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# On the Effect of Reciprocal Dyadic Relations on the Share of Lexical Practices

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## Abstract

Variationist studies have shown the implication of tie properties in the emergence and preservation of linguistic norms. This contribution deepens the understanding of this mechanism at the dyadic level. It explores relational subjectivity and relativity among individuals of a community and their implications in the distribution of lexical variants. The aim is to understand how the reciprocity of a relation influences the share of lexical practices. To do so, we analyze the network of discussions of bachelor's degree students of the University of Geneva and their lexical practices. Using the modern methods used in social network analysis to study relational properties and by running multiple regression quadratic assignment procedure (MRQAP), reciprocal interactions are found to lead to a higher lexical share and similarity.

### Keywords

Lexical practices, Reciprocity, Social network, Language, Dyads, Influence.

## Introduction

Variationist sociolinguists have dedicated their work to understanding the tenets of linguistic diversity and change. They have explored the reason why a practice occurs, rises, maintains, spreads, and disappears. They also have contributed to highlighting the mechanisms for local linguistic forms and for standard, neutral, linguistic forms to be used. They have focused on the context settings that can predict the emergence and the use of a norm. Relational patterns and structure have been found to be helpful in bringing light to these mechanisms. Two levels of analysis are of importance. On the one hand, network-level cohesive properties enforce norms; on the other hand, at the dyadic level, tie properties too participate in the emergence of norms. For the former, density and closeness of the network act as norm enforcers. For the latter, cohesive properties, such as tie strength and multiplexity, have been identified as participating in the emergence of norms. In this paper, we aim to extend and deepen the understanding of how social ties participate in the raising of norms by considering a property not yet considered in the literature, but which is a well-known property in the context of social network analysis (SNA), namely, reciprocity.

This contribution hence seeks to understand the mechanisms of lexical share at the dyadic level. By focusing on a pair of individuals, we want to see whether relational reciprocal and mutual interactions are associated with practice share and similarity. Indeed, we want to see whether symmetric and nonhierarchical relations can lead to the emergence of co-constructed practices. By doing so, we do not consider all social relations as equivalent and as equally implied in the share of linguistic practices, but instead as having different implications.

# Theoretical Framework

## Relational Approach to Language: A Social Network Perspective

Since the study of the Swiss linguist Gauchat (1905), who showed the relevance of studying relational networks to understand the diversity and regularity within language, the number of contributions tackling this postulate has risen since the 1970s. Milroy (1987) is the first to explicitly borrow and use concepts from SNA theories to study language. Communities are considered in terms of relational networks. Relational perspective is useful for two main reasons: on the one hand, for accounting for the diversity within an a priori homogeneous community; and, on the other hand, for bridging the micro and macro approaches. For the former, it allows accounting for the diversity of practices, by studying the relational structures and their implications in linguistic innovation and change. The relational approach is useful to outline the heterogeneity, owing to relational singularities, of groups that seem, a priori, homogeneous in their practices (Gauchat, 1905; Lippi-Green, 1989; Milroy & Milroy, 1992; Paolillo, 1999; Santa Ana & Parodi, 1998). Studying the relational network allows us to highlight the dynamics of the language and to consider individual linguistic behavior as evolutive and not fixed. The individual linguistic behavior is then influenced by the structure of its relations, which are not unchanging, but conducive to change. Observing the relational network thus leads to understanding the change and/or the preservation of linguistic norms.

The importance of network structure has been identified to be relevant at two different levels: the network level, whether an ego network or full network; and the dyadic level (at the group level, by focusing on the aggregate of personal relations and their linguistic practices; at the dyadic level, by focusing effectively on interpersonal relations and their linguistic practices). The following sections are dedicated to showing to what extent both levels participate in the emergence of norms.

### *The Network Level*

The sociolinguist paradigm borrows its rationale for diffusion and norm-building from the theory of social influence (see, e.g., Aral & Walker, 2014). As a matter of fact, language happens to follow similar mechanisms. Norms and social influence are strongly related to relational patterns. The structure and properties of the social network act as norm enforcers. Among the relational properties that influence language, the cohesiveness of a community is positively correlated to the preservation of norms (Dodsworth & Benton, 2020; Milroy, 1987): the more a network is considered cohesive, the more it would be hermetic to change. Different relational properties build cohesiveness. In the literature on language using relational concepts, two main ones are considered: the density and the closeness of the network (Milroy, 1987). Density is among the most influential components for the preservation of linguistic norms and the diffusion of linguistic innovations (Eckert, 1988; Fagyal et al., 2010; Labov, 1976; Lippi-Green, 1989; Milroy, 1987). Density is calculated by the number of active ties out of the possible ties (Wasserman & Faust, 2018). Dense networks present more social pressure and work as "norm enforcers" (Blom & Gumperz, 1986; Granovetter, 1973; Milroy, 1987): in these "close-knit" networks reigns a notion of duty and obligation stronger than in networks in which density is low. Indeed, networks such as the former maintain and control respect for the norms. Conformity of practices is expected, and nonrespect could be negatively perceived. Dense networks composed of strong ties hence favor a certain loyalty of their members (Blom & Gumperz, 1986; Milory, 1987).

The closeness of the network also affects the preservation and impermeability of the group to innovation: the smaller and the more closed the group, the less receptive it is to change (Gumperz, 1989; Labov, 1976; Lev, 2014; Milroy & Llamas, 2013; Simmel, 1999). Closed communities lead to the preservation of norms (Coleman, 1988). They seem to be more stable, less changing, and more homogeneous than open groups (Labov, 1976). Closed groups are less subject to linguistic innovations. Innovation comes from the creation of relations of members of the community with individuals from outside the community (Milroy, 1987). New relations "contaminate" the group. Intergroup contacts and mixes allow change to occur (Gumperz, 1989; Labov, 1976; Le Page, 1968; Lev-Ari, 2017, 2018; Milroy, 1987). By multiplying intragroup and intergroup contacts, the possibility to see a unique aggregation of linguistic practices within a given community rises. In sum, closeness favors diversity: each community will be intrinsically homogeneous, but extrinsically heterogeneous.

### *The Dyadic Level*

Linguistic change and innovation spread through social interactions and discussions among individuals (Lev, 2014; Nardy et al., 2014). Observing the structures of a relational network thus allows an understanding

of change's diffusion. It is notably through these that language moves and is transmitted, distributed, and propagated (Labov, 1976; Lev, 2014). Social ties are parts of the influence process. Gumperz (1989) argues that communication is a social activity, by the fact that it is made in interactions. He insists on the importance of considering the nature of social relations within a given group. As Kenny et al. (2020, p. 1) pose: "the dyad is arguably the fundamental unit of interpersonal interaction and interpersonal relations". For communication to occur, interaction of at least two individuals is needed. The study of interactions then allows to understand the context from a broader perspective and to understand the normative constraints that govern the context (Albert, 1986). One has to focus on the identity of people interacting and on the nature of their relations (Labov, 1976; Milroy, 1987). Social relations become a full element of the context, if not the context itself (Blom & Gumperz, 1986). Linguistic changes then reflect personal relational structures (Gumperz, 1989). What underlines the variety of speeches within a community lies in systematic relationships (Hymes, 1986).

A relational perspective allows the bridging of macro and micro approaches, by linking the individual and the structure, while outlining how one influences the other, and vice versa. Linguistic changes reflect changes in relational structures. Studying interpersonal relations allows the understanding of the heterogeneity of practices within a group, whereas studying the aggregate of personal relations allows the understanding of the homogeneity of practices and to try intergroup comparisons (Gumperz, 1989). In this perspective, microphenomena that locally emerge explain the macrophenomena, which will in turn influence the preservation of microphenomena. Thus, there exists an interdependence: the aggregate of individual behaviors will eventually lead to the rise of global behaviors (Meyerhoff & Strycharz, 2013).

We have highlighted the fact that cohesive properties act as norm enforcers. The importance of cohesion at the community level for the share of linguistic norms can be scaled down at the dyadic level. Cohesion can also be conceptualized at this level by considering the content of the relationships, namely, under the approach of tie strength (Granovetter, 1973). Tie strength is composed of varied dimensions. Ties are considered strong if they hold emotional thickness. The most simplistic way to conceptualize tie strength is in terms of contact frequency (Aral & Walker, 2014). The more frequently two individuals interact with each other, the more they can be viewed as sharing strong ties. Another way to consider strength is multiplexity. A tie is considered multiplex if individuals share multiple social realities (members of the same family, neighbors, coworkers, and so on) (Granovetter, 1973; Milroy, 1987). An easy and simple way to understand the difference between strong ties and weak ties is to compare the difference between a friend and an acquaintance. This implies that not all relations can be considered equal.

Tie strength is a function of cohesion: cohesive communities emerge from cohesive dyads, and cohesive dyads are enacted by community cohesion. Indeed, we observe a tendency toward transitivity (Holland & Leinhard, 1971) and triadic closure (Rapoport, 1953), that is, if two individuals share a common alter, they are likely to create a tie. This is particularly true for strong ties, which lead to bonding (Granovetter, 1973), compared to weak ties that allow for bridging social relations (Burt, 1992). This follows the basic principle that individuals who share strong ties are more likely to be similar in varied ways. Consequently, if two individuals connected with a third party happen to meet, there is a great likelihood for an affinity to be created, because of the sharing of interests, values, and so on. We also can extend it to the cognitive balance theory (Heider, 1946), which states that individuals will tend to match their attitudes with the attitudes they have toward a third object. Therefore, an increased number of strong ties will result in an increase in density and overall cohesion within a network.

In the sociolinguist theories, the strength of ties is found to be one of the most influential properties for the preservation of linguistic norms and the diffusion of linguistic innovations (Eckert, 1988; Fagyal et al., 2010; Labov, 1976; Lippi-Green, 1989; Milroy, 1987). With strong ties, people tend to interact more and develop and share privileged knowledge. This is based on the influential properties of strong ties (Aral & Walker, 2014). Indeed, they are more prompt to translate to social influence because they intrinsically imply trust and cooperation (Coleman, 1988). As Tasseli et al. (2020, p. 4) argue: "Through repeated interaction and development of localized knowledge, indeed, ties within subunits entail the absorption and construction of systems of meanings that individuals develop and share to make sense of the social environment in which they live and work". This construction of systems of meaning, in turn, urges individuals to develop a common language that reflects it. Milroy (1987) has shown a positive correlation between the multiplexity of social ties and the use of vernacular forms (context-specific linguistic variants).

Let us note that for a linguistic adaptation to be made, a certain indexicality is presupposed

(Sleverstein, 1975), that is, linguistic practices are to be identified as representative of a social group. Linguistic forms are social markers and allow the expressing and inferring of social identities (Hernández-Campoy, 2016; Sterponi & Bhattacharya, 2012). By applying a linguistic norm, an individual can situate him- or herself in the social space, and individuals that compose the social space can simultaneously place the individual that produces the language. In that sense, language can be used to express a certain form of belonging and to express an attitude of social proximity (Bell, 1984). By making the practice converge with that of the audience, the individual sends a message that she or he wants to create a bond. This can result in linguistic similarity being involved in the formation of social ties. Oppositely, by diverging from the practice of the listener, the individual can show a negative attitude toward the audience and thus favor the dissolution of a tie (Gasiorek, 2016). Because language is a marker, it also participates in the emergence of homophily, where individuals will tend to create relationships with individuals perceived as similar. There is indeed evidence in this sense (see, e.g., Aral & Walker, 2014; Tasseli et al., 2020; Kovacs & Kleinbaum, 2019). Thus, similarity can both be a result of contact frequency and the strength of ties (referred to as the influence process), and similarity can also be the cause of contact (referred to as the selection process). We could view it as a cyclical process by the fact that the intensity of relations allows for the creation of norms, and that norms allow the individuals to situate themselves in the social space. Hence, individuals have the ability to manipulate the norms to construct or maintain their social network. The maintenance of social relationships further enhances the reinforcement of current norms and the emergence of new ones.

## Reciprocity of the Relation

At the dyadic level, we have argued for the importance of tie strength, under the prism of frequency, emotional content, and multiplexity. All three properties are functions of density and, to a larger extent, social cohesion. Yet, at the dyadic level, another property, thus far not implemented in the study of language, is considered by the social network theory (Wasserman & Faust, 2018) as a key dimension of the strength of ties, namely, reciprocity. Reciprocity is understood as the presence of symmetrical relations, that is, relations that go both ways independently of their type. Reciprocity implies that relations can be directed. Directed relations need particular attention and methods (Borgatti et al., 2018; Harary et al., 1965; Wasserman & Faust, 2018). Contrary to what has been postulated in sociolinguistics (Gumperz, 1989; Milroy, 1987), social relations are not necessarily reciprocal or at least cannot be perceived in an equivalent way. Whereas a relation can be seemed important for one, it can be deemed not important for another. This can create a relational asymmetry. As Wasserman and Faust (2018) argue, in directed networks, cohesion is characterized by mutual acknowledgment. For instance, Luce and Perry (1949) state that cohesive subgroups are the ones for which a pair of individuals mutually elect each other as friends. Asymmetrical ties can thus be conceptualized as a weakening of tie strength.

Individuals then have a certain amount of agentivity in the creation of social ties and are considered as socializing agents (Brint, 2001; McPherson et al., 2001; Pescosolido & Rubin, 2000; Simmel, 1999). To some extent, creating and joining a group becomes more of an individual choice. This is called “choice-produced homophily” (McPherson et al., 2001, p. 432). Some individuals may have similar interests, and these interests can “materialize” in the creation of social ties. The individual is then free to choose whom s/he wants to be tightened with. A more important agentivity is given and the notion of desirability takes a bigger place (Labov, 1976). It is then the will of the individual to take part in relations and to adopt a consensual language, or not, depending on the sense of belonging (Blom & Gumperz, 1986; Eckert, 1988; Le Page, 1968; Merton, 1949; Milroy & Llamas, 2013). This sense of belonging and identification to a group does not depend on the strength of social ties in presence, but rather on a personal will. Let us, however, counterbalance this view with the fact that homophily can also be constrained by contextual factors (McPherson & Smith-Lovin, 1987). People belong to larger social structures (e.g., geographical locations, workplace), which are not uniformly composed. Instead, we observe the clustering of individuals by social characteristics (ethnicity, wealth, gender, age, etc.) (Liben-Nowell et al., 2005), which decreases the likelihood of interactions between individuals of varied backgrounds. Some ties cannot be formed merely due to nonavailability of choices. This form of constrained homophily is referred to as induced homophily (McPherson & Smith-Lovin, 1987) and competes with choice-produced homophily. Nevertheless, even though some social factors influence the availability of alters to create relationships, choice-produced homophily still holds. It is just limited.

It has been argued, and empirically supported, that influence is not only a matter of physical proximity of social relations but rather a matter of social proximity and intensity of the relations, for which reciprocity is one of the key components (Coleman et al., 1957; Aral & Walker, 2014; Tasseli et al., 2020; Saint-Charles & Mongeau, 2018). Some scholars (e.g., Hoffman et al., 1996; Trope et al., 2007) even consider that social distance and social proximity are two facets of perception of the reciprocity that constitutes an interaction. Because weak ties have lessened capacities to build commonly shared repertoires of knowledge and culture (Aral & Walker, 2014; Tasseli et al., 2020), we expect them to lack a certain ability to enforce the development of shared lexical practices. Oppositely, because reciprocity is a function of tie strength, we assume that it will give rise to a positive association with lexical similarity. As Granovetter (1973) argues, there is empirical evidence that the stronger the tie between two individuals, the more similar they are likely to be. Tasseli et al. (2020) support this view. In a study that explores the role of tie formation to organizational vocabulary share at the dyadic level, reciprocity, as a control variable, implies greater vocabulary share. Even though the language under study is extracted from written data, we assume to observe a similar association for spoken language. Saint-Charles and Mongeau (2018) have also tested the role played by intensity and reciprocity in the building of discourse similarity and have shown evidence for a positive association. Yet, conscious of the joint processes of influence and selection and their importance in understanding the full length of how social interactions and language are related, they will not be studied per se, as they are beyond the scope of this paper. This article aims to extend the existing sociolinguistic knowledge by deepening an already well-established process: the influence of social interaction on linguistic similarity. Reciprocity is a function of strength and cohesion. Cohesion is a key factor of similarity; thus, reciprocity is expected to be related in the same direction as other cohesive properties. We want to verify whether we find a positive association between reciprocity and lexical similarity:

- *Hypothesis: Reciprocal relations have a positive association with dyadic lexical similarity.*

An alternating hypothesis would be that nonreciprocal ties enhance the spread of practices. The strength of the interaction surely is dependent on reciprocity, but not the interaction itself. Even without reciprocity, interaction can still exist. In a directed network, it is highly probable that one individual named the other, but not vice versa. It would be logical to imagine that, even without reciprocity, practices are bridged through nonreciprocal ties, and that this latter would favor the spread of practice. This case would be similar to the information flow exchange that we encounter in both Granovetter's (1973) argument of the strength of weak ties and Burt's (1992) argument of the role of brokering for the diffusion of information. Evidence for this perspective exists in the sociolinguistic field (e.g., Milroy, 1987). This alternative hypothesis will further be tested. An emphasis not solely on reciprocal relations, but also on nonreciprocal ones, will be made, to try to disentangle the role of both tie contents.

## Method, Sample, and Variables

### Analysis Strategy

When dealing with dyadic design data, as is the case here, specific statistical tests are needed. The independence of answers is not postulated as in "classical" inferential statistics. To calculate relations at the dyadic level, classical statistic tests can lead to biased results, due to autocorrelations and the nonindependence of the answers (Borgatti et al., 2018). The method called quadratic assignment procedure (QAP) (Hubert & Schultz, 1976; Krackhardt, 1988) has been developed to avoid this problem. The QAP method proceeds by permutations. At first, the algorithm performs a standard regression for each cell of the observed matrixes. Then, the algorithm randomly permutes columns and rows, while keeping the relational properties, and performs a regression for each new result in the cells. To stabilize the standard errors of the coefficients, the algorithm has to permute a high number of times. To ensure the significance of the tests, the algorithm counts the proportion of random matrixes in which the results are the same as the observed matrixes. If <5% of the created matrixes yield the same results as the ones obtained from the observed matrixes, then the significance of the results is accepted (Borgatti et al., 1992).

Few limits can be addressed to this method. Among them is the fact that QAP can yield biased results if the sample distribution is skewed (Krackhardt, 1988). The multiple regression QAP (MRQAP) is an evolved version of the QAP, which can better support a skewed sample, up to a certain level (Dekker et al., 2007). Skewness and kurtosis of the independent variable will then be observed with particular attention. With MRQAP, the dependent

variable needs to be continuous. That is the case here.

For the analysis, I use the software called UCINET (Borgatti et al., 2002), which is specialized in SNA. Visualizations of the networks will be made with the software NETDRAW (Borgatti, 2002), available in UCINET.

## The University of Geneva and Its Students

To understand the implication of the direction of relations and reciprocity of dyadic relations, I have decided to study university students as an example of a community having low cohesiveness and low normative constraints and in which directed ties are expected to appear. The population for this research is the bachelor's degree students in sociology at the University of Geneva (UNIGE), Geneva, Switzerland. A university is a complex and socially heterogeneous reality. Individuals composing it come from diverse horizons and have diverse goals (Jellab, 2013; Safranková & Sikyr, 2016; Simmel, 1964). A university is a mutable, dynamic, and ephemeral relational configuration that creates and recreates depending on the students it welcomes. University is typically a social context where both choice-produced homophily and induced homophily are both at play and reinforce each other (Kossinets & Watts, 2009). It is the will of the students to create, transform, and give substance to their relations, depending on the will to invest in university life.

In the academic year 2019–2020, UNIGE was composed of 17,744 students (62% being women), among whom 1,257 were part of the social sciences faculty, enrolled for their bachelor's and master's degrees. We find diverse departments in this faculty, such as geography, political science, historical economy, and sociology. Bachelor's degree students can choose to specialize in any of these departments. Out of the 1,257 students in this faculty, 602 were enrolled in a bachelor's degree, and 100 were enrolled for the bachelor's degree in sociology. Our population of interest is the latter. We find that 58% of women and 73% of students are from Switzerland.

The bachelor's degree in sociology is organized into two parts: during the first one, lasting at least two semesters, sociology students are mixed with students from other departments of the social sciences faculty. During the second part, lasting at least four semesters, students can choose their lectures based on their interests. Students of the first two semesters of this second part have one mandatory lecture that is specific to them, and so do the students of the last two semesters who have a specific mandatory lecture. The latter also have to complete a final work. Second-part students can share lectures with first-part students if they have failed a first-part exam. We can observe mobility among the different parts.

Data collection was done with self-administered computer-assisted Web interviews (CAWIs). To constitute our sample, we used the probabilistic simple random sampling procedure. We collected the email addresses of all the students registered for the bachelor's degree of sociology. Out of the 100 students contacted, 74 completed the survey. Two respondents had to be taken out, because of the unexploitability of their lexical answers due to the excessive amount of missing data. Eventually, the size of the sample was 72. The error margin was ±6.2%. Table 1 shows the sample distribution. In this sample, we had 61% of women and 72% of respondents from Switzerland. This matches the structure of the population. This sample can be considered representative. Most of the students were 20–24 years old. This shows a certain consecutiveness of university studies from high school studies (Jellab, 2013). We find a diversified palette of mother tongues, which shows the cosmopolitanism of Geneva and of UNIGE. French is the most spoken language, followed by English; 54% of the students have a second language.

## Dependent Variable: Lexical Practices and Distributions

For studying linguistic practices, this paper focuses on a particular component of the language, namely, vocabulary. Lexical practices represent one of the components of language which can be considered as "simple" (Dodsworth & Benton, 2020, p. 165) or from the "surface" (Gumperz, 1989, p. 55), and which is hence influenced by the relational network, regardless of the strength of the ties. Moreover, only a few studies specifically focus on lexical practices, even though they have a particular place within the language, for different reasons (Beeching, 2012; Fasold, 2013; Lev, 2014; Lodge, 2004).

Firstly, lexical practices have a function of evaluation and expression of identitarian belonging. They are social markers. It has been proven that it was possible to assign an individual a group s/he belongs to, by her or his phonetic variation (Labov, 1976; Milroy, 1987; Preston, 2013). This principle is also applicable to lexical practices: some word usages allow the assigning of individuals to a belonging group (Mitchell-Kernan, 1986; Scholand et al., 2010; Shoemark et al., 2018). Depending on the

**Table 1. Descriptive distribution of the sample.**

| Sociodemographics | Distribution (%) |
|---|---|
| N | 72 |
| **Gender** | |
| Women | 61 |
| Nonbinary | 2 |
| **Origin** | |
| Swiss | 72 |
| **Year of study at the UNIGE** | |
| 1st year | 40 |
| 2nd year | 29 |
| 3rd year | 30 |
| **Age groups, years** | |
| 18–19 | 20 |
| 20–24 | 74 |
| 25–29 | 6 |
| **Mother tongue** | |
| French | 57 |
| English | 11 |
| Other | 23 |
| >1 Mother tongues | 54 |

Note: UNIGE, University of Geneva.

repertoire of chosen words, it is then possible to infer the social identity of the speaker.

Within language, secondly, the vocabulary can give information on the context and broader social stakes. For communication to be effective, individuals have to assign words the same meaning: the same word can have different meanings and values depending on the context (Hymes, 1974). Words do not have purely inherent meaning, but the meaning is mostly co-constructed (Blom & Gumperz, 1986). A word can have different meanings depending on the context of enunciation. Word use, thus, is an indicator of the local culture, of the local norms.

Thirdly, vocabulary constitutes one of the components of the language that is the most dynamic and the most receptive to social changes (Yu, 2016). Societies are in perpetual movement: they renew, they reinvent themselves (Pescosolido & Rubin, 2000), and with these changes, new concepts, new ideas, and new realities emerge. New words give these latter entities substance and allow their expressions. Words are mutable, sometimes stable, and sometimes ephemeral. They are nevertheless the reflection of a contextual reality (Yu, 2016). Furthermore, the vocabulary is more versatile, more instantaneous, and more evolutive depending on the direct and indirect relations. Lexical practices are typically one of the parts of the language that can be influenced by networks containing weak ties (Dodsworth & Benton, 2020; Tagliamonte et al., 2016; von Hipple, 1994). In this sense, lexical practices show the influence of the present network, more than that of the past one.

Finally, for lexical practices that are more unstable, more changing (Yu, 2016), focusing on the substructures becomes more relevant. The lexical practices allow distinguishing subgroups within groups. The vocabulary highlights a certain heterogeneity within heterogeneous homogeneity (Dodsworth & Benton, 2020; Tagliamonte et al., 2016; von Hipple, 1994). Thus, by studying lexical practices, it is possible to reach a higher level of precision and to outline substructures.

To collect data about the lexical practices of the students, a survey was chosen as it has proven to have certain efficiency (Bauer & Bauer, 2000; Cooper, 1980; Starks & McRobbie-Utasi, 2001; Wolfson, 1976). Surveys were elaborated and sent to the students via the software LE SPHINX[1]. To catch students' vocabulary, photos representing symbolic objects or places of the UNIGE were shown to them. The symbolic objects can typically be referred to as "organizational vocabularies", which can be defined as "systems of words that individuals, dyads, and social groups use to make sense of their organizational experience" (Tasseli et al., 2020, p. 2). In that view, language is considered a window of the organizational culture (Srivastava & Goldberg, 2017). Organizational vocabulary studies can follow two approaches (Loewenstein & Ocasio 2005): the focus is either on pre-elected specific words or on a more exploratory design; all words from a corpus are considered and the most relevant ones emerge, based on word distributions. We chose the first approach. This one requires that the chosen words reflect the actual environment. The words need to express organizational practices. To identify them, a prestudy interview with former students and master's degree students was made.

Students of bachelor's degree in sociology were asked to give the most used word for each item. We focus here on the equivalence of variants (Androutsopoulos, 2000, p. 4), that is, "different ways to say the same thing", which is a simple way to compare lexical similarities. The latent idea of only retaining the most used word is based on the fact that

**1** https://www.lesphinx-developpement.fr

individuals, according to the most intense interactions, build a preferred variant for each situation. Individuals are not monostylistic (Edwards, 2009; Giles & St. Clair, 1979; Hernández-Campoy, 2016). They adapt their language to the context. The language of the individuals is expected to vary across contexts but not within contexts (Bell, 2001). Individuals have consistency in linguistic behavior in similar contexts and are not ever-shifting. Variation is then expected to be interindividual and intercontextual. This is not an optimal and sophisticated way to discriminate practices, but it is useful to study the desired mechanism. The use of photos was motivated by the will to reduce my own inference on respondents' answers: using specific words in the questions could have influenced them (Martin et al., 2010). This is a way to avoid the "observer's paradox" (Feagin, 2013; Labov, 1972, 1976; Milroy, 1987).

Words were "cleaned" and standardized, for example, unnecessary capital letters were removed, and the orthograph was corrected, if it was not modifying the word's meaning, while keeping precise differences between the answers. We thus had eight items. Wordlists are given in Table 1A in the Appendix. For visualization of the word distributions, please see Figures A1–A8 in the Appendix. Q.5 concerns the main stairs that are in the middle of UNIGE's lobby. Q.6 refers to the main entrance of the UNIGE. Q.7 identifies answers for the back door of UNIGE. Q.8 represents the library of UNIGE. Q.9 and Q.10 have been fused as they concern the restaurants of UNIGE and because no particular differences emerged between the two different restaurants. Q.11 shows an iron cow standing in the Department of Sociology. Q.12 is a sculpture standing next to UNIGE's main entrance. Finally, Q.13 shows a decoration hanging on the ceiling of the main lobby of UNIGE.

To be able to relate the lexical practice share with the students' networks, I create a matrix of similarities for each pair of students. To do so, I proceed in two steps: first of all, I create a two-mode matrix (Borgatti & Everett, 1997) with students on rows and words on columns. Then, I transform this matrix into a one-mode matrix, using the function cross-products in UCINET (Borgatti et al., 2002). We now have a 72 by 72 matrix, within which, for each pair of students, I have the number of words they have in common. The more they have words in common, the more they can be considered similar, in the sense that they share lexical practices. This matrix will serve as the dependent variable.

Table 2 shows the descriptive statistics for this matrix of similarities. The average number of words dyads have in common is 1.683, which is quite low as the maximum they could have is eight. The standard deviation is 1.701. The minimum is zero, and the maximum is eight. In the part about analysis methods, I have highlighted the fact that the QAP method needs an unskewed distribution to be effective. The skewness and the kurtosis here are respectively 0.86 and -0.96. This distribution is platykurtic with a slight skewness. Nonetheless, it can be assumed to have a normal distribution (Gravetter & Wallnau, 2014). Thus, the MRQAP analysis will be unbiased (Dekker et al., 2007).

**Table 2. Descriptive statistics for the matrix of similarities.**

| | Matrix of similarities |
|---|---|
| N | 72 |
| Mean | 1.683 |
| Standard deviation | 1.701 |
| Variance | 2.893 |
| Minimum | 0 |
| Maximum | 8 |
| Skewness | 0.86 |
| Kurtosis | -0.96 |

## Independent Variables: Discussion Networks

As far as we are concerned with studying the dyadic relations that occur within a community and thus a relational approach, we want to capture this specific kind of interaction. Therefore, observing the relational network and using SNA methods remain the most relevant way to explore the phenomena studied here. To constitute the student network, the name interpreter question was as follows: "Who, within this list, are the students you are talking the most frequently with, outside the University?" We only focus here on the discussion network, as it is one of the simplest relations and because linguistic interaction has been proven to increase the share of linguistic usage (Nardy et al., 2014). We lack a certain level of multiplexity, but discussions are a simple way to catch student interactions and relational networks. By asking the most frequent interactions, it allows us to observe relative and subjective relations and consider asymmetric relations. It enables us to identify who, for each individual, is the primary source of access to lexical resources within the network of students. As exemplified hereafter, we do not seek to measure the actual frequency of interaction but rather the main source of interaction. As a matter of fact,

even though some interactions may exist between pairs of individuals, they may be not captured, as we do not aim to record the complete set of interactions, but rather the subjectively most important ones. We capture less the frequency of interactions than the importance. It is to be kept in mind when further analyzing the results. As an example of this approach, an introverted individual A may have only one contact per week with individual B, and yet individual B may be the person individual A interacts the most with. In contrast, individual B may be a more extroverted person, and although he or she interacts once a week with individual A, the latter is not the person who individual B interacts with the most. Rather, a third party, individual C, may be the one who individual B discusses the most with, as they have daily interactions. In the case where individual A and individual B do not share the same importance for each other, we expect that the practice share will be altered. Oppositely, if for individual C, individual B is also the one he or she interacts with the most, then they both are among the primary sources of linguistic resources. Consequently, we expect that the practice share will be higher.

Furthermore, regarding multiplexity, we asked for interactions happening outside of the university. It brings a certain form of multiplexity, as it considers relations that are not contained in the mere academic social sphere and presumes sociability that goes beyond education. Indeed, interactions that are only constrained to the university are de facto disregarded. This may be argued as a simplistic measure of multiplexity, and additional questions, which are not captured here, that consider a deeper understanding of the common social spheres would have given valuable information and would have deepened the analysis. This would lead to great improvement for future studies. Even though the strength of ties is not explicitly measured, the superlative “most” enables us to focus on the strongest ties in terms of frequency of contacts. Indeed, the frequency of contacts is often used to operationalize the tie strength (Aral & Walker, 2014). Another way to assess the strength of the ties would have been to have a valued network, for which the respondent would have to assess the frequency of contacts with a scale variable. However, I believe this is unlikely as it brings unnecessary complexity and heightens variability (Greenwald & O’Connell, 1970). Recall contact frequency is already difficult enough (Bernard et al., 1980; Sharma & Dodsworth, 2020). Moreover, the Likert scale and a dichotomous variable are highly correlated. The limit is that the strength is based on the strength of frequency. Another possible way, which has not been captured here, would have been to assess the emotional proximity one has with each alter. This is one of the limitations and is also a good opportunity for improvement.

The list gathers all the names of the students enrolled for the bachelor’s degree in sociology. This network questionnaire can be considered as a “roster”, as an exhaustive list of names was given (Wasserman & Faust, 2018). This type is useful for a full network study. This questionnaire can also be considered to be “free” (Wasserman & Faust, 2018), in the sense that, within the given list of names, respondents could choose as many students as they wanted. We, thus, obtain a network of discussions.

As we deal with relational and dyadic data, we will create matrixes to operationalize the relations. In our hypothesis, we want to observe whether reciprocal relations tend to positively influence the share of lexical practice. The perception of the importance of frequency of interaction is relative and subjective and thus directed. A matrix of adjacency within the discussion network is created, based on the question “Who, within this list, are the students you are talking the most frequently with, outside the University?” We thus obtain a nonsymmetric 72 by 72 matrix of adjacency, in which the discussions are directed. Pairs of individuals are coded “1” if the respondent named another student and “0” otherwise. Please see Table 3 for the cohesive properties of the initial discussion network. This directed discussion network (Figure 1, Table 3) has a low density (0.04): there are 197 active ties out of the 5,112 possible. This density may seem very low, yet it has to be reminded that the asked question focuses on the most frequent interactions and not all interactions. Reciprocity is 0.40. This means that 40% of students mutually identified each other as the most frequent person they talk to. Hence, 60% do not perceive each other the same way. It shows a certain relational asymmetry. Six students are completely disconnected from the other members of the network. We find seven components, including one block and six singletons. Except for the disconnected students, the longest geodesic path is of nine units.

In order to distinguish reciprocal ties from nonreciprocal ties, we want to identify and keep dyads within which both students have mutually named each other as one of the most frequent interlocutors. Reciprocal dyads in our study represent a mutual acknowledgment of the other as being among the main source of access to lexical resources. To do so, we use UCINET and run the function “symmetrize”, choosing the minimum symmetrizing method. The reciprocal discussion network is visualized in Figure 2. We then sum up the undirected discussion

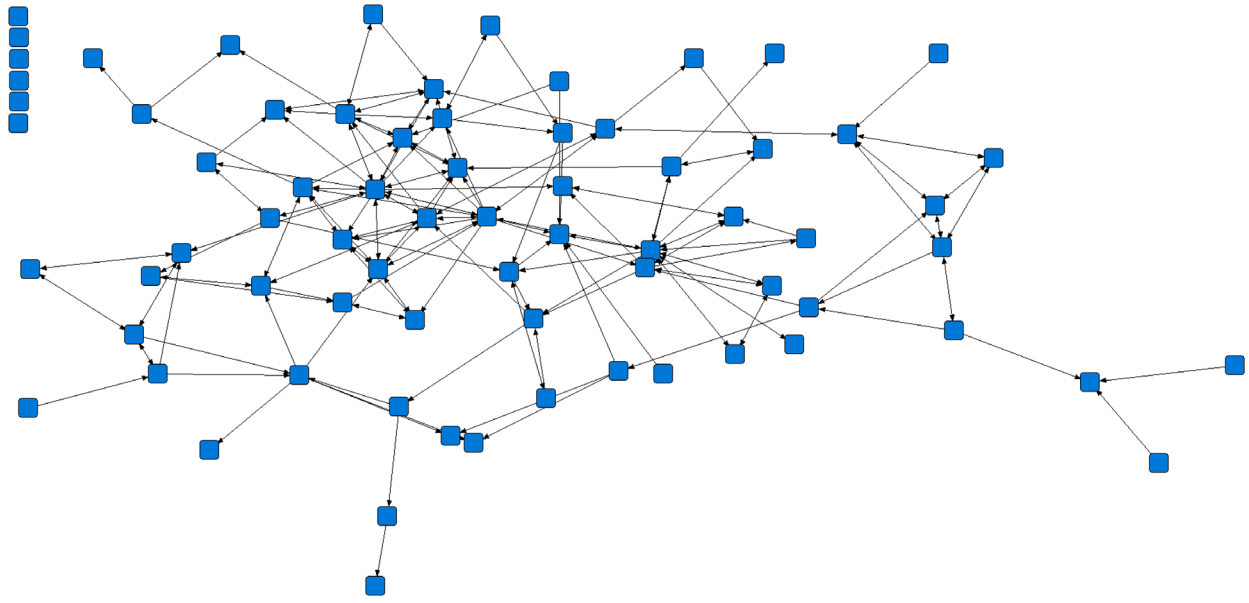

Figure 1: Visualization of the directed network.

network (this time, symmetrized with the maximum method) and the reciprocal network. We end up with a symmetrical 72 by 72 adjacency matrix, where reciprocal dyads are coded "2", nonreciprocal dyads are coded "1", and the absence of tie is coded "0". For our hypothesis to be confirmed, we expect a positive coefficient.

We also create two other matrixes to capture the specific role of reciprocal and nonreciprocal ties. For the former, we use the matrix obtained with the function "minimum symmetrize". For the latter, we subtract the minimum symmetrized matrix from the raw discussion network. This should enable us to test for the potential bridging and spreading capacities of nonreciprocal ties.

## Control Variables

To test possible confounding effects, I use control variables. These are the year of study, the gender, the origin (with the question "In what country did you spend most of your childhood/adolescence"), the age, and the mother tongue. We saw a possible form of homophily based on the year of study. This is the reason that it will be tested. For the other demographic variables, they have proven their influence on linguistic practices in past literature (Eckert, 1988; Fought, 2013; Greco, 2014; Kirkham & Moore, 2013; Labov, 1972, 1976; Milroy, 1987; Queen, 2013). To test them, we need to create matrixes for each variable. To do so, I use the methodology presented by Borgatti et al. (2018). For each pair of students, I code "1" if they share demographic characteristics and "0" if not. This process is repeated for each demographic variable. I add another control variable, namely, void relations. To do so, I code "1" if there are no relations identified in the discussion network and "0" otherwise.

**Table 3. Cohesiveness of the directed dyad network.**

| Variables | Directed network |
|---|---|
| N | 72 |
| Density | 0.04 |
| Reciprocity | 0.4 |
| Diameter | 9 |
| Blocks/singletons | 1/6 |

## Results: The Way of Discussions

Before presenting the results, we run pairwise QAP correlations, to control for any possible multicollinearity. As the coefficients show, we do not observe any strong correlations between the different variables; this seems to indicate the absence of potential multicollinearity. One can be surprised by the fact that mother tongue and origin are not highly correlated. However, Switzerland – and Geneva in particular – is an international entity, with a good share

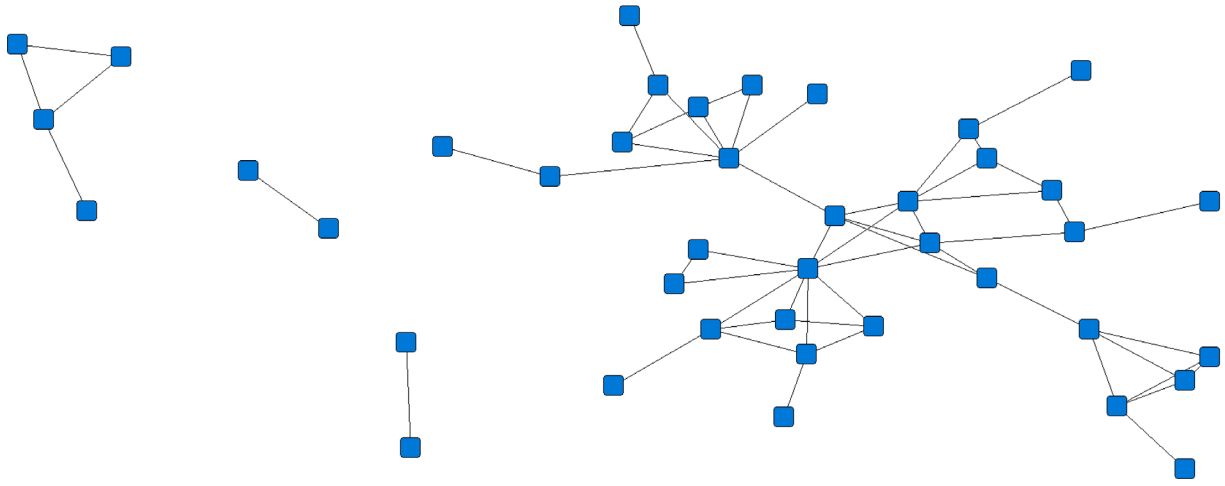

Figure 2: Visualization of the reciprocal network.
Note: Isolated students do not appear.

of second-generation migrants.[2] It is thus possible that even though people share common origins, they differ in their mother tongue, as the parents potentially transmitted their language of origin to their children. In our data, we observe that we have a great proportion of respondents who are Swiss (72%), while only 52% have French as their mother tongue. More than half of the respondents have multiple first languages.

The pairwise correlation (Table 4) also enables us to test for possible homophily. Indeed, we have stated in the theoretical part that it is sometimes hard to disentangle the influence process from the selection process, in particular in the case of communication. Even though our data and study design do not allow us to test for causality and to fully address this topic, by verifying the presence of a potential association, we can assume the existence of one or the other process. As a matter of fact, we want to control for the potential selection process, as it would undermine the possibility to assess for an association in the assumed direction – reciprocity influences the lexical share, rather than lexical share favoring tie formation. Indeed, if the selection process was at play, we would expect to see a positive and significant correlation between our discussion network and the matrix of the mother tongue. This relation can serve as a control because individuals who share a common mother tongue should be more likely to create relationships for ease of communication. Although organizational vocabularies and mother tongue do not fulfill the same function, it seems logical that the latter would reflect this process. The nonsignificant correlation between mother tongue and lexical similarity indicates the contextual aspect of the organizational vocabularies and its independence from the linguistic background. As we can observe, mother tongue is not significantly associated with the discussion network, which seems to indicate that the selection process does not hold in our data. Again, we can only presume this relation and cannot infer it with confidence, due to the cross-sectional nature of our data.

On another note, because the year of study is significant for homophily ($r$=0.19, $p$-value ≤0.01), we can assume a certain induced homophily as the organization of the bachelor's degree in sociology probably constrains the formation of relations between students of different levels.

For our hypothesis, we want to study the effect of reciprocal ties on lexical share. To do so, the MRQAP is run with our valued discussion network matrix, the control variables matrixes, and the matrix of similarities. The results are presented in Table 5. We can see that the discussion network that considers the reciprocity of ties shows a positive significant effect (b=0.17, $p$-value <0.05). The coefficient has to be interpreted as the fact that the language similarity increases as the ties gain in substance. Indeed,

2 As an example, the most widespread last name in the Geneva area is Da Silva, which is a Portuguese last name: https://www.bfs.admin.ch/bfs/fr/home.gnpdetail.2022-0542.html

## Table 4. Pairwise QAP correlations.

| Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
|---|---|---|---|---|---|---|---|---|---|
| (1) Discussions | | | | | | | | | |
| (2) Reciprocal | 0.91*** | | | | | | | | |
| (3) Non-reciprocal | 0.39*** | -0.02 | | | | | | | |
| (4) Void ties | -0.79* | -0.62*** | -0.54*** | | | | | | |
| (5) Similarity | 0.037* | 0.037* | -0.008 | -0.015 | | | | | |
| (6) Year of study | 0.19** | 0.19*** | 0.058*** | -0.19*** | 0.002 | | | | |
| (7) Gender | 0.015 | 0.015 | -0.021 | 0.014 | 0.061+ | -0.005 | | | |
| (8) Origin | -0.014 | -0.014 | -0.015 | 0.025+ | 0.072 | -0.019 | 0.115* | | |
| (9)Mother tongue | -0.032 | -0.004 | 0.006 | -0.005 | 0.026 | -0.008 | 0.087* | -0.047 | |
| (10) Age | -0.028 | -0.018 | 0.009 | 0.002 | 0.020 | -0.005 | 0.062* | 0.005 | -0.051* |

Notes: ***$p \leq 0.001$; **$p \leq 0.01$; *$p \leq 0.05$; +$p \leq 0.1$.
QAP, quadratic assignment procedure.

because we have valued data, we can understand it as the fact that the absence of tie will alter the possibility to develop a shared lexical usage; if one individual considers another person to be among the main source of linguistic interaction, it will increase the possibility to observe a practice share; finally, when two individuals mutually acknowledge the importance of one another, the practice share will be eased.

In order to fully understand what role is played by reciprocal ties versus nonreciprocal ties, we run two complementary models: Model 3 tests the association for reciprocal ties only and Model 4 tests the association for nonreciprocal ties only. Both models are controlled by void relations. We can see that the reciprocal ties network shows a significant and positive association (b=0.52, *p*-value <0.05), whereas the nonreciprocal ties result in a negative, yet nonsignificant, coefficient (b=-0.29, *p*-value >0.1). This reinforces the view on the role played by symmetrical relations in the building of shared norms. Nonreciprocal ties could have served as bridges and could have been involved in spreading lexical norms throughout the network. Because we have a nondirected linguistic network, we cannot track down who originated which practice. We can only assess to what extent pairs of individuals are similar in their use of organizational vocabularies. We still can conceptualize why this is not probable, even with our data. Let us imagine a situation, as provided by one of the reviewers, where we have a triad of students A, B, and C. A named B as one of his or her main sources of contact. B and A are de facto interacting with each other, and it has probably happened that they referred to one of the university objects. For some reason, B did not name A as one of his or her main sources of contact. Instead, B named C, and C also named B. In their daily interactions, B potentially reuses the same term as the one used with A. It is even possible that the practice emerged from A. In that case, nonreciprocal ties would result in the spread of lexical practices. Nevertheless, we can exclude this option and maintain our assumption that a certain strength of ties is necessary for the sharing of organizational vocabularies. Indeed, if that would be a systematical case, we would have observed that individuals with nonreciprocal ties would have a greater likelihood for similarity. We would also expect a positive association for nonconnected individuals, as they share common practices due to the transmission process. The results indicate a tendency contrary to it. Void relations even translate into a tendential negative coefficient (b=-0.7, *p*-value <0.1), when controlling for nonreciprocal ties. We can argue that the mere presence of a relation seems to not provide sufficient commitment and investment to enact the lexical similarity. Again, this indicates a certain need for mutual recognition and mutually exclusive interactions to co-construct linguistic norms. Overall, our hypothesis can be validated.

As for the quality of the model, the adjusted $R^2$ is quite low (0.001), which shows the small capacity of the model to explain the variance of the dependent variable. Yet, $R^2$ is not expected to be high when dealing with dyadic data (Borgatti et al., 2018). When adding the control variables, the model slightly gains in quality, even though we do not observe differences for the Bayesian Information Criterion (BIC) measures (Akaike Information Criterion [AIC] Model 1 = 19,940 and AIC Model 2 = 19,990; BIC Model 1 = 19,950 and BIC Model 2 = 19,950). This may be explained by the fact that the penalty term for the number of parameters is stronger for BIC. When deleting the

**Table 5. MRQAP: Practice share for the network of discussion and control variables (N=72).**

| Variables | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Intercept | 1.67 (0.024)*** | 1.54 (0.047)*** | 1.47 (0.138)*** | 1.76 (0.132)*** |
| Discussion network | 0.17 (0.075)* | 0.18 (0.076)* | | |
| Reciprocal ties | | | 0.52 (0.207)* | |
| Nonreciprocal ties | | | | -0.29 (0.220) |
| Void relations | | | 0.02 (0.044) | -0.07 (0.042)+ |
| Age | | 0.18 (0.077)* | 0.18 (0.077)* | 0.18 (0.77)* |
| Mother tongue | | -0.04 (0.045) | -0.04 (0.045) | -0.04 (0.045) |
| Year of study | | -0.01 (0.051) | -0.01 (0.051) | -0.004 (0.051) |
| Origin | | 0.24 (0.052)*** | 0.24 (0.052)*** | 0.24 (0.052)*** |
| Gender | | 0.17 (0.049)*** | 0.16 (0.049)*** | 0.17 (0.049)*** |
| Adjusted $R^2$ | 0.001 | 0.009 | 0.009 | 0.008 |
| AIC | 19,940 | 19,900 | 19,900 | 19,900 |
| BIC | 19,950 | 19,950 | 19,950 | 19,960 |
| *p*-value | * | *** | *** | *** |

Notes: ***$p \leq 0.001$, **$p \leq 0.01$, *$p \leq 0.05$, +$p \leq 0.1$; standard errors are in parentheses.
AIC, Akaike Information Criterion; BIC, Bayesian Information Criterion; MRQAP, multiple regression quadratic assignment procedure.

nonsignificant control variables (not shown here), the BIC decreases (19,930) and thus shows a gain in the goodness of fit. For the control variables, beside the year of study and the mother tongue, demographic variables happen to show significant and positive associations. This is in line with what has been found in the literature (Eckert, 1988; Fought, 2013; Greco, 2014; Kirkham & Moore, 2013; Labov, 1972, 1976; Milroy, 1987; Queen, 2013). This confirms the importance of shared cultural and social background for the use of words.

The nonsignificance of the year of study can be interpreted as a piece of evidence that mere interaction between individuals does not allow for the full sharing of lexical practices. Indeed, due to the structure of the organization of the academic courses, students tend to be gathered during the lectures by year of study. A certain form of homophily is encountered. Consequently, it increases the possibilities of interaction. However, physical proximity does not necessarily involve linguistic interaction, which is found to be of great importance for the sharing of lexical practice (Nardy et al., 2014). We are here in line with our hypothesis: if only contacts were the driving mechanisms of language share, we would have observed a significant effect.

## Discussion and Conclusions

Sociolinguists borrowing social network concepts have shown the importance of dyadic relations and cohesive properties. While strength of ties and multiplexity have been considered in the literature thus far, we aimed to deepen the knowledge of how such a level of interaction is involved in the emergence of linguistic norms. The paper focuses on an uninvestigated dyadic property, namely, reciprocity. Two main conclusions can be drawn from this contribution: (1) all relations are to be not considered equivalently (undirected); (2) reciprocity favors the emergence of dyadic practices. This contribution, thus, has different implications for further studies of language. First of all, it highlights the importance of considering relational subjectivity by allowing us to study the way of social relations. In a network containing weak ties, only the presence of a tie may not be sufficient to let a norm emerge and to lead to practice share. Without considering the direction of the discussions, the risk of missing the effect of the discussion network on the practice share arises. We saw that reciprocity indeed has a positive effect on lexical share. By incorporating the direction of social ties, it is then possible to distinguish relations and take into account asymmetrical relationships. I advocate here for systematic consideration of relational subjectivity, through the direction of the relations, in the study of language.

In that sense, we have shown that not only the objective frequency of interactions is of importance for the share of linguistic practices, as discovered elsewhere (Nardy et al., 2014), but that relative importance too is substantial. By doing so, it allows us to consider the situated importance of each relation. Whereas with an objective measure, a frequency may be low, this small interaction may be the most important for the individual. The latent idea is that if a relation is important for an individual, it will have consequences for his or her actions (Krackhardt, 1987; Poupart, 2011). Yet, our results indicate that it must be remembered that individuals interact in configurations (Elias, 1991) and are connected by chains of interdependences. Thus, although the relative importance appears to participate in the emergence of lexical share, the perception of the individual may be not sufficient, in particular, in the context of language, where the norms are negotiated (Elias, 1995). As language serves as a means of communication (Hymes, 1974), co-construction and a shared acceptance of the usage are needed for the communication to occur successfully (Blom & Gumperz, 1986). A certain symmetry of interdependence is needed. The outcome of the subjective interaction remains not the effect of a single person but is the outcome of a process of a configuration of interdependences.

Furthermore, as for another implication, we saw that symmetric relations favor the emergence of dyadic practice share. Taken at the aggregate level, this can explain the emergence, or otherwise, of linguistic norms. The more a community has reciprocal dyadic relations, the more it is possible to see norms emerge and stabilize. This can explain why the average of common words is low in the community we studied here. The network has a low proportion of reciprocal relations.

Moreover, considering the direction of the ties and symmetrical and nonhierarchical relations, through the prism of reciprocity, gives another element that contributes to the strength of ties and to overall social cohesion. Indeed, thus far, in sociolinguistics, strong ties have been considered on the sole concepts of multiplexity and intensity of a relation. Strength is hence related to the properties that contribute to cohesiveness. In the literature on SNA, reciprocity is identified as one of the core elements of cohesiveness. Therefore, by considering the reciprocity of ties, we are coherent with the social network framework, and we extend its relevance to the study of linguistic dynamics. Strong ties should be considered not only as the fact of sharing multiple social realities, but also as mutual recognition.

A few limitations can be addressed. Firstly, let us remind the existence of complementary assumptions, which have empirical evidence. Indeed, in our study, we hypothesized an association between reciprocity and lexical use. The theoretical rationale and the analytical design reveal that we expect the interaction to be the source of influence. Yet, there is evidence (see, e.g., Aral & Walker, 2014; Tasseli et al., 2020; Kovacs & Kleinbaum, 2019) that linguistic similarity translates into tie formation. As a matter of fact, disentangling the direction of the association is a common concern within the relational approach. Structural properties have endogenous processes that participate in their very existence (Aral & Walker, 2014). It brings us back to the concept of homophily elaborated herein (Aral et al., 2009). Indeed, cohesion, tie strength, and homophily are often highly correlated, which potentially leads to spurious causality. Rather than tie substance creating similar behavioral outcomes, it may be that it is the identified similar behavior that favors the creation of social ties. This is true for communication patterns. However, we have tried to control for this potential process by verifying an association between mother tongue and the presence of ties. Although this only serves as a proxy, the absence of significant relation may give confidence in the direction of the hypothesized direction. Nevertheless, testing our hypothesis in a longitudinal study is the only way to claim for causality. It is also highly probable that the process is cyclical and does not happen in a single way. Instead, it is logical to assume that both processes – the influence process and the selection process – nourish and reinforce each other. Again, only a longitudinal study would enable us to test for it. This gives room for further improvement. Yet, we believe that our aim is completed. Indeed, the goal of the study is not to exhaustively understand the interrelation of linguistic similarity and tie formation, but rather to deepen the understanding of the role played by the strength of ties, as thus far considered in the sociolinguistic literature. Indeed, we have addressed that this field has only parsimoniously used the modern methods of SNA and even its elementary and fundamental concepts. By deepening the concept of strong ties, it allows us to highlight the relevance of reciprocity and to further explore its full spectrum of implications in broader social phenomena. This article is a first step that, we hope, will encourage others to be made.

The method used to capture the vocabulary is a simple one and only allows a surface analysis. The objects that have been used to create the word lists can be discussed, notably in the relevance of their representativity of UNIGE's culture. It has to be

noted that before choosing them, a short prestudy interview with master's degree students was made to select the objects. The response rate is pretty high, which shows a certain validity and confidence in the chosen objects. However, this method of using a word list does not allow an analysis of the meaning of the words nor of an analysis of lexical production in situ. This method was thought to capture a basic lexical distribution and to see whether directed ties could explain it, in a quantitative and relational approach. Even with this simple method, we found significant effects, which allows us to believe that in a more complex study, this phenomenon would be even more salient. For further studies, a qualitative approach should be considered to allow a deeper insight, as well as other methods to capture lexical variants and similarities.

Another limitation that can be addressed is the fact that only the discussion network under the prism of frequency has been tested. Other measures of relationships could have been incorporated to test a certain level of multiplexity. The purpose of this study, though, was to test the implication of directed ties and reciprocity, and a discussion network was a simple way to do so. I have shown here the importance of a particular component of social ties. To go further, one should consider other elements that contribute to them, such as valued data, for instance, even though it has been argued. These results could have given deeper results if the valuation of importance of the discussions would have been asked. Another possible way, which has not been captured here, would have been to assess the emotional proximity one has with each alter. Negative ties also have shown particular relevance in other fields (Everett and Borgatti, 2014) and could have been studied. In sum, SNA theory has developed many concepts that have shown relevance in other fields. When studying language from this perspective, the knowledge developed in SNA should be systematically taken into account. The social network perspective is a complex way to apprehend social reality, and further linguistic studies should consider its whole spectrum.

The last limitation that can be addressed is the fact that dyads are considered as not embedded in broader contexts. Indeed, MRQAP allows understanding whether the presence of a tie in one network explains the presence of a tie in another one. However, it is limiting to consider that dyads are independent of other structural properties. For instance, dyads caught in transitive triads may differ from dyads caught in nontransitive triads. Higher-level configurations may also imply a differentiated role of the dyad. Indeed, network properties are nested in higher-level configurations that may influence lower levels (Lusher et al., 2013). For this to be controlled, other statistical models such as the exponential random graph model would, without doubt, be of substantial help. The purpose here, however, was to focus on the dyadic level, and this was for two main reasons. One is driven by the fact that it allows for enlarging existing knowledge by adding a new dimension to a well-known and studied mechanism. The second one is theoretically driven, as dyads may be seen as the smallest unit that constitutes a group and may be considered the fundamental unit of interaction. Therefore, focusing on dyads enables us to understand the elementary mechanism of the broader social phenomenon. Showing the relevance of reciprocity permits us to show that it needs to be further integrated if more complex models are tested.

Finally, as argued in the literature (Blom & Gumperz, 1986; Kroch, 1989; Lippi-Green, 1989; Macauly, 2013), these conclusions cannot be universally taken for granted. What has been shown here only allows an inference for the students of the UNIGE at the time of this research, but not necessarily for other contexts and other social groups. It has to be reminded that linguistic mechanisms are relative and need to be tested in every context. However, this research shows that directed relationships and dyadic reciprocity can have an implication in lexical practices and thus should be systematically tested.

## Conflict of Interest

None.

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## Data Availability

The data are available upon request.

## References

Albert, E. M. (1986). Culture patterning of speech behavior in Burundi. In Gumperz J. and Hymes D. (Eds) *Directions in Sociolinguistics : The Ethnography of communication* (pp. 72-105). Oxford : Basil Blackwell.

Androutsopoulos, J. K. (2000). Extending the concept of the (socio)linguistic variable to slang. In K. Tamas (Ed.), *Mi a szleng?* (pp. 109–140). Debrecen: Kossuth Lajos University Press.

Aral, S., Muchnik, L., & Sundararajan, A. (2009). Distinguishing influence-based contagion from homophily-driven diffusion in dynamic networks. *PNAS*, *106 (51),* 21545–21549.

Aral, S., & Walker D. (2014). Tie strength, embeddedness, and social influence: A Large-scale networked experiment. *Management Science, 60*(6), 1352–1370. http://dx.doi.org/10.1287/mnsc.2014.1936

Bauer, L., & Bauer W. (2000). Nova Zelandia est ominis divisa in partes tres. *New Zealand English Journal*, *14*, 7–17.

Beeching, K. (2012). Sociolinguistic aspects of lexical variation in French. In T. Pooley & D. Lagorgette (Eds.), *On linguistic change in French: Socio-historical approaches (Le changement linguistique en français)* (pp. 37–54). Savoie: Presses Universitaires de Savoie.

Bell, A. (1984). Language style as audience design. *Language in society*, *13*, 145–204.

Bell, A. (2001). Back in style: Reworking audience design. In P. Eckert & J. R. Rickford (Eds.), *Style and sociolinguistic variation* (pp. 139–169). Cambridge: Cambridge University Press.

Bernard, H. R., Killworth, P. D., & Sailer, L. (1980). Informant accuracy in social network data, IV: Comparison of clique-level structure in behavorial and cognitive data. *Social Networks*, *2*, 191–218. https://doi.org/10.1016/0378-8733(79)90014-5

Blom, J. P., & Gumperz, J. J. (1986). Social meaning in linguistic structures: Code-switching in Norway. In J. Gumperz & D. Hymes (Eds.), *Directions in Sociolinguistics: The ethnography of communication* (pp. 407–434). Oxford: Basil Blackwell.

Borgatti, S. P. (2002). *Netdraw network visualization*. Harvard: Analytic Technologies.

Borgatti, S. P., & Everett, M. G. (1997). Network analysis of 2-mode data. *Social Networks*, *19*, 243–269. https://doi.org/10.1016/S0378-8733(96)00301-2

Everett, M. G., & Borgatti, S. P., (2014). Networks containing negative ties. *Social Networks*, *38*, 111–120. https://doi.org/10.1016/j.socnet.2014.03.005

Borgatti, S. P., Everett, M. G., & Freeman, L. (2002). *UCINET 6 for windows: Software for social network analysis*. Massachusetts: Analytic Technologies.

Borgatti, S. P., Everett, M. G., & Johnson, J. C. (2018). *Analyzing social network*. London: SAGE.

Brint, S. (2001). Gemeinschaft revisited: A critique and reconstruction of the community concept. *Sociological Theory 19*(1), 1–23. https://doi.org/10.1111/0735-2751.00125

Britain, D. (2013). Space, diffusion and mobility. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed., pp. 472–500). Oxford: Wiley Blackwell.

Burt, R. S. (1992), *Structural holes*. Cambridge: Cambridge University Press.

Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology* 94, S95–S120. https://www.jstor.org/stable/2780243

Coleman, J., Katz, E., & Menzel, H. (1957). The diffusion of an innovation among physicians. *Sociometry 20*(4), 253–270. https://doi.org/10.2307/2785979

Carrington, P. J., & Scott, J. (2011). *The SAGE handbook of social network analysis*. London: SAGE.

Cooper, R. L. (1980). Sociolinguistic survey: The state of the art. *Applied Linguistics 1*, 113–128.

Dekker, D., Krackhard, D., & Snijders, T. A. B. (2007). Sensitivity of MRQAP tests to collinearity and autocorrelation conditions. *Psychometrika 2*, 563–581. https://doi.org/10.1007/s11336-007-9016-1

Dodsworth, R. & Benton, R. A. (2020). *Language variation and change in social networks: A bipartite approach*. New York and London: Routledge.

Eckert, P. (1988). Adolescent social structure and the spread of linguistic change. *Language in Society 17*(2), 183–207. https://doi.org/10.1017/S0047404500012756

Edwards, J. (2009). *Language and identity*. UK: Cambridge University Press.

Elias, N. (1991). *La société des individus*. Paris: Fayard.

Elias, N. (1995). *The symbol theory*. London: SAGE.

Ervin-Tripp, S. (1986). On sociolinguistic rules: Alternation and co-occurrence. In J. Gumperz & D. Hymes (Eds.), *Directions in sociolinguistics: The ethnography of communication* (pp. 214–250). Oxford: Basil Blackwell.

Fagyal, Z., Swarup, S., & Escobar, A. M. (2010). Centers and peripheries: Network roles in language change. *Lingua 120*(8), 2061–2079. https://doi.org/10.1016/j.lingua.2010.02.001

Fasold, R. W. (2013). Variation and Syntactic Theory. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed., pp. 185–202). Oxford: Wiley Blackwell.

Feagin, C. (2013). Entering the Community : Fieldwork. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed., pp. 19–37). Oxford: Wiley Blackwell.

Fought, C. (2013). Ethnicity. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed., pp. 388–407). Oxford: Wiley Blackwell.

Gasiorek, J. (2016). The "Dark side" of CAT: Nonaccommodation. In H. Giles (Ed.), *Communication accommodation theory: Negotiating personal relationships and social identities across contexts* (pp. 85–104). Cambridge, UK: Cambridge University Press.

Gauchat, L. (1905). *L'unité phonétique dans le patois d'une commune*. Halle: Max Niemeyer.

Giles, H. & St. Clair, R. (1979). *Language and social psychology*. Oxford: Blackwell.

Gouldner, A. W. (1960). The norm of reciprocity: A preliminary statement. *American Sociological Review 25*(2), 161–176. http://hdl.handle.net/10694/347

Granovetter, M. (1973). The strength of weak ties. *American Journal of Sociology 78*(6), 1360–1380. https://www.jstor.org/stable/2776392

Gravetter, F., & Wallnau, L. (2014). *Essentials of statistics for the behavioral sciences*. Belmont, California: Wads.

Greco, L. (2014). Les recherches linguistiques sur le genre: un état de l'art. *Langage et Société* 148, 11–29. https://doi.org/10.3917/ls.148.0011

Greenwald, H. J., & O'Connell, S. M. (1970). Comparison of dichotomous and Likert formats. *Psychological Reports 27*(2), 481–482.

Gumperz, J. J. (1989). *Sociolinguistique interactionnelle: une approche interprétative*. La Réunion: l'Harmattan.

Guy, G. R. (1988). Language and social class. In F. J. Newmeyer (Ed.), *Linguistics: The Cambridge survey* (pp. 37–63). Cambridge: Cambridge University Press.

Harary, F., Norman, R. Z., & Cartwright, D. (1965). *Structural models: An introduction to the theory of directed Graphs*. New York: John Wiley and Sons.

Heider, F. (1946). Attitudes and cognitive organization. *Journal of Psychology, 21*, 107–112. https://doi.org/10.1080/00223980.1946.9917275

Hernández-Campoy, J. M. (2016). *Sociolinguistic styles*. UK: Wiley Blackwell.

Hoffman, E., McCabe, K., & Smith, V. L. (1996). Social distance and other-regarding behavior in dictator games. *The American Economic Review, 86*(3), 653–660. https://www.jstor.org/stable/2118218

Holland, P. W., & Leinhard, S. (1971). Transitivity in structural models of small groups. *Comparative Group Studies*, *2*, 107–124.

Hubert, L., & Schultz, J. (1976). Quadratic assignment as a general data analysis strategy. *British Journal of Mathematical and Statistical Psychology, 29*(2), 190–241. https://doi.org/10.1111/j.2044-8317.1976.tb00714.x

Hymes, D. (1974). *Foundations in sociolinguistics: An ethnographic approach*. Philadelphia: University of Pennsylvania Press.

Hymes, D. (1986). Models of the interaction of language and social life. In J. Gumperz & D. Hymes (Eds.), *Directions in sociolinguistics: The ethnography of communication* (pp. 35–71). Oxford: Basil Blackwell.

Jellab, A. (2013). Cohérences et tensions dans la socialisation universitaire des étudiants: les enseignements d'une recherche qualitative. *L'Homme & la Société* 187, 227–250.

Kenny, D. A., Kashy, D. A., & Cook, W. L. (2020). *Dyadic data analysis*. New York: The Guilford Press.

Kiesling, F. S. (2013). Constructing identity. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed., pp. 448–467). Oxford: Wiley Blackwell.

Kirkham, S., & Moore, E. (2013). Adolescence. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed, pp. 277–297). Oxford: Wiley Blackwell.

Kossinets, G., & Watts, D. J. (2009). Origins of homophily in an evolving social network. *American Journal of Sociology, 115*(2), 405–450. https://doi.org/10.1086/599247

Kovacs, B., & Kleinbaum, A. M. (2019). Language-style similarity and social networks. *Pschological Science*, *31*(2), 202–213. https://doi.org/10.1177/0956797619894557

Krackhardt, D. (1987). Cognitive social structure. *Social Networks, 9*(2), 109–134. https://doi.org/10.1016/0378-8733(87)90009-8

Krackhardt, D. (1988). Predicting with networks: Nonparametric multiple regression analysis of dyadic data. *Social Networks, 10,* 359–381. https://doi.org/10.1016/0378-8733(88)90004-4

Kroch, A. (1989). Reflexes of grammar in patterns of language change. *Language Variation and Change 1*(3), 199–244. https://doi.org/10.1017/S0954394500000168

Labov, W. (1972). *Language in the inner city*. Philadelphia: University of Pennsylvania Press.

Labov, W. (1976). *Sociolinguistique*. Paris: Les éditions de minuit.

Le Page, R. B. (1968). Problems of description in multilingual communities. *Transactions of the Philological Society*, *67*, 189–212. https://doi.org/10.1111/j.1467-968X.1968.tb01134.x

Lev, M. (2014). Social dimensions of language change. In C. Bowern & B. Evans (Eds.), *Handbook of historical linguistics* (pp. 484–502). New York: Routledge.

Lev-Ari, S. (2017). Talking to fewer people leads to having more malleable linguistic representations. *PLOS One*, *12*(8), e0183593. https://doi.org/10.1371/journal.pone.0183593

Lev-Ari, S. (2018). Social network size can influence linguistic malleability and propagation of linguistic change. *Cognition, 176*, 31–39.

Liben-Nowell, D., Novak, J., Kumar, R., Raghavan, P., & Tomkins, A. (2005). Geographic routing in social networks. *Proceedings of the National Academy of Sciences, 102*(33), 11623–11628. https://doi.org/10.1073/pnas.0503018102

Lippi-Green, R. L. (1989). Social network integration and language change in progress in a rural alpine village. *Language in Society, 18*(2), 213–234.

Lodewijk, H. F. M. (2008). The norm of reciprocity. *International Encyclopedia of the Social Science 2*, 107–108.

Lodge, R. A. (2004). *A sociolinguistic history of Parisian French*. Cambridge: Cambridge University Press.

Loewenstein, J., & Ocasio, W. C. (2005). Vocabularies of organizing: How language links culture, cognition, and action in organizations. *McCombs*

*Working Paper OSSM-03-05*, University of Texas at Austin, Austin.

Luce, R. D., & Perry, A. D. (1949). A method of matrix analysis of group structure. *Psychometrika, 14,* 95–116. https://doi.org/10.1007/BF02289146

Lusher, D., Koskinen, J., & Robins, G. (2013). *Exponential random graph models for social networks: Theory, methods, and applications.* New York: Cambridge University Press.

Macauly, R. (2013). Discourse variation. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed., pp. 222–236). Oxford: Wiley Blackwell.

Martin, N., Chevrot, J.-P., & Barbu, S. (2010). Stylistic variations in the social network of a 10-year-old child: Pragmatic adjustments or automatic alignment? *Journal of Sociolinguistics, 14*(5), 678–692. https://doi.org/10.1111/j.1467-9841.2010.00459.x

McFarland, D. A., Moody, J., Diehl, D., Smith, J. A., & Thomas, R. J. (2014). Network ecology and adolescent social structure. *American Sociological Association 79*(6), 1088–1121. https://doi.org/10.1177/0003122414554001

McPherson, M., & Smith-Lovin, L. (1987). Homophily in voluntary organizations: Status distance and the composition of face-to-face groups. *American Sociological Review 52*, 370–379.

McPherson, M., Smith-Lovin, L., & Cook, J. M. (2001). Birds of a feather: Homophily in social networks. *Annual Review of Sociology, 27*, 415–444. https://doi.org/10.1146/annurev.soc.27.1.415

Merton, R. K. (1949). *Social theory and social structure*. New York: Free Press.

Meyerhoff, M., & Strycharz, A. (2013). Communities of practice. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed., pp. 428–447). Oxford: Wiley Blackwell.

Milroy, J., & Milroy, L. (1992). Social network and social class: Toward an integrated sociolinguistic model. *Language in Society, 21*(1), 1–26. https://doi.org/10.1017/S0047404500015013

Milroy, L. (1987). *Language and social networks* (2nd ed.). New York: Basil Blackwell Ltd.

Milroy, L., & Llamas, C. (2013). Social networks. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed., pp. 409–427). Oxford: Wiley Blackwell.

Mitchell-Kernan, C. (1986). Signifying and marking: Two Afro-American speech acts. In J. Gumperz & D. Hymes (Eds.), *Directions in sociolinguistics: The ethnography of communication* (pp. 161–179). Oxford: Basil Blackwell.

Nardy, A., Chevrot, J.-P., & Barbu, S. (2014). Socioliguistic convergence and social interactions within group of preschoolers: A longitudinal study. *Language, Variation and Change, 26*, 273–301.

Noble, B., & Fernandez, R. (2015). Centre stage: How social network position shapes linguistic coordination. *Proceedings of CMCL, 2015*, 29–38. https://doi.org/10.3115/v1/W15-1104

Paolillo, J. (1999). The virtual speech community: Social network and language variation on IRC. *Journal of Computer-Mediated Communication, 4*, 1–10. https://doi.org/10.1111/j.1083-6101.1999.tb00109.x

Pescosolido, B. A., & Rubin, B. A. (2000). The web of group affiliations revisited: Social life, postmodernism, and sociology. *American Sociological Review, 65*(1), 52–76. https://doi.org/10.2307/2657289

Poupart, J. (2011). Tradition de Chicago et interactionnisme: des méthodes qualitatives à la sociologie de la déviance. *Recherches qualitatives*, *30*(1), 178–199. https://doi.org/10.7202/1085485

Preston, D. R. (2013). Language with an attitude. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed., pp. 157–182). Oxford: Wiley Blackwell.

Queen, R. (2013). Gender, sex, sexuality and sexual identities. In J. K. Chambers & N. Schilling (Eds.), *The handbook of language variation and change* (2nd ed., pp. 368–387). Oxford: Wiley Blackwell.

Silverstein, M. (1975). Shifters, linguistic categories, and cultural description. In B.G Blount (Ed.), *Language, Culture, and Society: A Book of readings* (pp. 187-221). IL: Waveland.

Rapoport, A. (1953). Spread of Information through a population with sociostructural bias: Assumption of transitivity. *Bulletin of Mathematical Biophysics, 15*, 523–533.

Safranková, J. M., & Sikyr, M. (2016). The study of university students' motivation. *International Journal of Teaching and Education, 4*(4), 48–59. https://doi.org/10.52950/TE.2016.4.4.004

Saint-Charles, J., & Mongeau, P. (2018). Social influence and discourse similarity networks in workgroups. *Social Networks, 52,* 228–237. https://doi.org/10.1016/j.socnet.2017.09.001

Santa Ana, O., & Parodi, C. (1998). Modeling the speech community: Configuration and variable types in the Mexican Spanish setting. *Language in Society, 27*(1), 23–51. https://doi.org/10.1017/S0047404500019710

Scholand, A. J., Tausczik, Y. R., & Pennebaker, J. W. (2010). Assessing group interaction with social language network analysis. In S. K. Chai, J. J. Salerno, & P. L. Mabry (Eds.), *Advances in social computing* (pp. 248–255). Berlin: Springer.

Sharma, D., & Dodsworth, R. (2020). Language variation and social networks. *Annual Review of Linguistics*, *6*, 341–361.

Shoemark, P., Kirby, J., & Goldwater, S. (2018). Inducing lexicon of sociolinguistic variable from code-mixed text. *Proceedings of the 2018 EMNLP Workshop*

*W-NUT: The 4th Workshop on Noisy User-generated Text*, 1–6.

Simmel, G. (1964). *Conflict & The web of group-affiliations*. New York: The Free Press.

Simmel, G. (1999). *Sociologie: études sur les formes de la socialisation (traduction)*. Paris: PUF.

Srivastava, S. B., & Goldberg, A. (2017). Language as a window into culture. *California Management Review*, *60*(1), 56–69. https://doi.org/10.1177/0008125617731781

Starks, D., & McRobbie-Utasi, Z. (2001). Collecting sociolinguistic data: Some typical and some not so typical approaches. *New Zealand Journal of Sociology*, *16*(1), 79–92.

Sterponi, L., & Bhattacharya, U. (2012). Dans les traces de Hymes et au-delà: les études de la socialisation langagière. *Langage et société, 139*(1), 67–82. https://doi.org/10.3917/ls.139.0067

Tagliamonte, S. A., D'Arcy, A., & Louro Rodriguez, C. (2016). Outliers, impact, and rationalization in linguistic change. *Language, 92*, 824–849. https://doi.org/10.1353/lan.2016.0074

Tasselli, S., Zappa, P., & Lomi, A. (2020). Bridging Cultural Holes in Organizations: The Dynamic Structure of Social Networks and Organizational Vocabularies Within and Across Subunits. *Organization Science,* 1–21, https://doi.org/10.1287/orsc.2019.1352

Trope, Y., Liberman, N., & Wakslak, C. (2007). Construal levels and psychological distance: Effects of representation, prediction, evaluation, and behavior. *Journal of Consumer Psychology, 17(2)*, 83–95. https://doi.org/10.1016/S1057-7408(07)70013-X.

Vaquero Luis, M., & Cebrian, M. (2018). The weakness of weak ties in the classroom. *arXiv,* [en ligne] https://arxiv.org/pdf/1201.1589v1.pdf (consulté le 30.03.2020).

von Hipple, E. (1994). Sticky information and the locus of problem solving: Implications for innovation. *Management Science, 40*(2), 429–439.

Wasserman, S., & Faust, K. (2018). *Social network analysis: Methods and applications*. Cambridge: Cambridge University Press.

Wolfson, N. (1976). Speech events and natural speech: Some implications for sociolinguistic methodology. *Language in Society, 5*(2), 189–211. https://doi.org/10.1017/S0047404500007028

Yu, W. (2016). A study of catchwords from the perspective of speech community. *Theory and Practice in Language Studies, 6*(4), 804–809. http://dx.doi.org/10.17507/tpls.0604.18

# Appendix

## Table A1: Wordlists per questions.

| Questions | Wordlists |
|---|---|
| Q.5 | Les marches, Escaliers, Les grandes marches, Les grands escaliers, Les Marches du Jugement, Amphi, Aucun, conversation, convivial, escaliers de la biblio, hall, interaction, Le coin posé, Les blocs gris, les escaliers d'uni mail, Manger |
| Q.6 | Entrée, Entrée côté tram, Entrée principale, L'uni, Uni Mail, Mail, entrée tram, Tram, Devant l'uni, entrée côté métro, entrée de mail, Entrée Pont d 'Arve, Entrée Uni-Mail côté Tram, l'entrée devant le 15, L'entrée tram, passage, pressentiment |
| Q.7 | Entrée côté parc, 2entrée parc, Derrière, Entrée, Entrée Baud Bovy, Baud-Bovy, entrée côté baud-bovy, Arrière, entrée côté parc baud-bovy, Entrée Uni Mail côté parc, pause, Sortie, Uni mail, Coin fumeur Côté parc, Côté Baud-Bovy, Côté cafet, côté-parc, cour |
| Q.8 | Biblio, Bibliothèque, Bibli, Biblio de mail, Taff, révisions, étudier, Entrée de la bibli, Entrée bibliothèque côté parc, Entrée Bibliothèque baud-bovy, Entrée, disciplinant, Devant la bibli, bu, Bibliothèque de mail, Biblio uni mail, biblio côté baud-bovy, bibli-Baud |
| Q.9-Q.10 | Cafet, Caf, Caféteria, Cafet côté parc, Cafet côté tram, Cafétéria côté parc, Cafétéria côté tram, en-cas, Hall, la petite caf, Manger, 2 eme cafet, attendre, caf coté parc, Caf uni mail côté parc, Caf uni mail côté tram, Cafet baud-bovy, Cafet a coter de l'entrée, cafet côté bus, Cafet du tram, convivial, Dans la cafet, hall d'entrée, La caf côté Baud Bovy, La caf côté tram, La cafétéria côté baud bovy, Le contoire, Le restaurant, Le resto, Panini, Self, stressant |
| Q.11 | La vache, Sculpture, statue, Âne en métal, Art expérimental, Assemblage, l'endroit où il y a la statue de vache, la statue chelou, La vache de sociologie, Le taureau, oeuvre, Vache artistique, Vache en carosserie, Vache métallique |
| Q.12 | Sculpture, Arc, Virgule, Le truc, courbe, demi-cercle, Entrée, Monument, skate, Barre, croissant, curieux, Déco, design en face de l'unige, Devant l'entrée côté tram, L'arche, La place devant mail, la rampe, la statue d'uni mail, la statue du gros machin devant l'uni, le grand machin noir, le toboggan, lune, moche, oeuvre d'art, oeuvre d'art côté tram, Parenthèse, Sculpture côté entrée principale, Statue, statue bizarre |
| Q.13 | le toit, Cercles, Plafond, le plafond vitré, Verrière, cible, Couleur, Les vitraux, Auréoles, auréoles de couleurs, Cercles colorés, Cercles de couleurs, Coloré, emblématique, étoile, Hall, L'oeil, La coupole, Le plafond d'unimail, Le toit decorer, Le truc, Le truc qui fait de la couleur sur le plafond, les halos, Luminaires, plafond en verre, ronds, ronds, ronds colorés, soleil, Toit d'uni mail, veranda |

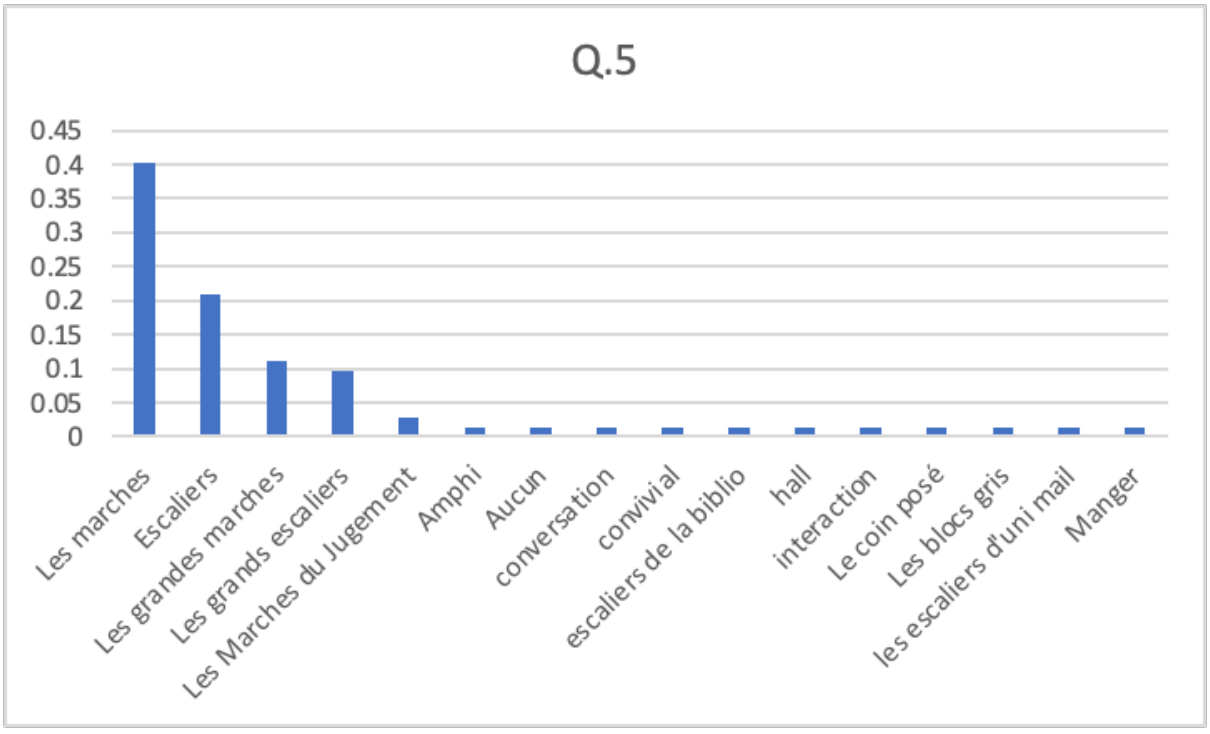


Figure A1: Q.5 word distribution.

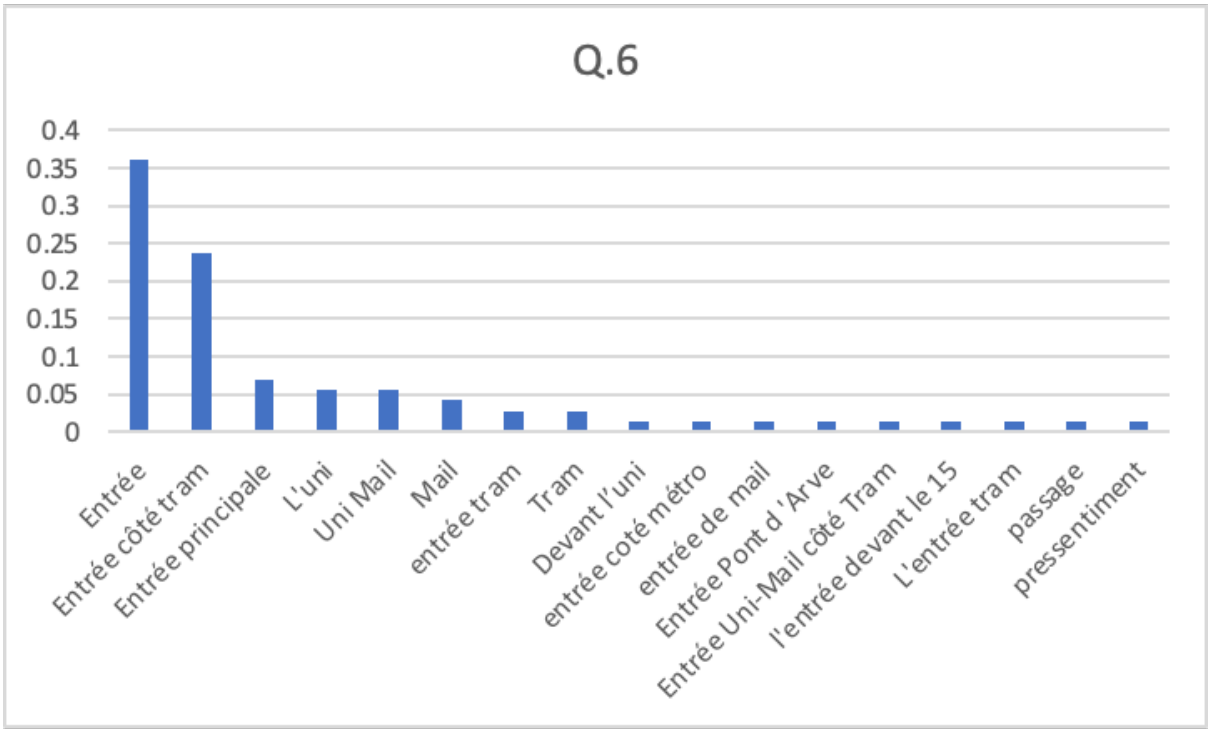


Figure A2: Q.6 word distribution.

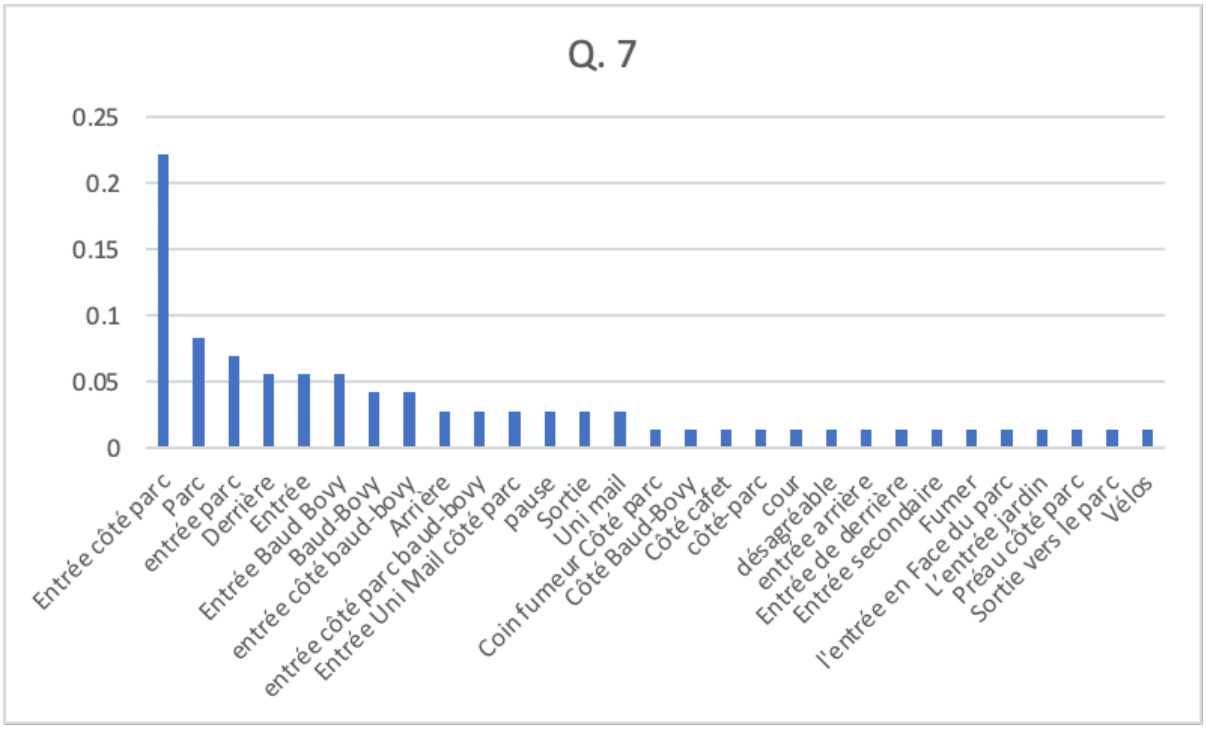


Figure A3: Q.7 word distribution.

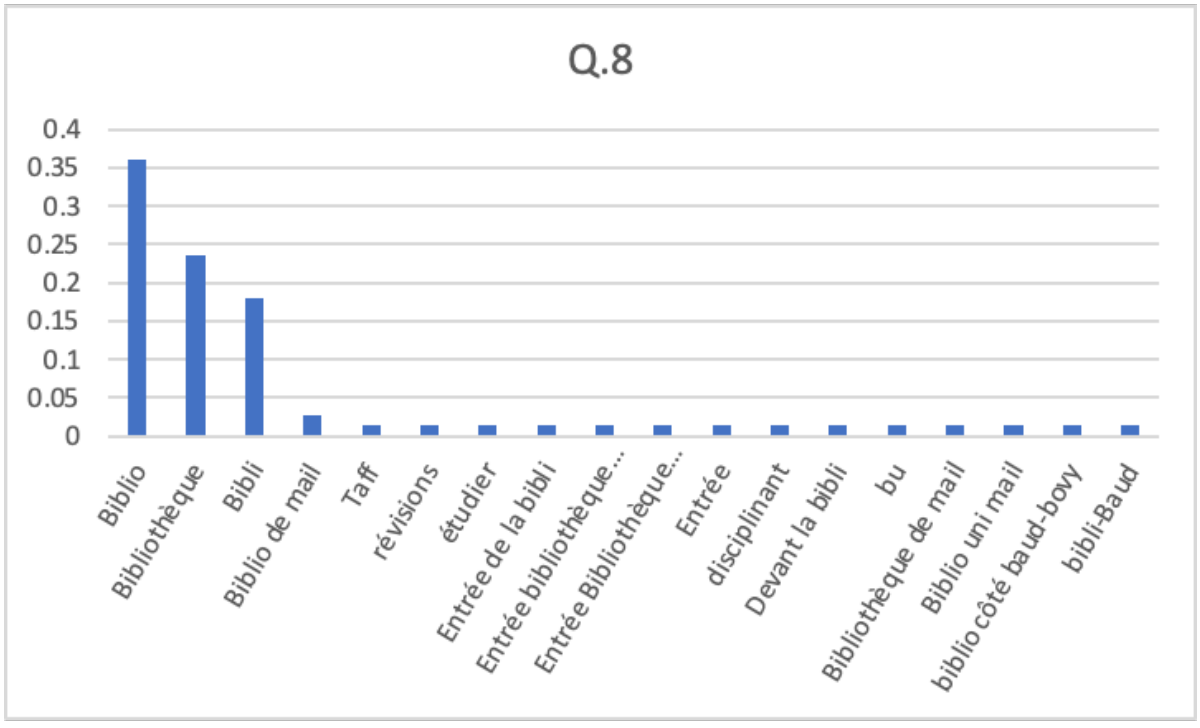


Figure A4: Q.8 word distribution.

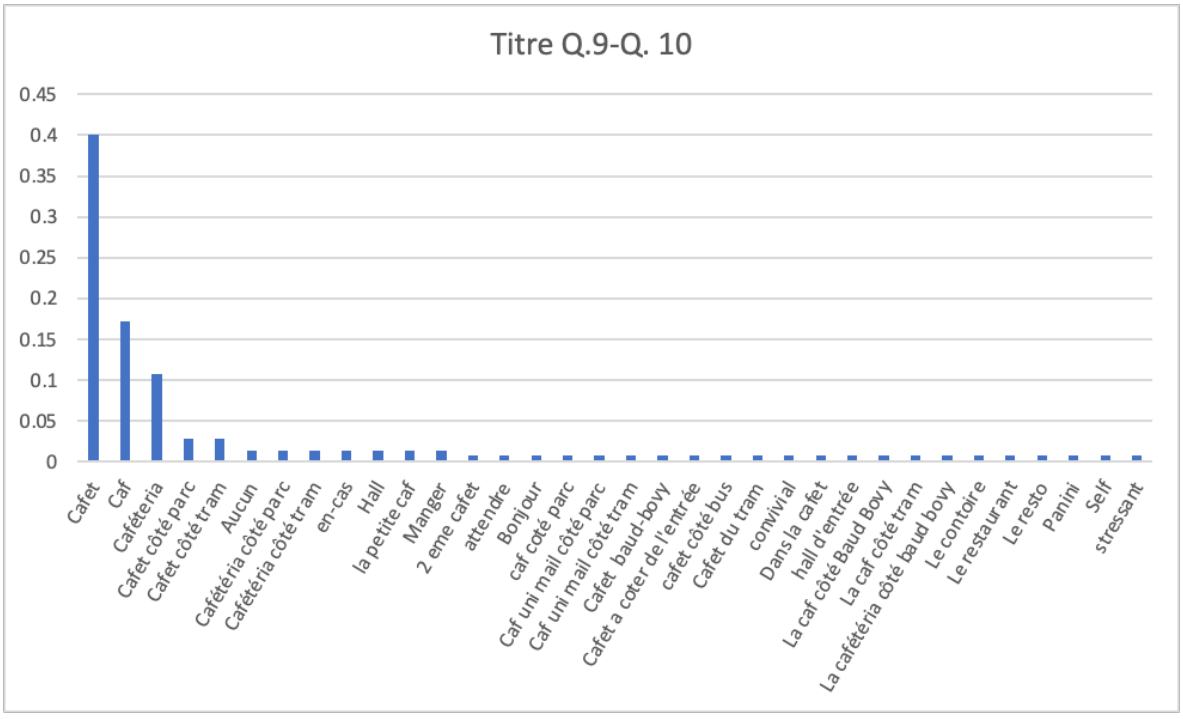


Figure A5: Q.9–Q.10 word distribution.

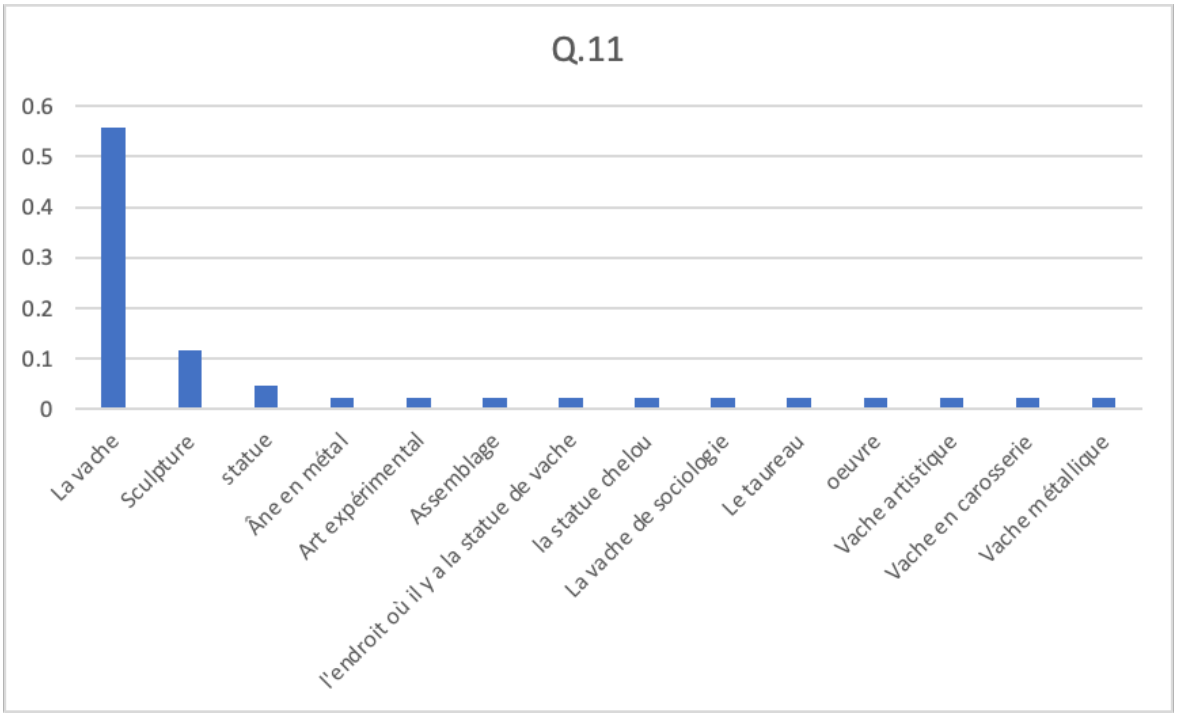


Figure A6: Q.11 word distribution.

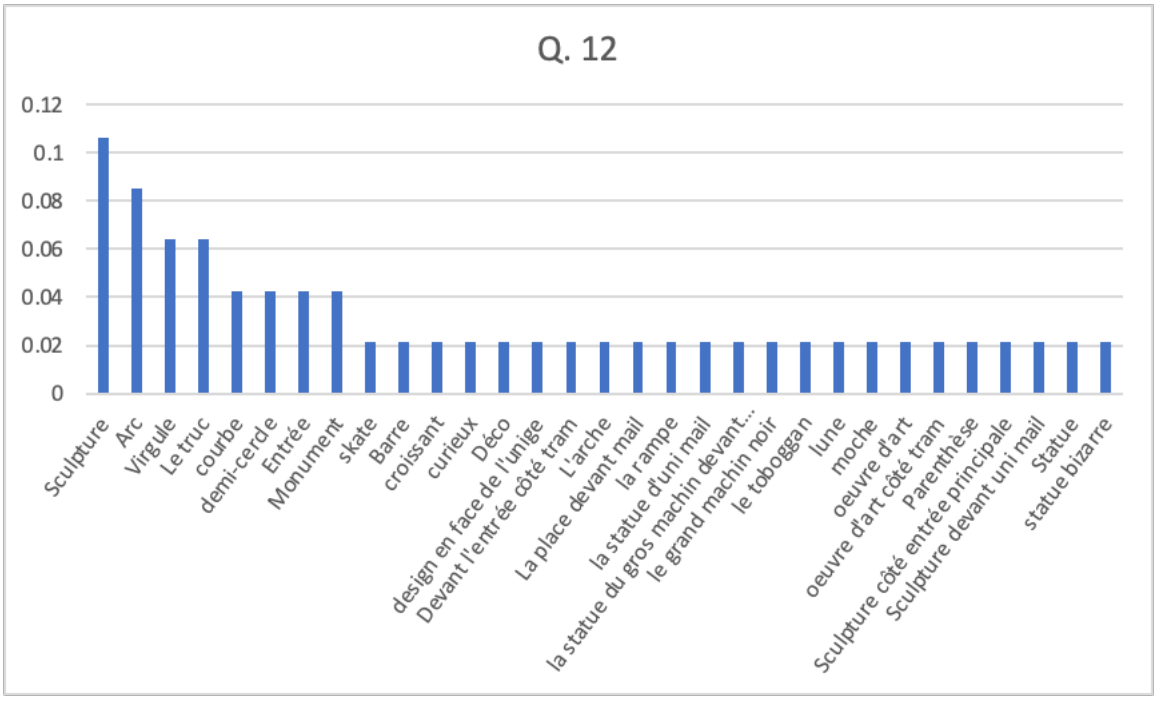


Figure A7: Q.12 word distribution.

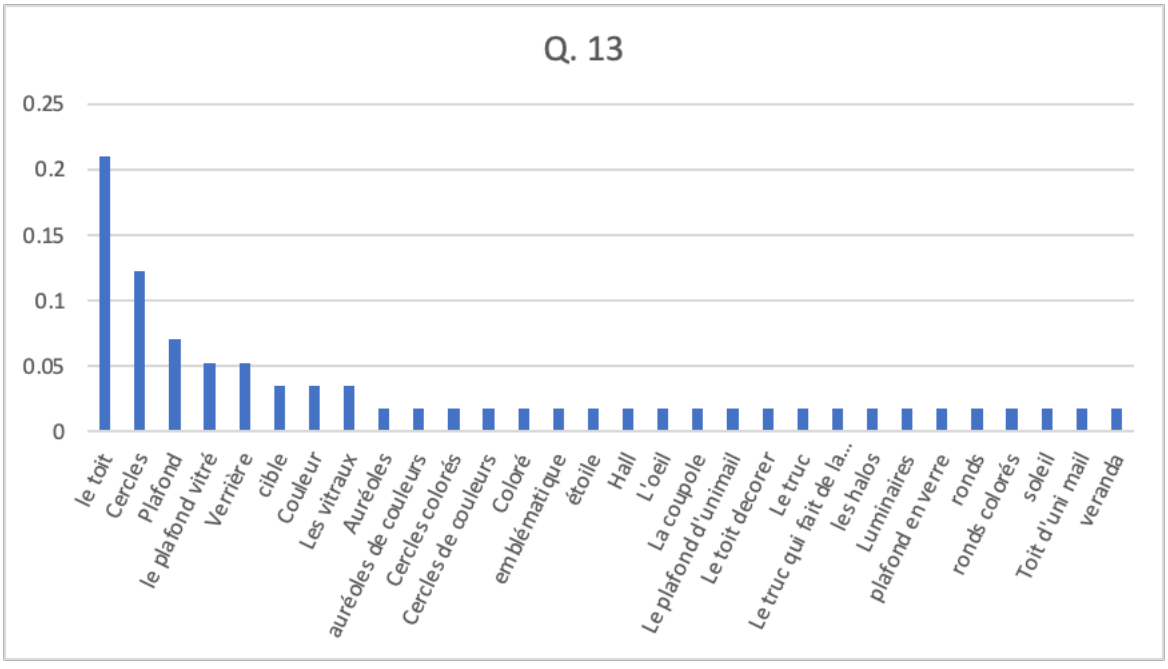


Figure A8: Q.13 word distribution.