In fact, a *wh*-phrase to which *–kin* has attached – or, for short, a *wh-kin*-phrase – can never undergo *wh*-movement, as shown in (218). In other words, some property of *–kin* seems to disallow the syntactic relationship that usually holds between Foc°, i.e. the head that triggers *wh*-movement in Finnish, and the *wh*-phrase.

(217) **–*kin* appears on non-fronted *wh*-phrases**

a. *Kuka* *t* *maisto-i* *mi-tä-kin* *kakku-a?*
who.NOM taste-PAST.3SG which-PAR-ADD cake-PAR
'Who tasted which cake?'

b. * *Kuka-kin* *t* *maisto-i* *mi-tä* *kakku-a?*
who.NOM-ADD taste-PAST.3SG which-PAR cake-PAR

[18] Note that when the *wh*-phrase is complex, as in (217), *–kin* must attach directly to the *wh*-determiner.

(218) ***Wh-kin*-phrases do not undergo *wh*-movement**

a. *Mi-tä kakku-a Joni maisto-i t?*
which-PAR cake-PAR Joni.NOM taste-PAST.3SG
'Which cake did Joni taste?'

b. **Mi-tä-kin kakku-a Joni maisto-i t?*
which-PAR-ADD cake-PAR Joni.NOM taste-PAST.3SG

As the comparison of (219) and (220) shows, the presence of *–kin* on the non-fronted *wh*-phrase dissolves Superiority effects that hold in its absence. This is unsurprising if *wh-kin* phrases indeed cannot undergo *wh*-movement. After all, Superiority effects can be seen as resulting from the competition between two *wh*-phrases, which both want to Agree with C^0 (or Foc^0) and move to SpecCP (orSpecFocP). If the *wh-kin*-phrase is unable to Agree with whichever head is responsible for *wh*-movement, the loss of Superiority effects is explained.

(219) **Superiority effects in binary *wh*-questions without *–kin***

a. *Kuka t maisto-i mi-tä kakku-a?*
who.NOM taste-PAST.3SG which-PAR cake-PAR
'Who tasted which cake?'

b. **Mi-tä kakku-a kuka maisto-i t?*
which-PAR cake-PAR who.NOM taste-PAST.3SG

(220) **No Superiority effects in binary *wh*-questions with *–kin***

a. *Kuka t maisto-i mi-tä-kin kakku-a?*
who.NOM taste-PAST.3SG which-PAR-ADD cake-PAR
'Who tasted which cake?'

b. *Mi-tä kakku-a kuka-kin maisto-i t?*
which-PAR cake-PAR who.NOM-ADD taste-PAST.3SG
'Who tasted which cake?'

Although (220b) does not strictly speaking violate Superiority – at least not if the *wh-kin*-phrase is not subject to the underlying syntactic operation to begin with – I will continue to refer to "superiority-violating" orders when the fronted *wh*-phrase crosses a *wh-kin*-phrase on its way to the CP.

The most obvious semantic difference between binary *wh*-questions with and without *–kin* is that the former require a pair-list answer, while the latter accept both a pair-list and a single-pair answer (cf. Huhmarniemi and Vainikka, 2011). Thus, in the Superiority-respecting (221), a single-pair answer is unacceptable regardless of word order (221a-b). The pair-list answer may be

expressed using either the basic SVO word order (221c), or with the OVS order that is used when the subject is discourse-new, and the object is discourse-old (221d) (see section 2.3.3.1).

(221) **Answering a binary *wh-kin* question (Superiority-respecting)**
Kuka maisto-i mi-tä-kin kakku-a?
who.NOM taste-PAST.3SG which-PAR-ADD cake-PAR
'Who tasted which cake?'

a. #*Mari maisto-i suklaakakku-a*
Mari.NOM taste-PAST.3SG chocolate.cake-PAR
'Mari tasted the chocolate cake'

b. #*Suklaakakku-a maisto-i Mari*
chocolate.cake-PAR taste-PAST.3SG Mari.NOM
'Mari tasted the chocolate cake'

c. *Mari maisto-i suklaakakku-a, ja Joni maisto-i*
Mari.NOM taste-PAST.3SG chocolate.cake-PAR and Joni.NOM taste-PAST.3SG
enkelikakku-a
angel.cake-PAR
'Mari tasted the chocolate cake, and Joni tasted the angel cake'

d. *Suklaakakku-a maisto-i Mari, ja enkelikakku-a maisto-i*
chocolate.cake-PAR taste-PAST.3SG Mari.NOM and angel.cake-PAR taste-PAST.3SG
Joni
Joni.NOM
'Mari tasted the chocolate cake, and Joni tasted the angel cake'

When the *wh-kin* question involves a superiority violation, as in (222), single-pair answers are still out (222a-b). This time, however, only the pair-list answer with SVO word order is acceptable (222c):

(222) **Answering a binary *wh-kin* question (Superiority-violating)**
Mi-tä kakku-a kuka-kin maisto-i?
which-PAR cake-PAR who.NOM-ADD taste-PAST.3SG
'Who tasted which cake?'

a. #*Mari maisto-i suklaakakku-a*
Mari.NOM taste-PAST.3SG chocolate.cake-PAR
'Mari tasted the chocolate cake'

b. # *Suklaakakku-a* *maisto-i* *Mari*
chocolate.cake-PAR taste-PAST.3SG Mari.NOM
'Mari tasted the chocolate cake'

c. *Mari* *maisto-i* *suklaakakku-a,* *ja* *Joni* *maisto-i*
Mari.NOM taste-PAST.3SG chocolate.cake-PAR and Joni.NOM taste-PAST.3SG
enkelikakku-a
angel.cake-PAR
'Mari tasted the chocolate cake, and Joni tasted the angel cake'

d. # *Suklaakakku-a* *maisto-i* *Mari,* *ja* *enkelikakku-a* *maisto-i*
chocolate.cake-PAR taste-PAST.3SG Mari.NOM and angel.cake-PAR taste-PAST.3SG
Joni
Joni.NOM
'Mari tasted the chocolate cake, and Joni tasted the angel cake'

The unacceptability of (222d) gives us an important hint about the information structure of *wh-kin* questions: in particular, the *wh-kin*-phrase does not have the same information-structural status as the fronted *wh*-phrase. Essentially, the values of the pair-list answer that correspond to the *wh-kin*-phrase may not be marked as discourse-new (as is the case for the subject in OVS orders (222d)). The natural conclusion is that the *wh-kin*-phrase is not compatible with discourse-newness, unlike foci in questions in general. Indeed, it has been noted that *wh-kin*-phrases are D-linked, and their possible values are restricted by the context (Huhmarniemi and Vainikka, 2011). In essence, then, there is something *topical* about *wh-kin*-phrases.

The second semantic observation related to binary *wh*-questions is also related to the discourse-status of the *wh-kin*-phrase. Hakulinen et al. (2004, §755) propose that *wh-kin*-phrases are distributive universal quantifiers, and take scope over the fronted *wh*-phrase. Therefore, the English translations of binary *wh-kin* questions in (223) would in principle be more accurate than those in (220):

(223) **Distributive universal quantifier analysis of *wh-kin***

a. *Kuka* *maisto-i* *mi-tä-kin* *kakku-a?*
who.NOM taste-PAST.3SG which-PAR-ADD cake-PAR
'For each cake x, who tasted x?'

b. *Mi-tä* *kakku-a* *kuka-kin* *maisto-i?*
which-PAR cake-PAR who.NOM-ADD taste-PAST.3SG
'For each person x, which cake did x taste?'

Although the analysis of *wh-kin*-phrases as distributive universal quantifiers has intuitive appeal,

it is nevertheless not satisfactory: it can be shown that *wh-kin*-phrases do not behave like universal quantifiers in questions. The relevant data comes from functional answers (Chierchia, 1991, 1993; Dayal, 1996). Functional answers typically contain a pronominal or anaphoric element that is bound by a universal quantifier that appears in the *wh*-question addressed by the answer. The availability of functional answers is subject to a particular structural requirement illustrated in (224): when the base position of the *wh*-phrase in the question is below the universal quantifier, a functional answer is available (224a), but when the base position of the *wh*-phrase is above the quantifier, a functional answer is not available (224b).

(224) **Structure-sensitivity of functional answers in English**

a. What does every/each student remember t? – His/her first day at school.

b. Who t remembers every/each student? – *His/*her first teacher.

Chierchia (1991, 1993) argues that the structure-sensitivity of functional answers is due to binding conditions. The semantics behind the asymmetry shown in (225) is not of great importance for the argument that will be put forth regarding the semantic status of *wh-kin*-phrases.[19] The point is that if *wh-kin*-phrases were universal quantifiers, one would expect functional answers to be available when the object-*wh*-phrase is fronted (cf. (224a)). This is not the case, however, as shown by the contrast in (225):

(225) ***Wh-kin* questions do not allow functional answers**

a. *Kene-lle Mari lähett-i jokaise-n kirja-n? – Omistaja-lle-en*
who-ALL Mari.NOM send-PAST.3SG every.ACC book-ACC owner-ALL-PX/3
'To whom did Mari send each book? – To its owner'

b. **Kene-lle Mari lähett-i minkä-kin kirja-n? – Omistaja-lle-en*
who-ALL Mari.NOM send-PAST.3SG which.ACC-ADD book-ACC owner-ALL-PX/3
Int. 'To whom did Mari send which book? – To its owner'

Thus, *wh-kin*-phrases are arguably distinct from universal quantifiers.[20] However, the claim that *wh-kin*-phrases take scope over the fronted *wh*-phrase seems well-founded. One way to show this is by manipulating the number of entities that the *wh*-phrases refer to.

The logic of the test is this. Under the assumption that binary *wh*-questions require pair-list answers denote families of questions – i.e. sets of sets of propositions – the *wh*-phrase that is highest at LF must be mapped to the lower *wh*-phrase exhaustively and uniquely in the answer

[19]The problem comes from Weak Crossover; in the particular implementation of Chierchia (1991, 1993), Weak Crossover prohibits the movement of the universal quantifier over the *wh*-trace, and without that movement, the required functional question semantics cannot be derived.

[20]Surányi (2002, p.180–) argues that in Hungarian, the highest *wh*-phrases in multiple-fronting multiple-*wh*-questions are not universal quantifiers, either (*contra* É. Kiss, 1993, 1994; Puskás, 1996, 2000; Horváth, 1998; Lipták, 2001).

(see section 2.1.4; Dayal, 1996; Kotek, 2014). This means that the answer must map each member of the higher *wh*-phrase (the domain) to a unique member of the lower *wh*-phrase (the range). If there are not enough members in the range to allow for unique and exhaustive mapping, infelicity follows. By looking at the order of the *wh*-phrases in infelicitous cases, we may deduce which of the *wh*-phrases is the domain, and which the range.

The results of this test show that in *wh-kin* questions, the *wh-kin*-phrase must be exhaustively and uniquely mapped to the fronted *wh*-phrase: this means that the *wh-kin*-phrase is the domain. Consider (226), where the denotations of both *wh*-phrases are known in the context (i.e. the speaker has in mind a specific set of four semanticists and three phonologists). The question in (226a) is felicitous; in answering it, the hearer maps each of the three phonologists to a unique semanticist. One semanticist is left over, but that is not problematic. In (226b), however, the answer should map each of the four semanticists to a unique phonologist. Given that there are only three available phonologists, this mapping fails: one phonologist is missing. Crucially, if the fronted *wh*-phrase was exhaustively and uniquely mapped to the *wh-kin*-phrase, the judgments of acceptability would be the reverse. This indeed is the case for the English translations of these *wh-kin* questions (cf. Dayal, 2002; Kotek, 2014). Therefore, in English, the visibly higher *wh*-phrase is also interpreted higher than the visibly lower *wh*-phrase. The obvious question is to ask, then, is what pulls the *wh-kin* above the fronted *wh*-phrase at LF in Finnish.

(226) **The *wh-kin*-phrase is exhaustively and uniquely mapped to the fronted *wh*-phrase**

a. *Kuka* *neljä-stä* *semantiko-sta* *na-i* *kene-t-kin* *kolme-sta*
who.NOM four-ELA semanticist-ELA marry-PAST.3SG who-ACC-ADD three-ELA
fonologi-sta?
phonologist-ELA
'Which of the four semanticists married which of the three phonologists?'

b. # *Kene-t* *kolme-sta* *fonologi-sta* *kuka-kin* *neljä-stä* *semantiko-sta*
who-ACC three-ELA phonologist-ELA who.NOM-ADD four-ELA semanticist-ELA
na-i?
marry-PAST.3SG
'Which of the three phonologists did which of the four semanticists marry?'

Interestingly, the mapping illustrated by (226) is reversed when the *wh-kin* question appears within an island. In (227), I illustrate this point with the past-tense temporal *–ttUA*-island (Vainikka, 1989; Vainikka and Levy, 1995; Koskinen, 1998; Huhmarniemi, 2012). In (227a), the subject-*wh*-phrase relates to four semanticists, and the object-*wh* to three phonologists. The question feels degraded; arguably, this is because its answer should link each of the four semanticists to a unique phonologist that they married, but one phonologist is missing. The question in (227b), however, is better; in the answer, each of the three semanticists should be mapped onto a unique phonol-

ogist.[21]

(227) **Temporal *–ttUa*-islands**

a. #*[Kene-n neljä-stä semantiko-sta t nai-tua kene-t-kin kolme-sta*
who-GEN four-ELA semanticist-ELA marry-TTUA who-ACC-ADD three-ELA
fonologi-sta] Joni ol-i iloinen t ?
phonologist-ELA Joni.NOM be-PAST.3SG happy.NOM
'After which of the four semanticists married which of the three phonologists was Joni happy?'

b. *[Kene-n kolme-sta semantiko-sta t nai-tua kene-t-kin neljä-stä*
who-GEN three-ELA semanticist-ELA marry-TTUA who-ACC-ADD four-ELA
fonologi-sta] Joni ol-i iloinen t ?
phonologist-ELA Joni.NOM be-PAST.3SG happy.NOM
'After which of the three semanticists married which of the four phonologists was Joni happy?'

Note that the numbers of semanticists and phonologists as well as their grammatical positions in (227) are exactly as in (226). In other words, embedding the *wh-kin* question within an island seems to have an interpretive effect: in island contexts, the *wh-kin*-phrase appears unable to outscope the fronted *wh*-phrase at LF.

Another way to show that the *wh-kin* phrase is actually not interpreted in its surface position in non-island contexts is by using binding tests. In (228), I only show questions where the fronted *wh*-phrase is the subject. This at least reduces the risk of binding being established in the base-generated positions of the *wh*-phrases, and not being affected by *wh*-movement (as is generally the case for A'-movement). Both examples in (228) involve the Finnish possessive suffix, which in (228a) takes the form *–Vn*, and in (228), *–nsA*. Crucially, while the possessive suffix in (228a) may well be bound by the object *wh-kin*-phrase, the reverse order, where the *wh-kin*-phrase contains the possessive suffix, is degraded.

(228) **Binding in *wh-kin* questions**

a. *Mones-ko julkaise-m-i-sta-an kirjo-i-sta nost-i kene-t-kin*
how.many-Q publish-PART-PL-ELA-PX/3 book-PL-ELA lift-PAST.3SG who-ACC-ADD
nä-i-stä kirjailijo-i-sta koko kansa-n tieto-on?
this-PL-ELA author-PL-ELA whole people-GEN knowledge-ILL
'In terms of order of publication, which book made which of these authors into household names?'

[21] The relevant judgments are subtle, and their validity should be tested experimentally.

b.*? *Kuka* *nä-i-stä* *kirjailijo-i-sta* *esittel-i* *minkä-kin*
who.NOM this-PL-ELA author-PL-ELA present-PAST.3SG which.ACC-ADD
julkaise-ma-nsa *kirja-n?*
publish-PART-PX/3SG book-ACC
Int. 'Which of these authors presented which of the books they published?'

A good answer to (228a) relates the different, contextually salient authors to the ordinal 'rank' of the book that made them famous (e.g. first, second, ...). While the question in (228b) initially feels well-formed, it is hard to understand what the question actually means; at best, the *wh-kin*-phrase seems to be transformed into a universal quantifier, in which case the question requests the identity of the author who presented each of their published books. On a pair-list multiple-*wh* reading, however, (228b) is ill-formed. Therefore, the data in (228) suggests that the *wh-kin*-phrase is in fact above the fronted *wh*-phrase also for binding.

Finally, if the *wh-kin* phrase was interpreted in situ, the presence of a focus particle such as *vain* 'only' should lead to a focus intervention effect (Beck, 2006; Kotek, 2014). This is not the case, as the well-formedness of (229) attests.[22] Therefore, focus intervention further supports the idea that the *wh-kin* phrase moves covertly.

(229) **No focus intervention in binary *wh-kin* questions**
Kuka *tuomare-i-sta* *anto-i* *vain* *yhde-n* *piste-en* *kene-lle-kin*
who.NOM judge-PL-ELA give-PAST.3SG only one-ACC point-ACC who-ALL-ADD
osallistuja-lle?
participant-ALL
'Which of the judges gave only one point to which participant?'

Although this section has focused on binary *wh-kin*-questions, it is also possible to form ternary *wh-kin* questions in Finnish. In this case, it is again not possible for *–kin* to attach to a fronted *wh*-phrase. However, *–kin* may attach either to the lowest *wh*-phrase (230a), or to both unfronted *wh*-phrases. Questions where *–kin* attaches to the middle-*wh* seem slightly degraded.

(230) **Ternary *wh-kin*-questions**

a. *Kuka* *maisto-i* *mi-tä* *kakku-a* *milloin-kin?*
who.NOM taste-PAST.3SG which-PAR cake-PAR when-ADD
'Who tasted which cake when?'

b. *Kuka* *maisto-i* *mi-tä-kin* *kakku-a* *milloin-kin?*
who.NOM taste-PAST.3SG which-PAR-ADD cake-PAR when-ADD
'Who tasted which cake when?'

[22] The validity of this judgment should be verified experimentally.

c.?? *Kuka* *maisto-i* *mi-tä-kin* *kakku-a* *milloin?*
who.NOM taste-PAST.3SG which-PAR-ADD cake-PAR when
'Who tasted which cake when?'

The analysis that I present in section 7.3 is focused on binary *wh-kin* questions. The application of the proposal to ternary *wh-kin* questions is left for another occasion.

To conclude, in this section I described the syntactic and semantic effects of the bound additive *–kin* in multiple-*wh* interrogatives. I showed that the presence of *–kin* makes the host-*wh* unavailable for *wh*-movement, which in turn leads to the loss of Superiority effects in *wh-kin* questions. Moreover, based on the word order patterns of acceptable answers, the discourse status of the *wh-kin*-phrase was shown to be discourse-old (i.e. D-linked or topical). Finally, the interpretation of *wh-kin* questions was shown to involve a reversal of the surface order of the *wh*-phrases: the visibly lower *wh-kin*-phrase is interpreted above the visibly higher, fronted *wh*-phrase. Data from binding and focus intervention support this conclusion.

One issue that was not discussed in this section is the fact that only *–kin* appears in the multiple-*wh* use. Indeed, when *–kAAn* is attached to *wh*-phrases, the result is what is typically classified as an negative polarity item or an n-word; examples include *milloin-kaan* 'ever/never' and *kenelle-kään* 'to anyone/to no one'. These forms will be discussed in sections 4.8 and 7.1. The unavailability of this use with unbound additives, on the other hand, may be traced back to the fact that the focus semantic value of the prejacent is of a complex semantic type (a set of sets of proposition); in other words, if the additive operator takes scope above the whole question, as was proposed for the recurring-issue use, then it must be type-flexible. As we have seen, this property seems to distinguish the additive operators associated with unbound and bound additives in general.

4.7.2 Relative type: *–kin*

In Finnish, relative pronouns are formed using the stems *jo–*, *mi–*, and *ku–*, of which *mi–* and *ku–* are also used for forming *wh*-phrases (Hakulinen and Karlsson, 1979, p. 125, 285) (see Manninen, 2003; Brattico et al., 2013 for recent analyses of Finnish relative clauses). Only *mi–* and *ku–* are relevant for the relative type of multiple-*wh* use. Therefore, the structures discussed in this section are classified as multiple-*wh*, and I will refer to them as *wh-kin* relative clauses.

There are two types of *wh-kin* relative clauses: restrictive relative clauses (with an overt head) and free relative clauses (without an overt head). In (231), I illustrate the former type with the head being *sinne* 'there, to the place'. First, (231a) is a simple, standard restrictive relative clause. The example in (231b) is a *wh-kin* relative clause: there is a second *wh*-phrase to which *–kin* must be attached. If *–kin* is absent, unacceptability follows, as (231c) shows. The translations of the examples involve an *each*-paraphrase. However, I do not mean this translation to be a semantic description: it is simply a handy way of paraphrasing the meaning of these structures approximately.

(231) **Restrictive relative clause (a) and restrictive *wh-kin* relative clause (b)**

a. *Ryhmä* *siirre-tään* *sinne* [$_{RC}$ *mi-ssä*$_i$ *si-tä* *eniten* *tarvi-taan*
group.NOM move-PASS.PRES there where-INE it-PAR most need-PASS.PRES
t_i]

'The group will be moved to where it is most needed'

b. *Ryhmä* *siirre-tään* *sinne* [$_{RC}$ *mi-ssä*$_i$ *si-tä* *milloin-kin* *eniten*
group.NOM move-PASS.PRES there where-INE it-PAR when-ADD most
tarvi-taan t_i]
need-PASS.PRES
'At each time t, the group will be moved to where it is most needed at t'

c. **Ryhmä* *siirre-tään* *sinne* [$_{RC}$ *mi-ssä*$_i$ *si-tä* *milloin* *eniten*
group.NOM move-PASS.PRES there where-INE it-PAR when most
tarvi-taan t_i]
need-PASS.PRES

The free relative type is illustrated in (232). Again, (232a) illustrates the baseline free relative, (232b) the *wh-kin* version of it, and (232c) the unacceptability of the free relative with two *wh*-phrases but no *–kin*.

(232) **Free relative clause (a) and free *wh-kin* relative clause (b)**

a. *Ryhmä-n* *jäsene-t* *tek-i-vät* [$_{RC}$ *mi-tä*$_i$ *heidä-n* *kuulu-i*
group-GEN member-PL.NOM do-PAST-3PL what-PAR they-GEN should-PAST.3SG
teh-dä t_i]
do-INF
'The group members did what they were supposed to do'

b. *Ryhmä-n* *jäsene-t* *tek-i-vät* [$_{RC}$ *mi-tä*$_i$ *heidä-n* *milloin-kin*
group-GEN member-PL.NOM do-PAST-3PL what-PAR they-GEN when-ADD
kuului *teh-dä* t_i]
should-PAST.3SG do-INF
'At each time t, the group members did what(ever) they were supposed to do at t'

c. **Ryhmä-n* *jäsene-t* *tek-i-vät* [$_{RC}$ *mi-tä*$_i$ *heidä-n* *milloin*
group-GEN member-PL-NOM do-PAST-3PL what-PAR they-GEN when
kuulu-i *teh-dä* t_i]
should-PAST.3SG do-INF

Although the examples above are constructed, it is not rare to encounter *wh-kin* relative clauses in corpora. An example of each type is given below in (233).[23]

(233) **Corpus examples of restrictive (a) and free (b) *wh-kin* relative clauses**

a. *Supersää-sovellus* *hyödyntä-ä* *käyttäjä-n* *päätelaitte-en*
Superweather.application.NOM exploit-PRES.3SG user-GEN terminal.device-GEN
sijaintitieto-j-a, *jotta* *se* *voi* *tarjo-ta*
location.information-PL-PAR so.that it.NOM can.PRES.3SG offer-INF
sääennuste-en *juuri* *sii-hen* *paikka-an* $[_{RC}$ *mi-ssä*$_i$ *käyttäjä*
weather.forecast-ACC exactly that-ILL place-ILL where-INE user.NOM
milloin-kin *o-n* t_i]
when-ADD be-PRES.3SG
'The Superweather-application exploits the location information of the user's terminal device so that for each time t, it can offer a weather forecast for exactly that place where the user is at t'

b. *Viiko-n* *mitta-an* *tule-e* *sit* *pysähel-tyä* $[_{RC}$ *mi-ssä*$_i$
week-GEN measure-ILL happen-PRES.3SG then stop-TTUA where-INE
sattu-u *milloin-kin* *ole-ma-an* t_i*]*
happen-PRES.3SG when-ADD be-PART-ILL
'During the week, for each time t, I tend to stop where(ever) I happen to be at t'

Wh-kin relative clauses are like normal relative clauses in two respects. First, the *wh*-phrase functioning as the relative pronoun must match the pronominal head (234) or correspond to the selectional requirements of the verb (235).

(234) **Restrictive *wh-kin* relatives: Head matching effect**

a. *Ryhmä* *siirre-tään* *sinne* $[_{RC}$ *mi-ssä*$_i$ *si-tä* *milloin-kin* *eniten*
group.NOM move-PASS.PRES there where-INE it-PAR when-ADD most
tarvi-taan t_i]
need-PASS.PRES
'At each time t, the group will be moved to where it is most needed at t'

b. * *Ryhmä* *siirre-tään* *sinne* $[_{RC}$ *milloin*$_i$ *si-tä* *missä-kin*
group.NOM move-PASS.PRES there when it-PAR where-INE-ADD
tarvi-taan t_i]
need-PASS.PRES

[23] (233a) is from https://www.sanoma.com/fi/tietosuoja/tuotekohtaiset-tarkennukset/sijaintiperusteiset-palvelut, and (233b) is from http://www.rahtihemmot.com/forum/index.php?topic=2857.66.

(235) **Free *wh-kin* relatives: Selection effect in terms of order of *wh*-phrases**

a. *Ryhmä-n jäsene-t tek-i-vät* $[_{RC}$ *mi-tä*$_i$ *heidä-n milloin-kin*
group-GEN member-PL.NOM do-PAST-3PL what-PAR they-GEN when-ADD
kuulu-i teh-dä t_i]
should-PAST.3SG do-INF
'At each time t, the group members did what they were supposed to do at t'

b. **Ryhmä-n jäsene-t tek-i-vät* $[_{RC}$ *milloin*$_i$ *heidä-n mi-tä-kin*
group-GEN member-PL.NOM do-PAST-3PL when they-GEN what-PAR-ADD
kuulu-i teh-dä t_i]
should-PAST.3SG do-INF

Second, the cross-linguistic restriction that bans free relative clauses formed with *miksi* 'why' also holds for free *wh-kin* relative clauses (237) (Caponigro, 2003).

(236) **Free *wh-kin* relatives: Rejection of *why***

**Ryhmä-n jäsene-t läht-i-vät* $[_{Rel}$ *miksi muu-t läht-i-vät*
group-GEN member-PL.NOM leave-PAST-3PL why other-PL.NOM leave-PAST.3PL
milloin-kin]
when-ADD
Int. 'At each time t, the group members left why the others left at t '

Moreover, *wh-kin* relative clauses differ from *wh-kin* interrogatives in that the latter may not contain more than two *wh*-phrases, regardless of whether the two *wh*-phrases that do not correspond to the relative pronoun carry *–kin.* This is illustrated in (237).

(237) ***Wh-kin* relatives cannot contain more than two *wh*-phrases**

a. **Ryhmä siirre-tään sinne* $[_{RC}$ *mi-ssä*$_i$ *si-tä milloin-(kin) miten-(kin)*
group.NOM move-PASS.PRES there where-INE it-PAR when-ADD how-ADD
paljon tarvi-taan t_i]
much need-PASS.PRES

b. **Ryhmä-n jäsene-t tek-i-vät* $[_{RC}$ *mi-tä*$_i$ *heidä-n milloin-(kin)*
group-GEN member-PL.NOM do-PAST-3PL what-PAR they-GEN when-ADD
mi-ssä-(kin) kuulu-i teh-dä t_i]
where-INE-ADD should-PAST.3SG do-INF

In conclusion, there are two types of *wh-kin* relative clauses: restrictive and free. Both types are subject to the same selectional constraints that normal relative clauses are, and the free relative

type rejects *why* as the relative pronoun just like standard free relatives do. As in *wh-kin* interrogatives, *–kin* must attach to the non-fronted *wh*-phrase (i.e. not the relative operator in the case of *wh-kin* relative clauses).

Again, this section did not discuss the fact that *wh-kin* relative clauses can only be formed with *–kin*. Arguably, the fact that *–kAAn* cannot be used to form *wh-kin* interrogatives or *wh-kin* relative clauses should receive a uniform explanation, which could refer to the use of *wh-kAAn* combinations as negative polarity items (as suggested at the end of section 4.7.1). The unavailability of unbound additives, however, may be connected to the fact that *–kin* is always obligatory in *wh-kin* relative clauses (cf. the interrogative type, which does not require *–kin*). As was suggested in the context of *wh*-concessives, it is possible that the obligatoriness of *–kin* signals that its role in the semantics of *wh-kin* relative clauses is truth-conditional, and not presuppositional. Based on the data presented in this dissertation, no such claim will be made for the operator associated with unbound additives.

4.7.3 Declarative type: *–kin*

The third type of *wh-kin* structure is perhaps the most intriguing. Although Finnish does not have *wh*-indefinites, multiple *wh-kin* structures are possible in the absence of interrogativity and clear relative clause structure. I dub this type 'declarative' to separate it from the relative type; however, I will make use of both the syntax and the semantics of relative clauses in my analysis of *wh-kin* declaratives in section 7.3.2.

The distinction between *wh-kin* interrogatives and declaratives is straightforward: the former involve interrogative syntax – specifically, *wh*-movement to the CP – and are interpreted as questions, while the latter do not involve *wh*-movement to the CP, and are interpreted as assertions. Thus, a *wh-kin* declarative may well be used to answer a *wh*-question, as shown in (238a). One of the translations I propose for *wh-kin* declaratives again uses the universal paraphrase that I introduced in the discussion of *wh-kin* interrogatives (and which was also used with the relative type). The other translation involves the use of *different*, which is to be understood as an existential expression that implies plurality. Now, as the comparison between (238a) and (238b) shows, it is again the linearly rightmost *wh*-phrase that must carry *–kin* in *wh-kin* declaratives. (I label the projection housing the *wh*-phrases as ?P for now.)

(238) **Clause type and position of *–kin* in *wh-kin* declaratives**
Minkälais-ta musiikki-a Mari kuuntele-e?
what.kind-PAR music-PAR Mari.NOM listen-PRES.3SG
'What kind of music does Mari listen to?'

a. *(Mari kuuntele-e)* [$_{?P}$ *mi-tä milloin-kin*]
Mari.NOM listen-PRES.3SG what-PAR when-ADD
'At each time t, Mari listens to some music at t' or 'Mari listens to different kinds of music at different times'

b. * *(Mari kuuntele-e)* [$_{?P}$ *mi-tä-kin milloin*]
Mari.NOM listen-PRES.3SG what-PAR-ADD when

Like *wh-kin* relative clauses, *wh-kin* declaratives require two *wh*-phrases, and do not allow more than two *wh-phrases*, as shown in (239).

(239) ***Wh-kin* declaratives require exactly two *wh-phrases***

a. * *Mari kuuntele-e* [$_{?P}$ *mi-tä-kin*]
Mari.NOM listen-PRES.3SG what-PAR-ADD

b. * *Mari kuuntele-e* [$_{?P}$ *mi-tä mi-ssä milloin-kin*]
Mari.NOM listen-PRES.3SG what-PAR where-INE when-ADD

There are three interesting contrasts between *wh-kin* declaratives and *wh-kin* relative clauses. First, while the identity of the *wh*-phrase functioning as the relative pronoun is restricted by selectional properties in *wh-kin* relative clauses, it is *not* restricted in such a way in *wh-kin* declaratives, as shown in (240a-b). However, the selectional requirements of the verb do need to be satisfied; for example, if the verb takes a direct object, and neither *wh*-phrase corresponds to a direct object, the result is unacceptable (240c).

(240) **Wh-kin declaratives: no selection effect in terms of order of *wh*-phrases**

a. *Mari kuuntele-e* [$_{?P}$ *mi–tä milloinkin*]
Mari.NOM listen-PRES.3SG what-PAR when-ADD
'For each time t, Mari listens to some music at t' or 'Mari listens to different kinds of music at different times'

b. *Mari kuuntele-e* [$_{?P}$ *milloin mi-tä-kin*]
Mari.NOM listen-PRES.3SG when what-PAR-ADD
'For each kind of music k, Mari listens to k sometimes' or 'Mari listens to different kinds of music at different times'

c. *? *Mari kuuntele-e* [$_{?P}$ *milloin mi-ssä-kin*]
Mari.NOM listen-PRES.3SG when where-INE-ADD

A second difference between *wh-kin* free relatives and declaratives is that while *wh-kin* free relatives cannot be formed with *miksi* 'why' as the relative pronoun, *wh-kin* declaratives can.

(241) ***Wh-kin* declaratives: No rejection of *why***

a. *Ryhmä-n jäsene-t suuttu-i-vat* [$_{?P}$ *miksi milloin-kin*]
group-GEN member-PL.NOM get.angry-PAST-3PL why when-ADD
'For each time t, the group members got angry for some reason at t' or 'The group members got angry for different reasons at different times'

b. *Ryhmä-n jäsene-t suuttu-i-vat* [$_{?P}$ *milloin miksi-kin*]
group-GEN member-PL.NOM get.angry-PAST-3PL when why-ADD
'For each time t, the group members got angry for some reason at t' or 'The group members got angry for different reasons at different times'

A third difference between the relative type and the declarative type is that in the former, the *wh*-phrases may be separated by lexical material, while in the latter, the two *wh*-phrases seem to always appear adjacent to each other. The only attested examples of the declarative type with lexical material intervening between the *wh*-phrases that I have found involve the emphatic particle *nyt* lit. 'now' (Hakulinen, 1998). The attested example in (242) illustrates this point.[24]

(242) **Emphatic particle *nyt* may intervene between the *wh*-phrases in *wh-kin* declaratives**
Julista-mme miele-llä-mme ole-va-mme maailma-n huippu-j-a
declare-PRES.1PL mind-ADE-PX/1PL be-PRESPART-1PL world-GEN best-PL-PAR
cleantechi-ssä ja [$_{?P}$ *mi-ssä nyt milloin-kin*]
clean.tech-INE and where-INE EMPH when-ADD
'We gladly declare that we are the world's best in cleantech and in different things at different times'

As the examples of this section show, subject, object, and adverbial *wh*-phrases may all readily appear in *wh-kin* declaratives. Interestingly, in contrast to both *wh-kin* interrogatives and relative clauses, when *wh-kin* declaratives involve a *wh*-subject – be it the 'bare' *wh*-phrase or the *wh*-phrase that carries *–kin* – the *wh*-subject is often doubled lexically.[25] The examples in (243) are all attested examples collected from the internet.[26] ALl translations are approximate; I have omitted the universal 'for each...' paraphrase and retained the paraphrase with 'different' for reasons of space.

[24]Source: http://www.eevaleenavaahtio.fi/index.php?option=comcontent&view=section&id=5&layout=blog&Itemid=53

[25]Subject doubling is also possible outside of *wh-kin* structures: it then involves a pronoun in SpecFP and a lexical subject that stays within the *v*P (Holmberg and Nikanne, 2002). Note also that both the singular form *kuka(kin)* and the plural form *ketkä(kin)* (nominative case forms) may be used.

[26]Sources: http://www.tekniikkatalous.fi/arkisto/2005-04-21/Ministerit-vastustavat-kuka-mitäkin-ja-kannattavat-mitä-sattuu-3275525.html for (243a); http://www.ilkka.fi/tilaajalle/maakunta/talkootyö-pitää-eläkeläiset-vireessä-1.1943953 for (243b); http://www.lansi-savo.fi/mielipide/kolumnit/kolumni-esko-olisi-ollut-varma-miljonaari-330578 for (243c); and http://www.pelulamu.net/jolry/JSEURT.HTM for (243d)

(243) **Subject doubling in *wh-kin* declaratives**

a. *Ministeri-t* *vastusta-vat* [$_{?P}$ *kuka* *mi-tä-kin*] *ja* *kannatta-vat*
minister-PL.NOM oppose-PRES.3PL who.NOM what-PAR-ADD and
mi-tä *sattu-u*
support-PRES.3PL what-PAR
'The ministers all oppose different things, and support random things'

b. *Muu-t* *teke-vät* [$_{?P}$ *mi-tä* *kuka-kin*]*:* *kanta-vat*
other-PL.NOM do-PRES.3PL what-PAR who.NOM-ADD carry-PRES.3PL
lauto-j-a *ja* *naulaa-vat* *kattopalkke-j-a*
stave-PL-PAR and nail-PRES.3PL roof.rafter-PL-PAR
'The others do different things: they carry staves and nail rafters'

c. *Kilpailija-t* *pärjää-vät* [$_{?P}$ *kuka* *miten-kin*]
contestant-PL.NOM do-PRES.3PL who.NOM how-ADD
'The contestants all have different degrees of success'

d. *Toteuttaja-t* *o-vat* *sitten ol-leet* [$_{?P}$ *ketkä* *milloin-kin*]
implementor-PL.NOM be-PRES.3PL then be-PASTPART who.PL.NOM when-ADD
'Different times involved different implementors'

Subject doubling seems impossible in *wh-kin* declaratives with OV and TopV word orders, as shown in the attested examples shown in (244) and (245).

(244) **No subject doubling in *wh-kin* declaratives with OV word order**

a. *Si-tä* *ennen* *poliisi-n* *tehtäv-i-ä* *o-vat* *hoita-neet*
that-PAR before police-GEN task-PL-PAR be-PRES.3PL execute-PASTPART
[$_{?P}$ *ketkä* *milloin-kin*]
who.PL.NOM when-ADD
'Before that, the tasks of the police have been executed by different people at different times'

b. * *Si-tä* *ennen* *poliisi-n* *tehtäv-i-ä* *o-vat* *hoita-neet*
that-PAR before police-GEN task-PL-PAR be-PRES.3PL execute-PASTPART
sotilaa-t [$_{?P}$ *ketkä* *milloin-kin*]
soldier-PL.NOM who.PL.NOM when-ADD

(245) **No subject doubling in *wh-kin* declaratives with TopV word order**

a. *Siellä huila-a* [$_{?P}$ *ketkä* *milloin-kin*]
there rest-PRES.3PL who.PL.NOM when-ADD
'Different people rest there at different times'

b. **Siellä huila-a* *poliisi-t* [$_{?P}$ *ketkä* *milloin-kin*]
there rest-PRES.3PL police-PL.NOM who.PL.NOM when-ADD

It therefore seems that the possibility to double subjects is intimately related to the availability of the topical Spec,FP-position: when an object or an adverbial occupies this position in a *wh-kin* declarative, subject doubling is not possible.

To conclude, *wh-kin* declaratives differ from *wh-kin* interrogatives and relative clauses in three main ways: (i) they may only contain two *wh*-phrases (as in the relative type, but not the interrogative type), (ii) only the emphatic particle *nyt* lit. 'now' seem to be able to intervene between the two *wh*-phrases (unlike in the relative and interrogative types), and (iii) they allow productive subject doubling (unlike the relative and interrogative types). Moreover, it was shown that unlike *wh-kin* relatives, *wh-kin* declaratives are not sensitive to selectional requirements, and can involve the *wh*-phrase *miksi* 'why' (which is cross-linguistically banned from free relatives). In contrast to the relative and interrogative types, the declarative type raises the question of why *–kin* must be carried by the linearly rightmost *wh*-phrase. Unlike in relative and interrogative clauses, this ordering cannot be straightforwardly explained by syntax.

Finally, as with the interrogative and relative types, there is the question of why *–kAAn* and unbound additives cannot be used to form *wh-kin* declaratives. In sections 4.7.1 and 4.7.2, I suggested that *wh-kAAn* combinations are not part of the multiple-*wh* use because they are interpreted as what are typically classified as negative polarity items or n-words, and not *wh*-words. As for unbound additives, the declarative type – like the relative type – might involve an additive operator that has a truth-conditional effect on the semantics of the structure, given that in this type as well, *–kin* is obligatory. This, however, seems not to be a property of unbound additives based on the data presented in this dissertation.

4.7.4 Summary

In this section, I presented the three types of multiple-*wh* uses of the bound additive *–kin*: the interrogative type (4.7.1), the relative type (4.7.2), and the declarative type (4.7.3). In all three types, only the bound additive *–kin* may be used, and it must attach to the *wh*-phrase that is linearly rightmost (at least in structures that contain exactly two *wh*-phrases).

I also identified some commonalities and differences between the three types. First, in contrast to the the interrogative and relative types, the declarative type does not allow for almost any intervening material between the two *wh*-phrases, but typically allows lexical subject doubling,

whereas the two first-mentioned types do not. Second, the declarative type differs from the relative type in that it does not show the selectional requirements of the latter, and allows for the use of *miksi* 'why' in the structure. And third, only the interrogative type seems to allow more than two *wh*-phrases in the structure.

While it is possible to form binary *wh*-interrogatives without *–kin* (with certain repercussions for the syntax and the semantics of the question, as was shown in section 4.7.1), it is not possible to leave out *–kin* in the relative and declarative types. Therefore, by analogy with the *wh*-concessive use presented in section 4.4.2, I suggested that the semantic role of the bound additive in the relative and declarative types is in fact not exactly the same as in the interrogative type: in particular, it is possible that the role of the bound additive is truth-conditional. In the next section, I present the last use of bound additives – the quantifier use – and argue that this suggestion receives further from the data from this use.

4.8 Quantifier uses

In this last content section of this chapter, I discuss the presence of the bound additives *–kin* and *–kAAn* in Finnish quantifiers. Although this use is typically not discussed in work on bound additives – possibly because it is assumed to involve grammaticalisation – bound additives show characteristics of clitics on this use as well. For example, the pronunciation of *jonne-kin* 'somewhere-ADD' involves initial gemination for *–kin*, and is therefore pronounced as /jon:ek:in/. In other words, there is reason to assume that the quantifier use, too, involves the cliticisation of *–kin* and *–kAAn* (see sections 2.3.3.5, 5.1.2). It is therefore interesting to consider the possibility that the structure of Finnish quantifiers is not opaque, as suggested by the grammaticalisation hypothesis.

To begin, both of *–kin* and *–kAAn* are part of the basic morphological structure of existential quantifiers (Hakulinen et al., 2004, §746) and some universal quantifiers (Hakulinen et al., 2004, §750).[27] For example, in (246), *–kin* attaches to the stem *jo–* to form an existential quantifier (246a)[28], and to the stem *ku–* to form a distributive universal quantifier (246b).[29,30] In all of the

[27] For a discussion of Finnish quantifiers (in Finnish), see Hakulinen and Karlsson, 1979 (p. 81).

[28] Note that *jokin* is morphologically singular, and has a plural form which is *jotkin* in the nominative case. Both forms are used in the examples.

[29] It is also possible to build distributive universal quantifiers using the stem *mi–*, as in *mikin* 'each'.

[30] In addition to number marking on quantifiers in *jo–* (see footnote 28), all quantifiers in *jo–*, *ku–*, and *mi–* carry case-marking, as shown in (i). Thus, the bound additives *–kin* and *–kAAn* do not technically attach directly to stems.

(i) a. *jo-i-ssa-kin* *juusto-i-ssa*
JO-PL-INE-ADD cheese-PL-INE
'in some cheeses'

b. *ku-sta-kin* *ryhmä-stä*
KU-ELA-ADD group-ELA
'of/from each group'

glosses of the examples of this section (and section **??**), the stems to which the bound additives attach are represented by small capital JO and KU, respectively.

(246) ***–kin* attaches to *jo–* (a) and *ku–* (b)**

a. *Jo-t-kin (nä-i-stä) tuoksu-vat hyvä-ltä* [∃]
JO-PL.NOM-ADD this-PL-ELA smell-PRES.3PL good-ABL
'Some (of these) smell good'

b. *Ku-kin (he-i-stä) tuoksu-u hyvä-ltä* [∀]
KU.NOM-ADD they-PL.ELA smell-PRES.3SG good-ABL
'Each (of them) smells good'

Both *jokin* and *kukin* may co-occur with sentential negation. In that case, *jokin* scopes above negation (247a), while *kukin* scopes under it (247b).

(247) **The relative scope of *jokin* and *kukin* with respect to negation**

a. *Jo-t-kin (nä-i-stä) ei-vät tuoksu hyvä-ltä* [∃ > ¬]
JO-PL.NOM-ADD this-PL-ELA NEG-3PL smell.CONN good-ABL
'Some of these do not smell good'

b. *Kukin (he-i-stä) e-i tuoksu hyvä-ltä* [¬ > ∀]
KU.NOM-ADD they-PL-ELA NEG-3SG smell.CONN good-ABL
'Not all of them smell good'

To express the outer negation of an existential statement – or the inner negation of a universal statement – the bound additive *–kAAn* is used. *–kAAn* combines with *ku–* or *mi–* (MI), but never *jo–* (**jo-kaan*).

(248) ***–kAAn* attaches to *ku–* (a) and *mi–* (b)**

a. *Ku-kaan (he-i-stä) e-i tuoksu hyvä-ltä* [∀ > ¬ = ¬ > ∃]
KU.NOM-ADD they-PL-ELA NEG-3SG smell.CONN good-ABL
'None of them smell good'

b. *Mi-kään (nä-i-stä) e-i tuoksu hyvä-ltä* [∀ > ¬ = ¬ > ∃]
MI.NOM-ADD this-PL-ELA NEG-3SG smell.CONN good-ABL
'None of these smell good'

In addition to the stem *ku–*, the bound additives *–kin* and *–kAAn* may also attach to *kumpi*, which contains the stem *ku–* and the (possibly semantically moot) comparative morpheme *–mpi*. *Kumpi* restricts the cardinality of the restriction of the quantifier to two, and may quantify over

both animate and non-animate entities. When *–kin* attaches to *kumpi*, I translate the quantifier as *both*; when *–kAAn* attaches to it, I translate it as *either*. Bare *kumpi* also appears as a *wh*-phrase in *wh*-questions, and means *which* (restricted to two-member denotations).

The examples in (249) illustrate the combinations of *kumpi* and the bound additives. I give both *kumpikin* and *kumpikaan* universal quantificational force; in (249b), negation takes wide scope over *kumpikin*, and in (249c), it takes narrow scope with respect to *kumpikaan*. The choice of universal quantificational force is supported by the fact that the combinations of the stem *ku–* and the show the same scopal behaviour with respect to negation (see (247b), (248a)).

(249) **Bound additives and *kumpi***

a. *Ku-mpi-kin* *viera-i-sta-mme* *halus-i* *lähte-ä* [∀]
KU-COMP-ADD guest-PL-ELA-PX/1PL want-PAST.3SG leave-INF
'Both of our guests wanted to leave'

b. *Ku-mpi-kin* *viera-i-sta-mme* *ei* *halun-nut* *lähte-ä* [¬ > ∀]
KU-COMP-ADD guest-PL-ELA-PX/1PL NEG-3SG want-PASTPART leave-INF
'It is not the case that both of our guests wanted to leave'

c. *Ku-mpi-kaan* *viera-i-sta-mme* *e-i* *halun-nut* *lähte-ä* [∀ > ¬]
KU-COMP-ADD guest-PL-ELA-PX/1PL NEG-3SG want-PASTPART leave-INF
'Neither of our guests wanted to leave'

The logical relationships between statements that involve *jokin*, *kukin*, and *kukaan* are illustrated using the Aristotelian logical square in figure 4.1. The corners of the logical square are assigned the mnemonic labels A and I (from *affirmo*) and E and O (from *nego*); the former pair refer to positive polarity statements, while the latter refer to negative polarity statements. In other words, the vertical axes differ in sentence polarity. The horizontal axes differ in quantificational strength: while A and E are universal, I and O are existential.

The corners of the logical square are related to each other in specific ways. First, A *entails* I, and E *entails* O: if the former is true, the latter will always be true as well. This relationship asymmetrical: the truth of I does not entail the truth of A, and the truth of O does not entail the truth of E. Second, A-O and I-E are *contradictories*, so that O corresponds to the outer negation of A, and E to the outer negation of I. By the law of contradiction, the contradictory statements may never be true at the same time. Finally, A and E are *contraries*, meaning that they can never be true at the same time, and I and O are *subcontraries*, meaning that they can never be false at the same time.

As figure 4.1 shows, statements with *kukin* may be placed in the A-corner, and *jokin*-statements in the I-corner. Due to the logical equivalence of the two statements in the E-corner, *kukaan* can in principle be analysed either as a wide-scoping universal, or a narrow-scoping existential. Finally, when *kukin* and *jokin* co-occur with sentential negation, as in the O-corner, they take

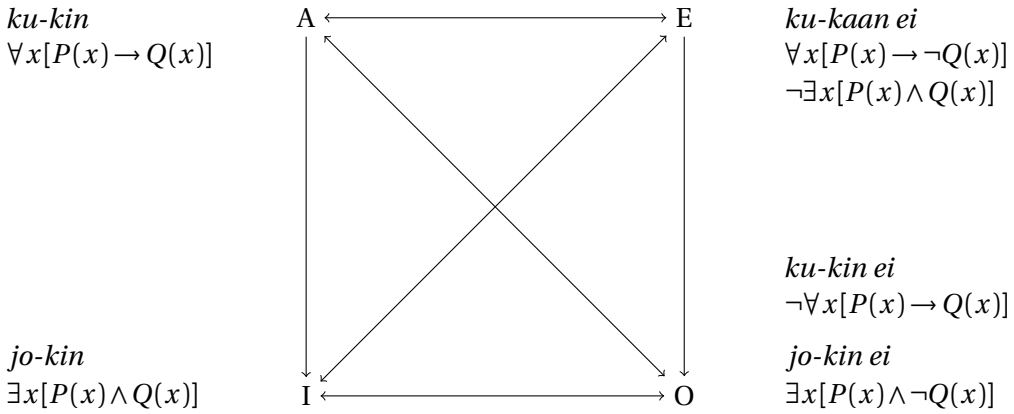


Figure 4.1: Logical square built with the stems *ku–* and *jo–* and the bound additives *–kin* and *–kAAn*. *Ei* spells out negation.

narrow and wide scope with respect to negation, respectively, but the resulting statements are logically equivalent.[31]

Note that within the square in figure 4.1, the E-corner *kukaan*-statement is restricted to predicates P that can be predicated of humans (e.g. student). The I-corner *jokin* mostly takes non-human restrictions; for humans, the form *joku* is used (Hakulinen et al., 2004, §748). Although *kukin* often appears with human restrictions – cf. the examples in (246b) and (247b) – it is not required to, as (250) shows.[32]

(250) **Non-human restrictions with *kukin***

a. *Ku-kin* *tehtävä* *o-n* *yhde-n* *piste-en* *arvoinen*
KU.NOM-ADD exercice.NOM be-PRES.3SG one-GEN point-GEN worthy.NOM
'Each exercice is worth one point'

b. *Maisto-i-n* *ku-ta-kin* *juusto-a*
taste-PAST-1SG KU-PAR-ADD cheese-PAR
'I tasted each type of cheese'

To conclude, the quantifier use involves the obligatory attachment of the bound additives *–kin* and *–kAAn* to quantificational stems. Although this use is not considered in studies of bound additives (cf. Hakulinen and Karlsson, 1979; Karttunen and Karttunen, 1976; Vilkuna, 1984; Vilppula, 1984; Holmberg, 2014), there is no clear reason to consider the structure of Finnish quantifiers to be opaque. In this dissertation, I propose that the quantifier use shows most clearly that

[31] Note that the cross-linguistically stable restriction on realising the O-corner with a simple lexical item also holds for Finnish (Horn, 1972): based on the other corners, one would expect O to be realised as **jokaan*, but this form is ungrammatical.

[32] In addition to *kukin*, universal quantification may be expressed using *kaikki* 'every, all' and *joka(inen)* 'every, each' (Hakulinen and Karlsson, 1979, p. 81, Hakulinen et al., 2004, §750-753). As the morphology of these quantifiers does not seem to include a bound additive ingredient, they will not be discussed further here.

the appearance of bound additives is sometimes associated with the presence of an operator that has a truth-conditional semantic effect. In chapter 7, I propose that this effect corresponds to quantificational closure over the focus semantic value of the prejacent of the additive operator (cf. Kratzer and Shimoyama, 2002).

Before moving on to the summary section of this chapter, I would like to make one last remark concerning the mapping between form and meaning in the quantifier use of *–kin* and *–kAAn*. In this section, we looked at two relevant quantifier stems – *jo–* and *ku–* – and saw that while the former has existential quantificational force with *–kin*, the latter has universal force with *–kin* and either universal or existential force with *–kAAn*. Moreover, it was shown that while *jokin* scopes above negation, *kukin* scopes underneath it, and *kukaan* scopes above negation if it has universal force, and underneath it if it has existential force. It therefore seems that the mapping between the stem, the surface form of the additive, and quantificational force of the quantifier is not a very simple one. In section 7.1, I propose that the force of the quantifier is ultimately due to the properties of the stem.

4.9 Summary

The goal of this chapter was to give a descriptive overview of the distribution of the unbound additives *myös* and *myöskään* and the bound additives *–kin* and *–kAAn* in Finnish. The description also involved some analytical elements, and already contained data that will be relevant for the discussions in chapters 5-7. I therefore begin this summary with table 4.1, which summarises the distribution of the four additives based on the type (and sometimes subtype) of use. I have also provided information about what type of constituent acts as the associate (and, in the case of bound additives, the host) of the additive.

Out of all uses presented in this chapter, the basic uses have (understandably) received the most attention in the literature (Karttunen and Karttunen, 1976; Hakulinen, 1976; Hakulinen and Karlsson, 1979; Vilkuna, 1984; Vilppula, 1984; Holmberg, 2014). The expectation-related uses[33] – i.e. the polar use, the reactive use, and the confirming use – are often mentioned, but also confounded; indeed, bound additives have been assumed to have a general "expectation-relating" use, where the direction of the fit between expectation and reality is not specified (Hakulinen et al., 2004, § 842; see also Karttunen and Karttunen, 1976, p. 103). As for the other uses, there exists a semantic-pragmatic analysis of the double contrast use (Vilkuna, 1984), and a syntactic analysis of the interrogative type of the multiple-*wh* use (Huhmarniemi and Vainikka, 2011). As a whole, however, it can be said that there is no coherent analysis of additivity that would cover all of the empirical data presented in this chapter.

Indeed, in light of the data presented in this chapter, the burning question is: how do we

[33] In this dissertation, I focus solely on the 'purely' additive use, disregarding the scalar additivity of *–kin* and *–kAAn*. In some of the uses described in this chapter, a scalarity inference is very natural (e.g. the polar use) while in others, it is not (e.g. the double contrast use). I leave the study of the scalarity of bound additives for future work.

Type	Subtype	*myös(kään)*	*–kin*	*–kAAn*	Associate/host
Basic	basic	✓	✓	✓	any
	confirming	✓	✓	✓	verb
	rhetorical	✓	✓	✓	any
Polar		✗	✓	✓	verb
Reactive		✗	✓	✓	verb
Concessive	concessive	✗	✓	✓	verb
	wh-concessive	✗	✓	✓	verb
Recurring-issue		✗	✗	✓	verb
Double contrast		✗	✓	✓	topic
Multiple-*wh*	interrogative	✗	✓	✗	*wh*-phrase
	relative	✗	✓	✗	*wh*-phrase
	declarative	✗	✓	✗	*wh*-phrase
Quantifier		✗	✓	✓	quant. stem

Table 4.1: A summary of the availability of different uses with the unbound additives *myös* and *myöskään* (collapsed into one column) and the bound additives *–kin* and *–kAAn* in Finnish.

account for the distribution of additives in Finnish? As this chapter has demonstrated, there is a clear line of separation between unbound and bound additives, where the former have a much more restricted distribution than the latter. What is the underlying reason for this separation? Is it syntax? Is it semantics?

In sections 4.2 to 4.5, I discussed uses that are only available with bound additives and involve tensed, F-marked verbs as host-associates. I proposed that the focus alternatives that are relevant for the semantics of these uses are polar, and not lexical (cf. Rooth, 1985, 1992; Höhle, 1992). As tense and the possibility to evoke polar alternatives seem to go hand in hand, showing that the unavailability of uses that involve polar alternatives is due to syntax would require showing that unbound additives cannot take scope above tense. In section 4.2, I argued that this argument is incorrect, as unbound additives may in fact associate with – and thus scope over – epistemic modals, which are interpreted above tense. Another argument against a syntactic restriction comes from the flexibility in the positioning of the bound additive on e.g. the polar use: it is not only the highest tensed verb that may act as the associate of the additive on the polar use, but all tensed verbs (even participials with tense marking).

Semantically, all of the uses that involve bound additives that associate with tensed F-marked verbs, and that thus make reference to polar focus alternatives, are characterised by two traits. First, it seems that the antecedent that satisfies the additive presupposition may *not* be asserted or presupposed to be true, i.e. it cannot be in the common ground. Instead, it is found in some

other component of the discourse; in chapter 5, I propose a number of options for what this source can be. Second, it seems that on some uses – the reactive, concessive, and recurring-issue uses – the antecedent may in fact be non-distinct from the prejacent. These characteristics suggest that the reason why these uses are not available with unbound additives could be related to the semantics of the additive operator involved: if the operator associated with unbound additives cannot use an antecedent that is not common ground or that is non-distinct from the prejacent, these uses will not surface with unbound additives.

Another semantic property that may be assumed to separate the additive operators associated with unbound and bound additives is particularly relevant for the double contrast use discussed in section 4.6. On the double contrast use, the bound additive attaches to a contrastive topic, and the focus semantic value of the prejacent is more complex than on the basic use. The unavailability of double contrast use with unbound additives suggests that only the additive operator associated with bound additives is able to work with a focus semantic value that is not a set of propositions, but a set of sets of propositions. Thus, in addition to being source-flexible and not requiring distinctness, the additive operator associated with bound additives seems to be type-flexible. The idea of a type-flexible operator that operates on the focus-semantic value of its prejacent is familiar from the discussion of the Q-particle approach to interrogative syntax and semantics (section 2.1.4; especially Kotek, 2014).

In addition to the difference in distribution between unbound and bound additives, one must also explain the restrictions that some uses exhibit within the set of bound additives. Notably, the recurring-issue use is only available with *–kAAn*, and the multiple-*wh* use is only available with *–kin*. Moreover, while the use of *–kAAn* is usually connected with negative polarity, this is not the case in some uses (*wh*-concessive, recurring-issue and rhetorical uses). These issues were discussed only superficially in this chapter.

Another question that was raised but left rather open concerns the obligatoriness question, which I presented as being potentially linked to the level at which the additive operators contribute to the semantics of their host sentence. Indeed, on some uses, the contribution of the additive seems to be presuppositional – and the presence of the additive is optional – while on other uses, the additive seems to be required for the semantic well-formedness of the structure. As an example of the latter type, bound additives are obligatory and irreplaceable on the quantifier use and on the relative and declarative types of multiple-*wh*-use. In the relevant sections, I speculated that it is possible that the surface realisations of *–kin* and *–kAAn* might in fact be related to an additive operator with a truth-conditional semantic effect in one case, and a presuppositional effect in another. In chapter 7, I propose that *–kin* and *–kAAn* sometimes appear as a marker of quantificational closure over the focus semantic value of the prejacent. This in turn suggests that the semantics of bound additivity in Finnish cannot, in fact, be reduced to the presence of a single additive operator.

In conclusion, the data presented in this chapter speaks to a lot of the issues discussed in sec-

tion 3.1: the antecedency question, the form alternation question, and the derivation questions are particularly salient. In the next three chapters, I tackle the question of how the distribution of unbound and bound additives may be explained formally, and what the implications of such an analysis for the investigation of additivity in general would be. The three chapters each present a different semantic operator: ADD (which I associate with unbound additives, and thus the basic uses) in chapter 5, BADD (for *bound*; associated with bound additives on the basic, polar, reactive, concessive, and recurring-issue) in chapter 6, and CADD (for *closure*; associated with bound additives on the *wh*-concessive, multiple-*wh*, and quantifier uses) in chapter 7. Although they are distinct, the three operators are also related to each other, so that BADD covers a superset of the uses that ADD covers (explaining the unbound-bound separation line), while CADD is essentially a truth-conditional closure operator (which nevertheless sometimes requires an antecedent). The three chapters rely on the same syntactic analysis, presented in chapter 5.

Chapter 5

Introducing ADD

In this chapter, I present the additive operator ADD. This operator is what the unbound additives *myös* and *myöskään* are semantically associated with. Therefore, ADD is what is minimally required for the basic use described in section 4.1. In chapter 6, I argue that bound additives are rather associated with another additive operator, BADD (for *bound* additive). BADD covers a superset of the cases that ADD does. However, in this chapter, I temporarily associate both unbound and bound additives with ADD in order to facilitate the comparison of the syntax and semantics of two types of additives.

This section is organised as follows. I begin by detailing a syntactic analysis of both unbound and bound additives (section 5.1). I then consider the form alternation question, and propose that topicality plays a crucial role in the determination of the form of the additive (section 5.2). In the last section, I provide a semantics for ADD, and present some example derivations of the basic use. The rest of the uses are discussed in chapters 6 and 7.

5.1 Basic syntax for *–kin* and *myös*

5.1.1 Adjunction analysis of *myös*

The reference grammars of Finnish classify the unbound additives *myös* and *myöskään* as particles (Hakulinen and Karlsson, 1979, p. 84, Hakulinen et al., 2004, §840). However, *myös* and *myöskään* are distributionally close to adverbs, much like unbound additives and focus particles in other languages (e.g. *also*, *only*, and *even*). Hence, it is natural to assume that unbound additives are adjuncts in terms of syntax. In what follows, I indeed assume that unbound additives are merged as heads of AddP. This section focuses mostly on the syntactic analysis of *myös*; the

form alternation question, and hence the analysis of *myöskään*, is left for section 5.2.

If *myös* is a syntactic adjunct, the question is: where can it adjoin? In section 4.1.1, I showed that *myös* has a preference for appearing either immediately before its associate or clause-finally. In addition, it may appear between different elements within the *v*P–FP portion of the tree, with varying acceptability depending on what its associate is. It is clear that *myös* may adjoin to *v*P, given that it may appear between the past participle and locative PP (251). In fact, *myös* is arguably even able to adjoin to VP (251): under the assumption that postposed, clause-final additives carry the same intonational contour as discourse-new constituents that stay in situ within the VP (indicated with an uparrow, as in section 4.1.1) (Vallduví and Vilkuna, 1998), it is natural to assume that postposed, clause-final additives are VP-internal.[1]

(251) **Adjunction to *v*P and VP**

[Mari o-n käy-nyt Berliini-ssä.]
Mari.NOM be-PAST.3SG visit-PASTPART Berlin-INE

Hän o-n käy-nyt (myös) Pariisi-ssa (↑myös)
she.NOM be-PAST.3SG visit-PASTPART ADD Paris-INE ADD
'(Mari has visited Berlin.) She has also visited Paris'

Moreover, it seems clear that *myös* may adjoin to FP, given that it may precede a subject that is positioned in Spec,FP.

(252) **Adjunction to FP**

[Mari o-n käy-nyt Berliini-ssä.]
Mari.NOM be-PAST.3SG visit-PASTPART Berlin-INE

Myös Joni o-n käy-nyt Berliini-ssä
ADD Joni.NOM be-PAST.3SG visit-PASTPART Paris-INE
'(Mari has visited Berlin.) Joni has visited Berlin, too'

And finally, *myös* may precede a topicalised XP that appears between PolP and FocP (cf. Kaiser, 2006):[2]

[1] Assuming that the additive adjoins low but on the left is compliant with the Linear Correspondence Axiom (LCA; Kayne, 1994), whereas high (or any) adjunction to the right is not.

[2] As in sections 2.1.3 and 4.2.2, the dashed underlining indicates reduced prosodic prominence of the associate of the additive.

(253) **Adjunction to high TopP**

[Anna puhu-i Mari-lle.]
Anna.NOM speak-PAST.3SG Mari-ALL

Kyllä myös Joni MARI-LLE puhu-i; kysymys kuulu-u,
EMPH ADD Joni.NOM Mari-ALL speak-PAST.3SG question.NOM be.audible-PRES.3SG

kuka puhu-i JESSE-LLE?
who.NOM speak-PAST.3SG Jesse-ALL

'(Anna spoke with Mari.) Joni, too, spoke with MARI; the question is, who spoke with JESSE?'

In principle, then, AddP seems to be able to adjoin to any of the following projections in Finnish (section 2.3.2):

(254) **Adjunction sites for unbound additives in Finnish**

TopP > FP > NegP > TMP > AuxP > TP > *v*P > VP

In this dissertation, I assume that *myös* and *myöskään* are themselves the surface realisation of the additive operator. As such, their surface position in syntax is flexible, and unbound additives are not restricted to appearing adjacent to their associate (cf. bound additives). Indeed, if unbound additives were markers of a cover additive operator, the freedom of their distribution would be harder to explain. Thus, when it comes to unbound additives, the derivation question receives the following answer: the semantics of additivity is associated with the lexical item itself.

There is one complication, however: unbound additives do not always c-command their associate from their position in surface syntax. For example, this is the case whenever a clause-final, VP-adjoining unbound additive associates with a subject (which originates in Spec*v*P). Unless the additive actually adjoins to the *v*P, a well-formed semantics is only possible if the additive moves above its associate at LF. If we assume that such LF-movement is necessary, we either have to assume that unbound additives simply do not carry the syntactic focus feature [*uF*] (Holmberg, 2014), or that this feature may be deleted via LF-movement. Of course, if we assume that unbound additives can adjoin to *v*P but not lower, the deletion of [*uF*] when associating with the subject becomes unproblematic.

Examples where the unbound additive associates with a modal show that clause-final additives may indeed move covertly and associate with constituents that they do not c-command in surface syntax. To see this, consider modal verbs, which are base-generated outside the *v*P. If clause-final additives are adjoined to *v*P – below the base-generation position of the modal – it is not possible to maintain that they associate with the modal unless it does so via movement. As (255) shows, such examples exist, showing that covert movement of the additive must be an option.[3]

[3] Of course, if unbound additives were simply markers of a covert additive operator, this problem would not arise.

(255) **Clause-final unbound additives may associate with modals**

a. *[Joni sa-i osallistu-a.]*
Joni.NOM may-PAST.3SG participate-INF

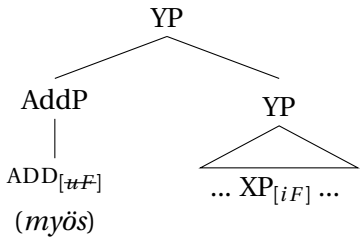
Itse asia-ssa häne-n täyty-i osallistu-a ↑myös
in fact-INE he-GEN must-PAST.3SG participate-INF ADD
'(Joni was allowed to participate.) In fact, he was required to participate, too'

Assuming that unbound additives carry an uninterpretable focus feature [uF] is conceptually neat, given that it establishes a clear syntactic parallel between unbound and bound additives Holmberg (2014), and refers to a semantic feature that they are known for (i.e. focus). It is possible that the Agree-based deletion of [uF] drives covert syntactic (not LF) movement of the additive. However, this particular type of movement has been claimed to be unattested in the literature (cf. section 2.1.1.3; Zeiljstra and Bjorkman, To appear).

One way out of this problem is to assume that the associate and the additive are also involved in another Agree-relationship where the associate is the probe, and the additive is the goal (i.e. a *quid pro quo* Agree relationship; see section 2.1.1.3). However, this configuration usually results in overt movement (Bošković, 2002a; Zeiljstra and Bjorkman, To appear). Therefore, at this point I simply postulate that Agree-motivated syntactic movement is possible, and such a movement is sometimes responsible for the deletion of [uF] on unbound additives. In section 5.2, I argue that Agree-motivated movement is also involved in the answer to the form alternation question. I speculate that the reason why Agree-motivated movement of the unbound additive is invisible in surface syntax is that (i) it involves a last-resort type deletion of [uF] through covert movement, and (ii) it does not involve feature valuation, which is more closely related with visible morphological changes in the goal and the probe.[4]

In sum, at some point in the syntactic derivation, the following syntactic configuration should hold between the unbound additive *myös* and its associate XP.

(256) ***Myös*: structural schema (final)**



However, as noted above, such an analysis would have a harder time explaining the very flexible distribution pattern of unbound additives (especially when compared to bound additives).

[4] I leave the proper investigation of this issue for future research.

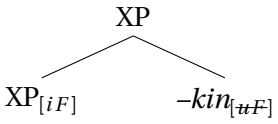
5.1.2 *–kin* as a clitic

While unbound additives are straightforwardly analysable as syntactic adjuncts, bound additives are clitics (Nevis, 1985; see section 2.3.3.5). Chomsky (1994) proposes that clitics are non-branching elements, which means that they are both heads and maximal projections; in other words, they are X^0/XP -ambiguous (Chomsky, 1994; Bošković, 1997, 2002b; Cardinaletti and Starke, 1999). In principle, then, clitics should be able to adjoin to both heads and phrases. This is what I propose for bound additives in this section. As in the previous section, I focus mostly on *–kin*, and postpone the discussion of *–kAAn* and the form alternation question to section 5.2.

5.1.2.1 XP-hosts

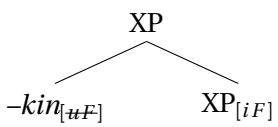
Holmberg (2014) proposes that bound additives adjoin to phrases. Although Holmberg does not explicitly address the question of whether the additives project syntactically, the tree representations of structures involving *–kin* provided in the paper show that their answer is no: when bound additives adjoin to maximal projections (XPs), they do not project (see section 3.4.3). For Holmberg, *–kin* itself is the additive, and it is adjoined to the right side of its host phrase XP, as shown in (257). From this position, *–kin* has its $[uF]$ deleted through Agreement with the associate XP (see section 3.4.3). The X^0/XP-ambiguity of *–kin* is reflected in the absence of a projection label.

(257) **Right-adjoined *–kin* (non-final)** (Holmberg, 2014)



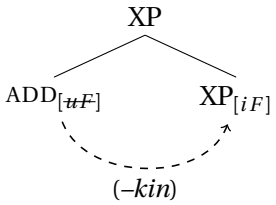
As was discussed in section 3.4.3, Holmberg's choice of adjoining *–kin* to the right of NP in (257) is not innocuous: right-adjunction of clitics violates the Linear Correspondence Axiom (LCA) (Kayne, 1994; Bošković, 2002b). To be compatible with the LCA, clitics should adjoin on the left, as in (258). However, in this case, the linearisation of the clitic and the host requires some extra assumptions: the clitic has to be pronounced after the host, not before it (as the LCA would predict).

(258) **Left-adjoined *–kin* (non-final)**



To avoid linearisation complications – and to constrain the syntactic distribution of *–kin* – I assume that the visible bound additive enclitic is a *marker* of a silent additive operator, ADD (although note that the identity of this operator is changed to BADD in chapter 6) (cf. Lee, 2004; Bruening, 2017). This operator – which is left-adjoined to XP in (259) – Agrees with the host-XP and deletes its [*uF*]. In the process, it marks the host with the enclitic *–kin*, as is indicated by the dashed arrow in (259).[5]

(259) **Left-adjoined ADD (pre-final; see chapter 6)**



In sum, while I assume that unbound additives themselves realise an additive operator, I propose that with bound additives, the answer to the derivation question is more complicated: the bound additive appears as a marker of a local silent additive operator. Previously, such an option has been discussed by e.g. Lee (2004).[6]

As ADD adjoins directly to its associate, determining exactly where the marker *–kin* (or *–kAAn*) is placed requires a bit more work than in the analysis of Holmberg (2014) (where the only thing that matters is that *–kin* itself c-commands [*iF*]). However, the solution is quite simple. Recall the contrast in the data in (260) (from section 4.1, example (163)):

[5]The syntax shown in (259) is only pre-final because it does not take into account the feature responsible for the distinction between *–kin* and *–kAAn*. This feature is introduced in section 5.2.3.

[6]Lee (2004) argues that when focus particles are markers of a silent operator, this is detectable in the semantics: two markers in fact correspond to one semantically meaningful operator. In the analysis I propose for *–kin* (and *–kAAn*), this argument is not valid, given that the overt realisation of the clitic happens due to a very local Agree-relationship. Therefore, if there is more than one *–kin* in a given sentence, one in fact expects there to be two operators (each with their local marker), not only one.

This prediction is relatively hard to test given that sentences with multiple basic use bound additives are marked. There is one type of example, however, where two *–kin* may appear: in this case, one *–kin* is on a tensed verb (polar use) and one somewhere else (basic use). In such examples, the interpretation points to the presence of two operators: in (i), for example, the basic use presupposition is that Joni brought some other type of olives (perhaps green ones), and the polar use presupposition is that Joni was expected not to bring black olives.

(i) *Joni* *to-i-kin* *must-i-a-kin* *oliive-j-a*
Joni.NOM bring-PAST.3SG-ADD black-PL-PAR-ADD olive-PL-PAR
'Joni brought black olives, too (although he was not expected to)'

(260) **F-marking and position of *–kin***

a.?? *[Mari pitä-ä vihre-i-stä oliive-i-sta.]*
Mari.NOM like-PRES.3SG green-PL-ELA olive-PL-ELA

Hän pitä-ä must-i-sta oliivei-sta-kin
she.NOM like-PRES.3SG black-PL-ELA olive-PL-ELA-ADD
'(Mari likes green olives.) She likes black olives, too'

b. * *Mari pitä-ä must-i-sta-kin oliive-i-sta*
Mari.NOM like-PRES.3SG black-PL-ELA-ADD olive-PL-ELA

Now, assume that ADD prefers to adjoin as soon as it can, i.e. as soon as there is a good *F*-marked host-associate for it. This means that optimally, the sister node of ADD is its *F*-marked associate (and nothing more). For (260), this analysis produces the following optimal marking configurations:

(261) **Optimal marking configurations**

a. $[_{KP}\ [_{AP}$ ADD $[_{AP}$ must-i-sta-kin]] $[_{KP}$ oliivei-sta]]]

b. $[_{KP}\ [_{AP}$ must-i-sta] $[_{KP}$ ADD $[_{KP}$ oliivei-sta-kin]]]

In this case, we can derive the markedness of (260a) by assuming that (i) ADD adjoins to a dispreferred location above KP, and (ii) marks its sister node KP with *–kin*. Crucially, this host KP *contains* the F-marked associate of ADD.[7]

(262) **Marginal marking configuration**

$[_{KP}$ ADD $[_{KP}\ [_{AP}$ must-i-sta] $[_{KP}$ oliivei-sta]]-kin]

Then, the problem with (260b) is that even if ADD is adjoined to the higher KP, it cannot place *–kin* on the *inside* of its sister node KP, even though that KP does contain the F-marked associate of ADD.

(263) **Impossible marking configuration**

$[_{KP}$ ADD $[_{KP}\ [_{AP}$ must-i-sta-*kin] $[_{KP}$ oliivei-sta]]]

The marking process that I assume therefore does not correspond to head-movement: it leaves the additive operator alone in its adjoined position. This assumption will become important later on, when I propose that the operator moves from its position for purposes of semantic interpretation (cf. the syntax and semantics of *–kO* developed in sections 2.3.3.3 and 2.3.3.4).[8] Recently,

[7] This means that there are indeed cases where the morphological host of *–kin* (or *–kAAn*) is not strictly speaking the associate of the additive operator. However, the markedness of these examples suggests that this structural option is only marginally available, and it moreover remains faithful to the general requirement that ADD be adjoined locally.

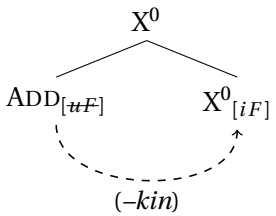
[8] Note that this type of 'marking' has been independently been proposed to be at play in e.g. Finnish case-marking (Nikanne, 1993).

Agree-based marking mechanisms have been argued to be able to replace the notion of head-movement altogether: Bruening (2017), for example, proposes that "by agreeing with clausal heads, [morphological markers] indicate that those heads are present and what their values are" (p. 31). Thus, tense-marking on a verb can be analysed as the product of Agree with T^0. In the same way, in (263), the presence of *–kin* can be seen as a marker indicating that a local additive operator is present. That the marker has to be on the sister node of the operator – be it either the F-marked associate (optimal case) or a constituent that contains the F-marked associate (marginal case) – is indicative of a very local relationship between ADD and its associate.

5.1.2.2 X^0-hosts

In addition to adjunction to XPs, I assume that ADD may adjoin to heads. As in the head-adjoining case, ADD Agrees with the $[iF]$-carrying head it adjoins to, deleting its $[uF]$-feature, and marks its host with *–kin*.

(264) **Left-adjoined ADD (pre-final)**



In practice, bound additives adjoin to (possibly complex) heads when *–kin* (and *–kAAn*) appear on verbs. The analysis of head-adjoining *–kin* is thus very similar to the analysis of the question clitic *–kO*, which I also argued to be able to adjoin to heads or phrases in sections 2.3.3.3 and 2.3.3.4.

5.1.3 Summary

In this section, I proposed that while the unbound *myös* is the surface realisation of the additive operator ADD, the bound *–kin* is a marker that appears in the presence of a covert additive operator (Lee, 2004; Bruening, 2017). Although I labeled this operator as ADD in this section, I will argue in chapter 6 that the relevant operator for bound additives is in fact semantically distinct from ADD. The differences between ADD and BADD partly explain the different distributions of bound and unbound additives in Finnish.

One theoretical issue that was raised in this section concerns the possibility of Agree-motivated movement, i.e. the possibility to delete uninterpretable features by (covert) movement. In particular, I proposed that unbound additives must sometimes (covertly) move above their associate

in order for their [*uF*]-feature to be deleted. While such configurations have been previously classified as unattested, at this point, I simply postulate that it is possible.

In the next section, I move on to consider the form alternation question, i.e. the choice between *–kin* vs. *–kAAn* in the bound domain, and *myös* vs. *myöskään* in the unbound domain.

5.2 The form alternation question

Applied to Finnish, the form alternation question (see section 3.1.4) is the following: Do *myöskään* and *–kAAn* have the same semantics as their "polar pairs", or a different semantics? In other words, do some additives necessarily scope above negation, as per the scope approach, or do some additives necessarily scope under negation and have a different semantics, as per the polarity approach? In section 4.1.1, I presented some Finnish data in favour of the scope approach. Here, I will repeat the relevant argument (section 5.2.1) and present additional issues and challenges of the polarity approach that arise in the domain of questions (section 5.2.2). Finally, in section 5.2.3, I propose that the feature that distinguishes the polar pairs is a topicality feature.

5.2.1 Scope with respect to negation

In section 4.1.1, I argued that data from the deontic universal modal *tulla* and sentential negation supports the scope approach to the form alternation question, i.e. to the question of whether *myöskään* and *–kAAn* scope under or over negation. In short, the data shows that an additive whose associate is embedded under the deontic universal *tulla* and negation – of which the former scopes over the latter – conveys a presupposition that always contains the deontic modal, and by transitivity, negation. Therefore, it is necessary for *myöskään* and *–kAAn* to be able to take scope above negation, which in turn means that they do not have the status of a negative polarity items (at least in the sense of Rullmann, 2003).

The relevant data from (172) and (173) is repeated below in (265) and (266). The host sentence of the additive in both (265) and (266) involves a prohibition: the deontic modal *tulla* takes scope above negation. By transitivity of scope, the polarity approach predicts that the additive will necessarily be interpreted below negation; in that case, the antecedent is not required to be prohibitive. The scope approach, however, predicts that the additive may be interpreted either between the modal and negation, or above both. In the latter case, the antecedent must be prohibitive. As (265) and (266) show, it is the prediction of the scope approach that is confirmed: while the first sentence in (265a) and (266a) may well be reinterpreted as somehow illustrating the prohibition for surgeons to be nervous, the simple change of the adjective to *keskittynyt* 'focused' in the (b)-examples leads to infelicity. This is because surgeons are typically required to be focused. Crucially, the polarity approach predicts that the additive presupposition is simply satisfied by the surgeon not having some property distinct from tiredness. In other words, the additive presupposition of the (b)-sentences should be satisfied, but the infelicity of the example

shows that it is not.

(265) **Deontic modal included in additive meaning: *myöskään***
[Context: A is about to undergo surgery. A and B talk about the operating surgeon.]

a. – *Kirurgi* *e-i* *näytä* *hermostunee-lta.*
surgeon.NOM NEG-3SG seem.CONN nervous-ABL

– *Häne-n* *e-i* *tule* *ol-la* *myöskään* *väsynyt*
(s)he-GEN NEG-3SG must.CONN be-INF ADD tired.NOM
'The surgeon does not seem nervous. – (S)he should also not be tired'

b. # – *Kirurgi* *e-i* *näytä* *keskittynee-ltä.*
surgeon.NOM NEG-3SG seem.CONN focused-ABL

– *Häne-n* *e-i* *tule* *ol-la* *myöskään* *väsynyt*
(s)he-GEN NEG-3SG must.CONN be-INF ADD tired.NOM
'The surgeon does not seem focused. – (S)he should also not be tired'

(266) **Deontic modal included in additive meaning: *–kAAn***
[Context: A is about to undergo surgery. A and B talk about the operating surgeon.]

a. – *Kirurgi* *e-i* *näytä* *hermostunee-lta.*
surgeon.NOM NEG-3SG seem.CONN nervous-ABL

– *Häne-n* *e-i* *tule* *ol-la* *väsynyt-kään*
(s)he-GEN NEG-3SG must.CONN be-INF tired.NOM-ADD
'The surgeon does not seem nervous. – (S)he should also not be tired'

b. # – *Kirurgi* *e-i* *näytä* *keskittynee-ltä.*
surgeon.NOM NEG-3SG seem.CONN focused-ABL

– *Häne-n* *e-i* *tule* *ol-la* *väsynyt-kään*
(s)he-GEN NEG-3SG must.CONN be-INF tired.NOM-ADD
'The surgeon does not seem focused. – (S)he should also not be tired'

In sum, the fact that both *–kAAn* and *myöskään* may be interpreted above negation – as demonstrated by (265) and (266) – is evidence that they are not negative polarity items, at least not in the way proposed by Rullmann (2003).[9] If this is the case, then it becomes hard to maintain that the distribution of *–kAAn* and *myöskään* is regulated by sentence polarity. In the next section, I put

[9] In another line of work, negative polarity items have been suggested to have universal quantificational force, and to take scope above negation (Giannakidou, 2000). Under this analysis of polarity-sensitivity, support for the scope approach would consist in showing that the additive operators associated with *–kAAn* and *myöskään* may sometimes take scope *below* negation (which would on this account show that they are not polarity-sensitive). I leave this issue open for now.

forth another argument for abandoning sentence polarity as the determining factor in the scope of *–kAAn* and *myöskään*.

5.2.2 Distribution in polar and recurring-issue questions

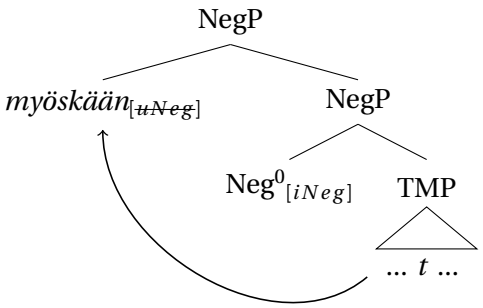
In the previous section, I showed that *–kAAn* and *myöskään* may both outscope negation, supporting the scope approach over the kind of polarity approach where negative polarity items must necessarily scope under negation. Now, recall from section 3.2.1 that the scope approach – whatever its driving force is – must explain how the surface form of the additive is determined if the additives have the same semantics. Under the T/Y-model of grammar, it cannot be assumed that the PF-form of the additive is determined by movements that happen at LF: no information may pass between the two interfaces. However, LF and PF *are* connected – by syntax. If we assume that the so-called "polar pairs" differ in their syntax, the question becomes: what feature is responsible for the difference we see between *myös* and *myöskään* on the one hand, and *–kin* and *–kAAn* on the other? In this section, I argue against a polarity-feature based scope approach, and pave the way for an approach based on a topicality feature.

For the sake of the argument, let us begin by assuming that the polarity approach to the form alternation question is right, and formulate a proposal for the syntax of *–kAAn* and *myöskään* using a polarity feature. If we assume that the expression of sentential negation in Finnish is semantically negative, it should carry an interpretable negation-feature [$iNeg$] (Zeiljstra, 2004). We may then postulate that the operators associated with *myöskään* and *–kAAn* carry an uninterpretable negation-feature [$uNeg$].[10] The deletion of [$uNeg$] through Agree requires the operator to c-command sentential negation ([$iNeg$]). As we have seen that both *myöskään* and *–kAAn* may appear below negation in surface syntax, let us continue to assume that the relevant position is sometimes reached via covert movement.

The tree diagram in (267) illustrates the [$uNeg$]-based analysis of *myöskään*, which is assumed to directly lexicalise the additive operator. With *–kAAn*, the covert movement above NegP would concern the additive operator associated with the clitic. (For purposes of clarity, the deletion of [uF] on the additive is not shown below.)

[10] Given the morphological composition of *myöskään*, we could also assume that the relevant feature is associated with the clitic *–kAAn*. I will not develop a decompositional analysis of *myöskään* here.

(267) **Analysis of *myöskään* with** [$uNeg$]



In principle, as long as the other negative expressions with which *myöskään* and *–kAAn* appear (e.g. *tuskin* 'probably not, hardly') involve [$iNeg$], the polarity-based analysis sketched above works. However, there is one context in which the involvement of [$iNeg$] can be disputed, and in which both *–kAAn* and *myöskään* may appear: polar interrogatives (268) (see section 4.1).

(268) **Polar interrogative with *myöskään***

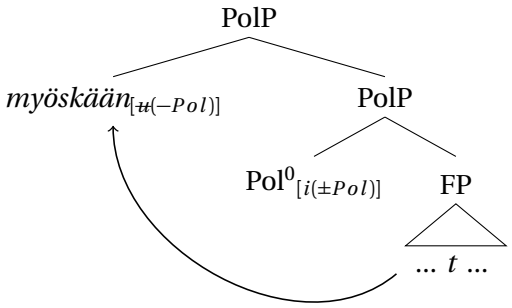
Pitä-ä-kö	*Mari*	*myöskään*	*must-i-sta*	*oliive-i-sta?*
like-PRES.3SG-Q	Mari.NOM	ADD	black-PL-ELA	olive-PL-ELA

'Does Mari like black olives either?'

While there is no overt negative expression in (268) that could naturally be assumed to carry [$iNeg$], it has been proposed that (Finnish) polar interrogatives have a polarity feature that is neither negative nor positive (Holmberg, 2015) . Formally, Holmberg proposes that this feature is 'disjunctive', and notates it as [$\pm Pol$]. Declaratives, on the other hand, involve either [$+Pol$] (positive polarity) or [$-Pol$] (negative polarity). In Holmberg's system, [$uNeg$] thus corresponds to [$u(-Pol)$], and it is deleted through Agreement with [$i(-Pol)$].

If we assume that polar interrogatives involve a [$i(\pm Pol)$] feature, and that this disjunctive feature is allowed to Agree with both [$u(-Pol)$] and [$u(+Pol)$], then *myöskään* and *–kAAn* are in fact correctly predicted to be 'licensed' in polar interrogatives. In this case, the relevant configuration in polar interrogatives corresponds to (269) (where [$i(\pm Pol)$] is located on an FP-dominating polarity head Pol^0, as suggested by Holmberg).

(269) ***Myöskään* in polar interrogatives: $[u(-Pol)]$ analysis**



However, as we saw in section 4.2, the polar use of bound additives makes it clear that the interpretable feature that is responsible for the involvement of polar alternatives – which is arguably the semantic role of the disjunctive $[i(\pm Pol)]$ in Holmberg's analysis of polar interrogatives – is not restricted to a single syntactic projection. In particular, we saw that any tensed F-marked verb may give rise to polar alternatives on the polar use of bound additives. Moreover, these structures do not have disjunctive polarity: the sentences are $[i(+Pol)]$ (in Holmberg's terms), and the involvement of polar alternatives is linked to the $[iF]$-feature on the tensed, F-marked verb, and reflected in the focus semantic value of the structure.

In other words, the assumption that polar interrogatives involve a disjunctive polarity feature in their syntax is unnecessary: the relevant semantic facts can be derived by relying on a focus feature whose nature and existence has independent support. However, if no $[i(\pm Pol)]$ feature is involved in the syntax of polar interrogatives, then *myöskään* should be acceptable in polar interrogatives such as (268) simply because it successfully associates with an F-marked constituent. Now, it is in turn unclear why *myöskään* is unavailable in positive declaratives:

(270) **Positive declarative with *myöskään***

* *Joni*	*pitä-ä*	*myöskään*	*must-i-sta*	*oliive-i-sta*
Joni.NOM	like-PRES.3SG	ADD	black-PL-ELA	olive-PL-ELA

Int. 'Joni likes black olives too'

Clearly, something more than a focus feature is at play in the syntax of *myöskään* and *–kAAn*. However, the evidence for that feature being $[uNeg]$ or $[u(-Pol)]$ is not convincing. In addition to the conceptual issues discussed above, a further problem for the polarity feature approach is posed by the recurring-issue use of *–kAAn* (section 4.5).[11] In Finnish, recurring-issue questions are *wh*-questions that also involve an F-marked verb with which *–kAAn* associates. Crucially, the analysis of *wh*-questions does not call for the use of Holmberg's disjunctive polarity feature

[11] Although the recurring-issue use is non-basic use that is only available with *–kAAn*, it is included in this discussion due to its relevance to the form alternation question.

[$i(\pm Pol)$], so explaining the acceptability of *–kAAn* in recurring-issue questions through the use of a polarity feature seems like non-starter. In addition, recurring-issue questions reveal an interesting property of *–kAAn*: in these contexts, the operator associated with seems to be interpreted above the *wh*-question, so that the antecedent is also a question (or issue) (see section 4.5). For such an interpretation to arise, the additive operator must move to a position above the *wh*-phrase and the Q-particle, i.e. above FocP. It seems unlikely that this movement step would be driven by any kind of sentence polarity feature.

(271) **Surface syntax of recurring-issue question with *–kAAn***

[$_{FocP}$ *Mi-ssä*	[$_{FP}$ *sinä*	*kävi-t-kään*	*t*	*(viime*	*kesä-nä)*	*]]?*
where-INE	you.NOM	visit-PAST.3SG-ADD		last	summer-ESS	

'Which place did you visit again (last summer)?'

In sum, if the position in which the additive operators associated with *–kAAn* and *myöskään* are interpreted is determined by a polarity feature, it is unclear how to account for their acceptability in polar and recurring-issue questions. In the next section, I consider another candidate for explaining the relevant scope of the additives: a topicality feature.

5.2.3 An approach based on a topicality feature

Although an analysis in terms of a polarity feature seems like a natural option to adopt for explaining the distribution of *myöskään* and *–kAAn*, in section 5.2.2 I argued that the distribution of *–kAAn* and *myöskään* in fact seems to be independent of polarity. In this section, I consider another feature that would require *myöskään* and *–kAAn* to (overtly or covertly) move above negation in the syntax, and that can be naturally associated with them.

Besides polarity, additives are inherently connected to *discourse-oldness*, which in turn is inherently connected to *topicality*. Indeed, many authors have argued that additive presuppositions relate to pieces of information that must be part of the context when the additive is used felicitously. In typical cases, the antecedent is discourse-old (i.e. it has been explicitly uttered before). Therefore, it is worthwhile to consider what we could gain by adopting an analysis in terms of a topicality feature.

The typical position of topical and discourse-old constituents is SpecFP in Finnish (Holmberg and Nikanne, 2002) (see section 2.3). In addition, as was mentioned in section 2.3.3.2, t the Finnish left periphery has also been argued to contain a high TopP projection that may only be filled with overt material in sentences with preposed polarity items (Kaiser, 2006), and possibly in uncanonical *–kO*-questions (cf. section 2.3.3.4). Both of these positions are syntactically above NegP, and a FocP projection is sandwiched between them. The positions of topicalised elements in the Finnish left periphery and finite clause are shown in (272).[12]

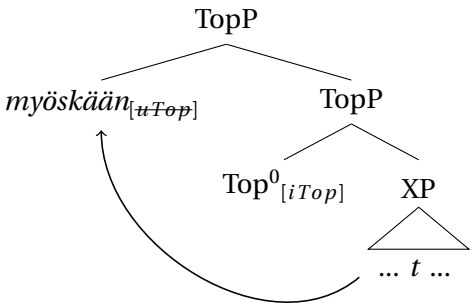
[12]Note that in (272), PolP and NegP are separate: this is because PolP is now the landing position of preposed

(272) **Topical positions in the Finnish CP and finite clause (Kaiser, 2006)**
ForceP > PolP > **TopP** > FocP > **FP** > NegP > ...

Given that the high TopP may only be *overtly* targeted in specific syntactic circumstances, I assume that it can be *covertly* targeted elsewhere.

Assume now that the operators associated with *–kAAn* and *myöskään* involve the uninterpretable topicality feature [$uTop$]. This topicality feature must Agree with a head that carries [$iTop$]. In (272), there are potentially two such heads: F^0 and Top^0. If it is the latter head that is relevant, the deletion of [$uTop$] requires the additive operator to move above above Top^0 (cf. section 2.1.1.3 on Agree-motivated movement). In this case, the operator will also be positioned above FocP (as is required for the recurring-issue use of *–kAAn*). The relevant movement is shown in (273) for *myöskään*. With *–kAAn*, we must assume that [$uTop$] is projected to the host XP: otherwise, the required c-command relationship between [$uTop$] and [$iTop$] cannot be established.[13]

(273) **Movement of *myöskään***



If the additive operator carried [$iTop$] instead, the Agree-relationship between Top^0 and the operator would have to be established by making reference to the EPP-feature or some other uninterpretable feature. As the EPP-feature is standardly linked to *overt* movement, it is unlikely that the EPP would be at play. Moreover, the general plausibility of attributing different interpretable (i.e. semantically relevant) features to the operators associated with *–kAAn/myöskään* and *–kin/myös* respectively is weak. Therefore, I will assume that the additive operators associated with *–kAAn* and *myöskään* carry [$uTop$], as in (273).[14]

polarity elements (Kaiser, 2006), not the base-generation position of e.g. negation. Holmberg's PolP is more like NegP, but it is located between FocP and FP (not shown in (272))(Holmberg, 2003, 2015).

[13]Admittedly, this is an undesirable result, but the same kind of trick would also have to be assumed if the relevant feature were [$u(-Pol)$]. In the absence of a more elegant solution, I adopt this idea here, but remain open for other implementations. In the rest of the dissertation, I will continue to talk as if the relevant feature could be just on the additive operator.

[14]Note that this choice leads to a slight discrepancy; Top^0 carries the interpretable [$iTop$], while Foc^0 carries the uninterpretable [uQ] (inherited from $Force^0$ under our assumptions: see section 2.3.3). However, the assumption that the Q-particle itself carries the interpretable feature is natural – after all, it is the Q-particle that is relevant for the

As was mentioned above, the possibility of [*iTop*] appearing on Top^0 explains why the additive operator associated with *–kAAn* scopes over a question on its recurring-issue use. However, it must also be possible for [*iTop*] to be located on F^0. This is because of the acceptability of (274), where *myöskään* again appears in a polar question.

(274) **Polar interrogative with *myöskään***

[*Mari* *e-i* *pidä* *vihre-i-stä* *oliive-i-sta.*]
Mari.NOM NEG-3SG like.CONN green-PL-PAR olive-PL-PAR

Pitä-ä-kö *Mari* *myöskään* *must-i-sta* *oliive-i-sta?*
like-PRES.3SG-Q Mari.NOM ADD black-PL-ELA olive-PL-ELA
'Does Mari like black olives either?'

In (274), the antecedent is not a question, but a proposition. However, if [*iTop*] can only be carried by Top^0, it is hard to explain how the antecedents can be of different semantic types in polar interrogatives with *myöskään* (or *–kAAn*) and in recurring-issue *wh*-questions. Crucially, in this dissertation, the semantics of the additive operator associated with *myöskään* is designed to not be compatible with the needs of recurring-issue questions (see chapter 6), and therefore, the acceptability of *myöskään* in (274) calls for another explanation. Here, I simply stipulate that both Top^0 and F^0 may be the carriers of [*iTop*] in the syntactic structure. Thus, in polar interrogatives, *myöskään* is not above FocP, and it does not have a non-propositional prejacent.[15]

Unfortunately, the topicality approach – without further modifications – suffers from an overgeneration problem: *–kAAn* and *myöskään* should be felicitous in *any* sentence that contains Top^0 or even F^0. In particular, as it makes no sense to restrict the availability of Top^0 and F^0 to e.g. negative declaratives and polar interrogatives – the main contexts in which *–kAAn* and *myöskään* appear – it seems that additional assumptions are required for the distribution of *–kAAn* and *myöskään* to be explained. In the next section, I consider a possible solution to this issue.

5.2.4 Overgeneration and choice of additive

In this section, I discuss a second issue that arises with the the topicality approach: if the relevant feature that distinguishes *–kAAn* from *–kin* and *myöskään* from *myös* is [*uTop*], we need an

semantics of interrogativity. By analogy, if Top^0 carries [*iTop*], it is also the head that is relevant for the semantics of topicality. For Rizzi (1990, p. 186), the interpretative effect of Top^0 is that the phrase in its specifier is interpreted as a topic, and the complement XP as a comment about that topic. This general effect seem to be compatible with the interpretation of additives.

[15]One issue that arises is the choice between F^0 and Top^0: if the closer head F^0 is available for [*uTop*]-deleting Agreement, why would the operators associated with additives go above and beyond it to Agree with Top^0? I propose that it is possible that in cases where the additive operator takes scope above FocP, [*iTop*] is only present on Top^0. This could be the case regardless of whether SpecFP hosts a (subject or non-subject) topic if movement to SpecFP is generally driven by an EPP-feature (and not a topicality feature). In general, it is possible that the additive operators often adjoin to FP, and not TopP, as indicated in the derivations of this chapter. I leave the in-depth investigation of this issue for future work, and retain the Top^0-Agreeing analysis for the example derivations within this dissertation.

explanation as to why positive polarity sentences with *myöskään* and *–kAAn* are ruled out.

To begin, note that so far, I have proposed that the syntactic features associated with unbound and bound additives are those shown in (275).

(275) **Feature composition of bound and unbound additives**

a. *–kin*: $[uF]$
   –kAAn: $[uF, uTop]$

b. *myös*: $[uF]$
   myöskään: $[uF, uTop]$

With both bound and unbound additives, one of the two is featurally richer than the other. Thus, from the perspective of economy of operations, all else being equal, the use of a simpler additive is preferred over a more complex one. This is because *–kAAn* requires the establishment of two Agree-relationships, but *–kin* only requires one.

All else is not always equal, though: although *–kAAn* and *myöskään* are featurally more complex, they are also the only additives that must be interpreted above negation (or in some cases, FocP).[16] This means that a speaker that chooses to use these additives does so because they *intend* to communicate a presupposition that can only be derived if the additive operator scopes above negation.

This idea can be cashed out as follows. Assume that the syntactic derivation begins with the speaker collecting items to form a numeration. These items are selected based on their usability for the expression of the thought(s) that the speaker wants to express. If the numeration contains negation, choosing to include the lexical item that is realised as *–kin* ensures that the additive presupposition will be triggered below negation. The presence of an element that carries $[iTop]$ in the numeration does not matter, given that *–kin* has no $[uTop]$. However, choosing to include *–kAAn* in the numeration now requires $[iTop]$ to be present, and furthermore ensures that the additive presupposition is derived above negation.

The same type of reasoning can also be used to explain how *myöskään* and *–kAAn* can ever appear in polar interrogatives – and why they do not have the same felicity requirements as *myös* and *myöskään*:

[16] As was already noted by Karttunen and Karttunen (1976) (see section 3.2.1), *–kin* and *myös* scope *under* negation when they co-occur.

(276) **Antecedents for additives in polar interrogatives**

a. [*Mari läht-i / #Mari e-i lähte-nyt.*]
Mari.NOM leave-PAST.3SG Mari.NOM NEG-3SG leave-PASTPART

Läht-i-kö Joni-kin?
leave-PAST.3SG-Q Joni.NOM-ADD
'(Mari left/#Mari did not leave.) Did Joni leave too?'

b. [*Mari e-i lähte-nyt / #Mari läht-i.*]
Mari.NOM NEG-3SG leave-PASTPART Mari.NOM leave-PAST.3SG

Läht-i-kö Joni-kaan?
leave-PAST.3SG-Q Joni.NOM-ADD
'(Mari did not leave/#Mari left.) Did Joni leave either?'

The key lies in the assumption that in polar interrogatives, there are two sources of alternatives: the associate of the additive, and the F-marked verb. However, as the F-marking on the verb is only introduced with tense (in some projection within the FP-TMP region), only additive operators whose prejacent contains the F-marked verb will be able to refer to the alternatives that are introduced by it. Crucially, we have proposed that the operators associated with *–kAAn* and *myöskään* must be interpreted at least above F^0, while the operators associated with *–kin* and *myös* are not subject to such a requirement. In other words, it is possible that the the use of *–kAAn* and *myöskään* in polar interrogatives is driven specifically by the possibility to refer to negative focus alternatives (by way of scoping over the F-marked verb): the operators associated with *–kin* and *myös* could well be interpreted too low, perhaps adjoined to *v*P. I take this sketch of an analysis to show that a polarity feature is not necessary for deriving the distribution of *–kAAn* and *myöskään*.

Thus, the speaker chooses items to be part of the numeration depending on what the they wish to communicate: in the case of additives, the relevant decision concerns the form of the presupposition – or more specifically, the form of the prejacent. For the hearer, the form of the additive signals where the additive operator must be interpreted, and what kind of focus alternatives are involved. From a Stalnakerian perspective, it is natural to assume that when a speaker uses an additive, they know which antecedent they have in mind, and therefore, they select additives that optimally allow their hearer to recover that antecedent as well.

This means that the approach outlined in this section avoids a major issue that the scope approach faces within the T/Y-model of grammar: the surface form of the additive does not depend on a relation that is determined only at LF based on a 'trial-and-error' mechanism (i.e. the hearer first tries position 1; if the presupposition triggered from this position is not satisfied, the additive moves higher up to position 2). In fact, the surface form of additives – or more specifically, their syntax, given that the surface forms are related to different syntactic features – already indicates

where the additive must be located at LF.

5.3 Basic semantics

In this section, I present the semantics that I assume for the operator ADD. As has been mentioned before, I assume that this operator covers a proper subset of the cases that are covered by BADD, which is presented in chapter 6. I assume that ADD is only associated with the unbound additives *myös* and *myöskään*. Given the overlap between ADD and BADD, however, the general discussion of additive semantics in this section concerns both unbound and bound additives.

5.3.1 Preliminaries

Thus far, I have argued that with respect to the form alternation question, the scope approach is superior to the polarity approach (section 5.1). I have also noted that existential approaches that directly encode truth value requirements in the semantics of the additive oeprator cannot account for e.g. the polar use of bound additives (section 3.2). And finally, in sections 3.3 and 5.2, I proposed that Stalnaker's (1973; 1974, a.o.) speaker presupposition approach is particularly suitable for the analysis of additive presuppositions. On this approach, a speaker that uses an additive signals that somewhere in the discourse context, there is a specific focus alternative of the prejacent α (i.e. an antecedent β) of which the speaker is thinking, or that is 'on their mind'.

The formal analysis that I propose in this dissertation is a mixture of Stalnakerian speaker presupposition and Alternative Semantics (Rooth, 1985, 1992). I propose that while the speaker typically uses an additive with a specific β in mind, the presupposition itself takes the form of a metaproposition concerning the context (Heim, 1990). In section 3.3, I showed that the perceived felicity of the use of an additive when the identity of β is not common ground is highly context-dependent. Thus, when the hearer believes that they should be able to recover the identity of β but cannot, they may protest (cf. Kapitonov, 2012); when they have no such belief (e.g. in the context of a game or a competition), they are satisfied with having simply discovered that the speaker does have some β in mind.

One question that this analysis gives rise to is whether the meaning of additives can, after all, be described as a conventional implicature (Karttunen and Karttunen, 1976; Karttunen and Peters, 1979). Indeed, Heim (1990) notes that the type of meta-proposition that is proposed here could be analysed as a conventional implicature. Both conventional implicatures and presuppositions project, so projection behaviour cannot be used to tell the two types of meaning apart (Simons et al., 2010). There is one major difference between them, though, and I use this difference to justify the analysis as presuppositional. In particular, the current view of conventional implicatures takes them to be typically anti-backgrounded, which means that they provide new information (Potts, 2005). Presuppositions, however, consist of information that is typically backgrounded, and taken for granted. Although there is a way to use speaker presuppositions to in-

troduce new information into the conversation (through what Stalnaker (1973) calls informative presuppositions), the typical situation is one where the content of the speaker presupposition is already common ground. This is the case with additivity, and this is why the analysis of additivity presented in this dissertation is couched in terms of presupposition, and not conventional implicature.

Crucially, the semantics that I propose for additive operators does not involve anaphora (of any type). It also does not involve general existential statements derived by replacing the (individual) associate of the additive with an e-type variable and binding it. Instead, I take the prejacent to always be of (at least) propositional type. This allows a more straightforward analysis of cases where the relevant focus alternatives are polar, and avoids the problem of set truth values. Indeed, the meta-proposition I formulate states, at its simplest, that there must be some antecedent β, where β must be a member of Γ (i.e. the set of alternatives that is related to the focus semantic value of the prejacent α by the squiggle operator), that is part of (or a member of) some component of the discourse model. With bound additives, the *source* (i.e. location within the discourse model) of β may vary; with unbound additives, the source is restricted to being the common ground. For a speaker, locating a specific β somewhere within the context is a typical reason for using an additive. For the hearer, the existential meta-proposition leads to the search for the identity of this β (Kapitonov, 2012) – unless this search is discouraged by the discourse context. As will become clear in chapter 6, the Stalnakerian view of accommodation as the hearer's attempt to adjust what they think to be common ground with what the speaker is perceived as taking to be common ground is particularly interesting in the analysis of e.g. the polar use, where the hearer immediately knows which β the speaker has in mind, although β may be fully 'private' until the utterance of the sentence that leads to its identification.

5.3.2 The squiggle and ADD

As mentioned above, I assume that ADD signals that the speaker has in mind some antecedent β, and more precisely, that β is located within the common ground ($c\,g$). This antecedent must be a member of Γ, the free contextual variable that in the simplest case denotes a set of propositions. Due to the meaning of the squiggle, the denotation of Γ is restricted to being a subset of the focus semantic value of the focus semantic value of the prejacent α. The exact presuppositions of the squiggle are repeated below in (277) (see section 2.1.3).

(277) **Presuppositions of the squiggle: set case (Rooth, 1992, p. 19)**
With $[\![\alpha]\!]^o$ of type $\langle s,t\rangle$ and $[\![\alpha]\!]^f$ of type $\langle s\,t,t\rangle$, $\sim(\Gamma)(\alpha)$ is defined iff
(i) $\Gamma \subseteq [\![\alpha]\!]^f$
(ii) $[\![\alpha]\!]^o \in \Gamma$
(iii) $\exists\beta[\beta \in \Gamma \wedge [\![\beta]\!]^o \neq [\![\alpha]\!]^o]$

The first condition in (277) requires Γ to be a subset of the focus semantic value of the prejacent α; the second condition requires the ordinary semantic value of the prejacent α to be a member of Γ; and the third condition requires that Γ contains a member whose ordinary semantic value is distinct from the ordinary semantic value of the prejacent α. When these presuppositions are satisfied, the squiggle returns the prejacent. It can therefore be modelled as a function from sets of propositions (Γ) to an identity function (a function from α to α). In (278), the presuppositions of the squiggle are expressed as a definedness condition between a colon and a dot. To avoid repetition, I use '(277)' as a shorthand for the relevant presuppositions in (278).

(278) **Squiggle semantics**

$[\![\sim]\!]_{\langle\langle st,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle st,t\rangle} . \lambda\alpha_{\langle s,t\rangle} : (277) . \alpha$

I propose that the use of the unbound additives *myös* and *myöskään* signals that the speaker takes the cg to contain an antecedent β that is distinct from the prejacent α, and that is a member of Γ.[17] The semantic entry for the operator ADD is given in (279).[18] Like the squiggle, it takes a set of propositions (Γ) and a proposition (the prejacent, i.e. the output of $\sim(\Gamma)(\alpha)$). Under the definedness condition view, (278) outputs α if the presupposition between the colon and the dot is defined. Although there is a slight risk of confusion, I also retain the colon-dot notation for indicating what the speaker presupposition (SPS) of the additive operator is, as (279) shows.

(279) **Semantics of ADD (for basic use)**

$[\![\text{ADD}]\!]_{\langle\langle st,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle st,t\rangle} . \lambda\alpha_{\langle s,t\rangle} : \exists\beta[\beta \in \Gamma \wedge \beta \neq \alpha \wedge \beta \in cg]_{SPS} . \alpha$

Speaker presupposition: There is some β such that β is a member of Γ (a set of focus alternatives of the prejacent α), β is distinct from the prejacent α, and β is a member of the common ground cg

[17] Later on, based on data from unbound additives, I will argue that ADD does not encode a distinctness condition, and that the distinctness effect is pragmatic in nature (Beaver, 2001).

[18] The semantics in (279) could also be modified so that it requires the presence of some β' within the cg that *entails* some β within Γ. This modification would explain why in (i), example (a) is felicitous, but (b) is not ((almost) all beers are alcoholic beverages, while all alcoholic beverages are not beers) (cf. Kaplan, 1984):

(i) a. *[Mari* *tilas-i* *olue-n.]* *Joni-kin* *tilas-i* *alkoholijuoma-n*
Mari.NOM order-PAST.3SG beer-ACC Joni.NOM-ADD order-PAST.3SG alcoholic.beverage-ACC
'(Mari ordered a beer.) Joni ordered an alcoholic beverage, too'

b. *#[Mari* *tilas-i* *alkoholijuoma-n.]* *Joni-kin* *tilas-i* *olue-n*
Mari.NOM order-PAST.3SG alcoholic.beverage-ACC Joni.NOM.ADD order-PAST.3SG beer-ACC
'(Mari ordered an alcoholic beverage.) Joni ordered a beer, too'

If we incorporated this possibility, additive semantics could be as in (ii). Now, β and β' may be identical, or the cg-contained antecedent may be a proposition that entails β.

(ii) Semantics for ADD (for basic use)

$[\![\text{ADD}]\!]_{\langle\langle st,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle st,t\rangle} . \lambda\alpha_{\langle s,t\rangle} : \exists\beta,\beta'[\beta \in \Gamma \wedge \beta \neq \alpha \wedge \beta' \subseteq \beta \wedge \beta' \in cg]_{SPS} . \alpha$

Note that on the speaker presupposition view, whether or not the hearer is able to retrieve the identity of β does not change the output of the semantic computation. I thus follow Kapitonov (2012) in assuming that the infelicity of additives is a pragmatic issue. Moreover, note that technically, the additive operator itself does not presuppose anything: the lexical entry rather encodes *presupposition requirement* on the use of its host sentence S (Stalnaker, 1999). Due to this requirement, the use of S requires the speaker to make the relevant speaker presupposition. For reasons of perspicuity, I will nevertheless continue to talk as if additive presuppositions were triggered by the additive operator.

As mentioned before, at this point, it is sufficient for our needs to work with only one ADD (as defined in (279)); later, accounting for the wider distribution of the bound additives will require a definition of two more operators (see chapters 6 and 7).

5.3.3 Example derivations

In this section, I present example derivations with ADD. The first two examples are positive (280) and negative (281) declaratives with *myös* and *myöskään*, respectively. Note that the semantic contribution of tense is not spelled out formally here or elsewhere in this dissertation.[19] In all examples, I use a 'direct' set representation of the focus semantic value of α instead of the more concise set notation used earlier (cf. section 2.1.4). This choice is made for visual clarity, since it allows immediate comparison of the members of Γ and $[\![\alpha]\!]^f$, and easy identification of the prejacent α and the antecedent β.

In our first example in (280), ADD associates with the F-marked subject *Mari* (280a), and has its $[uF]$ feature deleted through Agree (not shown). As the subject is in SpecFP, ADD can be assumed to be adjoined to FP, above the subject and the squiggle (280b). Both ADD and the squiggle take Γ as their first argument (280c). The ordinary semantic value of α, i.e. node ①, corresponds to the proposition shown in (280d); its focus semantic value is a set of propositions in which each the F-marked subject has been replaced with other e-type objects. In (280), I assume that this set is {Mari, Joni, Anna, ...}. The ordinary semantic value of ② is the same as the ordinary semantic value of ①, i.e. α, if the presuppositions of the squiggle are satisfied (280e). (Note the focus-neutralising effect of the squiggle for the focus semantic value of α: see section 2.1.3.) At ③, the ordinary semantic value is copied from ②: the whole structure is true at w_0 iff Mari left in w_0. If Γ is resolved to the set shown in (280f), the speaker presupposition can be deduced to concern the proposition *that Joni left*: this β either already is in the common ground, or it becomes part of it due to the utterance.

[19] If additives are tense-insensitive (Abrusán, 2014), then focus alternatives might need to be analysed as tenseless anyway (i.e. compatible with a prejacent of any tense.

(280) **Positive polarity declarative with *myös***

a. **Overt syntax of FP**

[$_{FP}$ Myös Mari läht-i]]

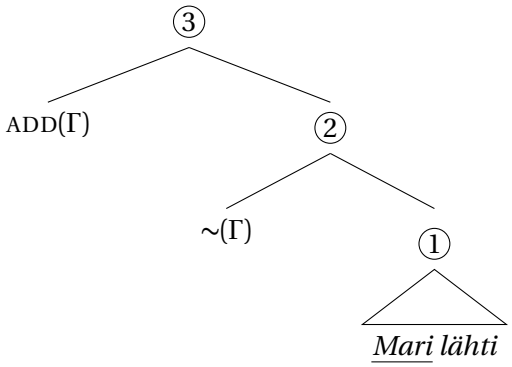
ADD Mari.NOM leave-PAST.3SG

'Mari left, too'

b. **LF of FP**

[$_{FP}$ ADD ∼ *Mari lähti*]

c.



d. $[\![①]\!]^o =$ λw[left(Mari)(w)]

$[\![①]\!]^f =$ {λw[left(Mari)(w)], λw[left(Joni)(w)], λw[left(Anna)(w)], ...}

e. $[\![②]\!]^o =$ defined iff (i) $\Gamma \subseteq [\![①]\!]^f$

(ii) $[\![①]\!]^o \in \Gamma$

(iii) $\exists \beta[\beta \in \Gamma \wedge \beta \neq [\![①]\!]^o]$

when defined, $[\![②]\!]^o = [\![①]\!]^o$

otherwise undefined

$[\![②]\!]^f =$ {$[\![②]\!]^o$}

f. $[\![③]\!]^o =$ $[\![②]\!]^o$

Speaker PS: $\exists \beta[\beta \in \Gamma \wedge \beta \neq [\![②]\!]^o \wedge \beta \in cg]$

Let $\Gamma =$ {λw[left(Mari)(w)], λw[left(Joni)(w)]}

Then $\beta =$ λw.left^w(joni)

The derivation of negative polarity declaratives with *myöskään* proceeds in almost the same way: the difference is that the prejacent has negative polarity, and ADD moves covertly to FP or TopP to have its [$uTop$]-feature deleted (not shown). Now, the additive presupposition states that the cg contains a negative-polarity antecedent (281g).

(281) **Negative polarity declarative with *myöskään***

a. **Overt syntax of FP**

[$_{FP}$ Myöskään <u>Mari</u>$_j$ e-i$_i$ [$_{NegP}$ t_i ... [$_{TMP}$ t_j lähte-nyt]]]]

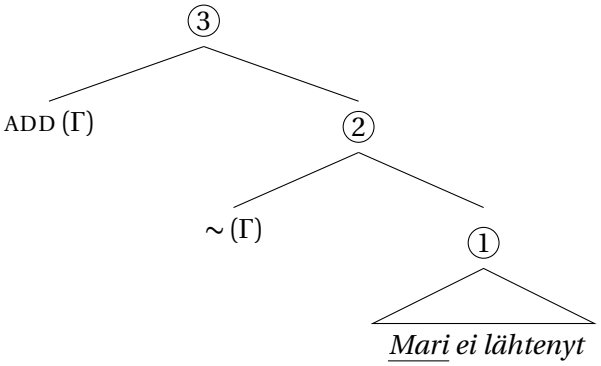
ADD Mari.NOM NEG-3SG leave-PASTPART

'<u>Mari</u> did not leave, either'

b. **LF of FP**

[$_{FP}$ ADD ~ [$_{FP}$ *<u>Mari</u> ei lähtenyt*]]

c.



d. $[\![①]\!]^o =$ λw[¬left(Mari)(w)]

$[\![①]\!]^f =$ {λw[left(Mari)(w)], λw[left(Joni)(w)], λw[left(Anna)(w)]...}

e. $[\![②]\!]^o =$ defined iff (i) $\Gamma \subseteq [\![①]\!]^f$

(ii) $[\![①]\!]^o \in \Gamma$

(iii) $\exists \beta[\beta \in \Gamma \wedge \beta \neq [\![①]\!]^o]$

when defined, $[\![②]\!]^o = [\![①]\!]^o$

otherwise undefined

$[\![②]\!]^f =$ {$[\![②]\!]^o$}

f. $[\![③]\!]^o =$ $[\![②]\!]^o$

Speaker PS: $\exists \beta[\beta \in \Gamma \wedge \beta \neq [\![②]\!]^o \wedge \beta \in cg]$

Let $\Gamma =$ {λw[¬left(Mari)(w)], λw[¬left(Joni)(w)]}

Then $\beta =$ λw[¬left(Joni)(w)]

In addition to the use of unbound and bound additives illustrated by the examples above, I presented two other basic uses in section 4.1: the confirming and the rhetorical uses. I proposed that the analysis of the former involves lexical alternatives that are defined by focus on some modal element within the prejacent, and presented Karttunen and Karttunen's analysis of the latter, whereby the rhetorical *wh*-question formation rule is responsible for the patterning of sentence polarity and universal closure in the perceived meaning of both the question and the additive

meaning. As announced in the respective sections, I do not attempt an explicit formal analysis of these uses here. However, because these uses are available with both unbound and bound additives, the prediction of the proposal I put forth in this dissertation is that they should involve (lexical alternative) antecedents that are in the common ground, and that are of propositional type. The in-depth investigation of this issue is left for future work.

5.4 Summary

In this chapter, I presented the basic syntactic and semantics assumptions I make for the unbound additives *myös* and *myöskään* and the bound additives *–kin* and *–kAAn* in Finnish.

On the syntactic side, I proposed that all four additives carry an uninterpretable focus feature $[uF]$, which is deleted through Agreement with a (local) F-marked associate (Holmberg, 2014). In addition, I argued that *–kAAn* and *myöskään*, but crucially not *–kin* and *–kAAn*, carry an uninterpretable topicality feature $[uTop]$. The deletion of this feature requires them to move to TopP. Due to this movement, *–kAAn* and *myöskään* are interpreted above negation and sometimes even FocP (the landing site of *wh*-phrases). I argued that the topicality feature is a natural choice due to the link between additivity and 'old' information, i.e. the involvement of an antecedent β that the speaker has in mind – which, on the basic use, means that β must be part of the common ground.

On the semantic side, I proposed the following semantics for the operator ADD, which I argued to be associated with unbound additives only.

(282) **Semantics of ADD (for basic use)**

$[\![\text{ADD}]\!]_{\langle\langle st,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle st,t\rangle}\,.\,\lambda\alpha_{\langle s,t\rangle}\,:\, \exists\beta[\beta\in\Gamma\wedge\beta\neq\alpha\wedge\beta\in cg]_{SPS}\,.\,\alpha$

Speaker presupposition: There is some β such that β is a member of Γ (a set of focus alternatives of the prejacent α), β is distinct from the prejacent α, and β is a member of the common ground cg

The denotation in (282) defines the content of the meta-proposition that the speaker presupposition consists of: some focus alternative β (i.e. an antecedent) of the prejacent α is part of the common ground. Typically, the speaker makes this presupposition with a specific antecedent β in mind, and typically, this antecedent is salient in the context. Thus, while the content of the presupposition is an existential statement expressing the existence of an antecedent in the context, the hearer proceeds to try to identify this antecedent – if the context warrants it (cf. section 3.3.1). Crucially, the use of *myös* signals to the hearer that the relevant antecedent has positive polarity, while the use of *myöskään* signals that the antecedent has negative polarity. Thus, the proposal put forth here is neither typically existential nor typically anaphoric: what the speaker presupposes is that there is some antecedent in the context, but this antecedent is not linked to the additive via anaphoric means.

Chapter 6

Introducing BADD

In this section, I propose a semantics for BADD, the additive operator whose presence is signalled by the bound additives *–kin* and *–kAAn* on many of their uses. I argue that BADD differs from ADD in three ways. First, in section 6.1, I show that in contrast to ADD, BADD is *type-flexible*. This allows BADD to function in semantic contexts that involve a prejacent α with a higher-typed focus semantic value than $\langle s\,t, t\rangle$, and is particularly relevant for the analysis of the double-contrast use, which is presented in section 6.1.1. Second, in section 6.2, I argue that BADD may involve an antecedent β that is located elsewhere than in the common ground. I call this property *source-flexibility*, and propose a formal analysis of the polar use that makes crucial use of it in section 6.2.1. And finally, in section 6.3, I argue that BADD and the squiggle do not encode a distinctness requirement in their semantics. I refer to this property as *non-distinctness*, and appeal to it in the formal analysis of the reactive (section 6.3.1), concessive (with connective; section 6.3.2), and recurring-issue (section 6.3.3) uses.

6.1 Type-flexibility

There are two uses of bound additives that require type-flexibility from the squiggle and/or the additive operator: the double contrast use, and the recurring-issue use. The discussion of the recurring-issue use is postponed until section 6.3.3. In this section, I focus on the double contrast use. I begin by proposing a syntax and semantics for the double contrast use. I then propose and justify a modification to the semantics of the squiggle and BADD. Finally, in section 6.1.2, I discuss the relationship between the double contrast use and accommodation from additives.

6.1.1 Double contrast use

The double contrast use differs from the basic use in that it involves two alternative-inducing expressions: a contrastive topic (double-underlined) and a focus (single-underlined). As was shown in section 4.6, the host of the bound additive on the double contrast use is a contrastive topic. The examples in (283) are repeated from (212) and (213). In neither case is there a plain vanilla additive presupposition in play: (283a) does not presuppose that someone distinct from Hugo is reading, and (283b) does not presuppose that someone distinct from Hugo does not like chocolate. Instead, the examples presuppose something along the lines of 'someone (else) does something (else)' in (283a) and 'someone (else) dislikes something (else)'.

(283) **Double contrast use with *–kin* and *–kAAn***

a. Mari wants to have a cup of coffee with Joni, who is taking care of little Hugo and Eino. Mari asks: "Can we have coffee?"
[What are Eino and Hugo doing? What is Eino doing? What is Hugo doing?]
Joni answers:
Eino nukku-u, ja Hugo-kin luke-e, joten juo-daan
Eino.NOM sleep-PRES.3SG and Hugo.NOM-ADD read-PRES.3SG so drink-PASS
vain kahvi-t
only coffee-PL.ACC
'Eino is sleeping, and Hugo is reading, so yes, let's have coffee'

b. Joni has baked a birthday cake for little Eino and Hugo. It has strawberries and chocolate. Joni wonders: "Will Eino and Hugo like the cake?"
[Which cake ingredients do Eino and Hugo not like? Which cake ingredients does Eino not like? Which cake ingredients does Hugo not like?]
Aino answers:
Eino e-i pidä mansiko-i-sta,
Eino.NOM NEG-3SG like.CONN strawberry-PL-ELA
e-i-kä Hugo-kaan pidä suklaa-sta,
NEG-3SG-and Hugo.NOM.ADD like.CONN chocolate-ELA
joten he ei-vät varmaan pidä Joni-n kaku-sta
so they.NOM NEG-3PL probably like.CONN Joni-GEN cake-ELA
'Eino does not like strawberries, and Hugo does not like chocolate, so they probably will not like Joni's cake'

In section 4.6, I argued that double contrast additivity cannot be reduced to broad focus in Finnish: this use is also possible with OVS word order, which in turn is only possible when the object is discourse-old, and the subject is discourse-new (see example (215)). Moreover, I argued that the

contrastive topic carrying *–kin* or *–kAAn* is either in SpecTopP, in SpecFocP, or even higher in surface syntax. Therefore, the analysis of double contrast additivity must explain two things: (i) the movement of the contrastive topic to the CP, and (ii) the two-tiered interpretation induced by the presence of a contrastive topic and a focus.

Let us begin with the second question. Recall from section 4.6 that sentences with contrastive topics have both an ordinary semantic value – of type $\langle s, t\rangle$ – and a complex focus semantic value (a *topic* semantic value) (Büring, 1997, 2003, 2014). The topic semantic value is a set of sets of propositions of type $\langle\langle s\,t, t\rangle, t\rangle$. The members of the topic value, which are sets of propositions, are distinguished from each other by the value of the contrastive topic. Inside each of these sets, the member propositions are distinguished from each other by the value of the focus. For example, for (283a), the ordinary and topic semantic values of the host sentence of *–kin* (284a) and (284b) respectively:[1]

(284) **Contrastive topics and foci: the two-tiered topic value (Büring, 1997, 2003)**

a. $[\![\alpha]\!]^o = \lambda w$[is-reading(Hugo)($w$)]

b. $[\![\alpha]\!]^t = \{\{\lambda w$[is-reading(Hugo)($w$)], λw[is-sleeping(Hugo)(w)], ...$\}$,
$\{\lambda w$[is-reading(Eino)(w)], λw[is-reading(Eino)(w)], ...$\}\}$

To derive the complex focus value required for double contrast compositionally, I define an operator T (for *topic*). T takes an argument whose ordinary semantic value is a proposition, and whose focus semantic value is a set of propositions. It returns the ordinary semantic value as is, but elevates the focus semantic value to the singleton set of the focus semantic value, as shown in (285) (cf. the Q-particle in Kotek, 2014).

(285) **T-operator**

i. $[\![\mathrm{T}(\alpha_{\langle s,t\rangle})]\!]^o = [\![\alpha]\!]^o$

ii. $[\![\mathrm{T}(\alpha_{\langle s,t\rangle})]\!]^f = \{[\![\alpha]\!]^f\}$

The second question now reduces to the question of where T is located. The contrastive topic itself will be located above T. In principle, T could be in Foc^0, Top^0, or higher. As we will see below, what is important is that on the double contrast use, both the additive operators associated with *–kin* and *–kAAn* and their F-marked associates are interpreted in a position above T.

The first question concerns the motivation behind the overt movement of the contrastive topic (i.e. the associate of the additive). In section 5.1.2, I proposed that the additive operators associated with *myöskään* and *–kAAn* carry $[uTop]$, and that the deletion of this feature is achieved through covert movement above a head that carries $[iTop]$. In the case of double con-

[1]The number of members in the outmost set is determined by how many people (contrastive topics) are salient in the context. If we assume that only Eino and Hugo are salient, then the set has only the two members given in (284).

trast, the CP-targeting movement of the additive and its host is overt, however. The question is: which feature could be driving this movement?

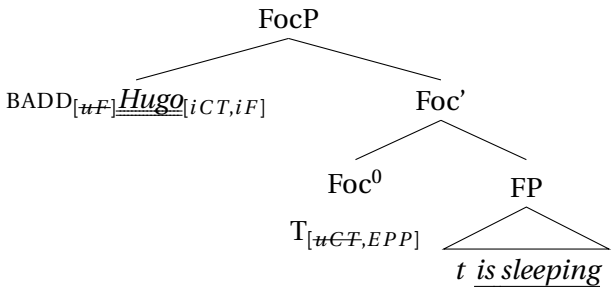
To answer this question, let us come back to the T-operator, which I argued to be responsible for the semantic derivation of the complex topic value above. Let us assume that this semantic role is reflected in the syntactic feature specification of the T-operator: it carries $[uCT]$. With this assumption in place, I propose that in double contrast contexts, the host and associate of the additive carries $[iCT]$ in addition to $[iF]$. The deletion of $[uCT]$ proceeds through standard Agreement: assumably, the overt movement of the contrastive topic phrase above the T-operator is due to an EPP-feature. Although one could also assume that the feature instances are go the other way around – with $[uCT]$ on the contrastive topic, and $[iCT]$ on the semantic T-operator – I take the semantic role of the feature $[iCT]$ to consist in the introduction of semantic alternatives, in full parallel to the feature $[iF]$. Thus, I adopt the assumption that the host and associate of the additive carries both $[iCT]$ and $[iF]$ on the double contrast use. This choice is also in line with the general idea that covert Agree-motivated movement happens as a last-resort type solution to the problem of uninterpretable features that are 'too low' (i.e. that have no appropriate goals): as contrastive topics move overtly, the standard picture where an uninterpretable feature probes for an interpretable feature is more suitable.

If we place the T-operator in Foc^0, the overt movement of the contrastive topic will target SpecFocP. The difference between *–kin* and *–kAAn*, then, is that the operator associated with *–kAAn* must also have its $[uTop]$ to be deleted (by Agreeing with either F^0 or Top^0). Thus, if the T-operator is in Foc^0, the overt movement of the contrastive topic seen in double contrast contexts targets a position that is overtly targeted by e.g. contrastive foci and *wh*-questions (see section 2.3.3). This is an advantage over assuming that the overt movement targets a higher TopP given that overt movement to this TopP is only possible in specific contexts (Kaiser, 2006). I therefore assume that the T-operator is in Foc^0.

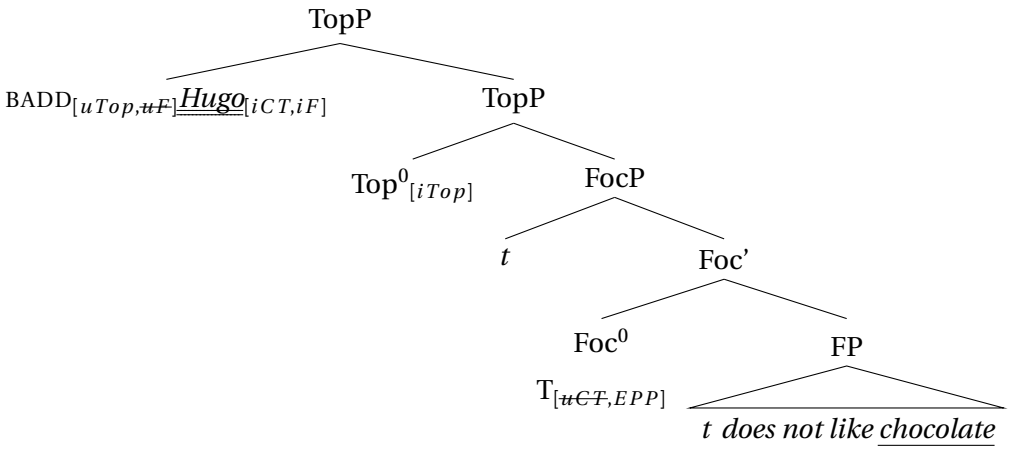
The relevant configurations and features are shown in (286). For the purposes of this example, I assume that Top^0 carries $[iTop]$.

(286) **Features in double contrast use of *–kin* and *–kAAn* (cf. (283))**

a.



b.



Now we are ready to begin to go through the semantic derivation of (283) which – due to the involvement of T – forces us to introduce type-flexibility into the semantics of BADD.

Let us place T in Foc^0 (for now). Up until the node where the contrastive topic is introduced, the semantic derivation is straightforward: it involves generating a focus semantic value from the F-marked expression, i.e. the verb (phrase) in (283a) and the direct object in (283b), as shown in (287d) for (283a). At node ②, the T-operator simply elevates the focus semantic value of ① to its singleton set (287e). At node ③, the contrastive topic is introduced (with the help of a λ-abstraction step); the ordinary semantic value is simply the proposition *that Hugo is reading*, and the focus semantic value is a set of sets of propositions such that the two member sets are distinguished by the value of the contrastive topic. If we assume that only Hugo and Eino are relevant, the end result is a set of two sets of propositions, as shown in (287f).

(287) **Double contrast use with *–kin***

a. **Overt syntax of FocP**

[$_{FocP}$ Hugo-kin [$_{FP}$ t luke-e]]

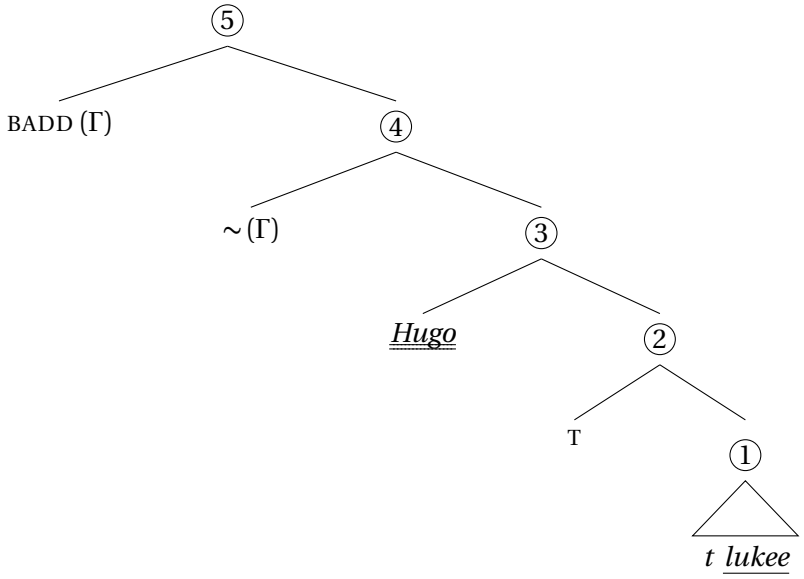
Hugo.NOM-ADD read-PRES.3SG.

'Hugo is reading'

b. **LF of FocP**

[$_{FocP}$ BADD ~ *Hugo* λ T [$_{FP}$ *t lukee*]]

c.



d. $[\![①]\!]^o = \lambda w[\text{is-reading}(t)(w)]$
$[\![①]\!]^f = \{\lambda w[\text{is-reading}(t)(w)], \lambda w[\text{is-sleeping}(t)(w)], ...\}$

e. $[\![②]\!]^o = \lambda w[\text{is-reading}(t)(w)]$
$[\![②]\!]^f = \{\{\lambda w[\text{is-reading}(t)(w)], \lambda w[\text{is-sleeping}(t)(w)], ...\}\}$

f. (λ-abstraction over t)
$[\![③]\!]^o = \lambda w[\text{is-reading(Hugo)}(w)]$
$[\![③]\!]^f = \{\{\lambda w[\text{is-reading(Hugo)}(w)], \lambda w[\text{is-sleeping(Hugo)}(w)], ...\},$
$\{\lambda w[\text{is-reading(Eino)}(w)], \lambda w[\text{is-reading(Eino)}(w)], ...\}\}$

The problems begin at node ④; here, the presuppositions of the squiggle may only be satisfied if the contextual variable Γ is resolved to $[\![③]\!]^f$ (where the three dots indicate that the set has more members than those that are shown). To see what the problem is, recall that the squiggle presupposes that (i) Γ is a subset of $[\![③]\!]^f$ (i.e. $[\![\alpha]\!]^f$), that (ii) $[\![③]\!]^o$ (i.e. $[\![\alpha]\!]^o$) is a member of Γ, and that (iii) there is a member in Γ that is distinct from $[\![③]\!]^o$ (i.e. $[\![\alpha]\!]^o$).

Let us first resolve Γ to the set in (288a). This set is distinct from $[\![③]\!]^f$. For Γ to be a subset of $[\![③]\!]^f$, every member of Γ has to be a member of $[\![③]\!]^f$. However, neither of the members of Γ is a member of $[\![③]\!]^f$: specifically, neither set contained in Γ is a member of $[\![③]\!]^f$ because the members of the latter have themselves more members, as indicated by the three dots in (288b). Moreover, $[\![③]\!]^o$ is not a member of Γ: it is rather a member of a member of Γ. The only presupposition of the squiggle that is (trivially) satisfied is in this case is the third one; this is because Γ has members, but $[\![③]\!]^o$ is not a member of Γ.

(288) **Non-identical Γ and $[\![\alpha]\!]^f$ on the double contrast use**

a. $\Gamma =$ {{λw[is-reading(Hugo)(w)], λw[is-sleeping(Hugo)(w)]},
{λw[is-reading(Eino)(w)], λw[is-sleeping(Eino)(w)]}}

b. $[\![③]\!]^f =$ {{λw[is-reading(Hugo)(w)], λw[is-sleeping(Hugo)(w)], ...},
{λw[is-reading(Eino)(w)], λw[is-sleeping(Eino)(w)], ...}}

If Γ is set to be identical to $[\![③]\!]^f$, the presuppositions of the squiggle can be satisfied as is.[2] However, setting Γ to be identical to the focus semantic value of the prejacent arguably defeats the purpose of including Γ in the derivation in the first place. It also contradicts the intuition that like many other uses, the double contrast use involves only a contextually relevant set of alternatives, and not all possible alternatives that are derived from F-marking.

Thus, instead of forcing identity between Γ and $[\![\alpha]\!]^f$, I propose that both the squiggle and BADD are *type-flexible*. Specifically, I propose that on the double contrast use, the presuppositions of the squiggle and BADD involve set-theoretic *unions* (∪). By definition, the union of two sets A and B is the set C that includes all members of A and B. Thus, if Γ is resolved to (288a), the *union* of Γ is as in (289a); the same applies to $[\![③]\!]^f$ in (289b).

(289) **Unions of Γ and $[\![\alpha]\!]^f$ for (288)**

a. $\cup\Gamma =$ {λw[is-reading(Hugo)(w)], λw[is-sleeping(Hugo)(w)],
λw[is-reading(Eino)(w)], λw[is-reading(Hugo)(w)]}

b. $\cup[\![③]\!]^f =$ {λw[is-reading(Hugo)(w)], λw[is-sleeping(Hugo)(w)],
λw[is-reading(Eino)(w)], λw[is-sleeping(Eino)(w)], ...}

Now, the presuppositions of the squiggle can be given as in (290), and the presupposition of BADD as in (291). (Note that this presupposition will be subject to further modifications throughout this chapter.)

(290) **Squiggle semantics (for double contrast use)**

$\sim(\Gamma)(\alpha)$ is defined iff

(i) $\cup\Gamma \subseteq \cup[\![\alpha]\!]^f$

(ii) $[\![\alpha]\!]^o \in \cup\Gamma$

(iii) $\exists\beta[\beta \in \cup\Gamma \wedge [\![\beta]\!]^o \neq [\![\alpha]\!]^o]$

$[\![\sim]\!]_{\langle\langle\langle st,t\rangle,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle\langle st,t\rangle,t\rangle}\,.\,\lambda\alpha_{\langle s,t\rangle}$: (i, ii, iii) . α

(291) **Additive semantics (for double contrast use; non-final)**

$[\![\text{BADD}]\!]_{\langle\langle\langle st,t\rangle,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle\langle st,t\rangle,t\rangle}\,.\,\lambda\alpha_{\langle s,t\rangle}$: $\exists\beta[\beta \in \cup\Gamma \wedge \beta \neq \alpha \wedge \beta \in cg]_{SPS}$. α

Speaker presupposition: There is some β such that β is a member of the union of Γ *(a set of*

[2] This is technically possible because Γ is not required to be a *proper* subset of $[\![\alpha]\!]^f$ (Rooth, 1992).

focus alternatives of the prejacent α), β is distinct from the prejacent α, and β is a member of the common ground c g

Now we are ready to go through the rest of the derivation in (287), i.e. nodes ④ and ⑤.

(292) a. $[\![④]\!]^o =$ defined iff (i) $\cup\Gamma \subseteq \cup[\![③]\!]^f$
(ii) $[\![③]\!]^o \in \cup\Gamma$
(iii) $\exists\beta[\beta \in \cup\Gamma \wedge \beta \neq [\![③]\!]^o]$
when defined, $[\![④]\!]^o = [\![③]\!]^o$
otherwise undefined

$[\![④]\!]^f = \{[\![④]\!]^o\}$

b. $[\![⑤]\!]^o = [\![④]\!]^o = \lambda w$[is-reading(Hugo)($w$)]
Speaker PS: $\exists\beta[\beta \in \cup\Gamma \wedge \beta \neq [\![④]\!]^o \wedge \beta \in c\,g]$
Let $\cup\Gamma =$ $\{\lambda w$[is-reading(Hugo)(w)], λw[is-sleeping(Hugo)(w)],
λw[is-reading(Eino)(w)], λw[is-sleeping(Eino)(w)]$\}$

In (292b), I have set Γ as in (288a). As the ordinary semantic value of ⑤ is λw[is-reading(Hugo)(w)], i.e. the proposition *that Hugo is reading*, the antecedent β that satisfies the additive presupposition could in principle be any of the other propositions in Γ. However, intuitively, we know that the antecedent is λw[is-sleeping(Eino)(w)], i.e. the proposition *that Eino is sleeping*. We must now show that why this follows.

First, let us establish that the two other members of ∪Γ in (292b) are infelicitous antecedents for our example:[3]

(293) **Unavailable antecedents with double contrast *–kin***
Mari wants to have a cup of coffee with Joni, who is taking care of little Hugo and Eino.
Mari asks: "Can we have coffee?"
[What are Eino and Hugo doing? What is Eino doing? What is Hugo doing?]
Joni answers:

a. #*Hugo* *nukku-u,* *ja* *Hugo-kin* *luke-e,* *joten* *juo-daan*
Hugo.NOM sleep-PRES.3SG and Hugo.NOM-ADD read-PRES.3SG so drink-PASS
vain *kahvi-t*
only coffee-PL.ACC
'Hugo is sleeping, and Hugo is reading, so yes, let's have coffee'

[3]Note that the judgments only hold with the given information-structural and intonational configuration: in particular, (293b) would be felicitous if *Hugo* was just F-marked.

b. #*Eino* *luke-e,* *ja* *Hugo-kin* *lukee,* *joten* *juo-daan*
Eino.NOM read-PRES.3SG and Hugo.NOM-ADD read-PRES.3SG so drink-PASS
vain *kahvi-t*
only coffee-PL.ACC
'Eino is reading, and Hugo is reading, so yes, let's have coffee'

I propose that the unacceptability of the examples in (293) derives from independent factors. First, in (293a), the contrastive topics do not refer to distinct entities; at whatever level the distinctness requirement of contrastive topics is encoded, i.e. be it part of the semantics or the pragmatics of contrastive topicality, (293a) violates this requirement (Büring, 2003, 2014). Second, in (293b), the F-marked predicates are identical. As the first conjunct introduces the predicate *reading*, then by the second conjunct, this verb is Given: therefore, it should not be F-marked, but it is. In sum, then, the relevant antecedent β in (292b) is the doubly-contrasting *that Eino is sleeping*.

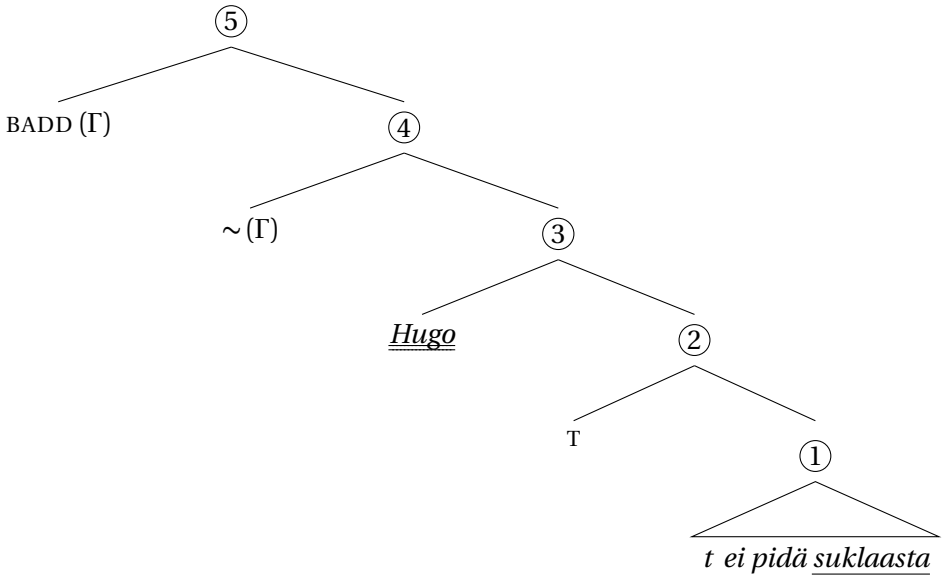
To close this section, I go through the derivation of the negative polarity example in (283b). I assume that although negation is preposed in the surface syntax of this example – potentially, the landing position is PolP (Kaiser, 2006) – it is interpreted in NegP. I also assume that $[iTop]$ is located on F^0, which means that BADD may have its $[uTop]$ deleted by adjoining to FocP. Its associate *Hugo* overtly appears in Spec,FocP due to the presence of the T-operator.

(294) **Double contrast use with *–kAAn***

a. **Overt syntax of PolP**
$[_{PolP}$ *e-i-kä*$_j$ $[_{FocP}$ *Hugo-kaan*$_i$ $[_{FP}$ t_i t_j *pidä* *suklaa-sta*]]
NEG-3SG-and Hugo.NOM-ADD like.CONN chocolate-ELA
'And Hugo does not like chocolate'

b. **LF of FocP**
$[_{FocP}$ BADD ~ $[_{FocP}$ *Hugo*$_i$ λ T $[_{FP}$ *t ei pidä suklaasta*]]

c.



d. $[\![①]\!]^o = \lambda w[\neg\text{likes}(\text{chocolate})(t)(w)]$
$[\![①]\!]^f = \{\lambda w[\neg\text{likes}(\text{chocolate})(t)(w)], \lambda w[\neg\text{likes}(\text{strawberries})(t)(w)], ...\}$

e. $[\![②]\!]^o = \lambda w[\neg\text{likes}(\text{chocolate})(t)(w)]$
$[\![②]\!]^f = \{\{\lambda w[\neg\text{likes}(\text{chocolate})(t)(w)], \lambda w[\neg\text{likes}(\text{strawberries})(t)(w)], ...\}\}$

f. (λ-abstraction over t)
$[\![③]\!]^o = \lambda w[\neg\text{likes}(\text{chocolate})(\text{Hugo})(w)]$
$[\![③]\!]^f = \{\{\lambda w[\neg\text{likes}(\text{chocolate})(\text{Hugo})(w)], \lambda w[\neg\text{likes}(\text{strawberries})(\text{Hugo})(w)], ...\},$
$\{\lambda w[\neg\text{likes}(\text{chocolate})(\text{Eino})(w)], \lambda w[\neg\text{likes}(\text{strawberries})(\text{Eino})(w)], ...\}\}$

g. $[\![④]\!]^o =$ defined iff (i) $\cup\Gamma \subseteq \cup[\![③]\!]^f$
(ii) $[\![③]\!]^o \in \cup\Gamma$
(iii) $\exists\beta[\beta \in \cup\Gamma \wedge \beta \neq [\![③]\!]^o]$

when defined, $[\![④]\!]^o = [\![③]\!]^o$
otherwise undefined

$[\![④]\!]^f = \{[\![④]\!]^o\}$

h. $[\![⑤]\!]^o = [\![④]\!]^o = \lambda w[\neg\text{likes}(\text{chocolate})(\text{Hugo})(w)]$

Speaker PS: $\exists\beta[\beta \in \cup\Gamma \wedge \beta \neq [\![④]\!]^o \wedge \beta \in cg]$
Let $\cup\Gamma =$ $\{\lambda w[\neg\text{likes}(\text{chocolate})(\text{Hugo})(w)],$
$\lambda w[\neg\text{likes}(\text{strawberries})(\text{Hugo})(w)],$
$\lambda w[\neg\text{likes}(\text{chocolate})(\text{Eino})(w)],$
$\lambda w[\neg\text{likes}(\text{strawberries})(\text{Eino})(w)]\}$
Then $\beta =$ $\lambda w[\neg\text{likes}(\text{strawberries})(\text{Eino})(w)]$ [see (293)]

6.1.2 Contrastive topics and accommodation

Now that we have an analysis of the syntax and semantics of double contrast additivity, it is interesting to consider the accommodation process that was mentioned in sections 3.1.7.2 and 4.1.1. Although the accommodation examples involve the basic use of additives, and hence both ADD (unbound additives) and BADD (bound additives) may be used, contrastive topics are clearly involved in the accommodation process, and that is why they are discussed here.

The contrast between double contrast use and accommodating use is illustrated in (295). The familiar example in (295a) has a double contrast reading (as in the examples of the previous sections) and only allows the bound additive to attach to the contrastive topic. The example in (295b), however, conveys a basic use presupposition which requires Eino to be doing something specific in addition to reading: β is resolved to *that Eino is sleeping*. This means that the second sentence in (295b) asserts that Eino is reading and presupposes that Eino is sleeping. The example is infelicitous because Eino cannot both read and sleep at the same time. (As the parantheses indicate, only bound additives are able to convey the double contrast reading, while both unbound and bound additives may lead to accommodation.)

(295) **Double contrast vs. infelicitous accommodating bound and unbound additives**

a. *Hugo* *nukku-u.* *(#Myös)* *Eino-(kin)* *luke-e* [Double contrast]
Hugo.NOM sleep-PRES.3SG ADD Eino.NOM-ADD read-PRES.3SG
'Hugo is sleeping, and Eino is reading'

b. #*Hugo* *nukku-u.* *Eino* *(myös)* *lukee-(kin)* [Accommodating]
Hugo.NOM sleep-PRES.3SG Eino.NOM ADD read-PRES.3SG-ADD
'Hugo is sleeping, and Eino is also reading'

For the sake of clarity, in (296), I present examples of the accommodating use that are felicitous. In (296a), the second sentence communicates that Joni listens to jazz *and* rock, while in (296b), Joni listens to neither.

(296) **Felicitous accommodating use of *myös(kään)***

a. *Mari* *kuuntele-e* *rokki-a.*
Mari.NOM listen-PRES.3SG rock-PAR

Joni *kuuntele-e* *myös* *jazzi-a*
Joni.NOM listen-PRES.3SG ADD jazz-PAR
'Mari listens to rock. Joni also listens to jazz'

b. *Mari* *e-i* *kuuntele* *rokki-a.*
Mari.NOM NEG-3SG listen.CONN rock-PAR

Joni *e-i* *kuuntele* *myöskään* *jazzi-a*
Joni.NOM NEG-3SG listen.CONN ADD jazz-PAR
'Mari does not listen to rock. Joni also does not listen to jazz'

Thus, in both (295) and (296), the hearer is able to identify exactly which β the speaker has in mind. Moreover, the identity of β seems to be based on the contents of the *first* sentence in both cases. Crucially, the examples in (295) and (296), are felicitous out of the blue: β does not have to already be common ground when the second sentence is uttered. This means that the relevant β is spontaneously added to the common ground (i.e. accommodated) as the second sentence is interpreted.

Projection tests show that we are indeed dealing with a presupposition in the accommodating use examples. In (297), the prejacent is embedded under the modal construction *voi olla että* 'it may be that'. These sentences give rise to the same effects as their counterparts in (296).

(297) **Projection test for accommodated presupposition**

a. *Mari* *kuuntele-e* *rokki-a.*
Mari.NOM listen-PRES.3SG rock-PAR

Voi *ol-la* *että* *Joni* *kuuntele-e* *myös* *jazzi-a*
may.PRES.3SG be-INF that Joni.NOM listen-PRES.3SG ADD jazz-PAR
'Mari listens to rock. It may be that Joni also listens to jazz'

b. *Mari* *e-i* *kuuntele* *rokki-a.*
Mari.NOM NEG-3SG listen.CONN rock-PAR

Voi *ol-la* *että* *Joni* *e-i* *kuuntele* *myöskään* *jazzi-a*
may.PRES.3SG be-INF that Joni.NOM NEG-3SG listen.CONN ADD jazz-PAR
'Mari does not listen to rock. It may be that Joni also does not listen to jazz'

Interestingly, although the first sentences in the accommodating use examples do not contribute the antecedent β itself, their presence is required for the accommodation process to take place. This suggests that the first sentence plays a crucial role in allowing the identification and accommodation of β. Even more interestingly, when two sentences with the right form precede the host sentence of the additive, it seems that there are also two accommodated β: in (298a), the interpretation of the last sentence is that Joni listens to pop and rock, and in (298b), the last sentence means that Joni does not listen to pop or rock.

(298) **Multiple sentences preceding the host sentence of accommodating *myös(kään)***

a. *Ilmari kuuntele-e poppi-a ja Mari kuuntele-e rokki-a.*
Ilmari.NOM listen-PRES.3SG pop-PAR and Mari.NOM listen-PRES.3SG rock-PAR

Mutta Joni kuuntele-e myös jazzi-a
but Joni.NOM listen-PRES.3SG ADD jazz-PAR

'Ilmari listens to pop and Mari listens to rock. But Joni also listens to jazz'

b. *Ilmari e-i kuuntele poppi-a, e-i-kä Mari kuuntele*
Ilmari.NOM NEG-3SG listen.CONN pop-PAR NEG-3SG-and Mari.NOM listen.CONN

rokki-a. Mutta Joni e-i kuuntele myöskään jazzi-a
rock-PAR but Joni.NOM NEG-3SG listen.CONN ADD jazz-PAR

'Ilmari does not listen to pop, and Mari does not listen to rock. But Joni also does not listen to jazz'

Given that additive presuppositions are notoriously hard to accommodate (see section 3.1.7.2), it is important to understand how accommodation happens in examples such as (296) and (298).

Let us start by discussing the position of the contrastive topic. In section 4.6, I proposed that that the double contrast use of bound additives involves the movement of the contrastive topic to SpecFocP. The accommodating use of additives is also possible when the contrastive topic is overtly at least as high as SpecFocP. This is illustrated in (299), where the contrastive topic is an indirect object that precedes the subject located in SpecFP.

(299) **Overtly moved contrastive topics with accommodating *myös(kään)***

a. *Joni anto-i Mari-lle paperi-a.*
Joni.NOM give-PAST.3SG Mari-ALL paper-PAR

Ilmari-lle Joni anto-i myös kynä-n
Ilmari-ALL Joni.NOM give-PAST.3SG ADD pen-ACC

'Joni gave Mari some paper. To Ilmari, Joni also gave a pen'

b. *Joni e-i anta-nut Mari-lle paperi-a.*
Joni.NOM NEG-3SG give-PASTPART Mari-ALL paper-PAR

Ilmari-lle Joni e-i anta-nut myöskään kynä-ä
Ilmari-ALL Joni.NOM NEG-3SG give-PASTPART ADD pen-PAR

'Joni did not give Mari any paper. To Ilmari, Joni also did not give a pen'

Let us therefore continue to assume that the T-operator is in Foc^0. Importantly, it must be the case that regardless of the choice of additive, the ordering of the important elements at LF remains the same on the accommodating use. In the previous section, we saw that on the double contrast use, the additive operator scopes highest: the associate of the additive operator is the contrastive

topic ($YP_{[iF,iCT]}$), and another F-marked constituent ($XP_{[iF]}$) is present in the structure below the associate of the additive operator and the T-operator. In essence, the operators associated *–kin* and *–kAAn* 'piggyback' to FocP due to the $[iCT]$-feature of their associate: they must be interpreted above their associate, which moves to FocP after Agreeing with the T-operator in Foc^0. This is shown (schematically) in (300).

(300) **Order of the main elements on the double contrast use:**
BADD > $YP_{[iF,iCT]i}$ > T > { $XP_{[iF]}$, t_i }

I propose that a small difference separates the double contrast use from the accommodating use. In particular, the additive operators still are interpreted above their associates ($XP_{[iF]}$), but the contrastive topic ($YP_{[iCT]}$) and the T-operator are now interpreted above both. This is illustrated in (301).

(301) **Order of the main elements on the accommodating use:**
$YP_{[iCT]_i}$ > T > (B)ADD > { $XP_{[iF]}$, t_i }

If the T-operator is in Foc^0, and the order of the elements is as shown in (301), it must be the case that the additive operators associated with *–kAAn* and *myöskään* Agree with $[iTop]$ on F^0 (as in polar interrogatives: see section 5.1.3). If $[iTop]$ was on Top^0 instead, the additives would end up taking scope over the T-operator in Foc^0. However, given the semantics I have given the T-operator, and the assumption that ADD is *not* type-flexible (and thus cannot manage a complex-typed prejacent), this option must be ruled out due to the availability of the accommodating use with *myöskään*. Possibly, this restriction could follow from some type of incompatibility between Foc^0 that carries $[uCT]$ (through the presence of the T-operator) and Top^0 that carries $[iTop]$, but I leave this question open.

As the comparison of (300) and (301) shows, the accommodating use is particular in that the prejacent α contains the trace of the contrastive topic, but not the contrastive topic itself (cf. double contrast in Zimmermann, 2015). This means that the prejacent of the additive operator is assignment-dependent: the exact proposition it denotes depends on the value of t assigned by the assignment function g. In what follows, I tentatively propose that this property of the prejacent is the source of the productive accommodation effect we see in these examples.

I will now go through the derivation of an example of the accommodating use using *–kin*. In (302), note that nodes ① through ④ are assignment-dependent due to the movement of the contrastive topic. Indeed, at ② and ③, Γ contains assignment-dependent propositions of the form *that t listens to x* (where x is the associate of BADD). While the presuppositions of the squiggle would be satisfied at this point, and BADD could contribute its presupposition – the relevant β could be resolved to *that Mari listens to rock*, the first sentence of (302a) – this does not happen: the meaning of the second sentence in (302a) is that Joni listens to both jazz and rock.

Because accommodation seems to be a property of structures where the prejacent of the additive operator contains the trace of a contrastive topic, I postulate that having an assignment-dependent prejacent leads the hearer to *postpone* the determination of Γ, and hence also the additive presupposition (cf. the notion of *postsupposition*, i.e. delayed test on the context; for *too*, see Brasoveanu, 2013; Brasoveanu and Szabolcsi, 2013). This is signalled with gray boxing in (302e) and (302f). Moreover, I propose that the additive presupposition is determined when the assignment-dependency is resolved: in (302), this happens after at ④, T has lifted the focus semantic value to a higher type, and at ⑤, the contrastive topic *Joni* is introduced into the structure. At ⑤, the identity of t_i is resolved to *Joni*: as a result, I argue that Γ is resolved to a set of propositions concerning *Joni*. Now, as we saw above, the first sentence plays a crucial role in determining the identity of β. At this point, I postulate that through some process that is not analysed here, Γ is further restricted to contain only propositions that refer to the F-marked portions of the host sentence (*jazz*) and the preceding sentence (*rock*) (302h). Within this set, the antecedent β must be resolved to a proposition distinct from the prejacent – in this case, there is only one option – and that β is accommodated.

(302) **Example derivation of accommodating use of *–kin***

a. **Surface syntax of FocP**

Mari *kuuntele-e* *rokki-a.* $[_{FocP}$ *Joni* $[_{FP}$ *t* *kuuntele-e*
Mari.NOM listen-PRES.3SG rock-PAR Joni.NOM listen-PRES.3SG

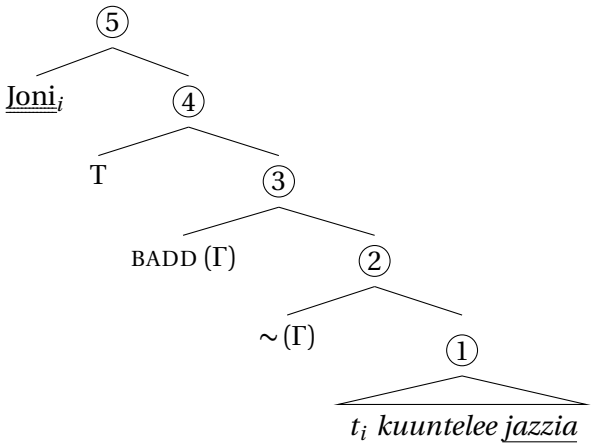
jazzi-a-kin]]
jazz-PAR-ADD

'Mari listens to rock. Joni also listens to jazz'

b. **LF of FocP**

$[_{FocP}$ *Joni*$_i$ λ T ... $[_{FP}$ BADD ~ t_i *kuuntelee jazzia*]]

c.



d. $[\![①]\!]^o = \lambda w$[listens-to(jazz)(t_i)(w)]

$[\![①]\!]^f =$ $\{\lambda w[\text{listens-to(jazz)}(t_i)(w)], \lambda w[\text{listens-to(rock)}(t_i)(w)], ...\}$

e. $[\![②]\!]^o =$ defined iff (i) $\Gamma \subseteq [\![①]\!]^f$ $_{postponed}$
(ii) $[\![①]\!]^o \in \Gamma$ $_{postponed}$
(iii) $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![①]\!]^o]$ $_{postponed}$

when defined, $[\![②]\!]^o = [\![①]\!]^o$
otherwise undefined

$[\![②]\!]^f =$ $\{[\![②]\!]^o\}$

f. $[\![③]\!]^o =$ $[\![②]\!]^o = \lambda w[\text{listens-to(jazz)}(t_i)(w)]$
$[\![③]\!]^f =$ $[\![②]\!]^f$

Speaker PS: $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![②]\!]^o \wedge \beta \in c\,g]_{postponed}$

g. $[\![④]\!]^o =$ $\lambda w[\text{listens-to(jazz)}(t_i)(w)]$
$[\![④]\!]^f =$ $\{\{\lambda w[\text{listens-to(jazz)}(t_i)(w)]\}\}$

h. (λ-abstraction over t_i)
$[\![⑤]\!]^o =$ $\lambda w[\text{listens-to(jazz)(Joni)}(w)]$

Speaker PS: $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![⑤]\!]^o \wedge \beta \in c\,g]$

Let $\Gamma =$ $\{\lambda w[\text{listens-to(jazz)(Joni)}(w)], \lambda w[\text{listens-to(rock)(Joni)}(w)]\}$
Then $\beta =$ $\lambda w[\text{listens-to(rock)(Joni)}(w)]$

Admittedly, the compositional implementation of the idea requires a lot of further work: for example, the postponed additive presupposition in (303h) involves reference not to the original prejacent, but the ordinary semantic value of node ⑤, while Γ makes reference to the focus semantic value of ①, but somehow restricts it to only concern the two values that are present in the host sentence and the preceding sentence. At this point, this restriction is simply stipulated.

Nevertheless, the tentative proposal that I make seems to be connected to the interpretation of presuppositions through the phenomenon of *trapping* (Sandt, 1992; Beaver and Zeevat, 2007). Trapping refers to situations where a variable bound by a quantifier from outside of the scope of the presuppositional trigger remains bound by the quantifier in an accommodated presupposition (Karttunen and Peters, 1979; Heim, 1983). For example, in (303), the presupposition contributed by *his* (shown inside a gray box) cannot be accommodated globally (i.e. directly added to the common ground), as it would result in x no longer being bound by $\forall$; in principle, the presupposition may be accommodated either at the intermediate level, resulting in the reading according to which every man loves his king if he has one, or at the local level, in which case every man has a king and loves him too.

(303) **Trapping (Beaver and Zeevat, 2007, p. 514)**
Every man$_i$ loves his$_i$ king

a. *Global: $\exists y[\text{king-of}(y,x)] \wedge \forall x[\text{man}(x) \rightarrow \text{love}(x,y)]$

b. Intermediate: $\forall x[\ [\exists y[\text{king-of}(y,x)] \wedge \text{man}(x)] \rightarrow \text{love}(x,y)]$

c. Local: $\forall x[\text{man}(x)] \rightarrow [\ [\exists y[\text{king-of}(y,x)] \wedge \text{love}(x,y)]]$

In (302), the antecedent β, namely *that Joni listens to rock*, is added accommodated globally, i.e. added to the common ground. As we saw above, the identity of the accommodated antecedent β is somehow determined by the preceding sentence. Moreover, it seems that in cases where there are two preceding sentences, *both* members of Γ that are distinct from α appear to be accommodated (see example (298)). Therefore, it is optimal to resolve Γ to as small a set as possible; F-marking in the preceding sentence might help do just that.

In sum, accommodation from additives *is* possible. The accommodating use presented in this section is a very natural way to convey information to the hearer, i.e. it represents informative presupposition in Stalnaker's terms (1973). (In fact, in section 6.2.1, I show that the speakers may also naturally rely on accommodation on the polar use of bound additives.) In this section, I argued that accommodation is intimately related to assignment-dependency, which in turn is intimately related to contrastive topicality, and the presence of another F-marked entity (which restricts the value of Γ). The compositional semantics presented in this section should be taken as a first step towards an explanation of the accommodating use.

6.1.3 Summary

In this section, I proposed that both the squiggle and BADD have a type-flexible semantics. One context where this type-flexibility is required is that of double contrast additivity, where the focus semantic value of the prejacent α is a set of sets of propositions instead of a set of propositions (as with the basic use of additives). I assume that the double contrast reading is unavailable with unbound additives because they are always associated with ADD, and ADD is not type-flexible. While in principle, the type-flexible squiggle could be available for unbound additives, the lack of type-flexibility of ADD means that the double contrast reading cannot be derived.

In addition to the double contrast reading, this section also contained a discussion of examples where the additive presupposition is accommodated. This seems to happen productively when the sentence contains both a contrastive topic and a focus, and the additive associates with the focused constituent only (scoping between the contrastive topic and the focus). I proposed that in this case, the presuppositions of both the squiggle and the additive are temporarily postponed so that they do not have to be based on an assignment-dependent prejacent and Γ. The presupposition is instead based on a non-assignment-dependent Γ, derived through the reinsertion of the contrastive topic higher up in the structure, and restricted to only contain alternatives that make use of the F-marked parts of the host sentence and the preceding sentence(s).

The analyses that I propose in this section go against previous literature in two ways. First,

double contrast additivity is derived using complex focus semantic values and type-flexible focus operators (cf. Zimmermann, 2015). Second, accommodation from additives is shown to be possible and even productive, although here restricted to contexts that involve contrastive topics (cf. Kripke, 1990/2009; Heim, 1990; Beaver and Zeevat, 2007).

In the next section, I introduce a second type of flexibility into the semantics of BADD.

6.2 Source-flexibility

In section 6.1, I introduced a first difference between ADD and BADD: BADD is type-flexible, and it is therefore able to operate on a prejacent α whose focus semantic value is a set of sets of propositions. In this section, I introduce a second modification to the semantics of BADD. This modification allows the additive presupposition to state the presence of an antecedent β not only within the common ground – a property that BADD shares with ADD – but also within different components of the discourse model. In other words, BADD is *source-flexible*.

Although other uses also involve source-flexibility, I only discuss the polar use (from section 4.2) in this section. The reason is that other source-flexible uses also involve an antecedent that is non-distinct from the prejacent. Non-distinctness is a third property that differentiates BADD from ADD, and the source-flexible uses that also involve non-distinctenss will therefore be discussed separately in the section focuses on non-distinctness (section 6.3).

6.2.1 Polar use

Recall from section 4.2 that the hallmark of the polar use of *–kin* and *–kAAn* is the involvement of a *polar* alternative of the prejacent α. This antecedent β cannot have been previously presupposed (or asserted) to be true, as shown by the contrast between the examples in (304) (see section 4.2).

(304) **Polar use: Non-factive (a) and factive (b) complements as antecedents for *–kin***

a. *Luul-i-n* *että* *Joni* *e-i* *nukku-nut,*
think-PAST-1SG that Joni.NOM NEG-3SG sleep-PASTPART

mutta *hän* *nukku-i-kin*
but he.NOM sleep-PAST.3SG.ADD

'I thought that Joni was not sleeping, but he was (sleeping)'

b. # *(Ties-i-n* *että)* *Joni* *e-i* *nukku-nut,*
think-PAST-1SG that Joni.NOM NEG-3SG sleep-PASTPART

mutta *hän* *nukku-i-kin*
but he.NOM sleep-PAST.3SG.ADD

'(I knew that) Joni was not sleeping, but he was (sleeping)'

Another striking property of the polar use is that although the host and associate of the bound additive has to be a tensed verb, any such verb will do. This is shown in (305) (repeated from (189) and (190)). Therefore, although a syntactician's immediate reaction to the polar use could be to assume that what is F-marked on this use is sentence polarity, i.e. Pol^0 or an equivalent head, the data in (304) show that this cannot be the whole story; the availability of polar alternatives is not correlated with a single syntactic position, but with F-marking and tense. I therefore assume that F-marking a tensed verb gives the semantics access to polar alternatives.[4]

(305) **Varying the host and associate of *–kin***

a. *Luul-i-n* *että* *Joni* *e-i* *ol-lut* *nukku-nut,*
think-PAST-1SG that Joni.NOM NEG-3SG be-PASTPART sleep-PASTPART

mutta *hän* *ol-i-kin* *nukku-nut*
but he.NOM be-PAST.3SG-ADD sleep-PASTPART
'I thought that Joni had not slept, but he had slept'

b. *Luul-i-n* *että* *Joni* *e-i* *ol-lut* *nukku-nut,*
think-PAST-1SG that Joni.NOM NEG-3SG be-PASTPART sleep-PASTPART

mutta *hän* *ol-i* *nukku-nut-kin*
but he.NOM be-PAST.3SG sleep-PASTPART-ADD
'I thought that Joni had not slept, but he had slept'

c. #*Luul-i-n* *että* *Joni* *e-i* *aiko-nut* *nukku-a,*
think-PAST-1SG that Joni.NOM NEG-3SG intend-PASTPART sleep-INF

mutta *hän* *aiko-i* *nukku-a-kin*
but he.NOM intend-PAST.3SG sleep-INF-ADD
Int. 'I thought that Joni did not intend to sleep, but he did sleep'

As the semantics we have given to BADD require determining a source or location for the antecedent β, and thus far, that source has been the common ground, the question that arises with the polar use is simple: where is the antecedent? I propose that on the polar use, the relevant antecedent β is part of some set of propositions that is possibly *private* and not shared with other discourse participants. In (304a), for example, β is located within the set of propositions that results from the application of a modal conversational background function $f^S_{doxastic}$ to the world of evaluation w_0 (see section 2.2.1 for modal semantics). The result is the set of propositions that correspond to the speaker S's beliefs at w_0. In short, (304a) can be used by a speaker who holds the belief *that Joni was not sleeping*.

That the antecedent β can be found in private sets of propositions is supported by the possi-

[4] In section 5.2, I argued that [*iF*] can also replace Holmberg's (2015) disjunctive polarity feature [±*Pol*] for Finnish polar interrogatives.

bility to use *–kin* and *–kAAn* without an overt antecedent, as in (306). The sentence in (306a) may be uttered by a positively surprised person upon finding out that their addressee did clean the kitchen; again, β is in $f^S_{doxastic}(w_0)$. As can be expected, β can also be interpreted as being part of sets of propositions derived through other conversational backgrounds. In (306b), for example, it is natural to interpret the speaker's remark in a context where the speaker would have *wanted* their addressee to clean the kitchen. In that case, we can say that β is found in $f^S_{bouletic}(w_0)$ (i.e. the set of propositions describing the speaker S's wishes at w_0).[5]

(306) **Antecedent β is located within a set provided by a conversational background**

a. *Ai, sinä siivos-i-t-kin keittiö-n*
oh you.NOM clean-PAST-2SG-ADD kitchen-ACC
'Oh, you cleaned the kitchen (I did not believe you would)'

b. *Ai, sinä e-t siivon-nut-kaan keittiö-tä*
oh you.NOM NEG-3SG clean-PASTPART-ADD kitchen-PAR
'Oh, you didn't clean the kitchen (like I wanted you to)'

Thus, the relevant difference between ADD (associated with *myös* and *myöskään*) and BADD (associated with *–kin* and *–kAAn*) that disallows the polar use for the former, and allows it for the latter, lies in the source-flexibility of BADD with respect to β. In the entry given for BADD in (307), I show the possible sources of β as a set containing cg and $f(w)$ (where f is a conversational background). The notation is meant to reflect the fact that β must be a member of cg or some $f(w_0)$ (for the speaker).

(307) **Source-flexibility of BADD (for polar use; non-final)**

$[\![\text{BADD}]\!]_{\langle\langle st,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle st,t\rangle}\,.\,\lambda\alpha_{\langle s,t\rangle}\,:\, \exists\beta[\beta\in\Gamma\wedge\beta\neq\alpha\wedge\beta\in\{cg, f(w_0)\}]_{SPS}\,.\,\alpha$

Speaker presupposition: There is some β such that β is a member of Γ (a set of focus alternatives of the prejacent α), β is distinct from the prejacent α, and β is a member of the common ground cg or a set of propositions derived through applying a conversational background function to the world of evaluation

Note that the impossibility of locating β in the cg on the polar use – i.e. the impossibility to use bound additives to contradict information in the common ground – does not follow from the semantics in (307). To explain this property of the polar use, I assume that the specialisation of the discourse particle combination *–pA–s* just for this job in Finnish blocks this possibility independently (see section 4.2).

Two example derivations of the polar use are shown in (308) and (309). With the polar use, the focus semantic value of α and Γ are by definition identical, and therefore the presuppositions

[5] As the difference between modal bases and ordering sources is irrelevant here, I use f as a variable for both types of conversational backgrounds (see section 2.2.1).

of the squiggle are always satisfied. The speaker presupposition in (308) roughly corresponds to the statement that the polar alternative of α is a belief (or e.g. wish) of the speaker at w_0.

(308) **Polar use with *–kin***

a. **Overt syntax of FP**

[$_{FP}$ Joni *nukku-i-kin* *]]*

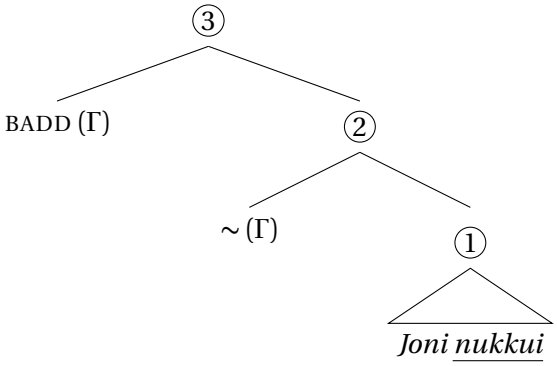
Joni.NOM sleep-PAST.3SG-ADD

'Joni slept'

b. **LF of FP**

[$_{FP}$ BADD ~ *Joni nukkui*]

c.



d. $[\![①]\!]^o =$ λw[slept(Joni)(w)]

$[\![①]\!]^f =$ {λw[slept(Joni)(w)], λw[¬slept(Joni)(w)]}

e. $[\![②]\!]^o =$ defined iff (i) $\Gamma \subseteq [\![①]\!]^f$

(ii) $[\![①]\!]^o \in \Gamma$

(iii) $\exists \beta[\beta \in \Gamma \wedge \beta \neq [\![①]\!]^o]$

when defined, $[\![②]\!]^o = [\![①]\!]^o$

otherwise undefined

$[\![②]\!]^f =$ {$[\![②]\!]^o$}

f. $[\![③]\!]^o =$ $[\![②]\!]^o = \lambda w$[slept(Joni)(w)]

Speaker PS: $\exists \beta[\beta \in \Gamma \wedge \beta \neq [\![②]\!]^o \wedge \beta \in \{cg, f(w_0)\}]$

Let Γ = {λw[slept(Joni)(w)], λw[¬slept(Joni)(w)]}

Then β = λw[¬slept(Joni)(w)]

With *–kAAn* and sentential negation, the derivation proceeds essentially as in (308): the difference is that [$uTop$] on BADD has to be deleted. In (309), I assumed this is done through Agreement with F^0.

(309) **Polar use with *–kAAn***

a. **Overt syntax of FP**

[$_{FP}$ Joni$_j$ e-i$_i$ [$_{NegP}$ t_i ... [$_{TMP}$ t_j nukku-nut-kaan]]]]

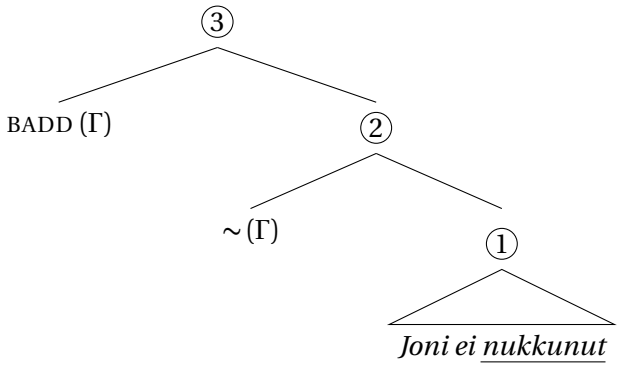
Joni-NOM NEG-3SG sleep-PASTPART-ADD

'Joni did not sleep'

b. **LF of FP**

[$_{FP}$ BADD ~ [$_{FP}$ *Joni ei nukkunut*]]

c.



d. $[\![①]\!]^o =$ $\lambda w[\neg\text{slept(Joni)}(w)]$

$[\![①]\!]^f =$ $\{\lambda w[\neg\text{slept(Joni)}(w)], \lambda w[\text{slept(Joni)}(w)]\}$

e. $[\![②]\!]^o =$ defined iff (i) $\Gamma \subseteq [\![①]\!]^f$

(ii) $[\![①]\!]^o \in \Gamma$

(iii) $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![①]\!]^o]$

when defined, $[\![②]\!]^o = [\![①]\!]^o$

otherwise undefined

$[\![②]\!]^f =$ $\{[\![②]\!]^o\}$

f. $[\![③]\!]^o =$ $[\![②]\!]^o = \lambda w[\neg\text{slept(Joni)}(w)]$

Speaker PS: $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![②]\!]^o \wedge \beta \in \{cg, f(w_0)\}]$

Let $\Gamma =$ $\{\lambda w[\neg\text{slept(Joni)}(w)], \lambda w[\text{slept(Joni)}(w)]\}$

Then $\beta =$ $\lambda w[\text{slept(Joni)}(w)]$

Let us now apply this analysis to examples of polar use that include contrastive focus, illustrated in (310). In section 4.2.1, I argued that in such examples, the host of the bound additive – the verb – is still its associate, although it is admittedly prosodically less prominent than the contrastively focused constituent. This is indicated in (310) with dashed underlining.

(310) **Polar use and contrastive focus: *–kin***

Luul-i-n *että* *Mari* *to-isi* *VIHRE-I-TÄ* *oliive-j-a,* *mutta*
think-PAST-1SG that Mari.NOM bring-COND.3SG green-PL-PAR olive-PL-PAR but
hän *to-i-kin* *MUST-I-A* *oliive-j-a* *(e-i-kä* *vihre-i-tä)*
she.NOM bring-PAST.3SG-ADD black-PL-PAR olive-PL-PAR NEG-3SG-and green-PL-PAR
'I thought Mari would bring GREEN olives, but she brought BLACK ones (and not green ones)'

With such structures, the question is: what is the focus semantic value of the prejacent α? In principle, there are two options. According to the first, both the contrastively focused constituent and the focused tensed verb contribute alternatives to the focus semantic value. The focus semantic value then instantiates *complex focus* (Krifka, 1991). According to the second option, only the verb contributes alternatives: this is the case if the focus semantic value of the contrastively focused constituent is neutralised before the additive presupposition is derived.

Under the complex focus account, the contextual variable Γ relevant for (310) is resolved to the set in (311a) (assuming that only two types of olives are salient or relevant in the context). Under the second approach, Γ is resolved to the set in (311b).

(311) Γ **of (310)**

a. $\Gamma = \{\lambda w[\text{brought(black-olives)(Mari)}(w)], \lambda w[\neg\text{brought(black-olives)(Mari)}(w)],$
$\lambda w[\text{brought(green-olives)(Mari)}(w)], \lambda w[\neg\text{brought(green-olives)(Mari)}(w)]\}$

b. $\Gamma = \{\lambda w[\text{brought(black-olives)(Mari)}(w)], \lambda w[\neg\text{brought(black-olives)(Mari)}(w)]\}$

I adopt the second option: the reason lies in the focus-neutralising effect of the squiggle introduced in section 2.1.3. Recall that for Rooth (1992), contrastive focus is the core 'individual case' of focus interpretation: it involves the variable γ, and not Γ. In Rooth's trees, the interpretation of contrastive focus is done at the level of the focused constituent. If we assume that this is the case, the effect of contrastive focus is too fleeting to have an effect on the focus semantic value of the prejacent in (310): it is neutralised by the squiggle as soon as it is introduced.

In (312), I show the tree diagram and semantic derivation of (310). The semantics of the lower squiggle (present for the contrastive focus) is not spelled out separately; as (312d) shows, the effect of contrastive focus is neutralised locally by it (see section 2.1.3 for details). By uttering (312a), the speaker indicates that the polar alternative of the prejacent α is a belief (or wish) of the speaker at w_0.

(312) **Polar use with *–kin* with contrastive focus**

a. **Overt syntax of FP**

[$_{FP}$ Mari to-i-kin MUST-I-A oliive-j-a]]

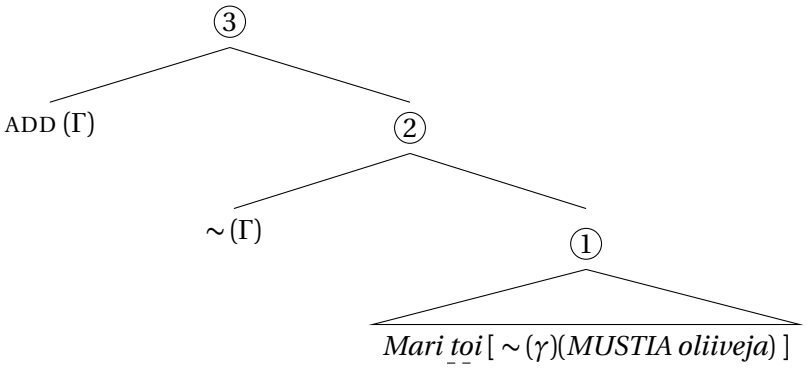
Mari.NOM bring-PAST.3SG-ADD black-PL-PAR olive-PL-PAR

'Mari brought BLACK olives'

b. **LF of FP**

[$_{FP}$ ADD ∼ [$_{FP}$ *Mari toi* [∼(γ)(*MUSTIA oliiveja*)]]]

c.



d. $[\![①]\!]^o =$ λw[brought(black-olives)(Mari)(w)]

$[\![①]\!]^f =$ {λw[brought(black-olives)(Mari)(w)], λw[¬brought(black-olives)(Mari)(w)]}

e. $[\![②]\!]^o =$ defined iff (i) $\Gamma \subseteq [\![①]\!]^f$

(ii) $[\![①]\!]^o \in \Gamma$

(iii) $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![①]\!]^o]$

when defined, $[\![②]\!]^o = [\![①]\!]^o$

otherwise undefined

$[\![②]\!]^f =$ {$[\![②]\!]^o$}

f. $[\![③]\!]^o =$ $[\![②]\!]^o = \lambda w$[brought(black-olives)(Mari)(w)]

Speaker PS: $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![②]\!]^o \wedge \beta \in \{c\,g, f(w_0)\}]$

Let Γ = {λw[brought(black-olives)(Mari)(w)], λw[¬brought(black-olives)(Mari)(w)]}

Then β = λw[¬brought(black-olives)(Mari)(w)]

To conclude, the polar use of bound additives is characterised by (i) a polar Γ whose evocation is not tied to a single syntactic projection, and (ii) a speaker presupposition stating that the polar antecedent β is located within some discourse component (that is not the common ground) (cf. verum focus; Höhle, 1992; Gutzmann et al., 2017). Typically, the polar use involves sets of propositions derived through conversational backgrounds, or, in other words, sets of the speaker's be-

liefs, wishes, and so on. When using a bound additive on the polar use, the speaker has in mind a specific β that corresponds to some belief or wish of theirs. On the polar use, it is an easy task for the hearer to know which β the speaker has in mind; the inferential work, then, consists in knowing where β is 'from', i.e. what its source is. In the next section, I add two more possible sources for β.

6.3 Distinctness

In this section, I discuss a third difference between BADD and ADD: the absence of a distinctness requirement. I argue that a number of the uses of bound additives in Finnish provide evidence that the relevant additive operator does not encode a distinctness requirement. Therefore, in cases where distinctness effects arise, they may be attributable to pragmatics (see section 3.1.3). I begin with the reactive use (from section 4.3). The analysis of this use also introduces a new possible source for the antecedent β: the public set of discourse commitments of a discourse participant X, notated as DC_X. I then discuss the concessive use that involves a connective (from section 4.4), which I argue to be reducible to either the polar use or the reactive use (depending on the context). Finally, I propose an analysis of the recurring-issue use (from section 4.5), and add one more discourse component to the list of possible sources for the antecedent β: the $Table$.

6.3.1 Reactive use

The reactive use of *–kin* and *–kAAn* is illustrated in (313) (repeated from (198) and (197)). As the additive operator associates with a tensed F-marked verb, I again assume that the relevant focus alternatives are polar.[6]

(313) **Reactive use with *–kin* and *–kAAn***

a. *Joni tykkä-ä oliive-i-sta. – Niin tykkä-ä-kin.*
Joni.NOM like-PRES.3SG olive-PL-ELA so like-PRES.3SG-ADD
'Joni likes olives. – So he does.'

b. *Joni e-i tykkää oliive-i-sta. – E-i tykkää-kään.*
Joni.NOM NEG-3SG like.CONN olive-PL-ELA NEG-3SG like.CONN-ADD
'Joni does not like olives. – No, he doesn't.'

I propose that the reactive use of *–kin* and *–kAAn* involves an antecedent β from another discourse participant's public set of discourse commitments, i.e. DC_X (where X is a discourse participant) (Farkas and Bruce, 2010: see section 2.2.1). This set may or may not be a subset of the

[6] One exception to this general pattern is the confirming use, where the host-associate must also be the F-marked verb, but the alternatives involve different modal expressions, such as *possible* and perhaps *actual* (see section 4.1).

common ground; while the common ground contains all propositions that all discourse participants have accepted as true of the world of the conversation, each discourse participant may also have publicly expressed their belief in propositions that are contested by other discourse participants. Thus, on the reactive use, bound additives express agreement with a proposition β that is not (yet) in the common ground, but has been publicly committed to by another discourse participant.

Crucially, on the reactive use, α and β are *non-distinct*. In fact, it is not possible to express disagreement with *–kin* or *–kAAn*: to do so, one uses *–pA-s* (see sections 2.3.3.5, 4.2 and 6.1.2):[7]

(314) **Disagreeing reactive use with *–pAs***

a. *Joni* *tykkä-ä* *oliive-i-sta.* – *E-i-pä-s* *tykkää!*
Joni.NOM like-PRES.3SG olive-PL-ELA NEG.3SG-PA-S like.CONN
'Joni likes olives. – No he doesn't!'

b. *Joni* *e-i* *tykkä-ä* *oliive-i-sta.* – *Tykkä-ä-pä-s!*
Joni.NOM NEG-3SG like.CONN olive-PL-ELA like-PRES.3SG-PA-S
'Joni does not like olives. – Yes he does!'

The non-distinctness of α and β does not require any changes in the semantics of the squiggle. However, the semantics of BADD must be modified to allow β to be non-distinct from α. Moreover, as argued before, the set of public discourse commitments of a discourse participant must be included as an option for the source of β. An updated entry for BADD is shown in (315).

(315) **Semantics of BADD (for reactive use; non-final)**

$[\![\text{BADD}]\!]_{\langle\langle st,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle st,t\rangle}\,.\,\lambda\alpha_{\langle s,t\rangle}\,:\; \exists\beta[\beta\in\Gamma\wedge\beta\in\{cg, f(w_0), DC_X\}]_{SPS}\;.\;\alpha$

Speaker presupposition: There is some β such that β is a member of Γ (a set of focus alternatives of the prejacent α), and β is a member of the common ground cg, a set of propositions derived through applying a conversational background to the actual world, or the set of public discourse commitments of a discourse participant X

The derivation of the reactive replies in (313) is now straightforward in terms of semantics. The use of the reactive reply by a speaker reveals that the speaker takes it to be common ground that some antecedent β is already present in some discourse component; in this case, β is in fact the same proposition as the prejacent α, and it is located in the set of public discourse commitments of the hearer.

In terms of syntax, I follow Holmberg (2001) somewhat in assuming that both *niin* and negation are overtly in PolP, but above TopP (Kaiser, 2006), and the verbs are overtly fronted to FocP.

[7] In the negative polarity reaction, the particle *–kA* may also be used.

The rest of the sentence is elided under identity with the antecedent given in the previous assertion (cf. Merchant, 2001, 2004). Negation, I assume, is interpreted in NegP, and not PolP, and *niin* 'so' is left unanalysed here. Finally, I assume that the movement of the verb to FocP leaves behind a trace V which can be abstracted over to reintroduce the verb later in the structure.

(316) **Reactive use with *–kin***

a. **Surface syntax of PolP**

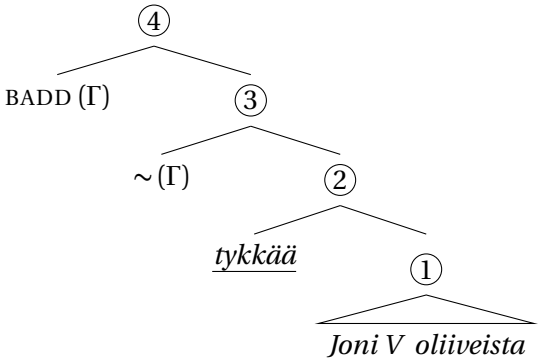
$[_{PolP}$	*niin*	$[_{FocP}$	*tykkä-ä-kin*$_i$	$[_{FP\Rightarrow\triangle}$	*Joni*	t_i	*oliive-i-sta*	]]]
	so		like-PRES.3SG-ADD		Joni.NOM		olive-PL-PAR.	

'So he does (like olives)'

b. **LF of FocP**

$[_{FocP}$ BADD $\sim$ *tykkää* λ $[_{FP}$ *Joni V oliiveista*]]

c.



d. $[\![①]\!]^o = \lambda w[V(\text{olives})(\text{Joni})(w)]$
$[\![①]\!]^f = \{\lambda w[V(\text{olives})(\text{Joni})(w)]\}$

e. (λ-abstraction over V)
$[\![②]\!]^o = \lambda w[\text{likes}(\text{olives})(\text{Joni})(w)]$
$[\![②]\!]^f = \{\lambda w[\text{likes}(\text{olives})(\text{Joni})(w)], \lambda w[\neg\text{likes}(\text{olives})(\text{Joni})(w)]\}$

f. $[\![③]\!]^o =$ defined iff (i) $\Gamma \subseteq [\![②]\!]^f$
(ii) $[\![②]\!]^o \in \Gamma$
(iii) $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![②]\!]^o]$

when defined, $[\![③]\!]^o = [\![②]\!]^o$
otherwise undefined

$[\![③]\!]^f = \{[\![③]\!]^o\}$

g. $[\![④]\!]^o = [\![③]\!]^o = \lambda w[\text{likes}(\text{olives})(\text{Joni})(w)]$

Speaker PS: $\exists\beta[\beta \in \Gamma \wedge \beta \in \{cg, f(w_0), DC_X\}]$
Let $\Gamma =$ $\{\lambda w[\text{likes}(\text{olives})(\text{Joni})(w)], \lambda w[\neg\text{likes}(\text{olives})(\text{Joni})(w)]\}$

Then $\beta =$ λw[likes(olives)(Joni)(w)]

In (316), the identity of β is resolved to the proposition *that Joni likes olives*, and not the negative polarity alternative. Possibly, the hearer reasons that if the speaker had wanted to refer to the negative alternative, they would have used *–pA-s* instead of *–kin*. In other words, some type of blocking or competition effect could be behind the reactive use of bound additives.

Reactive examples with *–kAAn* are derived in parallel fashion, as shown in (317). Here, I assume that [$uTop$] on BADD may be deleted through Agreement with F^0.

(317) **Reactive use with *–kAAn***

a. **Surface syntax of PolP**

[$_{PolP}$ *ei* [$_{FocP}$ *tykkää-kään*$_i$ [$_{FP\Rightarrow\triangle}$ *Joni* t_i *oliive-i-sta*]]]

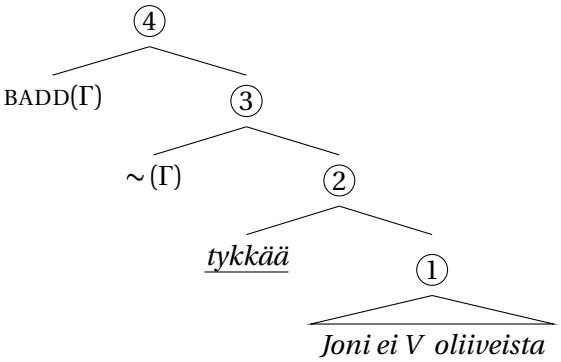
NEG-3SG like.CONN-ADD Joni.NOM olive-PL-PAR.

'No he does not (like olives)'

b. **LF of TopP**

[$_{TopP}$ BADD $\sim$ *tykkää* λ [$_{FP}$ *Joni ei V oliiveista*]]

c.



d. $[\![①]\!]^o =$ λw[$\neg V$(olives)(Joni)(w)]
$[\![①]\!]^f =$ {λw[$\neg V$(olives)(Joni)(w)]}

e. (λ-abstraction over V)
$[\![②]\!]^o =$ λw[¬likes(olives)(Joni)(w)]
$[\![②]\!]^f =$ {λw[¬likes(olives)(Joni)(w)], λw[likes(olives)(Joni)(w)]}

f. $[\![③]\!]^o =$ defined iff (i) $\Gamma \subseteq [\![②]\!]^f$
(ii) $[\![②]\!]^o \in \Gamma$
(iii) $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![②]\!]^o]$

when defined, $[\![③]\!]^o = [\![②]\!]^o$
otherwise undefined

$[\![③]\!]^f = \{[\![③]\!]^o\}$

g. $[\![④]\!]^o = [\![③]\!]^o = \lambda w[\neg\text{likes(olives)(Joni)}(w)]$

Speaker PS:	$\exists\beta[\beta \in \Gamma \wedge \beta \in \{cg, f(w_0), DC_X\}]$
Let $\Gamma =$	$\{\lambda w[\neg\text{likes(olives)(Joni)}(w)], \lambda w[\text{likes(olives)(Joni)}(w)]\}$
Then $\beta =$	$\lambda w.\neg\text{likes}^w(\text{joni}, \text{olives})$

In sum, the reactive use can be analysed straightforwardly once we assume that BADD does not encode a distinctness condition. Moreover, letting β be located within another discourse participant's public set of discourse commitments directly links the function of the reactive use as an agreeing (and, perhaps, cg-update-supporting) response to its semantics.

6.3.2 Concessive use (with concessive connective)

In section 4.4, I presented two concessive uses: one that involves a concessive connective, and one that I dubbed *wh*-concessive. The former use is the topic of this section; the latter is presented later in section 7.2.

On the concessive use, BADD associates with an F-marked tensed verb within a concessive subordinate clause, as in (317) (repeated from (201) and (202)). As usual, I assume that this means that BADD operates over polar focus alternatives.

(318) **Concessive use with *–kin* and *–kAAn***

a. *Vaikka Mari läht-i-kin, sinu-n e-i tarvitse*
although Mari.NOM leave-PAST.3SG-ADD you-GEN NEG-3SG need.CONN
'Although Mari left, you don't need to'

b. *Vaikka Mari e-i lähte-nyt-kään, sinu-n täyty-y*
although Mari.NOM NEG-3SG leave-PASTPART-ADD you-GEN need-PRES.3SG
'Although Mari did not leave, you need to'

I propose that on the concessive use, the antecedent β may be either (i) a non-distinct β found within DC_x (as on the reactive use), or (ii) a distinct β found within some $f(w_0)$ (as on the polar use). The first option accounts for cases where α is discourse-old – i.e. it has been previously uttered by another discourse participant – and the second option for cases where the concessive clause carries a modal flavour, and α can be discourse-new. In other words, the concessive use can be reduced to the reactive and polar uses. Interestingly, the Merriam-Webster dictionary provides the following two definitions of for 'concede':[8]

1. to acknowledge grudgingly or hesitantly; to relinquish grudgingly or hesitantly

[8]https://www.merriam-webster.com/dictionary/concede, accessed on April 4, 2018.

2. to accept as true, valid, or accurate

The first definition characterises the polar-concessive use, the second characterises the reactive-concessive use. For the former, the key element of the definition lies in the expression of unwillingness: on the polar-concessive use, the source of the polar antecedent β is $f(w_0)$, where f is naturally interpreted as the bouletic conversational background (i.e. referring to what the speaker's wishes are). The feeling of reluctance comes from acknowledging the opposite of what one would have wanted. On the reactive-concessive use, the antecedent β may be identical to α, and its source is DC_x: by using the concessive, the speaker signals that they accept the addition of β to the common ground.

Assuming that the form of the additive presupposition is determined under the concessive connective, the derivation of this concessive use is straightforward, and will not be shown here (see example derivations of the polar use and reactive use in sections 6.2.1 and 6.3.1).

6.3.3 Recurring-issue use

The recurring-issue use is only available in *wh*-interrogatives and with *–kAAn*. An example is shown in (319a) (repeated from (208).

(319) **Recurring-issue use of *–kAAn***

Mi-ssä *sinä* *(taas)* *käv-i-t-kään?*
where-INE you.NOM (again) visit-PAST-2SG-ADD
'Where did you visit again?' (recurring-issue)

On the recurring-issue use, the host of *–kAAn* may not be prosodically prominent, which is indicated in (319a) with the familiar dashed underlining. However, I assume that the tensed verbal host of *–kAAn* is still its F-marked associate, and hence, the recurring-issue use involves polar alternatives.

The analysis of recurring-issue *–kAAn* was discussed briefly in section 5.2.2, where I argued that the operator associated with *–kAAn* deletes its $[uTop]$ by agreeing with Top^0 above FocP. Hence, the additive operator also takes scope over the *wh*-question and the Q-particle, which means that the prejacent α and the antecedent β can be questions of type $\langle s\,t, t\rangle$. We may already note at this point that this means that BADD must be type-flexible also in the sense that it does not require its prejacent to have a propositional ordinary value. However, this point will be stressed less in this section: we will come back to it when introducing modifications to the entry of BADD below.

Crucially, if the host of *–kAAn* is its F-marked associate, we expect the focus semantic value of the prejacent of BADD (and by extension, the value of Γ) to make reference to polar alternatives. Depending on the order in which the *wh*-phrase (and its associated Q-particle) and the F-marked

verb are composed, the focus semantic value of the prejacent could be either of the sets given in (320) (where the *wh*-phrase is a set of entities $\{a, b, ...\}$:

(320) **Possible values for $[\![\alpha]\!]^f$**

a. Q > *wh* > V_F: $\{V(a), \neg V(a), V(b), \neg V(b), ...\}$

b. V_F > Q > *wh*: $\{\{V(a), V(b), ...\}, \{\neg V(a), \neg V(b), ...\}\}$

Essentially, introducing the F-marked verb above the Q-particle gives the polar alternatives the role of a 'contrastive topic': the members of the focus semantic value are characterised by opposite polarities. If the F-marked verb is introduced below the Q-particle, however, the alternative set remains 'flat'. As we want the antecedent β to be a question on the recurring-issue, we want the focus semantic value of the prejacent to correspond to (320b) (schematically). In other words, we need to figure out how the F-marked verb ends up being introduced to the structure above FocP.

While most of the examples with *–kAAn* that we have seen so far have involved deleting $[uTop]$ through Agreement with F^0, I propose that the recurring issue rather involves Top^0. This head carries $[iTop]$, and BADD must move above it to have its $[uTop]$ deleted. Crucially, the recurring-issue shows us that the F-marked associate and host of *–kAAn* moves along with it: this way, the order of the F-marked associate and the Q-particle is as shown in (320). In previous examples, the host of the clitic has not been claimed to move covertly with BADD. Indeed, in most examples, this covert movement would not change the LF in a tangible way. However, in terms of uniformity, we might want to retroactively state that in all examples with *–kAAn*, the host moves with BADD to a position above the $[iTop]$-carrying head.

With this assumption in place, let us now go through the derivation of a recurring-issue question up to the point where the squiggle is introduced, i.e. up to node ④ in (321).

First, recall from section 2.1.4 that the ordinary semantic value of *wh*-phrases is undefined (Beck, 2006; Kotek, 2014) (321e). A Q-particle is required for the whole structure to have a well-defined ordinary semantic value: it takes the focus semantic value of its sister node, i.e. ② which here involves different cities, and copies that value as the new ordinary semantic value (321f). The focus semantic value of the result is the singleton set of the ordinary semantic value (321f) (see section 2.1.4 for Q-particle semantics). As I assume that the F-marked tensed verb contributes polar focus alternatives, the ordinary semantic value of node ④ is a set of propositions – with the variable V replaced by *kävit* – but its focus semantic value is now a set of sets of propositions; the two sets are distinguished from each other only with respect to presence of negation (cf. contrastive topics and topic values (Büring, 1997, 2003) and family-of-questions denotations of multiple-*wh* questions (Kotek, 2014)).

(321) **Recurring-issue use of *–kAAn***

a. **Overt syntax of FocP**

[$_{FocP}$ mi-ssä [$_{FP}$ sinä <u>käv-i-t-kään</u> t]]

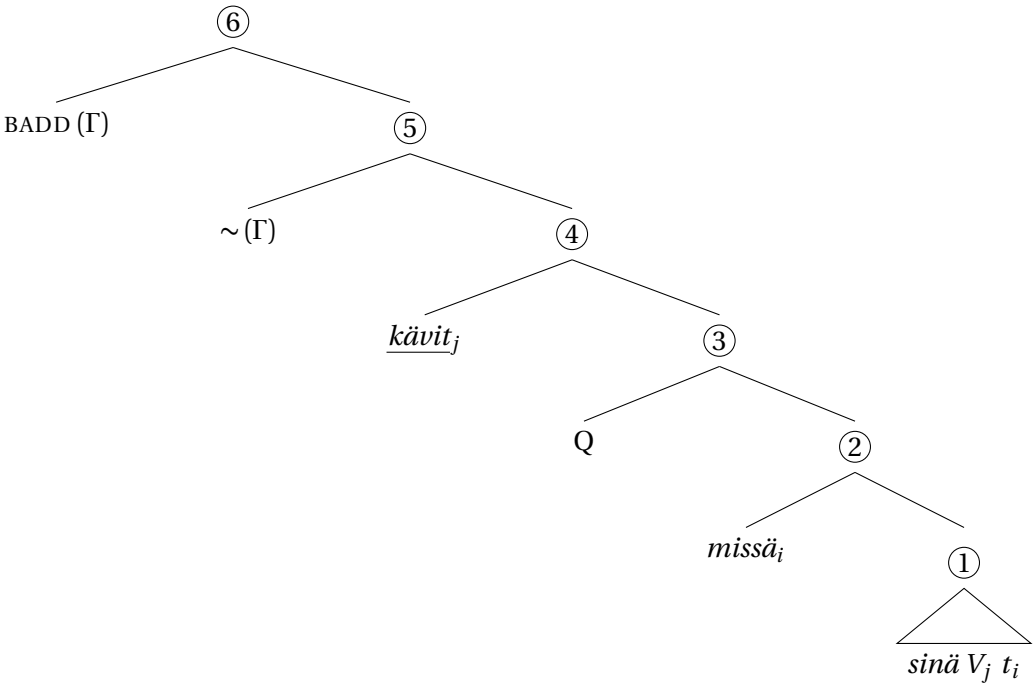
where-INE you.NOM visit-PAST.3SG.ADD

'Where did you visit again?'

b. **LF of TopP**

[$_{TopP}$ BADD ~ <u>*kävit*$_j$</u> λ [$_{FocP}$ Q *missä*$_i$ [$_{FP}$ *sinä* V_j t_i]]]

c.



d. $[\![①]\!]^o$ = $\lambda w.[V(t)(\text{you})(w)]$

$[\![①]\!]^f$ = $\{\lambda w.[V(t)(\text{you})(w)]\}$

e. (λ-abstraction over t)

$[\![②]\!]^o$ = undefined (due to the undefinedness of *missä*)

$[\![②]\!]^f$ = $\{\lambda w.[V(\text{Oulu})(\text{you})(w)], \lambda w.[V(\text{Turku})(\text{you})(w)], ...\}$

f. $[\![③]\!]^o$ = $\{\lambda w.[V(\text{Oulu})(\text{you})(w)], \lambda w.[V(\text{Turku})(\text{you})(w)], ...\}$

$[\![③]\!]^f$ = $\{\{\lambda w.[V(\text{Oulu})(\text{you})(w)], \lambda w.[V(\text{Turku})(\text{you})(w)], ...\}\}$

g. (λ-abstraction over V)

$[\![④]\!]^o$ = $\{\lambda w[\text{visited}(\text{Oulu})(\text{you})(w)], \lambda w[\text{visited}(\text{Turku})(\text{you})(w)], ...\}$

$[\![④]\!]^f$ = $\{\{\lambda w[\text{visited}(\text{Oulu})(\text{you})(w)], \lambda w[\text{visited}(\text{Turku})(\text{you})(w)], ...\},$
$\{\lambda w[\neg\text{visited}(\text{Oulu})(\text{you})(w)], \lambda w[\neg\text{visited}(\text{Turku})(\text{you})(w)], ...\}\}$

At this point of derivation, we face the same problem as with the double contrast use; the presuppositions of the squiggle are can only be satisfied if the contextual variable Γ is identical to the focus semantic value of ④. To see this, let us first set Γ as in (322a).

(322) **Γ and $[\![④]\!]^f$ of (321)**

a. $\Gamma =$ $\{\{\lambda w[\text{visited(Oulu)(you)}(w)], \lambda w[\text{visited(Turku)(you)}(w)]\},$
$\{\lambda w[\neg\text{visited(Oulu)(you)}(w)], \lambda w[\neg\text{visited(Turku)(you)}(w)]\}\}$

b. $[\![④]\!]^f =$ $\{\{\lambda w[\text{visited(Oulu)(you)}(w)], \lambda w[\text{visited(Turku)(you)}(w)], ...\},$
$\{\lambda w[\neg\text{visited(Oulu)(you)}(w)], \lambda w[\neg\text{visited(Turku)(you)}(w)], ...\}\}$

For Γ to be a subset of $[\![④]\!]^f$, every member of Γ has to be a member of $[\![④]\!]^f$. As neither of the sets in Γ is a member of $[\![④]\!]^f$, this condition is not fulfilled. Indeed, this condition can only be fulfilled if Γ is identical to $[\![④]\!]^f$. The second presupposition of the squiggle – which states that $[\![④]\!]^o$ must be a member of Γ – can also only be satisfied if Γ is equal to $[\![④]\!]^f$; this should be clear from the comparison of (321g) and (322). Finally, the third presupposition, requiring that Γ contain a member that is distinct from $[\![④]\!]^o$, is satisfied regardless of which set Γ is resolved to; if Γ denotes the set in (322b), both of its members are distinct from $[\![④]\!]^o$, and if it denotes the set in (322a), the second member is distinct from $[\![④]\!]^o$.

In section 6.1.1, I fixed this problem for the double contrast use by introducing unions (∪) in the denotation of the squiggle, thus making it type-flexible. This fix could also work for the first presupposition in the case of recurring-issue questions. However, in recurring-issue questions, setting Γ to $[\![\alpha]\!]^f$ has a certain advantage. In section 4.5, I argued that the antecedent β is itself a question – indeed, the *same* question that the ordinary semantic value of the prejacent α denotes. Setting Γ to $[\![\alpha]\!]^f$, and not e.g. a set of sets of propositions whose union is a subset of the union of $[\![\alpha]\!]^f$ (as on the double contrast use), allows retaining the exact match between α and β: the first member of Γ is identical to $[\![⑤]\!]^o$ (i.e. the prejacent of BADD). In this way, the recurring-issue is just another use that involves a prejacent α and an antecedent β that are non-distinct.

Now that we have set a Γ and identified β, we need to know where β of this semantic type can be found. I propose that in addition to the common ground and the set of propositions derived via conversational backgrounds, β may also be on the *Table*, which corresponds to a stack or ordered set of Questions Under Discussion (QUDs) (Farkas and Bruce, 2010) (see section 2.2.1). An entry for BADD that reflects this possibility is shown in (323). As was mentioned at the beginning of this section and earlier in section **??**, the recurring-issue use of BADD also requires flexibility in terms of the semantic type of prejacent α and Γ: as on the double contrast use, Γ is of type $\langle\langle s\,t\rangle, t\rangle, t\rangle$, but unlike the double contrast use, α is of type $\langle s, t\rangle$.

(323) **Semantics of BADD (for recurring-issue use; non-final)**

$$[\![\text{BADD}]\!]_{\langle\langle\langle s,t\rangle,t\rangle,\langle\langle s,t\rangle,\langle s,t\rangle\rangle\rangle} = \lambda\Gamma_{\langle\langle s,t\rangle,t\rangle}\,.\,\lambda\alpha_{\langle s,t\rangle}\,:\, \exists\beta[\beta\in\Gamma\wedge\beta\in\{cg, f(w_0), DC_X, Table\}]_{SPS}\,.\,\alpha$$

Speaker presupposition: There is some β such that β is a member of Γ (a set of focus alternatives of the prejacent α), and β is a member of the common ground cg, a set of propositions derived through applying a conversational background to the actual world, the set of public discourse commitments of a discourse participant X, or the $Table$

Therefore, the rest of the derivation in (322) proceeds as follows.

(324) a. $[\![⑤]\!]^o =$ defined iff (i) $\Gamma \subseteq [\![④]\!]^f$
(ii) $[\![④]\!]^o \in \Gamma$
(iii) $\exists\beta[\beta \in \Gamma \wedge \beta \neq [\![④]\!]^o]$

when defined, $[\![⑤]\!]^o = [\![④]\!]^o$
otherwise undefined

$[\![⑤]\!]^f = \{[\![⑤]\!]^o\}$

b. $[\![⑥]\!]^o = [\![⑤]\!]^o = \{\lambda w[\text{visited(Oulu)(you)}(w)], \lambda w[\text{visited(Turku)(you)}(w)], ...\}$

Speaker PS: $\exists\beta[\beta \in \Gamma \wedge\ \beta \in \{cg, f(w_0)\}]$
Let $\Gamma =$ $\{\{\lambda w[\text{visited(Oulu)(you)}(w)], \lambda w[\text{visited(Turku)(you)}(w)], ...\},$
$\{\lambda w[\neg\text{visited(Oulu)(you)}(w)], \lambda w[\neg\text{visited(Turku)(you)}(w)], ...\}\}$
Then $\beta =$ $\{\lambda w[\text{visited(Oulu)(you)}(w)], \lambda w[\text{visited(Turku)(you)}(w)], ...\}$

The derivation of recurring-issue questions with the bound additive *–kAAn* thus relies on the source-flexibility of BADD, and the movement of the F-marked associate to TopP. Under this analysis, unbound additives do not have a recurring-issue use because they are associated with ADD, not BADD. Now, note that *–kin* does not allow for recurring-issue readings in *wh*-questions. I propose that this is because of the main syntactic difference between *–kin* and *–kAAn*: while the former is associated with the feature $[uF]$ only, the latter is associated with $[uF]$ and $[uTop]$, and must therefore undergo movement above some head with $[iTop]$ in order to have its $[uTop]$ deleted (cf. section 5.2.2). As I argue that recurring-issue questions involve an antecedent β whose denotation is a set of propositions, it is necessary for a recurring-issue additive to scope over a question: in this case, then, it is natural to assume that $[iTop]$ is on Top^0, above FocP. Therefore, the syntax of *–kAAn* conspires to place BADD in the right position for a recurring-issue presupposition to be derivable; the syntax of *–kin*, on the other hand, does not.

6.4 Summary

In this section, I discussed the syntax and semantics of five uses of bound additives, and proposed three modifications to the semantics of BADD in order to account for them.

1. In section 6.1, I showed that the **double contrast use** requires **type-flexibility** from both the squiggle and the additive operator itself. The type-flexible semantics of BADD is able to op-

erate on prejacents whose focus semantic value is more complex than a set of propositions, as is the case on the double contrast use. I moreover underlined an interpretive difference between two types of structures with a contrastive topic and a focus; when the additive operator scopes over both, the result is a double contrast reading (which is only available with bound additives in Finnish, and subject to cross-linguistic variation), but when the additive operator scopes between them, the resulting meaning involves accommodation.

2. In section 6.2, I showed that the **polar use** not only involves polar alternatives instead of lexical alternatives, but also, the polar antecedent is retrieved from a different source than on the basic use. I proposed that this **source-flexibility** of BADD allows it to look for the antecedent at least in sets of propositions that are derived using conversational backgrounds. Later, in section 6.3, I also identified the discourse participant's public discourse commitments and the $Table$, which keeps track of QUDs in a conversation, as possible sources for the antecedent β.

3. Finally, in section 6.3, I proposed that the analysis of the **reactive, concessive** and **recurring-issue** uses show that BADD is not restricted to searching for an antecedent β that is distinct from the prejacent α. This **distinctness** condition of additive semantics has been previously argued to be due to an implicature based on the expected informativity of utterances, and the existence of the uses described in this section support that claim.

The final semantics for BADD is given in (325). Instead of providing just one lexical entry for BADD, I separate the uses by the semantic types of the arguments involved. This choice is made for readability; in terms of the lexicon, I assume that there is only one type-flexible entry for BADD, and the types of its arguments may vary in the way shown in (325) as long as they are internally compatible. The presupposition requirements of BADD per use are shown below (note the parentheses around the union operator, indicating optionality).

(325) **Semantics of BADD**

a. Polar, reactive, concessive: $[\![\text{BADD}]\!]_{\langle\langle st,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle st,t\rangle} . \lambda\alpha_{\langle s,t\rangle} :$

b. Double contrast: $[\![\text{BADD}]\!]_{\langle\langle\langle st,t\rangle,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle\langle st,t\rangle,t\rangle} . \lambda\alpha_{\langle s,t\rangle} :$

c. Recurring issue: $[\![\text{BADD}]\!]_{\langle\langle\langle st,t\rangle,t\rangle,\langle\langle st,t\rangle,\langle st,t\rangle\rangle\rangle} = \lambda\Gamma_{\langle\langle st,t\rangle,t\rangle} . \lambda\alpha_{\langle st,t\rangle} :$

$\exists\beta[\beta \in (\cup)\Gamma \wedge \beta \in \{cg, f(w_0), DC_X, Table\}]_{SPS} . \alpha$

Speaker presupposition: There is some β such that β is a member of (the union of) Γ (a set of focus alternatives of the prejacent α), and β is a member of the common ground cg, a set of propositions derived through applying a conversational background to the actual world, the set of public discourse commitments of a discourse participant X, or the $Table$

The semantic modifications introduced in this chapter explain why BADD covers a superset of contexts covered by ADD. In other words, this chapter brings a first answer to the question of why the distribution of unbound additives is so much more restricted than that of bound additives. Moreover, the modifications open an interesting window into many of the issues discussed in chapter 3. For example, in terms of the antecedency question, we have seen that the search for an antecedent reaches well beyond the common ground into private sets of propositions and different components of the discourse model. On the speaker presupposition view, the possibility of being able to refer to 'private' antecedents besides 'public' ones, without actually asserting those antecedents to be true or false, is a conceptually natural property for additivity to have. That such flexibility is possible with only unbound additives in Finnish also raises interesting questions concerning the semantics of additivity cross-linguistically.

Chapter 7

Introducing CADD

In this section, I discuss the three remaining uses of bound additives; the quantifier use (from section 4.8), *wh*-concessive use (from section 4.4.2), and the multiple-*wh* use (from section 4.7). The reason why these uses are separated from the others is that their analysis is not built on ADD or BADD; instead, I argue that these uses involve CADD (for *closure*).

In this section, I make extensive use of existential and universal sentential closure, defined as in Kratzer and Shimoyama, 2002, p. 6;

(326) **Closure operators**

When A is a set of propositions,

a. The existential closure $\exists$ of A results in the proposition that is true in all worlds in which some proposition in A is true

b. The universal closure $\forall$ of A results in the proposition that is true in all worlds in which every proposition in A is true

c. Let $A = \{\lambda w[P(w)], \lambda w[Q(w)]\}$. Then

   (i) $[\![\exists(A)]\!] = \lambda w[P(w) \vee Q(w)]$

   (ii) $[\![\forall(A)]\!] = \lambda w[P(w) \wedge Q(w)]$

In contrast to the uses involving BADD, the uses presented in this chapter (almost all) involve an additive marker that evokes an operator with a truth-conditional semantics. The only case in which the contribution of CADD can be assumed to be presuppositional is in *wh-kin* interrogatives, where the structure does not *need* a closure operator to have a well-defined ordinary semantic value. Therefore, the red thread running through this chapter is the semantic *necessity*

of the additive (cf. the obligatoriness question; section 3.1.8).

7.1 Quantifier use

In section 4.8, I noted that the bound additives *–kin* and *–kAAn* are a crucial part of the syntax and semantics of quantification in Finnish. Although quantifiers without *–kin* and *–kAAn* exist – e.g. *kaikki* 'every/all', *joka(inen)* 'every/each' and *joku* 'someone' (Hakulinen and Karlsson, 1979, p. 81) – there is a core set of quantifiers that involve bound additives. In (327), I repeat the relevant data from (246), (247), and (248).

(327) **–*kin* attaches to *jo–* (a) and *ku–* (b)**

a. *Jo-t-kin (nä-i-stä) tuoksu-vat hyvä-ltä* [∃]
JO-PL.NOM-ADD this-PL-ELA smell-PRES.3PL good-ABL
'Some (of these) smell good'

b. *Ku-kin (he-i-stä) tuoksuu hyvä-ltä* [∀]
KU.NOM-ADD they-PL-ELA smell-PRES.3SG good-ABL
'Each (of them) smells good'

(328) **The relative scope of *jokin* and *kukin* with respect to negation**

a. *Jo-t-kin (nä-i-stä) ei-vät tuoksu hyvä-ltä* [∃ > ¬]
JO-PL.NOM-ADD this-PL-ELA NEG-3PL smell.CONN good-ABL
'Some of these do not smell good'

b. *Ku-kin (he-i-stä) e-i tuoksu hyvä-ltä* [¬ > ∀]
KU.NOM-ADD they-PL-ELA NEG-3SG smell.CONN good-ABL
'Not all of them smell good'

(329) **–*kAAn* attaches to *ku–* (a) and *mi–* (b)**

a. *Ku-kaan (he-i-stä) e-i tuoksu hyvä-ltä* [∀ > ¬ = ¬ > ∃]
KU.NOM-ADD they-PL-ELA NEG-3SG smell.CONN good-ABL
'None of them smell good'

b. *Mi-kään (nä-i-stä) e-i tuoksu hyvä-ltä* [∀ > ¬ = ¬ > ∃]
MI.NOM-ADD this-PL-ELA NEG-3SG smell.CONN good-ABL
'None of these smell good'

So far in this dissertation, I have argued that *–kAAn* is not a negative polarity item, and the operator associated with it moves above negation due to a topicality feature. In the name of consistency,

I also import the topicality feature into the analysis of Finnish quantifiers involving bound additives. If we use the topicality feature to model the scope interactions shown in (328) and (329), quantifiers that scope above negation must carry [$uTop$]; specifically, this feature is must be carried by the additive operator, as in the previous sections. However, this cannot be the whole story; we must also account for the different quantificational forces that the combinations of the stems *jo–*, *ku–*, and *mi–* and the bound additives *–kin* and *–kAAn* together give rise to.

I propose that each quantificational stem (*jo–*, *ku–*, *mi–*) is inherently associated with a quantificational force. However, quantificational stems are like *wh*-words in that they lack a well-defined ordinary semantic value, and contribute a set of entities as their focus semantic value (cf. Kratzer and Shimoyama, 2002; Beck, 2006). For the structure to be well-defined, quantificational closure must be applied. For this reason, quantificational stems are associated with a feature determining which type of closure they go with: they carry either [$i\exists$] or [$i\forall$]. The operators associated with *–kin* and *–kAAn* are those closure operators, and carry [$u\exists$] or [$u\forall$].[1]

However, the mapping between the force of the quantificational closure and the form of the unbound additive is not one-to-one: *–kin*, for example, may be associated with both existential and universal closure. To see this, consider the pair *jokin* and *kukin*. While *jokin* is interpreted as an existential – and hence, *jo–* must carry [$i\exists$] – *kukin* is a universal, and so *ku–* must carry [$i\forall$]. Note, now, that while *jokin* scopes above negation, *kukin* scopes below it. Therefore, the closure operator that surfaces as *–kin* in *jokin* must carry both [$u\exists$] and [$uTop$], while in *kukin*, the operator associated with *–kin* must carry only [$u\forall$]. This is shown in (330).

(330) **Feature specifications of *jokin* and *kukin***

a. $jo_{[i\exists]} + kin_{[u\exists, uTop]}$

b. $ku_{[i\forall]} + kin_{[u\forall]}$

Assuming that the form *–kin* may be associated with two different closure operators, as indicated by the closure features in (330), leads to the expectation that *–kAAn*, too, is ambiguous in such a way. At first sight, it seems that this expectation is not borne out. As I assume that *ku–* carries [$i\forall$], *–kAAn* should carry [$u\forall$] in *kukaan*; in that case, *kukaan* must scope above negation, and therefore *–kAAn* must also carry [$uTop$]. Indeed, *kukaan* shows two properties that are elsewhere associated with n-words that denote universal quantifiers (Giannakidou, 2000): they can appear left of negation, and they can be modified by *lähestulkoon* and *melkein* 'almost', as shown in (331).

[1]The assumption that the closure operator itself carries an interpretable closure feature would in some sense be more natural; after all, it is the closure operator that is semantically responsible for the actual quantificational closure operation. However, under the assumption that the additive clitic marks the presence of a closure operator, giving the quantificational stem an uninterpretable feature would require it to move above the additive in order for the feature to be deletable via Agree. Given that the closure operator must take scope above the quantificational element, the only viable distribution of the features is to give the uninterpretable feature to the closure operator itself.

(331) **Universal-like properties of *kukaan***

{ Lähestulkoon / melkein }	*ku-kaan*	*e-i*	*tuoksu-nut*	*hyvä-ltä*
almost	KU.NOM-ADD	NEG-3SG	smell-PASTPART	good-ABL

'Almost no one smelled good'

At this point, out of the four possible feature combinations for a closure operator, we have encountered three: $[u\exists, uTop]$ (realisation as *–kin*), $[u\forall]$ (realisation as *–kin*), and $[u\forall, uTop]$ (realisation as *–kAAn*). The remaining possibility, $[u\exists]$, would result in a quantifier that is existential, and scopes under negation.

I propose that *–kAAn* may in fact mark the presence of an operator that is syntactically associated with $[u\exists]$; its existence, however, is sometimes masked by the presence of another morpheme, *–kA*. I propose that the semantic job of *–kA* is to *reverse* the closure requirement of the stem. Thus, when attached to *jo–*, the end result is universal quantification (as in *joka* 'every'); and crucially, when attached to *ku–*, the attaching closure operator must be existential (as in e.g. *kuka* 'who'). The *–kA* marker may or may not be morphologically realised. I propose that it is overtly present in *wh*-phrases such as *kuka* 'who' and the quantifier *joka* 'every', and that it may be covert in quantifiers such as *ku(ka)kaan* 'anyone/no one'. Thus, *–kAAn*, too, is associated with both quantificational forces.

(332) **Feature specifications of *kukaan*, *ku(ka)kaan*, *kukin*, and *kukakin***

a. $ku_{[i\forall]} + kaan_{[u\forall, uTop]}$

b. $ku(ka)_{[i\exists]} + kaan_{[u\exists]}$

c. $ku_{[i\forall]} + kin_{[u\forall, uTop]}$

d. $kuka_{[i\exists]} + kin_{[u\exists]}$

That *kukaan* (i.e. *ku(ka)kaan*) may be interpreted also as an existential is supported by some existential-like properties it shows. For example, in antecedents of conditionals, *kukaan* rejects modification by *lähestulkoon* and *melkein*.

(333) **Universal-like properties of *kukaan***

Jos	*(*lähestulkoon/melkein)*	*ku-kaan*	*tule-e,*	*soita*	*kello-a*
if	almost	KU.NOM-ADD	come-PRES.3SG	ring-IMP.2SG	bell-PAR

'If anyone comes, ring the bell'

In sum, given the feature specifications laid out in (332), *–kin* and *–kAAn* mark the presence of two closure additives: one existential, and one universal. From now on, we will refer to these operators as $\text{CADD}_{\exists}$ and $\text{CADD}_{\forall}$ (for *closure additive*). The data is summarised in Table 7.1. Note that I add the familiar $[u/iF]$-features on the stems and the additives for the sake of consistency; as I

assume that the stems contribute focus alternatives, this assumption is justified. (The impossibility of the combination **jokaan* was related to the cross-linguistic ban on realising the O-corner of the logical square in section 4.8 (Horn, 1972).)

Host		**Clitic**		
Form	**Features**	**Form**	**Features**	**Operator**
jo–	$[i\exists, iF]$	*–kin*	$[u\exists, uF, uTop]$	$\text{CADD}_{\exists}$
		**–kAAn*		
ku–	$[i\forall, iF]$	*–kin*	$[u\forall, uF]$	$\text{CADD}_{\forall}$
	$[i\forall, iF]$	*–kAAn*	$[u\forall, uF, uTop]$	$\text{CADD}_{\forall}$
ku-(ka)–	$[i\exists, iF]$	*–kin*	$[u\exists, uF, uTop]$	$\text{CADD}_{\exists}$
	$[i\exists, iF]$	*–kAAn*	$[u\exists, uF]$	$\text{CADD}_{\exists}$

Table 7.1: Featural specifications of quantificational stems and bound additives functioning as closure operators.

Let us now define a semantics for $\text{CADD}_{\exists}$ and $\text{CADD}_{\forall}$. As was mentioned in the beginning of this chapter, Kratzer and Shimoyama (2002) define universal and existential closure as operations that take a set of propositions A and yield (i) the proposition that is true in all worlds in which *some* proposition in A is true (existential), or (ii) the proposition that is true in all worlds in which *every* proposition in A is true (universal). Building on this definition, I propose that both closure additives set the otherwise undefined ordinary semantic value of their prejacent α to the existential or universal closure of the focus semantic value of α. Like the Q-particle, the focus semantic value is set to be the singleton set of the new ordinary semantic value. The semantics of $\text{CADD}_{\exists}$ and $\text{CADD}_{\forall}$ are shown in (334).[2]

(334) **Semantics of $\text{CADD}_{\forall}$ (non-final)**
Let $[\![\alpha]\!]^o$ be undefined; $[\![\alpha]\!]^f$ a set of propositions; and Γ a set of propositions whose denotation is restricted by $\sim(\Gamma)(\alpha)$.

a. $[\![\text{CADD}_{\exists}(\alpha)]\!]^o = \exists([\![\alpha]\!]^f)$
$[\![\text{CADD}_{\exists}(\alpha)]\!]^f = \{[\![\text{CADD}_{\exists}(\alpha)]\!]^o\}$

b. $[\![\text{CADD}_{\forall}(\alpha)]\!]^o = \forall([\![\alpha]\!]^f)$
$[\![\text{CADD}_{\forall}(\alpha)]\!]^f = \{[\![\text{CADD}_{\forall}(\alpha)]\!]^o\}$

The semantics of *jo–* and *ku–* is shown in (335); it is the same as that of *wh*-phrases. As in the previous sections, I retain a semantic notation that overtly spells out some members of a set (and

[2]The semantics of CADD crucially does not involve the squiggle. If it did, the resulting configurations would instantiate focus intervention (Beck, 2006); applying the squiggle before CADD would make both semantic values of the prejacent undefined, and CADD would not be able to save the structure from undefinedness.

indicates continuation with three dots); thus, in (335b), the set of entities of type e is set to correspond to an open-ended set of e-type expressions.

(335) **The semantics of *jo–* and *ku–***

a. $[\![jo\text{–}/ku\text{–}]\!]^o$ = undefined

b. $[\![jo\text{–}/ku\text{–}]\!]^f = \{x \mid x \in D_e\} = \{a, b, c, ...\}$

We are now ready to go through some derivations. As the structures show, I assume that the quantifier stem moves with CADD if movement is required for purposes of feature deletion. However, CADD is interpreted as adjoined to the root tree, as was the case with ADD and BADD in previous sections.

First, in (336), the denotation assigned to (336a) is the existential (i.e. disjunctive) proposition in (336f). (Note that I am assuming that $[iTop]$ is on F^0.)

(336) **Example with *jokin***

a. **Surface syntax of FP**

$[_{FP}$ *Jo-kin* *tuoksu-u* *hyvä-ltä*]

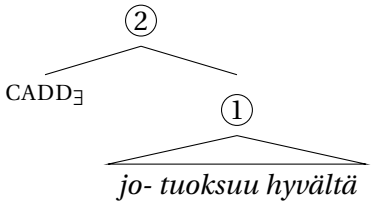
JO.NOM-ADD smell-PRES.3SG good-ABL

'Something smells good'

b. **LF of FP**

$[_{FP}$ CADD$_\exists$ *jo–* *tuoksuu hyvältä*]

c.



d. $[\![①]\!]^o$ = undefined (because of *jo–*)
$[\![①]\!]^f$ = $\{\lambda w[\text{smells-good}(a)(w)], \lambda w[\text{smells-good}(b)(w)], ...\}$

e. $[\![②]\!]^o$ = $\lambda w[\text{smells-good}(a)(w)] \vee [\text{smells-good}(b)(w)] \vee ...]$
$[\![②]\!]^f$ = $\{\lambda w[\text{smells-good}(a)(w)] \vee \text{smells-good}(b)(w) \vee ...]\}$

The sentence in (337a) in turn denotes a proposition that involves negative disjuncts (337f).

(337) **Example with *jokin* and negation**

a. **Surface syntax of FP**

[$_{FP}$ Jo-kin e-i tuoksu hyvä-ltä]

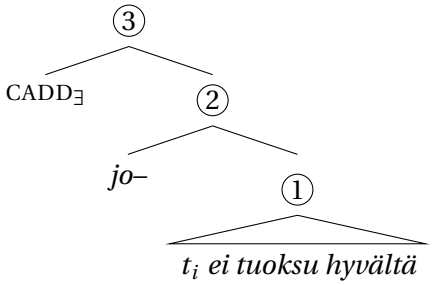
JO.NOM-ADD NEG-3SG smell.CONN good-ABL

'Something does not smell good'

b. **LF of FP**

[$_{FP}$ CADD$_{\exists}$ *jo–* λ [$_{FP}$ t_i *ei tuoksu hyvältä*]]

c.



d. $[\![①]\!]^o = \lambda w[\neg\text{smells-good}(t_i)(w)]$

$[\![①]\!]^f = \{\lambda w[\neg\text{smells-good}(t_i)(w)]\}$

e. (λ-abstraction over t_i)

$[\![②]\!]^o =$ undefined (because of *jo–*)

$[\![②]\!]^f = \{\lambda w[\neg\text{smells-good}(a)(w)], \lambda w[\neg\text{smells-good}(b)(w)], ...\}$

f. $[\![③]\!]^o = \lambda w[\neg\text{smells-good}(a)(w) \vee \neg\text{smells-good}(b)(w) \vee ...]$

$[\![③]\!]^f = \{\lambda w[\neg\text{smells-good}(a)(w) \vee \neg\text{smells-good}(b)(w) \vee ...]\}$

For (338a), the end result is a conjunctive proposition (338e).

(338) **Example with *kukin***

a. **Surface syntax of FP**

[$_{FP}$ Ku-kin tuoksu-u hyvä-ltä]

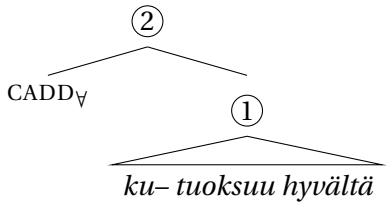
KU.NOM-ADD smell-PRES.3SG good-ABL

'Each (one) smells good'

b. **LF of FP**

[$_{FP}$ CADD$_{\forall}$ *ku– tuoksuu hyvältä*]

c.



d. $[\![①]\!]^o =$ undefined (because of *ku–*)
$[\![①]\!]^f = \{\lambda w[\text{smells-good}(a)(w)], \lambda w[\text{smells-good}(b)(w)], ...\}$

e. $[\![②]\!]^o = \lambda w[\text{smells-good}(a)(w) \wedge \text{smells-good}(b)(w) \wedge ...]$
$[\![②]\!]^f = \{\lambda w[\text{smells-good}(a)(w) \wedge \text{smells-good}(b)(w) \wedge ...]\}$

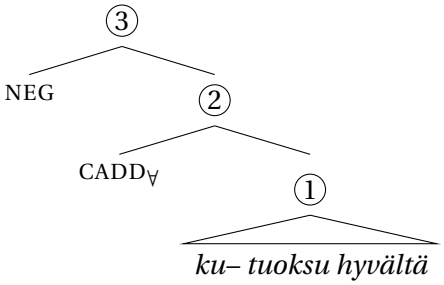
And finally, the right denotation for (339a) is derived by having negation scope over the closure operator. By De Morgan's law, the result is a disjunction of the negations of the conjuncts (339f).

(339) **Example with *kukin* and negation**

a. **Surface syntax of FP**
$[_{FP}$ *Ku-kin* *e-i* *tuoksu* *hyvä-ltä*]
KU.NOM-ADD NEG-3SG smell.CONN good-ABL
'Each (one) does not smell good'

b. **LF of NegP**
$[_{NegP}$ NEG $[_{TMP}$ CADD$_\forall$ *ku– tuoksu hyvältä*]]

c.



d. $[\![①]\!]^o =$ undefined (because of *ku–*)
$[\![①]\!]^f = \{\lambda w[\text{smells-good}(a)(w)], \lambda w[\text{smells-good}(b)(w)], ...\}$

e. $[\![②]\!]^o = \lambda w[\text{smells-good}(a)(w) \wedge \text{smells-good}(b)(w) \wedge ...]$
$[\![②]\!]^f = \{\lambda w[\text{smells-good}(a)(w) \wedge \text{smells-good}(b)(w) \wedge ...]\}$

f. $[\![③]\!]^o = \lambda w[\neg\text{smells-good}(a)(w) \vee \neg\text{smells-good}(b)(w) \vee ...]$
$[\![③]\!]^f = \{\lambda w[\neg\text{smells-good}(a)(w) \vee \neg\text{smells-good}(b)(w) \vee ...]\}$

Now, given that multiple quantifiers may appear within the same sentence, it is necessary to show that the closure-approach derives the right readings. First note that while the surface order *kukin* > *jokin* is scopally ambiguous (340a), the surface order *jokin* > *kukin* is not (340b).[3]

(340) **Scope interactions of *jokin* and *kukin***

a. *Ku-kin saippua tuoksu-u jo-lta-kin kuka-lta* [∃ > ∀, ∀ > ∃]
KU.NOM-ADD soap.NOM smell-PRES.3SG JO-ABL-ADD flower-ABL
'Each soap smells like some flower'

b. *Jo-kin saippua tuoksu-u ku-lta-kin kuka-lta* [∃ > ∀, *∀ > ∃]
JO.NOM-ADD soap.NOM smell-PRES.3SG KU-ABL-ADD flower-ABL
'Some soap smells like each flower'

In keeping with the practice of spelling out the members of the sets of which the focus semantic values consist, in the following examples, I refer to the members in *jokin/kukin saippua* 'some/each soap' and *jokin/kukin kukka* 'some/every flower' as in (341).

(341) **The denotations of *jo–/ku– saippua* and *jo–/ku– kukka***

a. $[\![jo\text{–}/ku\text{–}\ saippua]\!]^o$ = undefined
$[\![jo\text{–}/ku\text{–}\ saippua]\!]^f = \{x \mid \text{soap}(x)\} = \{s_1, s_2, s_3, ...\}$

b. $[\![jo\text{–}/ku\text{–}\ kukka]\!]^o$ = undefined
$[\![jo\text{–}/ku\text{–}\ kukka]\!]^f = \{x \mid \text{flower}(x)\} = \{k_1, k_2, k_3, ...\}$

Now, crucially, given that the examples involve two closure operators, and the first changes the focus semantic value of the new node to the singleton set of its ordinary semantic value, the focus semantic value that the higher closure operator operates on will be a set of sets of propositions, and not a simple set of propositions. We must therefore modify the semantics of the closure operators so that they know what to do with such focus semantic values. In (342a), I repeat the set of propositions denotation from (326). In (342b), I define the meaning of the closure for set of sets of propositions. Note that the member sets themselves are singleton sets; this is guaranteed by the earlier application of closure.

(342) **Type-flexible closure**

a. Let $A = \{\lambda w[P(w)], \lambda w[Q(w)]\}$. Then
(i) $[\![\exists(A)]\!] = \lambda w[P(w) \vee Q(w)]$
(ii) $[\![\forall(A)]\!] = \lambda w[P(w) \wedge Q(w)]$

b. Let $A = \{\{\lambda w[P(w)]\}, \{\lambda w[Q(w)]\}\}$. Then

[3]The reasons behind this scope freezing effect are not explored further here.

(i) $[\![\exists(A)]\!] = \lambda w[[P(w)] \vee [Q(w)]] = \lambda w[P(w) \vee Q(w)]$

(ii) $[\![\forall(A)]\!] = \lambda w[[P(w)] \wedge [Q(w)]] = \lambda w[P(w) \wedge Q(w)]$

I will now go through the derivations for the two interpretations of (340a). On the first reading, the existential scopes over the universal. As (343g) shows, the truth-conditions come out right: the sentence is true at w if there is some flower k_n such that each soap s_n smells like k_n at w.

(343) **Example with *kukin* and *jokin*:** [$\exists > \forall$]

a. **Surface syntax of FP**

[$_{FP}$ Ku-kin saippua tuoksu-u jo-lta-kin kuka-lta]

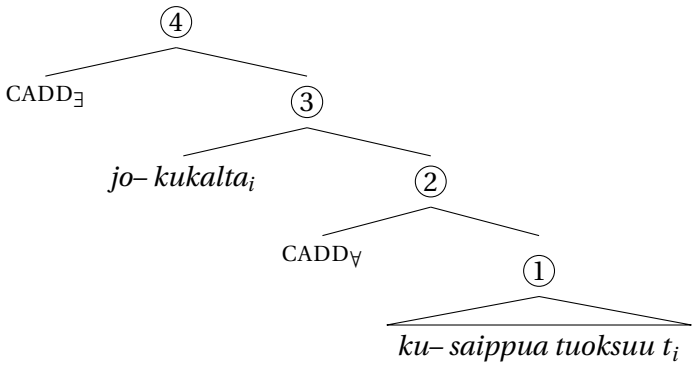
KU.NOM-ADD soap.NOM smell-PRES.3SG JO-ABL-ADD flower-ABL

'Each soap smells like some flower'

b. **LF of FP**

[$_{FP}$ CADD$_\exists$ *jo– kukalta$_i$* λ [$_{FP}$ CADD$_\forall$ *ku– saippua tuoksuu t$_i$*]

c.



d. $[\![①]\!]^o =$ undefined (because of *ku–*)

$[\![①]\!]^f = \{\lambda w[\text{smells}(t)(s_1)(w)], \lambda w[\text{smells}(t)(s_2)(w)], ...\}$

e. $[\![②]\!]^o = \lambda w[\text{smells}(t)(s_1)(w) \wedge \text{smells}(t)(s_2)(w) \wedge ...]$

$[\![②]\!]^f = \{\lambda w[\text{smells}(t)(s_1)(w) \wedge \text{smells}(t)(s_2)(w) \wedge ...]\}$

f. (λ-abstraction over t_i)

$[\![③]\!]^o =$ undefined (because of *jo–*)

$[\![③]\!]^f = \{\{\lambda w[\text{smells}(k_1)(s_1)(w) \wedge \text{smells}(k_1)(s_2)(w) \wedge ...]\},$
$\{\lambda w[\text{smells}(k_2)(s_1)(w) \wedge \text{smells}(k_2)(s_2)(w) \wedge ...]\}, ...\}$

g. $[\![④]\!]^o = \lambda w[[\text{smells}(k_1)(s_1)(w) \wedge \text{smells}(k_1)(s_2)(w) \wedge ...]$
$\vee [\text{smells}(k_2)(s_1)(w) \wedge \text{smells}(k_2)(s_2)(w) \wedge ...] \vee ...]$

$[\![④]\!]^f = \{\lambda w[[\text{smells}(k_1)(s_1)(w) \wedge \text{smells}(k_1)(s_2)(w) \wedge ...]$
$\vee [\text{smells}(k_2)(s_1)(w) \wedge \text{smells}(k_2)(s_2)(w) \wedge ...] \vee ...]\}$

To derive the surface scope reading – on which each soap might smell like a different flower – I assume that the subject quantifier may take scope above the FP-located object quantifier at LF. As (344h) shows, the truth conditions come out right: each soap s_n must smell like some flower k_n in w.

(344) **Example with *kukin* and *jokin*:** [$\forall > \exists$]

a. **Surface syntax of FP**

[$_{FP}$ Ku-kin saippua tuoksu-u jo-lta-kin kuka-lta]

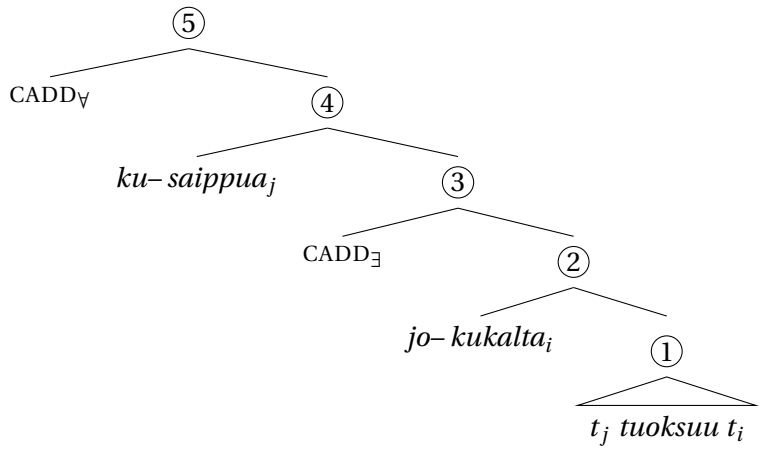
KU.NOM-ADD soap.NOM smell-PRES.3SG JO-ABL-ADD flower-ABL

'Each soap smells like some flower'

b. **LF of FP**

[$_{FP}$ CADD$_{\forall}$ *ku– saippua$_i$* λ CADD$_{\exists}$ *jo– kukalta$_i$* λ [$_{FP}$ t_j *tuoksuu* t_i]

c.



d. $[\![①]\!]^o = \lambda w[\text{smells}(t_i)(t_j)(w)]$

$[\![①]\!]^f = \{\lambda w[\text{smells}(t_i)(t_j)(w)]\}$

e. (λ-abstraction over t_i)

$[\![②]\!]^o =$ undefined (because of *jo–*)

$[\![②]\!]^f = \{\lambda w[\text{smells}(k_1)(t_j)(w)], \lambda w[\text{smells}(k_2)(t_j)(w)], ...\}$

f. $[\![③]\!]^o = \lambda w[\text{smells}(k_1)(t_j)(w) \vee \text{smells}(k_2)(t_j)(w) \vee ...]$

$[\![③]\!]^f = \{\lambda w[\text{smells}(k_1)(t_j)(w) \vee \text{smells}(k_2)(t_j)(w) \vee ...]\}$

g. (λ-abstraction over t_j)

$[\![④]\!]^o =$ undefined (because of *ku–*)

$[\![④]\!]^f = \{\{\lambda w[\text{smells}(k_1)(s_1)(w) \vee \text{smells}(k_2)(s_1)(w) \vee ...]\},$
$\{\lambda w[\text{smells}(k_1)(s_2)(w) \vee \text{smells}(k_2)(s_2)(w) \vee ...]\}\}$

h. $[\![⑤]\!]^o = \lambda w[[\text{smells}(k_1)(s_1)(w) \vee \text{smells}(k_2)(s_1)(w) \vee ...]$
$\wedge [\text{smells}(k_1)(s_2)(w) \vee \text{smells}(k_2)(s_2)(w) \vee ...] \wedge ...]$

$$[\![⑤]\!]^f = \{\lambda w[[\text{smells}(k_1)(s_1)(w) \vee \text{smells}(k_2)(s_1)(w) \vee ...] \\ \wedge [\text{smells}(k_1)(s_2)(w) \vee \text{smells}(k_2)(s_2)(w) \vee ...] \wedge ...]\}$$

The derivation of (340b) with a subject-existential and an object-universal is not shown here; the two previous derivations indicate how it would work. Derivations that involve the *–kA* morpheme are discussed in section 7.3.3 in connection with the interrogative multiple-*wh* use.

This concludes the proposal for the quantifier use of the bound additives *–kin* and *–kAAn*. In sum, I propose that the surface realisations of the bound additives may be associated with a syntax (features) and a semantics (operator) that are distinct from but related to those proposed for the surface realisations of the bound additives on the presuppositional uses discussed in chapter 6. In contrast to previous proposals that relate additives to quantification (Ahn, 2015; Szabolcsi, 2015), I do not assign a single quantificational force to the operators associated with *–kin* and *–kAAn*; instead, I propose that the combinations of the closure features [$u\exists$] and [$u\forall$] and the topicality feature [$uTop$] derive the data.[4]

7.2 *Wh*-concessive use

In this section, I propose that CADD is also involved in the derivation of what have been called universal concessive conditionals (Haspelmath and König, 1998), free adjunct free relatives (Izvorski, 2000; Caponigro, 2003), and constituent unconditionals (Rawlins, 2013), and what I here call *wh*-concessives (see section 4.4.2). The relevant data is shown in (345) (repeated from (203) and (204)).

(345) **Concessive use with *–kin* and *–kAAn***

a. *Kene-t* *valitse-t-*(kin),* *e-t* *varmasti* *pety*
who-ACC choose-PRES.2SG-ADD NEG-2SG surely be.disappointed.CONN
'No matter who/whoever you choose, you will surely not be disappointed'

b. *Kene-t* *valitse-t-*(kaan),* *e-t* *varmasti* *pety*
who-ACC choose-PRES.2SG-ADD NEG.2SG surely be.disappointed.CONN
'No matter who/whoever you choose, you will surely not be disappointed'

On the *wh*-concessive use, the presence of *–kin* or *–kAAn* is obligatory; however, it seems that the choice between the two is free, and moreover, no difference in meaning seems to be related to

[4] In section 3.4.1, I discussed the derivation of conjunctive readings based on double-exhaustification of disjunctions (Bar-Lev and Margulis, 2014; Szabolcsi, 2017). It is interesting to consider the possibility that both *–kin* and *–kAAn* indicate the presence of an existential closure operator, but in some cases, the disjunction is not exhaustified, and in others, it is – and moreover, it is exhaustified twice. The problem is that double-exhaustification cannot then be connected with the type of the quantificational stem, given that e.g. *ku–* may end up with either existential or universal force, or with the form of the clitic, given that *–kin* must be able to signal closures of both forces. In other words, the lack of a one-to-one mapping remains a problem even if a double-exhaustification account would be shown to work otherwise. Therefore, I retain the quantificational closure analysis here.

the choice of the bound additive.[5] As in many uses discussed earlier in this section, the bound additives attach to a tensed verb on the concessive use. Therefore, the focus alternatives that are involved in the semantics of the structure are assumed to be polar.

I propose that the 'no matter'-reading typical of concessive free adjunct free relatives is due to the interaction of polar focus alternatives from the tensed verb, and lexical alternatives from the *wh*-phrase. The bound additive overtly marks the presence of the closure operator $\text{CADD}_{\exists}$ – with both *–kin* and *–kAAn* – which takes scope over both alternative-inducing elements. By doing so, the operator allows the adjunct to have a well-defined ordinary semantic value. Essentially, after existential closure, the meaning of the concessive clause is the disjunction of $P(x)$ and $\neg P(x)$ for all x that are contributed by the *wh*-phrase. By the law of contradiction, it is impossible for such a disjunction to be false.

(346) **'No matter'-reading**

$[P(x_1) \vee \neg P(x_1) \vee P(x_2) \vee \neg P(x_2) \vee ... \vee P(x_n) \vee \neg P(x_n)] = \top$

Given the syntactic features associated with *–kin* and *–kAAn* in the previous section, the assumption that both *–kin* and *–kAAn* both mark the presence of $\text{CADD}_{\exists}$ in *wh*-concessives leads to some predictions. To see whether the syntax and semantics will play out as we want them to, let us look at structures involving *–kin* and *–kAAn* one at a time.

First, if the closure operator whose presence *–kin* marks in *wh*-concessives must be existential, it is related to the presence of the features $[u\exists, uF, uTop]$ (according to section 7.1). Thus, I must assume that the concessive clause contains some head with $[iTop]$. If CADD deletes its $[uTop]$ through agreement with F^0, there is no motivation for it to move above FocP, where the *wh*-phrase moves overtly. As we want CADD to scope over the *wh*-phrase so that it can give the whole adjunct clause a well-defined ordinary semantic value, I postulate for now that the relevant head for $[uTop]$-deletion is Top^0 above FocP.[6]

Given that the concessive clause cannot stand alone, and always requires a matrix clause, let us assume that the concessive clause contains a silent connective in ForceP. This connective has a conditional semantics, which makes it a two-place propositional operator (cf. Stump, 1985; Izvorski, 2000). Let us refer to this connective as $C_{\rightarrow}$, and define it very simply as in (347) (as the focus is not on the semantics of conditionality, this will do).[7]

(347) **Definition of $C_{\rightarrow}$**

$[\![C_{\rightarrow}]\!]_{\langle st,\langle st,st\rangle\rangle} = \lambda p_{\langle s,t\rangle} \lambda q_{\langle s,t\rangle} \lambda w[p(w) \rightarrow q(w)]$

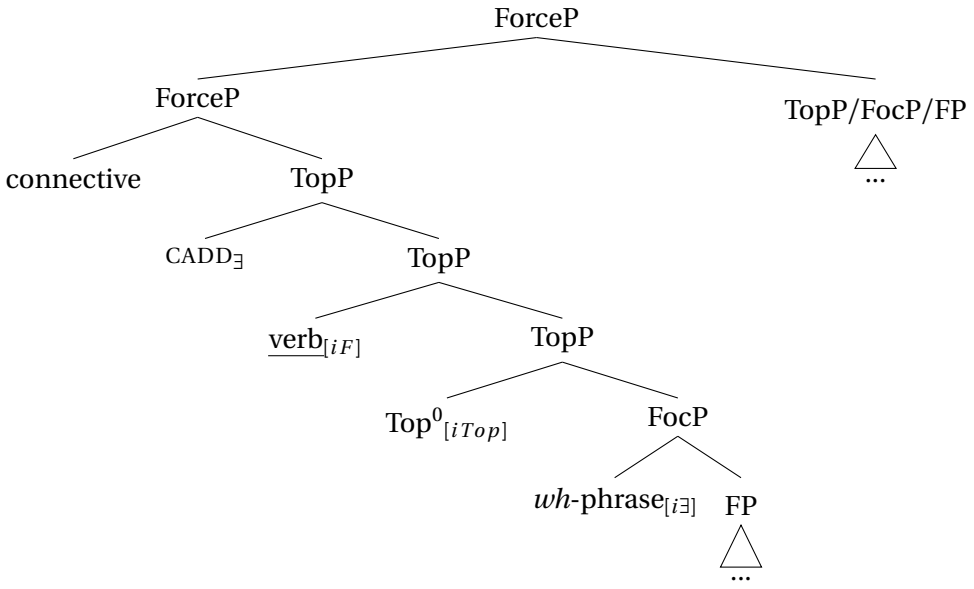
[5] For example, neither additive is associated with a specific positive or negative bias.

[6] Below, we will see that there is another motivation for CADD to move above the *wh*-phrase.

[7] Rawlins (2013) gives a compositional analysis of this structure where the conditionality is due to the presence of a modal operator in the matrix clause (Heim, 1982; Kratzer, 1977; Lewis, 1975). On this account, the adjunct clause denotes a set of propositional alternatives that are fed pointwise to the modal as its restriction, and the end result – a set of propositions – is closed universally.

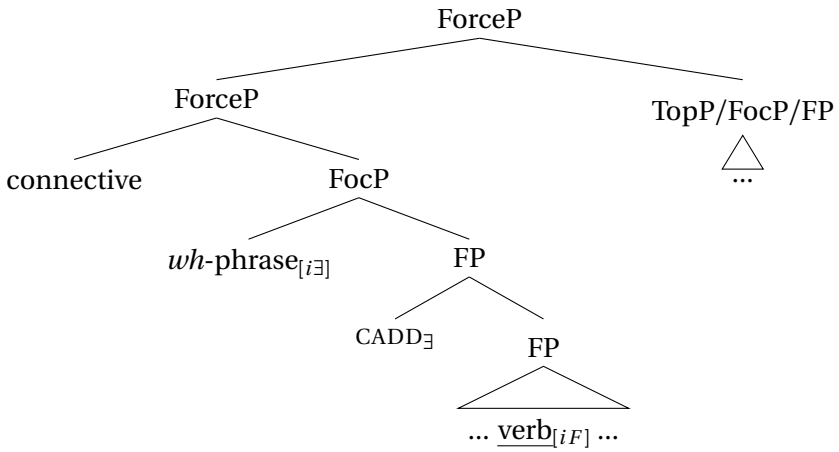
Now, the schematic (LF-) structure of (345a) should be as in (348). For the matrix clause, what matters is that the ordinary semantic value of the maximal projection is a proposition; in principle, the projection could be a TopP, FocP, or simply a FP. Note that the host of the additive marker is again assumed to move to TopP with the operator.

(348) **Structure with *–kin*, assuming CADD$_{\exists}$ is associated with** $[u\exists, uF, uTop]$ **(final)**



In section 7.1, I argued that the difference between *–kin* and *–kAAn*, when associated with CADD$_{\exists}$, is that with *–kAAn* there is no $[uTop]$ involved. Thus, the predicted schematic structure of a *wh*-concessive like (345b) is (349).

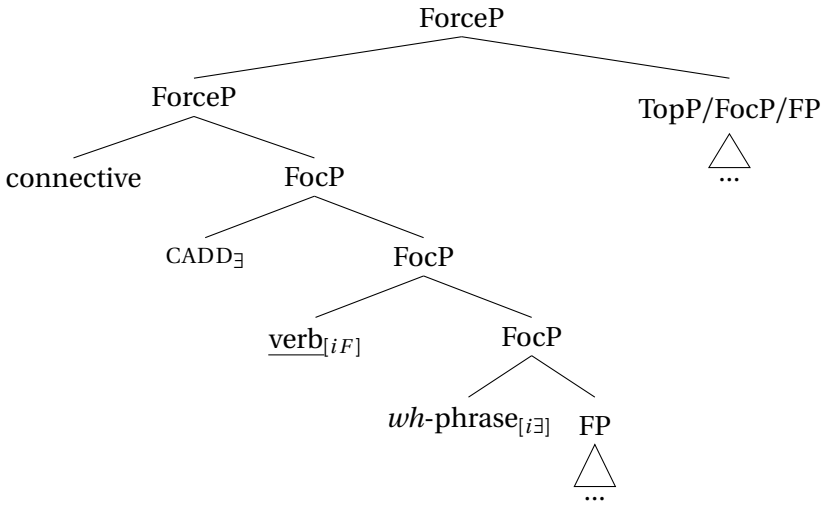
(349) **Structure with *–kAAn*, assuming CADD$_{\exists}$ is associated with** $[u\exists, uF]$ **(non-final)**



The main problems with (349) are that (i) $[u\exists]$ on CADD$_{[\exists]}$ cannot be deleted, and (ii) the ordinary semantic value of the concessive clause, and hence the whole structure in (349), is undefined.

These problems are both due to the position of the closure operator, which is too low below the *wh*-phrase. For the structure to be well-formed, it must be that CADD moves above the *wh*-phrase to have its [$u\exists$] deleted. I assume that it does so, and 'pulls' its host with it. In fact, if the closure operator associated with *–kin* was assumed to Agree with [$iTop$] on F^0 instead of the high Top^0, the same reasoning would still take CADD above the *wh*-phrase as well: in other words, the assumption that *wh*-concessives involve Top^0 with [$iTop$] is not necessary. Thus, the structure of concessive clauses with *–kin* and *–kAAn* are identical in terms of semantics (syntactic details aside); schematically, *wh*-concessives that involve *–kAAn* have the structure shown in (350).

(350) **Structure with *–kAAn*, assuming CADD$_\exists$ is associated with [$u\exists$, uF] (final)**



In (352), I spell out the details of the derivation of (345a).

(351) **Derivation of (345a)**

a. **Surface syntax of ForceP**

[$_{ForceP}$ [$_{Force'}$ [$_{FocP}$ kene-t [$_{FP1}$ (sinä) valitse-t-kin t_i]]]

who-ACC you.NOM choose-PRES.2SG-ADD

[$_{FP2}$ e-t varmasti pety]]

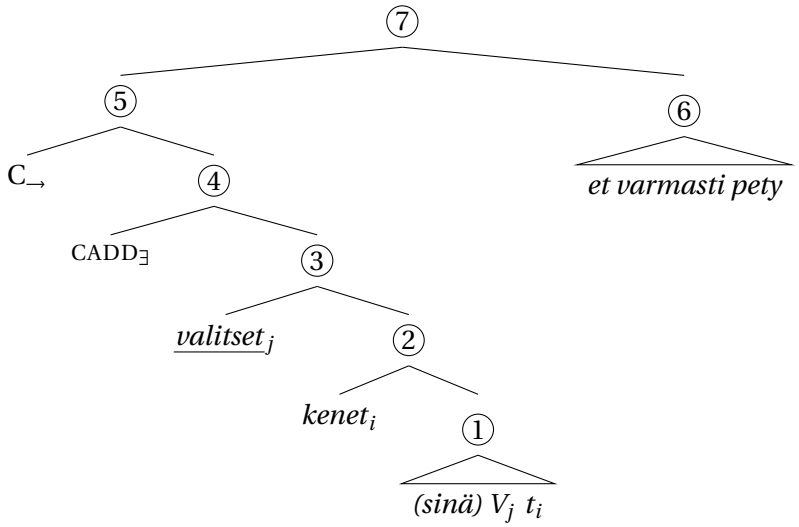
NEG-2SG surely be.disappointed.CONN

'No matter who/whoever you choose, you will surely not be disappointed'

b. **LF of ForceP**

[$_{ForceP}$ C$_\rightarrow$ ([$_{TopP/FocP}$ CADD$_\exists$ *valitset*$_j$ λ [$_{FocP}$ *kenet*$_i$ λ [$_{FP}$ *(sinä)* V_j t_i]]]) ([$_{FP}$ *et varmasti pety*])]

c.



d. $[\![①]\!]^o = \lambda w[V(t_i)(\text{you})(w)]$
$[\![①]\!]^f = \{\lambda w[V(t_i)(\text{you})(w)]\}$

e. (λ-abstraction over t_i)
$[\![②]\!]^o =$ undefined (because of *kenet*)
$[\![②]\!]^f = \{\lambda w[V_j(a)(\text{you})(w)], \lambda w[V_j(b)(\text{you})(w)], ...\}$

f. (λ-abstraction over V_j)
$[\![③]\!]^o =$ undefined (because of *kenet*)
$[\![③]\!]^f = \{\lambda w[\text{choose}(a)(\text{you})(w)], \lambda w[\neg\text{choose}(a)(\text{you})(w)],$
$\lambda w[\text{choose}(b)(\text{you})(w)], \lambda w[\neg\text{choose}(b)(\text{you})(w)], ...\}$

g. $[\![④]\!]^o = \lambda w[\text{choose}(a)(\text{you})(w) \vee \neg\text{choose}(a)(\text{you})(w)$
$\vee\ \text{choose}(b)(\text{you})(w) \vee \neg\text{choose}(b)(\text{you})(w) \vee ...]$
$[\![④]\!]^f = \{\lambda w[\text{choose}(a)(\text{you})(w) \vee \neg\text{choose}(a)(\text{you})(w)$
$\vee\ \text{choose}(b)(\text{you})(w) \vee \neg\text{choose}(b)(\text{you})(w) \vee ...]\}$

h. $[\![⑤]\!]^o = \lambda q_{\langle st\rangle}\lambda w[\text{choose}(a)(\text{you})(w) \vee \neg\text{choose}(a)(\text{you})(w)$
$\vee\ \text{choose}(b)(\text{you})(w) \vee \neg\text{choose}(b)(\text{you})(w) \vee ...] \rightarrow q(w)]$

i. $[\![⑥]\!]^o = \lambda w[\neg\text{be-disappointed}(\text{you})(w)]$

j. $[\![⑦]\!]^o = \lambda w[\text{choose}(a)(\text{you})(w) \vee \neg\text{choose}(a)(\text{you})(w)$
$\vee\ \text{choose}(b)(\text{you})(w) \vee \neg\text{choose}(b)(\text{you})(w) \vee ...] \rightarrow \neg\text{be-disappointed}(\text{you})(w)]$

The truth-conditions of (345a) are correctly captured by the semantics given in (351). The derivation of (345b) only differs from the one shown in (351) in terms of syntax, and will not be shown here.

To conclude, the *wh*-concessive use may be analysed as involving CADD$_\exists$, an existential clo-

sure operator. The relevant examples have intuitively right truth-conditions if existential closure applies on the concessive clause, and the result is then fed to a general silent connective so that it becomes the antecedent of a conditional (cf. Haspelmath and König, 1998; Izvorski, 2000; Rawlins, 2013). Both *–kin* and *–kAAn* may be interchangeably used in *wh*-concessives. I proposed that regardless of the presence of $[uTop]$ on these operators, they must move above the $[i\exists]$-carrying *wh*-phrase in order for their uninterpretable closure feature $[u\exists]$ to be deleted.

7.3 Multiple-*wh* use

In this last section, I give a proposal for the syntax and semantics of the three multiple-*wh* uses of the bound additive *–kin*: the relative (section 7.3.1), declarative (section 7.3.2), and interrogative type (section 7.3.3). As this section will show, all three involve the closure operator $\text{CADD}_{\exists}$. However, in *wh-kin* relative and declarative clauses, the semantic contribution of $\text{CADD}_{\exists}$ is truth-conditional, whereas in *wh-kin* interrogatives, the direct contribution of the closure operator is presuppositional. Indirectly, the presence of $\text{CADD}_{\exists}$ also has other implications for the syntax and semantics of *wh-kin* interrogatives (cf. section 4.7.1).

7.3.1 Relative type

There are two types of *wh-kin* relative clauses: restrictive and free (from section 4.7.2). In (352), I repeat an example of each (from (231) and (232)). (Recall that I use the universal quantifier *each* in the translations simply to give the reader an approximation of the meaning that these sentences have, and this choice does not reflect a semantic commitment. Another possibility would be to use *different*, as was sometimes done in section 4.7.)

(352) **Restrictive and free *wh-kin* relative clauses**

a. *Ryhmä* *siirre-tään* *sinne* $[_{Rel}$ *mi-ssä*$_i$ *si-tä* *milloin-kin* *eniten*
group.NOM move-PASS.PRES there where-INE it-PAR when-ADD most
tarvi-taan t_i]
need-PASS.PRES
'At each time t, the group will be moved to where it is most needed at t'

b. *Ryhmä-n* *jäsene-t* *tek-i-vät* $[_{Rel}$ *mi-tä*$_i$ *heidä-n* *milloin-kin*
group-GEN member-PL.NOM do-PAST-3PL what-PAR they-GEN when-ADD
kuulu-i *teh-dä* t_i]
should-PRES.3SG do-INF
'At each time t, the group members did what they were supposed to do at t'

In section 4.7.2, I noted that as can be expected of relative clauses, the *wh*-phrase – or, more accurately, the relative pronoun – must yield a relative clause that can modify the head noun

(restrictive type) or match the selectional requirements of the verb when the relative clause acts as an argument of the verb (free type). Thus, in (352a), the relative clause is semantically a predicate; in (352b), it is an entity of type e (Caponigro, 2003, and references therein).

The syntax of relative clauses involves a gap. Brattico et al. (2013) propose that in Finnish, the phrase functioning as the relative pronoun is fronted to σP, which corresponds to the same projection that has been labeled as FocP for the purposes of e.g. *wh*-movement.[8] The semantics of relative clauses, then, involves λ-abstraction over the trace left by movement; this creates the required predicate (Heim and Kratzer, 1998). It has been proposed that the semantic function of the relative pronoun itself is to impose a further restriction on the set denoted by the predicate (Caponigro, 2003). Thus, the relative clause *who I saw* denotes not just the set of x such that I saw x, but the set of x such that x is *human* and I saw x (i.e. λx[I-saw(x)$\wedge$human(x)]).

Now, in (352), a *–kin*-carrying *wh*-phrase appears within the relative clause. Although *wh-kin* relative clauses cannot be formed with any other type of relative pronoun than the one that is homophonous with *wh*-phrases, I will assume that the *wh*-phrase is a relative pronoun on this use. However, I assume that the other *wh*-phrase is like the *wh*-phrase in *wh*-concessives and questions in general in that it has no well-defined ordinary semantic value, and carries [$i\exists$].[9]

The semantic undefinedness of the whole structure is averted by using a closure operator whose surface realisation is *–kin*. In section 7.1, I proposed that when *–kin* attaches to the combination of the stem *ku–* and the 'flipper' morpheme *–kA* – which together form *kuka* 'who', a *wh*-phrase – the closure operator involved is CADD$_\exists$, and the relevant syntactic features are [$u\exists$, uF, $uTop$]. Given that the relative pronoun does not introduce undefinedness into the structure, we may assume that the closure operator is interpreted above F^0 (with [$iTop$]): in other words, CADD only has to scope over the *wh*-phrase.[10]

I now go through some derivations to show how the structures work, beginning with the restrictive type. First, in (353), I give the relevant denotations for the relative pronoun and the *wh*-phrase. (The restrictive semantics of the relative pronoun are derived by composing the relative clause predicate and the relative pronoun using predicate modification.)

(353) **Denotations for *missä*$_{rel}$ and *milloin***

a. $[\![missä_{rel}]\!]^o = \lambda x$[location($x$)]
$[\![missä_{rel}]\!]^f = \{\lambda x$[loc(ation)($x$)]$\}$

b. $[\![milloin]\!]^o =$ undefined

[8] Brattico et al. (2013) argue that relative clauses are structurally deficient in that they lack a ForceP. This explains, among other things, why relative clauses cannot contain discourse particles, and why they cannot contain the overt complementiser *että* 'that'.

[9] However, given that it does not appear in an interrogative sentence, it is not merged with a Q-particle.

[10] Brattico et al. also argue that the full left periphery of Finnish finite clauses only contains one projection housing topics – SpecFP (Holmberg and Nikanne, 2002). However, Kaiser (2006) shows that there is a high TopP in Finnish; its presence is hard to detect because it only accepts overt material in specific circumstances, e.g. in the presence of preposed polarity items (section 2.3.3.2). Therefore, here and throughout this dissertation, I make use of the specific TopP that is above FocP in the left periphery.

$[\![milloin]\!]^f = \{\{m_1, m_2, ...\}\}$

In (354), I show an example derivation of the relevant part of the restrictive *wh-kin* relative clause in (352a).

(354) **Example derivation of restrictive *wh-kin* relative clause**

a. **Surface syntax of DP**

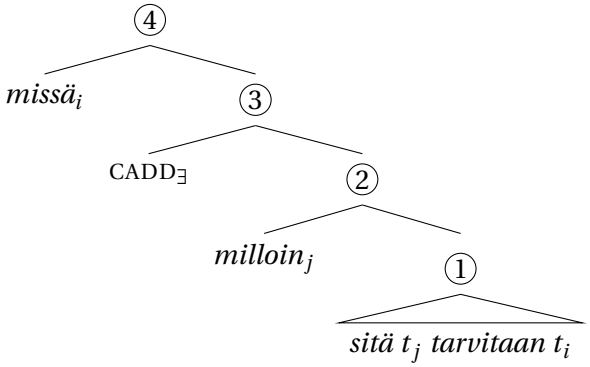
[$_{FocP}$ mi-ssä$_i$ [$_{FP}$ si-tä milloin-kin tarvi-taan t_i]]]

where-INE it-PAR when-ADD need-PASS.PRES

b. **LF of FocP**

[$_{FocP}$ *missä$_i$* λ [$_{FP}$ CADD$_\exists$ *milloin$_j$* λ [$_{FP}$ *sitä* t_j tarvitaan t_i]]]]

c.



d. $[\![①]\!]^o = \lambda w$[it-is-needed$(t_j)(t_i)(w)$]

$[\![①]\!]^f = \{\lambda w$[it-is-needed$(t_j)(t_i)(w)$]$\}$

e. (λ-abstraction over t_j)

$[\![②]\!]^o =$ undefined (because of *milloin*)

$[\![②]\!]^f = \{\lambda w$[it-is-needed$(m_1)(t_i)(w)$], λw[it-is-needed$(m_2)(t_i)(w)$], ...$\}$

f. $[\![③]\!]^o = \lambda w$[it-is-needed$(m_1)(t_i)(w) \vee$ it-is-needed$(m_2)(t_i)(w) \vee$ ...]

$[\![③]\!]^f = \{\lambda w$[it-is-needed$(m_1)(t_i)(w) \vee$ [it-is-needed$(m_2)(t_i)(w) \vee$ ...]$\}$

g. (λ-abstraction over t_i)

$[\![④]\!]^o = \lambda x \lambda w$[loc$(x) \wedge$ [it-is-needed$(m_1)(x) \vee$ it-is-needed$(m_1)(x) \vee$ ...]]

$[\![④]\!]^f = \{\lambda x \lambda w$[loc$(x) \wedge$ [it-is-needed$(m_1)(x) \vee$ it-is-needed$(m_1)(x) \vee$ ...]]$\}$

The denotation given in (354g) is a predicate of locations, as required. This predicate can combine with a a definite description such as *sinne* 'there' in (352a). If one indeed feeds a location x to the predicate in (354g), the result is a proposition that is true at w if x is a location and 'it' is needed at x at any of the moments m_1, moment m_2, moment m_3 and so on at w: this is effectively a way of saying 'whenever' or 'at different times', as suggested in the translations of *wh-kin* relative clauses.

In free *wh-kin* relatives, the relative clause combines with a verb. I will focus on argumental free *wh-kin* relatives. Caponigro (2003) proposes that the semantics of argumental free relative clauses involve the operator δ (Link, 1983). The δ-operator takes a predicate of entities and returns the maximal entity to which the predicate applies. The maximal entity is a plural individual, i.e. the mereological sum of atoms to which the predicate applies such that there is no bigger individual to which the predicate applies. In other words, if P is λx[apple(x)], then $\delta(P)$ is the maximal plural individual that is made of all atoms that are apples. As shown in (355), the semantics of δ uses the mereological star operator. (355) states that when applied to a predicate P, δ returns the unique maximal x such that P applies to x or to some part of x.

(355) **The semantics of δ**
$[\![\delta(P_{\langle et\rangle})]\!] = \iota x[*P(x)]$

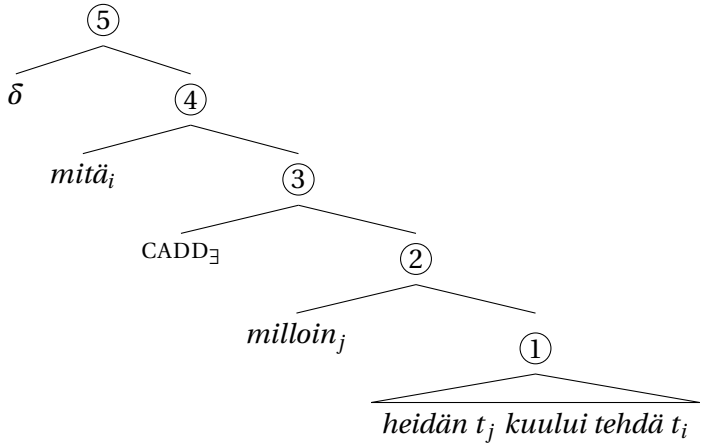
The computation of free *wh-kin* relatives may now proceed as in restrictive *wh-kin* relatives except for the insertion of the δ-operator at the top. (Note that the relative pronoun *mitä* denotes λx[thing(x)] in (356)).

(356) **Example derivation of a free *wh-kin* relative clause (argumental)**

a. **Surface syntax of FocP**
[$_{FocP}$ mi-tä$_i$ [$_{FP}$ heidä-n milloin-kin kuulu-i teh-dä t_i]]]
what-PAR they-GEN when-ADD should-PRES.3SG do-INF

b. **LF of FocP**
[$_{FocP}$ δ [$_{FocP}$ *mitä$_i$* λ [$_{FP}$ CADD$_\exists$ *milloin$_j$* λ [$_{FP}$ *heidän t_j kuului tehdä t_i*]]]]

c.



d. $[\![①]\!]^o$ = λw[they-supposed-to-do(t_i)(t_j)(w)]
$[\![①]\!]^f$ = {λw[they-were-supposed-to-do(t_i)(t_j)(w)]}

e. (λ-abstraction over t_j)

$[\![②]\!]^o =$ undefined (because of *milloin*)
$[\![②]\!]^f = \{\lambda w[\text{they-supposed-to-do}(t_i)(m_1)(w)],$
$\lambda w[\text{they-supposed-to-do}(t_i)(m_2)(w)],...\}$

f. $[\![③]\!]^o = \lambda w[\text{they-supposed-to-do}(t_i)(m_1)(w)$
$\vee \text{they-supposed-to-do}(t_i)(m_2)(w) \vee ...]$
$[\![③]\!]^f = \{\lambda w[\text{they-supposed-to-do}(t_i)(m_1)(w)$
$\vee \text{they-supposed-to-do}(t_i)(m_2)(w) \vee ...]\}$

g. (λ-abstraction over t_i)
$[\![④]\!]^o = \lambda x \lambda w[\text{thing}(x) \wedge [\text{they-supposed-to-do}(x)(m_1)(w)$
$\vee \text{they-supposed-to-do}(x)(m_2)(w) \vee ...]]$
$[\![③]\!]^f = \{\lambda x \lambda w[\text{thing}(x) \wedge [\text{they-supposed-to-do}(x)(m_1)(w)$
$\vee \text{they-supposed-to-do}(x)(m_2)(w) \vee ...]]\}$

h. $[\![⑤]\!]^o = \iota x \lambda w[*\text{thing}(x) \wedge [*\text{they-supposed-to-do}(x)(m_1)(w)$
$\vee *\text{they-supposed-todo}(x)(m_2)(w) \vee ...]]$

In conclusion, the syntax and semantics of *wh-kin* relatives can be accounted for if *–kin* realises an existential closure operator that moves covertly to TopP, above the relative pronoun, ensuring that the relative clause has a well-defined ordinary semantic value.

In the next section, I discuss the syntax and semantics of *wh-kin* declaratives, which I propose are both similar and dissimilar from *wh-kin* relative clauses.

7.3.2 Declarative type

In (357), I reproduce examples of *wh-kin* declaratives from (240).

(357) **Examples of wh-kin declaratives**

a. *Mari* *kuuntele-e* [$_{?P}$ *mi-tä* *milloin-kin*]
Mari.NOM listen-PRES.3SG what-PAR when-ADD
'For each time t, Mari listens to some music at t' or 'Mari listens to different kinds of music at different times'

b. *Mari* *kuuntele-e* [$_{?P}$ *milloin* *mi-tä-kin*]
Mari.NOM listen-PRES.3SG when what-PAR-ADD
'For each kind of music k, Mari listens to k sometimes' or 'Mari listens to different kinds of music at different times'

c.*? *Mari* *kuuntele-e* [$_{?P}$ *milloin* *mi-ssä-kin*]
Mari.NOM listen-PRES.3SG when where-INE-ADD

The most striking differences between the declarative and relative type of multiple-*wh* structures with *–kin* are that although the selectional requirements of the main verb must be satisfied (357c), (i) the *wh*-phrase that does not carry *–kin* need not match the selectional requirements of the verb it follows linearly (357b), and (ii) *wh*-phrases that are not allowed as relative pronouns in *wh-kin* relative clauses (e.g. *miksi* 'why') are acceptable as first or second *wh*-phrase in the declarative type (see section 4.7.2, example (241)). This evidence suggests that *wh-kin* declaratives cannot be reduced to free relatives.

I propose that *wh-kin* declaratives indeed do not involve a relative clause structure, and neither *wh*-phrase is interpreted as a relative pronoun. Instead, both *wh*-phrases contribute alternatives to the structure, and the structure is rendered interpretable by the application of $\text{CADD}_{\exists}$ at the very end of the derivation. To explain why the order of the *wh*-phrases is strictly restricted so that the *wh*-phrase carrying *–kin* must be linearly rightmost, I propose that the bare *wh*-phrase moves in surface syntax. It is possible that the specific position to which the bare *wh*-phrase moves is a low FocP (Belletti, 2004); this could be the projection that houses e.g. discourse-new subjects in OVS word orders in Finnish as well as in Italian.

Crucially, whatever motivates this small movement step of the bare *wh*-phrase cannot target the *wh-kin*-phrase, regardless of the the original hierarchical order of the two *wh*-phrases (as shown by the lack of adjunct-object asymmetry in (357), for example). If indeed the bare *wh*-phrase targets a low FocP, it becomes possible to argue that the relevant Agree relationship concerns the $[iF]$-feature on the *wh*-phrase. In that case, we may argue that after the additive operator associated with *–kin* Agrees with the $[iF]$ of its host-*wh*, this *wh* becomes unavailable for further $[iF]$-targeting agreement.

If indeed the bare *wh*-phrase moves to a low FocP, then CADD must ultimately move above it in order to ensure a well-defined ordinary semantic value. As we have been assuming that the $\text{CADD}_{\exists}$ realised by *–kin* carries $[uTop]$ and can delete it by Agreeing with F^0, we simply continue here to assume that this $[uTop]$-driven movement also takes $\text{CADD}_{\exists}$ to its right interpretative position.

Before we set out to examine an example derivation of a *wh-kin* declarative, let us set the denotations of the relevant *wh*-phrases as in (358).

(358) **Denotations of *mitä* and *milloin* for (358)**

a. $[\![mitä]\!]^o$ = undefined
   $[\![mitä]\!]^f$ $= \lambda x[\text{band}(x) = \{b_1, b_2, b_3, ..., b_n\}$

b. $[\![milloin]\!]^o$ = undefined
   $[\![milloin]\!]^f$ $= \lambda x[\text{moment}(x)] = \{m_1, m_2, m_3, ..., m_n\}$

Now, the derivation proceeds as shown in (359) (with some simplifications within the low FocP).

(359) **Example of *wh-kin* declarative**

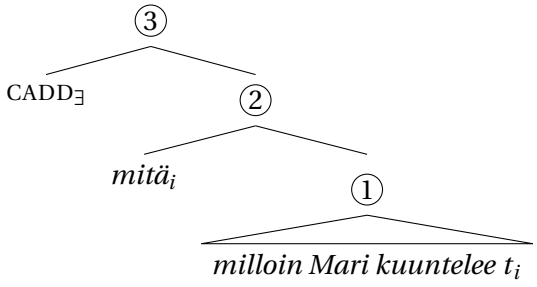
a. **Surface syntax of FP**

[$_{FP}$ Mari$_k$ kuuntele-e$_j$ [$_{FocP}$ milloin$_i$ [$_{vP}$ t_k V_j [$_{VP}$ t_i V_j mi-täkin
Mari.NOM listen-PRES.3SG when what-PAR-ADD
]]]]

b. **LF of FP**

[$_{FP}$ CADD$_\exists$ *mitä$_i$* λ [$_{FP}$ *milloin Mari kuuntelee* t_i]]

c.



d. $[\![①]\!]^o =$ undefined (because of *milloin*)
$[\![①]\!]^f = \{\lambda w[\text{listens}(t_i)(\text{Mari})(m_1)(w)], \lambda w[\text{listens}(t_i)(\text{Mari})(m_2)(w)], ...\}$

e. (λ-abstraction over t_k)
$[\![②]\!]^o =$ undefined (because of *mitä*)
$[\![②]\!]^f = \{\lambda w[\text{listens}(b_1)(\text{Mari})(m_1)(w)], \lambda w[\text{listens}(b_1)(\text{Mari})(m_2)(w)],$
$\lambda w[\text{listens}(b_2)(\text{Mari})(m_1)(w)], \lambda w[\text{listens}(b_2)(\text{Mari})(m_2)(w)]...\}$

f. $[\![③]\!]^o = \lambda w[\text{listens}(b_1)(\text{Mari})(m_1)(w) \vee \text{listens}(b_2)(\text{Mari})(m_1)(w) \vee ...]$
$[\![③]\!]^f = \{\lambda w[\text{listens}(b_1)(\text{Mari})(m_1)(w) \vee \text{listens}(b_1)(\text{Mari})(m_1)(, k_1, m_1)w) \vee ...]\}$

As (359f) shows, the ordinary semantic value of a *wh-kin* declarative is a proposition; in the case at hand, it is the set of worlds where Mari listens to k_1 at m_1 or to k_2 at m_2 or any combination of $\{k_1, k_2, ...k_n\}$ and $\{m_1, m_2, ...m_n\}$. This corresponds to what the *wh-kin* declarative intuitively means. Note moreover that as desired, the semantics of the structure remain the same regardless of the order of the two *wh*-phrases. And, as desired, all selectional requirements are satisfied locally, regardless of which order the *wh*-phrases end up being in.

The analysis detailed above has one apparent problem, however: subject-doubling. This phenomenon is illustrated in (360) (repeated from (243) in section 4.7.3).

(360) **Subject doubling in *wh-kin* declaratives**

a. *Ministeri-t vastusta-vat* [$_{?P}$ *kuka mi-tä-kin*]
minister-PL.NOM oppose-PRES.3PL who.NOM what-PAR-ADD
'The ministers all oppose different things'

b. *Ministeri-t* *vastusta-vat* [$_{?P}$ *mi-tä* *kuka-kin*]
minister-PL.NOM oppose-PRES.3PL what-PAR who.NOM-ADD
'The ministers all oppose different things'

As (360) shows, subject doubling is possible with either order of the *wh*-phrases. Under the analysis presented above, we expect *kuka* to be base-generated in the specifier of *v*P, i.e. the base-generation position of the subject. In that case, where is the lexical subject *ministerit* 'ministers'? In overt syntax, it is clearly in SpecFP, where it agrees with the finite verb in person and number. However, in terms of semantics, *ministerit* is interpreted as a further restriction on the denotation of *kuka*, which now denotes a set of humans that are ministers, and not a set of humans.

I propose that in overt syntax, *ministerit* realises a lexical restriction on *kuka*, but moves to SpecFP; at LF, the *wh*-phrase and its restriction are interpreted together in FP, with *kuka ministerit* (which, as a phrase, is ungrammatical due to the lack of number agreement on the *kuka*) denoting a set of ministers. For reasons of space, I do not show the full derivation of the example in (361); it is almost exactly identical to that presented in (359).

(361) **Example of *wh-kin* declarative**

a. **Surface syntax of FP**
[$_{FP}$ *ministeri-t* *vastusta-vat*$_j$ [$_{FocP}$ *kuka*$_k$ [$_{vP}$ t_k V_j [$_{VP}$ V_j
minister-PL.NOM oppose-PRES.3PL who.NOM
mi-tä-kin]]]]
what-PAR-ADD

b. **LF of FP**
[$_{FP}$ CADD$_{\exists}$ *mitä*$_i$ λ [$_{FP}$ *kuka ministerit*$_k$ λ *vastustavat*$_j$ [$_{FocP}$ t_k λ [$_{vP}$ t_k V_j t_i]]]]

In conclusion, with the help of CADD$_{\exists}$, the *wh-kin* declarative may be given both a syntax and a semantics that is no longer as mysterious as it might have seemed at the start. I proposed that the surface ordering of the two *wh*-phrases can be explained by referring to a low FocP (and the [*iF*]-feature of *wh*-phrases). The *wh-kin* phrase moves with CADD$_{[\exists]}$ to FP so that the [*uTop*] of the operator can deleted, and as a result, the whole structure receives a well-defined, propositional semantics by way of existential closure.

In the next section, I discuss the last type of *wh-kin* structure to be presented, i.e. *wh-kin* interrogatives.

7.3.3 Interrogative type

The interrogative type of multiple-*wh* use of *–kin* is illustrated below in (362) (repeated from (220)).

(362) **Interrogative multiple-*wh* use of *–kin***

a. *Kuka maisto-i mi-tä-kin kakku-a?*
who.NOM taste-PAST.3SG which-PAR-ADD cake-PAR
'Who tasted which cake?'

b. *Mi-tä kakku-a kuka-kin maisto-i?*
which-PAR cake-PAR who.NOM-ADD taste-PAST.3SG
'Who tasted which cake?'

In section 4.7.1, I argued that *wh-kin* interrogatives involve the covert movement of the *wh-kin*-phrase to a position above the overtly fronted *wh*-phrase in FocP. In light of the proposal that the *–kin* on the *wh-kin* phrase marks the presence of the existential closure operator $\text{CADD}_{\exists}$, which is associated with the features $[u\exists, uF, uTop]$, it is natural to assume that this movement targets TopP. This conclusion is also supported by the word-order data presented in (222).

I also showed that in contrast to the other multiple-*wh* uses, the interrogative type is interpretable without *–kin*, although there are both syntactic and semantic differences between multiple-*wh* interrogatives with and without *–kin*: multiple-*wh* interrogatives without *–kin* show Superiority effects, and allow both single-pair and pair-list answers, while *wh-kin* interrogatives do not show Superiority effects, and only allow pair-list answers.

Based on the analysis of interrogative syntax presented in section 2.1.4, I noted in section 4.7.1 that the lack of Superiority effects in *wh-kin* interrogatives should be tied to the fact that *wh-kin*-phrases simply do not undergo *wh*-movement, regardless of whether there is another bare *wh*-phrase present. Indeed, single-*wh* questions with a *wh-kin*-phrase are ungrammatical, as (363b) shows (examples repeated from (217) and (220)):

(363) ***Wh-kin* phrases do not undergo *wh*-movement**

a. *Mi-tä kakku-a Joni maisto-i?*
what-PAR cake-PAR Joni.NOM taste-PAST.3SG
'What cake did Joni taste?'

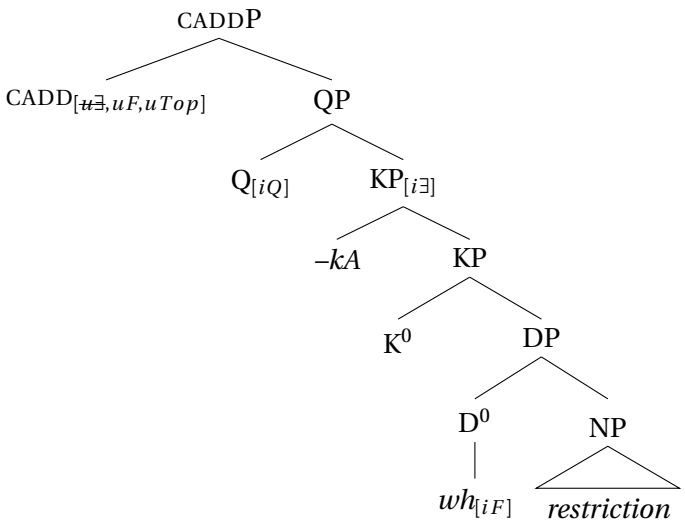
b. **Mi-tä-kin kakku-a Joni maisto-i?*
what-PAR-ADD cake-PAR Joni.NOM taste-PAST.3SG

The impossibility of *wh-kin*-phrases to undergo *wh*-movement can be assumed to be due to an intervention effect. In particular, if the Q-particle on the *wh-kin*-phrase is unable to Agree with Foc^0, then another *wh*-phrase – whichever its structural position with respect to the *wh-kin*-phrase – must Agree with Foc^0 and undergo *wh*-fronting. What remains to be explained is *how* the intervention effect arises. Here, I will rely on the formalisation of (syntactic) intervention through Featural Relativised Minimality (fRM) (Starke, 2001; Rizzi, 2010; see also Rizzi, 1997). Under fRM, Agree between a probe x and a goal y is not allowed if there is an intervenor z such

that z has a same kind of feature that is involved in the attempted Agree between x and y, and if x asymmetrically c-commands z and z asymmetrically c-commands y. Being of the 'same kind' is determined by feature classes. Crucially, both $[F]$ (the focus feature) and $[Q]$ (the feature relevant for *wh*-movement) belong to the same quantificational feature class (Rizzi, 2010; cf. Rizzi, 1997). Thus, the possibility of fRM-intervention arises.

To see what kind of intervention configuration is at play, let us first consider the internal syntax and semantics of *wh-kin*-phrases. If the the closure additive $\text{CADD}_{\exists}$ is to disallow the establishment of an Agree-relationship between with Foc^0 and the Q-particle of the *wh-kin* phrase, CADD should c-command the Q-particle (otherwise, no fRM-intervention effect is predicted to arise). As before, the existential closure additive is associated with $[u\exists, uF, uTop]$, and the Q-particle carries $[iQ]$. In addition, the *–kA*-particle is present, and responsible for the 'flipping' of the closure feature of *ku–* (and *mi–*) from universal to existential (see section 7.1). As usual, the *wh*-KP has no well-defined ordinary semantic value, and its focus semantic value is a set of entities. Now, the *wh*-KP can be further decomposed into a *wh*-determiner and a lexical restriction part (a set of entities) that combine through predicate modification. When this is done, the structure of a *wh-kin* phrase looks like (364).[11]

(364) **Structure of a *wh-kin* phrase**



If the internal structure of *wh-kin*-phrases is as shown in (364), the closure operator may not Agree with the *wh*-part of the KP due to presence of an fRM-intervenor, namely, the Q-particle. In other words, because the additive c-commands the Q-particle, and the Q-particle c-commands

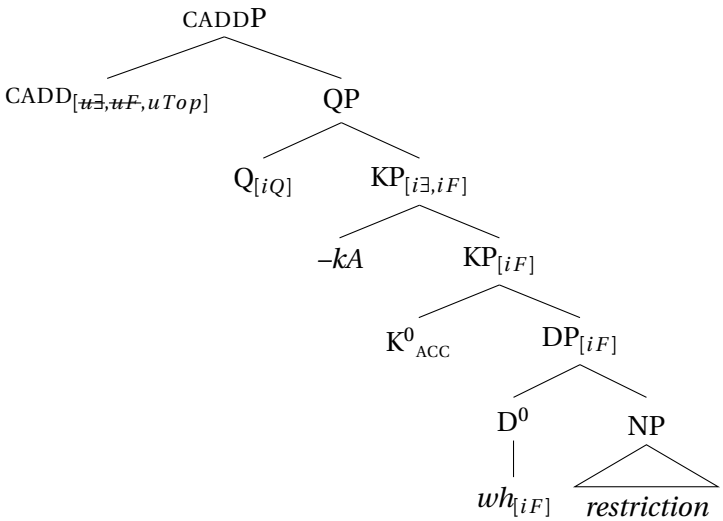
[11] It is possible to maintain that the syntax of *wh*-KPs is different with respect to the position of K^0; what is important is that the $[iF]$-feature is on the *wh*-part (perhaps a *wh*-determiner) and not on the restriction KP. This explains why the marker *–kin* obligatorily attaches to the *wh*-word itself, and never to the lexical restriction. Moreover, not putting $[iF]$ on the lexical restriction is consistent with the observation that the lexical restriction does not contribute alternatives to the semantics; the focus semantic value of *which cake* is a set of cakes, and not cakes and other types of baked goods, as one would expect if *cake* was F-marked.

the *wh*, and the features on the Q-particle and the *wh* are of the same type, the configuration in (364) instantiates fRM-intervention. Moreover, if a higher Foc^0 probes for $[iQ]$, the feature $[uF]$ on the additive in turn makes the $[iQ]$ on the Q-particle unavailable for Agree (due to fRM).[12] This means that the structure is at a syntactic impasse. One feature-deletion relationship that can be assumed to be possible in (364) concerns $[u\exists]$ on CADD; if we assume that the flipper morpheme *–kA* changes the closure feature of its sister node through composition, so that the higher KP in (364) is the node with the relevant feature, then, although $[i\exists]$ must belong to the class of quantificational features, there is no fRM-intervention configuration between CADD, Q, and the higher KP (because Q does not c-command the higher KP-projection).

To repeat, when it comes to $[uF]$ on CADD$_{[\exists]}$ in (364), we are at an impasse: it cannot be deleted in the current configuration. However, we know that at some point in the derivation, it must be deleted: otherwise, the derivation would crash at LF. Moreover, in (364), $[iQ]$ is not an available goal for Foc^0. This is the desired result: it means that *wh-kin* phrases cannot undergo *wh*-movement (see (**??**) and (363)).

Therefore, we need to figure out how to solve the problem of $[uF]$. To do this, recall from section 2.1.3 that focus features may *project* (Selkirk, 1996; Schwarzschild, 1999). If the $[iF]$ of the *wh*-determiner projects all the way to the higher KP projection, the fRM-intervention configuration between the closure operator and $[iF]$ is defeated: the Q-particle and the KP no longer stand in an asymmetrical c-command relationship, and $[uF]$ on CADD may be deleted. This is shown in (365).

(365) **Structure of a *wh-kin* phrase after focus projection**



In (365), the NP is Given (it is non-new), and it can therefore not be F-marked. The structure involves minimal F-marking (Schwarzschild, 1999); it allows the deletion of $[uF]$ on the additive,

[12] This is assuming that fRM applies to both interpretable and uninterpretable instances of features.

but does not reach any further than it has to. Indeed, $[iF]$ must not project up to CADDP; if it did, it could intervene in the establishment of Agreement between Foc^0 and a lower bare *wh*-phrase in the structure, which is not the case (as shown by the grammaticality of Superiority-violating *wh-kin* interrogatives).

If this analysis is on the right track, the syntactic analysis of *wh-kin* interrogatives that do not involve islands is straightforward; the bare *wh*-phrase is always attracted to FocP after Foc^0 has Agreed with it, and the *wh-kin*-phrase covertly moves to TopP above FocP. In terms of semantics, I assume (as usual) that the closure operator and the Q-particle adjoin to the clausal spine at LF. If the higher-merged closure operator and the lower-merged Q-particle of the *wh-kin* phrase are required to exit so that their remerge order replicates their hierarchical order within the *wh-kin* phrase, the resulting LF can be schematically presented as in (366).

(366) **Schematic LF of a *wh-kin* interrogative**

$[_{TopP}$ CADD$_\exists$ Q wh_i $[_{FocP}$ Q wh_j $[_{FP}$ ... t_i / t_j ...]]]

Anticipating the step at which CADD$_\exists$ applies, in (367), I define one more type of type-flexible closure operation (see (342) for cases (a) and (b)). This closure applies to a set of sets of propositions that are not singleton sets (i.e. another closure operator has not applied previously). The result of existential or universal closure over such sets is shown in (367c). Essentially, the closure operation applies recursively; it takes the closures of both member sets, and outputs their closure. As the member sets are not singleton sets, the result proposition in (367c) still reflects their internal structures (in (367c-i), for example, the meaning is a disjunction of disjunctions, and not a simple disjunction).

(367) **Type-flexible closure**

a. Let $A = \{\lambda w[P(w)], \lambda w[Q(w)]\}$. Then
   (i) $[\![\exists(A)]\!] = \lambda w[P(w) \vee Q(w)]$
   (ii) $[\![\forall(A)]\!] = \lambda w[P(w) \wedge Q(w)]$

b. Let $A = \{\{\lambda w[P(w)]\}, \{\lambda w[Q(w)]\}\}$. Then
   (i) $[\![\exists(A)]\!] = \lambda w[[P(w)] \vee [Q(w)]] = \lambda w[P(w) \vee Q(w)]$
   (ii) $[\![\forall(A)]\!] = \lambda w[[P(w)] \wedge [Q(w)]] = \lambda w[P(w) \wedge Q(w)]$

c. Let $A = \{\{\lambda w[P(w)], \lambda w[R(w)]\}, \{\lambda w[Q(w)], \lambda w[S(w)]\}\}$. Then
   (i) $[\![\exists(A)]\!] = \lambda w[[P(w) \vee R(w)] \vee [Q(w) \vee S(w)]]$
   (ii) $[\![\forall(A)]\!] = \lambda w[[P(w) \wedge R(w)] \wedge [Q(w) \wedge S(w)]]$

Also in anticipation of the derivation example that I will go through below, note that due to the Q-particles, the ordinary semantic value of the structure is well-defined by the time CADD$_\exists$ is interpreted. Moreover, the *wh-kin* interrogative is clearly interpreted as a question (or more precisely, a family of questions, given the presence of two sandwiched Q-particles), and thus, it should not

get a denotation that corresponds to a proposition. Therefore, I propose a modification to the semantics of CADD that makes its semantic contribution dependent on whether the prejacent α has an undefined ordinary semantic value or not. In particular, when the ordinary semantic value is defined, CADD reverts back to functioning more like BADD and ADD: it states that there is some antecedent β in the context. The difference with BADD is that that β corresponds to the existential or universal closure of the well-defined ordinary semantic value. As *wh-kin* interrogatives involve $\text{CADD}_{\exists}$, the closure will look like the proposition shown in (367c-i). When evaluated at a world w, this proposition will be true if at least one of its disjuncts is true. Therefore, the antecedent β corresponds to a simple existential presupposition: for a question such as *Kuka maistoi mitäkin kakkua?* 'Who tasted which cake?', the presupposition is that some cake was tasted by someone.[13] This presupposition is perfectly compatible with the semantics of multiple-*wh* questions.

(368) **Semantics of CADD (final)**

Iff $[\![\alpha]\!]^o$ = undefined,

(i) $[\![\text{CADD}_{\exists}(\alpha)]\!]^o = \exists([\![\alpha]\!]^f)$

$[\![\text{CADD}_{\exists}(\alpha)]\!]^f = \{[\![\text{CADD}_{\exists}(\alpha)]\!]^o\}$

(ii) $[\![\text{CADD}_{\forall}(\alpha)]\!]^o = \forall([\![\alpha]\!]^f)$

$[\![\text{CADD}_{\forall}(\alpha)]\!]^f = \{[\![\text{CADD}_{\forall}(\alpha)]\!]^o\}$

Otherwise

(i) Speaker PS with $\text{CADD}_{\exists}$: $\exists\beta[\beta = \exists([\![\alpha]\!]^o) \wedge \beta \in \{cg, f(w_0), Table, DC_x\}]_{SPS}$

Armed with these modifications, I will now go through an example derivation of a *wh-kin* interrogative. For the purposes of this example, let $\{c_1, c_2, ...\}$ denote a set of cakes (for *mitä kakkua*), and $\{a, b, ...\}$ a set of people (for *kuka*). At the end of the derivation, the presupposition of the question is that some person tasted some cake.

(369) **Example derivation**

a. **Surface syntax of FocP**

[$_{FocP}$ mi-tä *kakku-a$_i$* *[$_{FP}$ kuka-kin* *maisto-i* *t$_i$]]*

which-PAR cake-PAR who.NOM-ADD taste-PAST.3SG

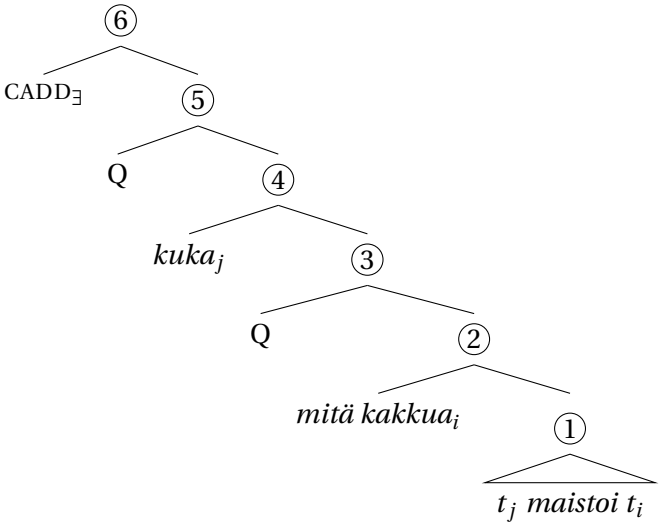
'Who tasted which cake?'

b. **LF of TopP**

[$_{TopP}$ $\text{CADD}_{\exists}$ Q *kuka$_j$* λ [$_{FocP}$ Q *mitä kakkua$_j$* λ [$_{FP}$ *t$_j$ maistoi t$_i$*]]]

[13] This presupposition differs from the exhaustiveness presupposition linked to the Answerhood operator by Dayal (2002) (for multiple-*wh* questions, see Kotek, 2014): it does not require that *each* cake was tasted by someone.

c.



d. $[\![①]\!]^o =$ $\lambda w[\text{tasted}(t_i)(t_j)(w)]$
$[\![①]\!]^f =$ $\{\lambda w[\text{tasted}(t_i)(t_j)(w)]\}$

e. (λ-abstraction over t_i)
$[\![②]\!]^o =$ undefined (because of *mitä kakkua*)
$[\![②]\!]^f =$ $\{\lambda w[\text{tasted}(c_1)(t_j)(w)], \lambda w[\text{tasted}(c_2)(t_j)(w)], ...\}$

f. $[\![③]\!]^o =$ $\{\lambda w[\text{tasted}(c_1)(t_j)(w)], \lambda w[\text{tasted}(c_2)(t_j)(w)], ...\}$
$[\![③]\!]^f =$ $\{\{\lambda w[\text{tasted}(c_1)(t_j)(w)], \lambda w[\text{tasted}(c_2)(t_j)(w)], ...\}\}$

g. (λ-abstraction over t_j)
$[\![④]\!]^o =$ undefined (because of *kuka*)
$[\![④]\!]^f =$ $\{\{\lambda w[\text{tasted}(c_1)(a)(w)], \lambda w[\text{tasted}(c_2)(a)(w)], ...\},$
$\{\lambda w[\text{tasted}(c_1)(b)(w)], \lambda w[\text{tasted}(c_2)(b)(w)]...\}, ...\}$

h. $[\![⑤]\!]^o =$ $\{\{\lambda w[\text{tasted}(c_1)(a)(w)], \lambda w[\text{tasted}(c_2)(a)(w)], ...\},$
$\{\lambda w[\text{tasted}(c_1)(b)(w)], \lambda w[\text{tasted}(c_2)(b)(w)]...\}, ...\}$
$[\![⑤]\!]^f =$ $\{\{\{\lambda w[\text{tasted}(c_1)(a)(w)], \lambda w[\text{tasted}(c_2)(a)(w)], ...\},$
$\{\lambda w[\text{tasted}(c_1)(b)(w)], \lambda w[\text{tasted}(c_2)(b)(w)]...\}, ...\}\}$

i. $[\![⑥]\!]^o =$ $\{\{\lambda w[\text{tasted}(c_1)(a)(w)], \lambda w[\text{tasted}(c_2)(a)(w)], ...\},$
$\{\lambda w[\text{tasted}(c_1)(b)(w)], \lambda w[\text{tasted}(c_2)(b)(w)]...\}, ...\}$
Speaker PS: $\exists\beta[\beta = \exists([\![⑤]\!]^o) \wedge \beta \in \{cg, f(w_0), Table, DC_x\}]$
Then $\beta =$ $\lambda w[[\text{tasted}(c_1)(a)(w) \vee \text{tasted}(c_2)(a)(w) \vee ...] \vee$
$[\text{tasted}(c_1)(b)(w) \vee \text{tasted}(x_2)(b)(w) \vee ...]...]$

The derivation of *wh-kin* interrogatives that involve an island is more complicated. First, recall from section 4.7.1 that when the *wh-kin* phrase is embedded within e.g. a temporal *–ttUA*-island

(Huhmarniemi, 2012), the LF-reversal effect observed in non-island questions disappears.[14] The data in (370) is repeated from (370).

(370) **Temporal *–ttUa*-islands**

a. #*[Kene-n neljä-stä semantiko-sta t nai-tua kene-t-kin kolme-sta*
who-GEN four-ELA semanticist-ELA marry-TTUA who-ACC-ADD three-ELA
fonologi-sta] Joni ol-i vihdoin tyytyväinen t?
phonologist-ELA Joni.NOM be-PAST.3SG finally satisfied.NOM
'After which of the four semanticists married which of the three phonologists was Joni finally satisfied?'

b. *[Kene-n kolme-sta semantiko-sta t nai-tua kene-t-kin neljä-stä*
who-GEN three-ELA semanticist-ELA marry-TTUA who-ACC-ADD four-ELA
fonologi-sta] Joni ol-i vihdoin tyytyväinen t?
phonologist-ELA Joni.NOM be-PAST.3SG finally satisfied.NOM
'After which of the three semanticists married which of the four phonologists was Joni finally satisfied?'

Huhmarniemi (2012) follows Vainikka (1989), Vainikka and Levy (1995) and Koskinen (1998) in assuming that temporal adjunct islands maximally involve a tense projection; indeed, in addition to the past tense variant used here, a present tense variant also exists.[15] Huhmarniemi argues that in *–ttUa*-islands with *wh*-phrases, *wh*-movement targets the edge of the tense projection. The whole adjunct clause (shown in brackets in (370)) may then be *wh*-fronted to the matrix CP.[16]

If the whole adjunct clause – the *–ttUa*-island – is fronted to SpecFocP, how may the $[uTop]$ carried by $\text{CADD}_{\exists}$ be deleted? The lack of LF-reversal of the *wh*-phrases indicates that if the closure operator moves in this structure, it does so without its host. As the relevant structure is an island for movement (Huhmarniemi, 2012, p. 182), the impossibility of the host-KP to move comes as no surprise. However, as the temporal construction is not assumed to have any structure beyond

[14] Note that this effect constitutes *evidence* for the covert movement of the *wh-kin* phrase in non-island *wh-kin* interrogatives.

[15] The distinction is in fact not as much about tense as it is about aspect; the 'past tense' variant involves perfective aspect, and the 'present tense' variant involves progressive aspect. This distinction is immaterial for the analysis, however.

[16] Interestingly, *–ttUa*-island questions with two *wh*-phrases are subject to very strict ordering requirements: it is not possible for non-subject *wh*-phrases to head the island, not even if the subject-*wh* carries *–kin*. This is illustrated in (i).

(i) **[Kene-t kolme-sta fonologi-sta kene-n-kin neljä-stä semantiko-sta nai-tua t] Joni*
who-ACC three-ELA phonologist-ELA who-GEN-ADD four-ELA semanticist-ELA marry-TTUA Joni.NOM
ol-i vihdoin tyytyväinen t?
be-PAST.3SG finally satisfied.NOM
'After which of the four semanticists married which of the three phonologists was Joni finally satisfied?'

I leave this issue for future work.

a tense projection, the deletion of [$uTop$] on CADD$_\exists$ must happen through Agree with a matrix clause F^0 or Top^0. If such Agreement is possible, possibly due to the covert movement of ADD$_\exists$, then the temporal adjunct island boundary must not be relevant for that movement.

I will not provide a detailed exploration into the syntax and semantics of temporal islands or *wh-kin* interrogatives involving them here. I merely note that letting only CADD$_\exists$, but not its host, move from within the temporal adjunct to TopP would predict the observation that at LF, the two *wh*-phrases are in the same order as they are in surface syntax. Moreover, the syntax of CADD$_\exists$ could be kept the same as elsewhere (i.e. [$uTop$] could be deleted within the derivation). I hope that future work will be able to explain exactly how this type of solution could be implemented syntactically.

To conclude, this section presented a syntax and semantics for *wh-kin* interrogatives with two *wh*-phrases. I proposed that accounting for *wh-kin* interrogatives requires small but natural modifications to the semantics of the closure operations and CADD itself. Specifically, I proposed that in contrast to the relative and declarative types, the interrogative type involves a well-defined ordinary semantic value, and hence the semantic contribution of CADD is not at the level of truth-conditional semantics, but at the level of presuppositions – connecting CADD to the 'pure' additive semantics of BADD and ADD.

Some open questions remain. First, I left the syntax and semantics of *wh-kin* interrogatives that involves islands and *wh-kin* interrogatives with more than two *wh*-phrases for future work. However, I believe that the current proposal may be extended to cover these cases too. Second, the role of the 'flipper morpheme' *–kA* in the syntax and semantics of *wh*-words was not discussed in proper detail. Indeed, in section 7.1, I proposed that (an overt or covert) *–kA* is responsible for reversing the closure feature from existential to universal in the quantifier *joka* 'every', and from universal to existential in *wh*-phrases such as *kuka* 'who' and *mikä* 'what'. In this section, I let *–kA* adjoin to the *wh*-KP below the Q-particle. Crucially, I proposed that the closure feature is positioned on the projection just above *–kA*. This helped avoid a featural Relativised Minimality effect between CADD and the Q-particle. I hope to expand on these claims in future work.

7.4 Summary

In this chapter, I presented a third operator associated with the bound additives *–kin* and *–kAAn*:, CADD (for *closure*; cf. Kratzer and Shimoyama, 2002). I argued that CADD is involved in the semantics of three uses: the quantifier use (section 7.1), the *wh*-concessive use (section 7.2), and the multiple-*wh* use (section 7.3). The emerging picture is that the relationship between CADD and the additive markers *–kin* and *–kAAn* is complex: a single surface form may be associated with both existential and universal quantificational force (i.e. type of closure) depending on the what type of features the host has. In Table 7.2, I show the relevant features of the hosts and the bound additives. The table also illustrates the complex mapping between the surface form of the

additive marker and the quantificational force of the closure operator.

Host		**Clitic**		
Form	**Features**	**Form**	**Features**	**Operator**
jo–	$[i\exists, iF]$	*–kin*	$[u\exists, uF, uTop]$	$\text{CADD}_{\exists}$
		**–kAAn*		
ku–	$[i\forall, iF]$	*–kin*	$[u\forall, uF]$	$\text{CADD}_{\forall}$
	$[i\forall, iF]$	*–kAAn*	$[u\forall, uF, uTop]$	$\text{CADD}_{\forall}$
ku-(ka)–	$[i\exists, iF]$	*–kin*	$[u\exists, uF, uTop]$	$\text{CADD}_{\exists}$
	$[i\exists, iF]$	*–kAAn*	$[u\exists, uF]$	$\text{CADD}_{\exists}$

Table 7.2: Featural specifications of quantificational stems and bound additives functioning as closure operators. (Repeated from Table 7.1)

The first non-quantifier application of the semantics of CADD was to the *wh*-concessive use (section 7.2). I proposed that *wh*-concessives involve two alternative-inducing expressions – a *wh*-phrase and a tensed verb – and that an existential closure operation gives the concessive clause the semantics of a proposition. This proposition is a disjunction of focus alternatives such that for each value of the *wh*-phrase, both a positive and a negative polarity predication are included in the disjunction. Therefore, the disjunction is always true (by the law of the excluded middle). The concessive clause and the matrix clause are linked to each other via a silent operator that has the semantics of material implication; as the antecedent is always true, the consequent is always true as well.

The last section of this chapter was focused on the multiple-*wh* use of *–kin*. I began with *wh-kin* relatives, which were shown to also involve existential closure by $\text{CADD}_{\exists}$. Besides this new ingredient, the syntax and semantics that I proposed for *wh-kin* relative clauses is familiar from previous literature on restricted and free relative clauses. I then argued that *wh-kin* declarative clauses may be derived in a very similar fashion, although no relative clause structure is involved. Specifically, I proposed that the visibly higher *wh*-phrase moves to a low FocP above the *v*P (cf. Belletti, 2001, 2004). The *wh-kin* phrase in turn moves above it to (at least FP), where the existential closure operator has its $[uTop]$-feature deleted, and gives the whole structure a well-defined propositional ordinary semantic value. This explains why *wh-kin* declaratives allow the use of some *wh*-phrases that *wh-kin* relative clauses do not (e.g. *miksi* 'why') and why they do not show the same selectional effects as *wh-kin* relative clauses do.

Finally, to end this chapter, I presented a proposal for the syntax and semantics of *wh-kin* interrogatives. I argued that the presence of *–kin* creates an intervention effect (Rizzi, 1997; Starke, 2001; Rizzi, 2010), which explains why *wh-kin* phrases may never undergo *wh*-movement. Moreover, the syntactic $[uTop]$-feature of the closure operator associated with the presence of *–kin* was argued to be responsible for the reversal of the order of the *wh*-phrases at LF. The lack of this

reversal in e.g. temporal constructions that disallow extraction altogether can be seen as a support for an approach based on (covert) syntactic movement. However, I did not give an explicit proposal as to how the syntax and semantics of *wh-kin* interrogatives involving islands work. In future work, it should be shown that the closure approach proposed for examples without islands also extends to examples with islands.

Chapter 8

Conclusion

8.1 Research questions and goals

The goal of this dissertation was twofold:

1. To provide a syntax and semantics for unbound and bound additives in Finnish
2. To provide a new window into the phenomenon of additivity through the study of the wide distribution of bound additives in Finnish

I begin this section with a summary of the syntactic analysis of unbound and bound additives in section 8.1.1.1. I then provide a summary of the semantics I propose for them in section 8.1.2. These sections serve as the backdrop of section 8.2, where I discuss the implications of the proposal for the study of additivity in general.

8.1.1 Syntax

The syntax of the unbound additives *myös* and *myöskään* and the bound additives *–kin* and *–kAAn* was presented in section 5.1. In this section, I will summarise the core proposal by with respect to the derivation question (section 8.1.1.1), the form alternation question (section 8.1.1.2), and the variation question (section 8.1.1.3).

8.1.1.1 The derivation question: Basic structure and focus feature

In section 5.1, I proposed that the unbound additives *myös* and *myöskään* correspond to the additive operator ADD in the semantics. As these forms are standardly classified as particles, I gave

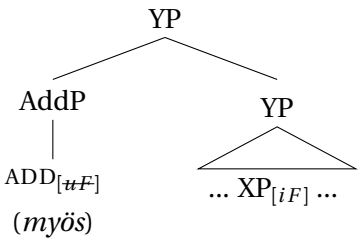
them an adjunctive syntax, and proposed that they may adjoin to many different projections from VP to FP. Moreover, I argued that unbound additives are sometimes driven to move covertly: this is the case if they are initially adjoined below their F-marked associate.

In contrast, in section 5.2, I argued that the bound additive forms *–kin* and *–kAAn* are morphological markers that signal the presence of an additive operator in the structure. I identified two such operators: BADD and CADD. I proposed that in both cases, the relevant additive operator is merged locally to the associate. This allowed me to assume throughout the dissertation that the host of the enclitic marker is also the associate of the additive operator.

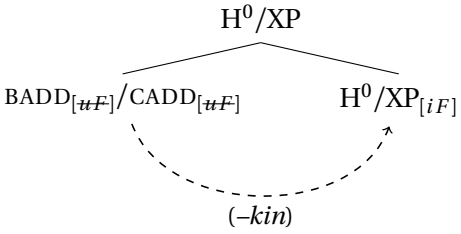
Following Holmberg (2014), I proposed that the focus-sensitivity of both unbound and bound additives in Finnish is reflected in their syntax: the operators carry an uninterpretable focus feature [uF] which is deleted through Agreement with an interpretable focus feature [iF] on their associate. Therefore, the general structural schemas for unbound and bound additives – with only the focus feature shown – are as in (371). As (371b) illustrates, the additive operator associated with bound additives may adjoin to both heads (X^0) and phrases (XP).

(371) **Structural schemas for *myös* and *–kin***

a.



b.



8.1.1.2 The form alternation question: The role of the topicality feature

In section 5.2, I argued that the bound additive *–kAAn* and the unbound additive *myöskään* may be interpreted above negation. This means that it is hard to maintain that these additives are negative polarity items. Moreover, I argued that under the T/Y-model of grammar adopted in this dissertation, it is not possible to let the LF position of the additive operator be the determining

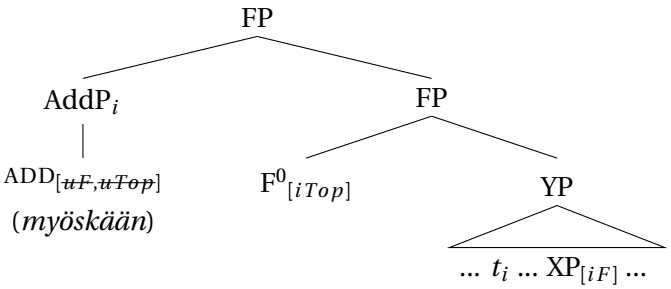
factor in the lexical realisation of the additive. Hence, I proposed that the difference between *–kin* and *–kAAn* on the one hand and *myös* and *myöskään* on the other is due to a syntactic difference.

In particular, I argued that the 'polar pairs' differ in their featural make-up: while the operators associated with *–kAAn* and *myöskään* carry an uninterpretable topicality feature [$uTop$], the operators associated with *–kin* and *myös* do not (to the exception of one case involving CADD). This analysis has the advantage of explaining why the additive operators associated with *–kAAn* and *myöskään* scope over negation, but also why these additives appear in contexts where no negative polarity is present. Specifically, I presented data from polar interrogatives and recurring-issue questions which indicate that the additive operators in question are driven to move to different positions than the operators associated with *–kin* and *myöskään*.

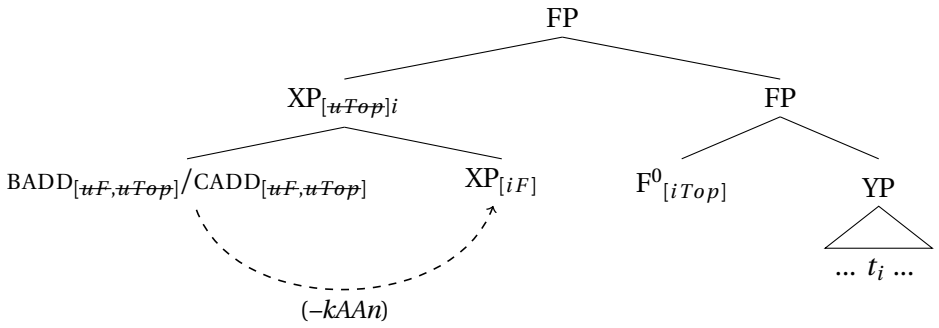
As an uninterpretable feature, [$uTop$] must be deleted through Agreement with a goal that carries [$iTop$]. I suggested that this feature may be carried by both F^0 (i.e. the head of the finite phrase, which in Finnish hosts not only subjects but also topics) and (more rarely) a high Top^0. Crucially, I argued that the additive operators associated with *–kAAn* and *myöskään* have to undergo a covert movement step in order to Agree with either head, and delete [$uTop$]. For this to be possible with the additive operator associated with *–kAAn*, I argued that the [$uTop$] feature projects to cover the whole host XP. This ensures that the relevant c-command configuration between [$uTop$] and [$iTop$] holds.

(372) **Structural schemas for *myöskään* and *–kAAn***

a.



b.



8.1.1.3 Variation question: Connecting form and meaning

In chapter 6, I proposed that associating *myös* and *myöskään* with the operator ADD and *–kin* and *–kAAn* with the operator BADD derives some of the differences in the distributions of the two types of additives. In chapter 7, however, I argued that associating *–kin* and *–kAAn* with BADD (which, in terms of syntactic features, is identical to the additive operator ADD associated with unbound additives) is not enough to derive the full distribution of bound additives. To complete the picture, I proposed that on some uses, *–kin* and *–kAAn* mark the presence of a quantificational closure operator CADD.

In uses that involve quantificational closure, the one-to-one mapping between the surface form, features, and operator was argued to break down. Specifically, both *–kin* and *–kAAn* were proposed to be associated with existential and universal closure. Furthermore, one of the closure operators associated with *–kin* was argued to carry $[uTop]$. While these featural specifications made the associations between the surface form and meaning complex, the suggested system is not redundant, as the positions in which the closure operators are interpreted differ due to the presence or absence of a topicality feature.

The following table shows a summary of the additive operators that can be associated with unbound and bound additives in Finnish, as well as their relevant syntactic features.

	Operator			
Form	**ADD**	**BADD**	**CADD$_{\exists}$**	**CADD$_{\forall}$**
myös	$[uF]$			
myöskään	$[uF, uTop]$			
–kin		$[uF]$	$[uF, u\exists, uTop]$	$[uF, u\forall]$
–kAAn		$[uF, uTop]$	$[uF, u\exists]$	$[uF, u\forall, uTop]$

Table 8.1: Form-operator-feature matrix

8.1.2 Semantics

The semantics of unbound and bound additives were discussed in section 5.3 and chapters 6 and 7. As mentioned above, in section 5.3, I proposed that unbound additives are the surface realisation of a 'standard' additive operator, ADD, while bound additives may mark the presence of either BADD (which covers a superset of cases covered by ADD) or CADD (which is related to BADD but also shows clearly distinctive semantic behaviour). In this section, I summarise the main proposal of this dissertation concerning the three additive operators. I begin with the presuppositionality question (section 8.1.2.2), and then go over the proposed semantics while addressing the questions of derivation, antecedency, distinctness, and variation (section 8.1.2.2).

8.1.2.1 Presuppositionality question: An analysis based on speaker presupposition

In this dissertation, I defended a variation of the speaker presupposition view on additivity (Stalnaker, 1973; Kapitonov, 2012). In particular, I argued that the use of an additive reveals that there is a specific alternative to the prejacent (i.e. an antecedent) that the speaker has in mind (or that belongs to some part of the discourse model).

I argued that this view is superior to the more standard existential and anaphoric accounts in a number of ways. First, it allows the speaker to use additives when the antecedent β that they have in mind has no established truth value, as required in existential analyses of additivity. In Finnish, this property is necessary for the analysis of the polar use of bound additives, where the antecedent usually corresponds to a belief or a wish of the speaker. Second, the semantics of the additive operators do not have to contain an anaphoric element to refer to an antecedent on this approach. As the discussion in sections 3.2 3.3 showed, this is a theoretical advantage given the fact that additives do not behave like other anaphoric elements in natural language. And third, the view defended in this dissertation allows a rather straightforward explanation of the infelicity of certain utterances with additives: when the hearer believes that they should be able to identify the antecedent β, they will protest if they are unable to. Crucially, I showed that in some contexts, the necessity to identify β is lifted: in contexts of games and competitions, for example, the hearer knows not to ask. In these cases, additives are indeed felicitous.

Contexts where the antecedent β does not have to be identified are particularly interesting because they clearly reveal the underlying content of the additive presupposition. In particular, I argued that even if the hearer cannot identify the antecedent β, they now know the content of the additive presupposition: there is some β in the mind of the speaker – or more generally, the discourse model.

I classified this presupposition as a metaproposition about the context. Assuming that the additive presupposition is a metaproposition about the context was proposed by Heim (1990) as a potential way to salvage the conventional implicature approach to additivity. However, conventional implicatures are typically used for conveying anti-backgrounded (i.e. new) information, while presuppositions typically relate to information that is backgrounded, and taken for granted. Of course, additive presuppositions may be informative; the important word here is *typically*, and typically, they seem to refer to backgrounded information. Therefore, I chose to classify additive meaning as mainly presuppositional.

The modifier 'mainly' is required because of CADD. To be specific, in chapter 7, I argued that a number of uses that involve the closure operator CADD in fact depend on this operator for their semantic well-formedness. Thus, I also gave CADD a truth-functional semantics, which means that the analysis that I propose for the three operators associated with *myös*, *myöskään*, *–kin* and *–kAAn* is not fully unified.

8.1.2.2 The semantics of additivity in Finnish

In chapters 5, 6, and 7, I presented the semantics of three different operators – ADD, BADD, and CADD – and showed how they can be used to derive the distribution of unbound and bound additives in Finnish. Below, I repeat the proposed semantics for all three operators.

(373) **Semantics of ADD (without a distinctness condition)**

$[\![\text{ADD}]\!]_{\langle\langle st,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle st,t\rangle}\,.\,\lambda\alpha_{\langle s,t\rangle}$: $\exists\beta[\beta\in\Gamma\wedge\beta\in cg]_{SPS}$. α

Speaker presupposition: There is some β such that β is a member of Γ (a set of focus alternatives of the prejacent α), β is distinct from the prejacent α, and β is a member of the common ground cg

(374) **Semantics of BADD**

a. Polar, reactive, concessive: $[\![\text{BADD}]\!]_{\langle\langle st,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle st,t\rangle}\,.\,\lambda\alpha_{\langle s,t\rangle}$:

b. Double contrast: $[\![\text{BADD}]\!]_{\langle\langle\langle st,t\rangle,t\rangle,\langle st,st\rangle\rangle} = \lambda\Gamma_{\langle\langle st,t\rangle,t\rangle}\,.\,\lambda\alpha_{\langle s,t\rangle}$:

c. Recurring issue: $[\![\text{BADD}]\!]_{\langle\langle\langle st,t\rangle,t\rangle,\langle\langle st,t\rangle,\langle st,t\rangle\rangle\rangle} = \lambda\Gamma_{\langle\langle st,t\rangle,t\rangle}\,.\,\lambda\alpha_{\langle st,t\rangle}$:

$\exists\beta[\beta\in(\cup)\Gamma\wedge\beta\in\{cg, f(w_0), DC_X, Table\}]_{SPS}$. α

Speaker presupposition: There is some β such that β is a member of (the union of) Γ (a set of focus alternatives of the prejacent α), and β is a member of the common ground cg, a set of propositions derived through applying a conversational background to the actual world, the set of public discourse commitments of a discourse participant X, or the $Table$

(375) **Semantics of CADD**

Iff $[\![\alpha]\!]^o$ = undefined,

(i) $[\![\text{CADD}_\exists(\alpha)]\!]^o = \exists([\![\alpha]\!]^f)$

$[\![\text{CADD}_\exists(\alpha)]\!]^f = \{[\![\text{CADD}_\exists(\alpha)]\!]^o\}$

(ii) $[\![\text{CADD}_\forall(\alpha)]\!]^o = \forall([\![\alpha]\!]^f)$

$[\![\text{CADD}_\forall(\alpha)]\!]^f = \{[\![\text{CADD}_\forall(\alpha)]\!]^o\}$

Otherwise

(i) Speaker PS with $\text{CADD}_\exists$: $\exists\beta[\beta=\exists([\![\alpha]\!]^o)\wedge\beta\in\{cg, f(w_0), Table, DC_x\}]_{SPS}$

I argued that the different distributions of unbound and bound additives directly follow from the operators they may be associated with (variation question). First, unbound additives only have

a basic use. The overlap between the speaker presuppositions associated with ADD and BADD explains why this use is also available with bound additives.

Second, I proposed that three properties separate BADD from ADD, and allow BADD to be used on the double contrast, polar, reactive, concessive, and recurring-issue uses. These three properties are (i) type-flexibility[1], (ii) source-flexibility, and (iii) lack of a distinctness condition. The first of these properties allows for the antecedent β to be presupposed to be a member of the union of Γ (derivation question). This was shown to be especially important for the double contrast use. The second property was involved in the analysis of the polar, reactive, concessive, and recurring-issue uses (antecedency question). As the presuppositions above show, I identified four different components of the discourse model as potential sources for the antecedent β: in addition to the classic common ground, I made use of sets of propositions derived by applying a conversational background to the actual world (deriving a set of beliefs, wishes, etc. of the speaker), the set of public discourse commitments of a discourse participant X, and the $Table$ (a stack of QUDs). And finally, the analysis of the reactive, concessive, and recurring-issue uses involved an antecedent β which was shown to be semantically non-distinct from the prejacent α (distinctness question). This result supports the view according to which distinctness may not be encoded in additive semantics, and is derived as a conversational implicature based on expectations of informativity.

I then proposed that the third operator, CADD, has the semantics of a quantificational closure operator. The quantificational force of the operator was shown to be dependent on the syntactic features of the host. I used CADD to model the semantics of the three remaining uses of bound additives: the quantifier, *wh*-concessive, and multiple-*wh* uses. While in all other uses, the effect of CADD was shown to be truth-conditional (and related to its obligatory presence in the structures), the interrogative type of multiple-*wh* use was argued to involve a speaker presupposition that nevertheless involves a closure operation (presuppositionality and obligatoriness questions).

In table 8.2, I show a summary of the different uses discussed in this dissertation. In it, I indicate not only the operator, but also the type of alternatives involved in their semantics; as this dissertation has demonstrated, polar alternatives are not only relevant for the semantics of polar interrogatives, but they also play an important role in the semantics of additivity in Finnish. The table also indicates the special properties of the additive operator that are associated with each use.

[1]The squiggle (Rooth, 1985, 1992), whose semantic job is to restrict the denotation of the contextual variable Γ with respect to the focus semantic value of the prejacent, was also argued to be type-flexible.

Operator	Use	Alternatives	Special properties
ADD, BADD	Basic (Sections 4.1, 5.3, 6.1.2)	Lexical	Accommodation
BADD	Double contrast (Sections 4.6, 6.1.1)	Lexical	Type-flexibility
	Polar (Sections 4.2, 6.2.1)	Polar	Source-flexibility
	Reactive (Sections 4.3, 6.3.1)	Polar	Source-flexibility, distinctness
	Concessive (Sections 4.4.1, 6.3.2)	Polar	Source-flexibility, distinctness
	Recurring-issue (Sections 4.5, 6.3.3)	Polar	Source-flexibility, distinctness
CADD	Quantifier (Sections 4.8, 7.1)	Lexical	Truth-conditional closure
	Wh-concessive (Sections 4.4.2, , 7.2)	Lexical and polar	Truth-conditional closure
	Multiple-*wh* (Sections 4.7, 7.3)	Lexical	Truth-conditional and presuppositional closure

Table 8.2: Classification of the uses of bound and unbound additives based on the operator involved

8.2 Implications for the investigation of additivity in general

The two main goals of this dissertation were to provide an analysis of unbound and bound additivity in Finnish, and by doing so, to provide a new perspective on the phenomenon of additivity in general. In this section, I will discuss the general implications of this dissertation for the investigation of additivity.

In many ways, the most important point that this dissertation makes concerns the importance of considering the full spectrum of roles in which additives appear in different languages when devising a theory of additivity. By considering more than just the simplest examples of the basic uses of bound and unbound additives in Finnish, we arrived at a picture of the nature of additivity that is much richer than before.

In particular, we saw that although some additives may well be associated with an operator that may only make reference to the common ground, other additive operators have much less constraints imposed upon them. In particular, we postulated a principled difference between two additive operators in Finnish: one that the speaker may only use to indicate that they have in mind an antecedent that is part of the common ground (ADD) and another that the speaker may use when that antecedent is part of for example their beliefs or wishes (BADD). We identified multiple components of the discourse model that may function as the source of the relevant an-

tecedent. The data presented in this dissertation therefore empirically validates the rather vague claim made in earlier literature according to which the antecedent is simply required to be part of the 'active context' (Kripke, 1990/2009). Another property that we saw not to hold of all additive operators, contrary to common assumptions, was the distinctness requirement: while the possibility of the prejacent and the antecedent to be identical is not manifest on the basic use of Finnish additives, it becomes obvious once we look at their non-basic uses.

We also encountered other new ingredients in the semantics of additivity. For example, once we left the domain of the basic use in Finnish, it became obvious that some additive operators are able to manipulate both polar and lexical alternatives. Such a property is in no way unexpected under the proposal put forth in this dissertation, but it is harder to make sense of under the more standard existential and anaphoric approaches. Indeed, the involvement of polar focus alternatives has gone unnoticed in previous analyses of additivity.

In addition, by letting the Finnish data guide the analysis, we gained a better understanding of many old problems. For example, while accommodation from additives has been argued to be impossible, we saw that on the contrary, accommodation is productive once the right configuration is identified. The close morphosyntactic relationship between BADD and its associate in Finnish allowed us to work out the outlines of an analysis of accommodation from additives. In the same vein, the use of speaker presupposition instead of more common approaches to presupposition was not only beneficial to the analysis of the Finnish examples: it also allowed a fresh look at the so-called Kripke-examples, which are a main point of dispute between the existential and anaphoric approaches.

Of course, many open questions remain. For example, this dissertation did not offer a diachronic perspective on the expression and interpretation of additivity in Finnish or elsewhere. However, it would be very interesting to study how the different properties of additive operators have evolved over time: knowing in which order the 'extensions' and points of freedom came about could tell us a lot about the connections between them. Also missing is a cross-linguistic perspective, even though it is unlikely that Finnish is the only Finno-Ugric or even Uralic language in which additives show so many interesting properties. The comparison of Finnish and Estonian, for example, could shed more light on the way that additive operators work in different languages.

To conclude, with this dissertation, we have learned that additive operators are at the same time quite simple and still complex: they are simple because they do not ask for much – just the presence of an antecedent somewhere in the context – and complex because of the differing requirements they impose on their arguments and context of interpretation.

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