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Lost Luggage: A Field Study of Emotion–Antecedent Appraisal[1]

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One hundred twelve airline passengers reporting their luggage lost to the baggage retrieval service in a major international airport were interviewed after their interaction with an airline agent. Participants were asked to rate their emotional state before and after the interaction with the agent and to provide information on how they had appraised the situation. The data are interpreted with respect to (1) type and intensity of the emotions felt in this situation, (2) appraisal theory predictions of emotion elicitation and differentiation, and (3) emotional change in the course of the interaction following reappraisal of the situation.

In recent years, the psychology of emotion has been strongly marked by appraisal theories. In contrast to the classic assumption that prototypical situations serve as antecedents of different emotions, these theories utilise an individual's subjective appraisal of an antecedent situation to explain the elicitation and differentiation of emotional responses (Arnold, 1960; deRivera, 1977; Frijda, 1986; Lazarus, 1968, 1991; Ortony, Clore, & Collins, 1988; Roseman, 1984, 1991; Scherer, 1982, 1984, 1986, 1988; Smith and Ellsworth, 1985; Solomon, 1976; Weiner, 1982, 1986).

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While there is some convergence with respect to the nature of the appraisal dimensions postulated by different theories (see Lazarus and Smith, 1988; Manstead and Tetlock, 1989; Reisenzein and Hofmann, 1990; 1993; Roseman, Spindel, & Jose, 1990; Scherer, 1988), there are also some differences (see detailed review in Scherer, 1997).

The major claim made by all appraisal theorists is that objectively similar situations or events can elicit, in different individuals, highly dissimilar emotional reactions depending on idiosyncratic subjective appraisal. A number of recent empirical studies have confirmed this suggestion and have shown that a limited number of appraisal dimensions is sufficient to explain emotional differentiation. These studies have used a variety of different paradigms to establish the relationships between particular configurations of appraisal results and the nature of the ensuing emotional reactions (see also Ellsworth, 1991; Lazarus and Smith, 1988; Parkinson and Manstead, 1992; Scherer, 1988):

1. Asking for judgements of emotion labels with respect to the nature of the appraisal implied by the underlying concepts (Conway and Bekerian, 1987; Frijda, 1987; Parkinson and Lea, 1991; Smolenaars and Schutzelaars, 1986/87) This is a rather indirect approach, relying mainly on the nature of the semantic fields of the emotion labels in a particular language. While providing interesting information on the social representation of different emotions as stored in semantic concepts, it does not directly address the issue of divergence of emotional reactions given varying appraisals of a concrete situation.
2. Using vignettes or scenarios that have been systematically manipulated with respect to appraisal relevant dimensions and asking subjects to indicate the emotional reactions that they (or a fictitious other) might experience in this situation (McGraw, 1987; Roseman, 1984; Russel and McAuley, 1986; Smith and Lazarus, 1993; Stipek, Weiner, & Li, 1989; Weiner, Amirhan, Folkes, & Verette, 1987; Weiner, Graham, & Chandler, 1982; Weiner, Russell, & Lerman, 1979). This technique allows to present subjects with exactly the same situational scenario and to consistently vary different aspects of the situation. A potential drawback of this technique is the highly mediated response—subjects have to imagine being in the situation and responding to it. Thus subjects may use cultural stereotypes in predicting their responses. While providing systematic information that could not be obtained otherwise, this approach has relatively low ecological validity in being too far removed from actual emotional responses to experienced events.
3. Asking subjects to recall specific emotional experiences and questioning them about the outcome of antecedent evaluation processes

(Ellsworth and Smith, 1988a,b; Folkman and Lazarus, 1988; Frijda, Kuipers, & ter Schure, 1989; Gehm and Scherer, 1988; Mauro, Sato, & Tucker, 1992; Reisenzein and Hofmann, 1993; Reisenzein and Spielhofer, 1994; Roseman, Spindel, & Jose, 1990; Smith and Ellsworth, 1985; Tesser, 1990). Since real emotion situations are to be recalled and reported, ecological validity is not a major concern. However, one drawback of this method, apart from the problem of having to rely on long-term memory, is that each individual situation is likely to be different and thus cannot be compared over individuals.

4. Making use of naturally occurring emotion-producing events (such as examinations) or inducing emotions experimentally to obtain judgements on appraisal processes (Folkman and Lazarus, 1985; Smith, 1989; Smith and Ellsworth, 1987). This would seem to be the method of choice given the requirements outlined above: Subjects are studied in comparable situational contexts and thus different emotional reactions can be traced back to individual differences in appraisal processes. As is commonly known, the induction of realistic emotions in the laboratory is exceedingly difficult, for both ethical and practical reasons (see Wallbott & Scherer, 1989). In consequence, the use of occasions in which many individuals are confronted with comparable, naturally occurring emotion inducing situations, constitutes a royal road for the investigation of emotion antecedent appraisal. Studies by Folkman and Lazarus (1985) and Smith and Ellsworth (1987) represent pioneering efforts in this direction. In both of these studies university examinations were used as eliciting events. This situation, which is highly comparable across individuals, has the advantage of constituting a very significant event in the life of the participants.

Following this line of research, the present paper reports a field study of a common emotion-inducing situation with high ecological validity, affecting a wide range of different individuals: Waiting in vain for one's luggage in front of an empty conveyor belt in an airport arrival hall. We assume that this situation is sufficiently comparable across many different individuals to at least partly meet the requirements for an empirical test of appraisal theories outlined above: The situation represents an objectively similar, prototypical instance of losing property, at least temporarily. Whereas prototypical situation explanations of emotion elicitation and differentiation should postulate highly similar emotional reactions to this event, appraisal theories would predict differential emotional reactions depending on different profiles of subjective appraisal. Thus, this paper examines the variability of the emotional responses to the given situation and the extent to which the specific reaction can be predicted on the basis of

the dimensions or criteria of situation evaluation suggested by appraisal theorists.

Specifically, the following questions were investigated:

Q1. With which intensity are a number of major emotions felt by airline passengers in this situation, i.e. discovering that their baggage is lost?

Given the ubiquitous nature of this event, it is of interest to determine empirically which emotions are more or less intensively felt by airline passengers afflicted by the disappearance of their luggage and whether these affective reactions consist of relatively "pure" states or of "blends" of different emotions (see Ellsworth, & Smith, 1988a,b)? This question is to empirically examine one of the fundamental tenets of appraisal theory: the notion that objectively similar events or situations will elicit dissimilar patterns of emotional reactions in different individuals, due to variable appraisal patterns. The variable investigated in this context is the experiential component of emotion, the individual's verbally reported *subjective feeling state.*

Q2. Can the emotional reactions reported by the airline passengers be related to the limited number of appraisal dimensions as predicted by appraisal theorists? What is the relative contribution of objective situation characteristics as compared to subjective appraisal results to the explanation of the differential reactions shown by different persons in the situation?

The present study is based the senior author's version of appraisal theory. The component process theory proposed by Scherer (1984, 1986) contains a model of the appraisal process in form of a hypothetical sequence of "stimulus evaluation checks" (SECs) the results which are expected to produce the different emotions. While a detailed description of the theoretical background cannot be provided in the present context (see Scherer, 1986, 1988, for details), the major predictions of the model for the emotions investigated in this paper, as based on a synthesis of published predictions, are shown in Table I (adapted from Scherer, 1997). The appraisal-related questions in the questionnaire used in this study were based on this theoretical framework. They will be used to examine to which extent the specific emotion(s) reported by a participant can be predicted on the basis of these variables. It is further examined whether objective situation characteristics, such as the specific nature of the journey, affect feeling state over and above the extent to which they are reflected in appraisal outcomes.

Q3. Does the initial emotional reaction upon discovery of the luggage loss change in the course of the interaction with the agent in the baggage retrieval office, possibly due to a reappraisal of the situation?

Most emotion theorists insist on the dynamic nature of emotion, assuming a process in which the nature of the emotional reaction is constantly changing. Appraisal theorists assume that such changes can often be conceived of as "reappraisals" of the situation or of one's ability to deal with

Table I. Predictions of Appraisal Patterns for the Emotions Studied in This Research

	Anger	Resignation	Worry	Good Humor
Novelty/expectancy				
Unexpectedness	open	open	high	open
Goal/need conduciveness				
Goal obstructiveness	high	high	high	very low
Coping potential				
External causation	external	open	external	open
Coping ability	high	low	very low	medium
Compatibility with standards				
Norm incompatibility	high	open	open	open

Note. This table was adapted to the present context on the basis of earlier published predictions (Scherer, 1984, 1986, 1988; see Scherer, 1997, for details on adaptation). Open = several different results of the respective appraisal check are compatible with the emotion concerned.

the consequences of an event. The nature and regularity of such emotional change following reappraisal has been rarely studied empirically. In the present study, differences in the emotional states reported before and after the interaction with the agent of the retrieval service are examined. In particular, it is asked whether the changes in emotional state can be predicted on the basis of the *evaluation of the retrieval service* (which is likely to be an important component of the appraisal of the situation with respect to the probability of recovering the lost luggage).

METHOD

Participants

Participants in the study were 112 airline passengers who were unable to retrieve their luggage in the baggage claim area of a major international airport and having to claim it at the baggage retrieval office. Their behavior during the interaction with the agents of the retrieval service was videotaped[3] and their emotional reactions and appraisal of the event were assessed by means of a structured interview.

[3]A camera was hidden behind the airline agent's desk in such a way as to allow to videotape the full face and part of the upper body of the passenger in interaction with the claims agent in charge of dealing with these cases. Two microphones, one for the passenger and one for the agent, were attached under the desk and out of the passenger's sight. When the passenger entered the office, one member of the research team directed the person to this special desk. Upon leaving the office, every passenger was explicitly given the choice to have the tape erased. All of the 112 passengers were willing to have the tape used for research purposes and all except two answered all of the questions in the questionnaire, the two refusals being due to time constraints of the passengers. These tapes have been analysed in the context of a related study (Scherer & Ceschi, submitted) and are currently analyzed for further information.

Table II. Participant Characteristics

Characteristic	Percentage
Gender	
Male	59.8
Female	40.2
Age in years	
below 20	0.0
between 20–30	12.5
between 30–60	84.4
older than 60	2.7
Language group	
French	30.9
English	29.1
German/Northern Europe	16.4
Asian	8.2
Other	15.5

Personal background information for the participants in this study is provided in Table II.

Agents

In negotiating field access, an agreement was reached that the identity of the agents processing the claims of the participants would not be monitored to ensure anonymity and confidentiality as well as to avoid evaluation apprehension. For this reason, no information on the number, the gender, the age of the agents, or the number of participants dealt with by each, was retained. Approximately *12* airline employees, predominantly female, participated as agents in the study.

Participant–Agent Interactions

Single airline passengers (not accompanied by others) arriving at the baggage retrieval offce were directed to a specially prepared desk, allowing for surreptitious recording of the interaction with the agent (for details of the recording procedure, see footnote 3 and Scherer & Ceschi, submitted).

None of the participants was aware that his or her behavior was being recorded. The agents working at this desk were informed about the recording activity (and that they had to fill out a questionnaire after each interaction), but were unaware of the exact purpose of the study. They were instructed to obtain the information necessary for processing the baggage claim in their habitual manner.

The information gathering procedure generally consisted of the following phases: (1) Greeting and obtaining information about the ticket and the

final destination; (2) obtaining a description of the piece(s) of luggage and their contents; (3) Ascertaining the forwarding address in case the luggage was found; (4) handing the participant a copy of the retrieval forms and saying good-bye. In general, these interactions lasted about 10 min, in a few exceptional cases up to 20 min, and were conducted in French or English.

Participant Interviews

After the participants had left the desk, they were approached by a member of the research team who explained to them that they had been videotaped during the interaction with the airline agent and asked them to take part in an interview.

The questionnaire used to conduct the interviews existed in four languages, French, English, German, and Italian. Four research assistants, each speaking one or more of these languages, were present on site. In each case, one of the assistants, able to speak the participant's preferred language, read the questions and noted the answers in the questionnaire by checking the appropriate answer alternatives or by categorizing open responses into one of the predetermined alternatives (listed in parentheses following each of the questions in the description below). The questions tapped five major areas: nature of the travel; appraisal of the situation created by the luggage loss; subjective feeling state; evaluation of the agent and the retrieval services, and personal background. In the actual interview, questions belonging to these five areas were posed in an order ensuring a logical sequence of question content. Only the questions and procedures pertinent to emotion–antecedent appraisal are reported here. Questions and results relative to the social communication of the emotion elicited by the luggage loss, based in particular on the analysis of the video records, are reported elsewhere (Scherer & Ceschi, submitted).

Nature of travel was determined by asking about the purpose of the trip (vacation vs. business) and its present stage (final destination vs. transit point).

Appraisal of the Event. In most studies of emotion–antecedent appraisal, the assumed appraisal dimensions are assessed by direct questioning, i.e., requesting information on the novelty and pleasantness of an event, its relation to the person's goals and the perceived power to deal with the consequences. These direct questions may cause problems since "normal" people may not be used to think in the categories underlying appraisal dimensions. For example, Scherer has reported that participants often have difficulties in identifying their goals, needs, or plans which are affected by a particular event (Scherer, 1993, 1997). For instance, it often occurs only to psychologists or biologists that survival can be construed as a very basic "need" of any organism.

In the present study, an attempt was made to use an *indirect* approach to obtain self-report on appraisal. Rather than asking questions that are directly concerned with appraisal dimensions, we asked for context-specific information that can be assumed to contain the results of appraisal processes. The following dimensions, based on the series of emotion–antecedent stimulus evaluation checks suggested by Scherer (1984, 1988), were assessed by such indirect questioning: novelty; goal importance; causal attribution; coping ability; and compatibility with external standards.

The *novelty check* was assessed by referring to the participant's expectancies concerning potential baggage loss: "When you first arrived at the baggage belt, did it occur to you that your baggage might be lost or delayed?" (1 = yes; 2 = no).

The goal conduciveness check was operationalized as the interference of the baggage loss with the participant's plans or goals. Two different questions were used: "How much does the fact that you have to wait for your baggage to arrive interfere with your plans or activities today and tomorrow?" (categories: 1 = it is a catastrophe, have to change plans; 2 = it is a serious problem; 3 = a bit, but have enough time; 4 = no specific plans) and "If your baggage is not found and returned within 24 hours, will you suffer serious consequences with respect to your plans and activities?" (categories: 1 = enormously, very grave consequences; 2 = perhaps, some consequences envisaged; 3 = probably not, not important; 4 = not at all). The mean of both answers constituted the goal conduciveness variable (the variable was reversed and recoded to a 1-8 scale to have goal obstructiveness be represented by the high end of the scale).

The *causal attribution check* was also measured by means of two questions: "Who do you think is most responsible for what happened?" and "Do you have any idea what might have caused the loss or delay of your baggage?" The answers were recorded on the questionnaire and later recoded into 1-6 scale ranging from internal to external responsibility.

The assessment of perceived *coping ability* in this situation was particularly difficult, since it was felt that a direct question on control or power might not yield appropriate information, given the nature of the situation in which there is little possibility to intervene directly. The following questions were used to estimate perceived coping and adjustment ability in an indirect fashion (as described above): "Have you yourself, or someone you know well, had the experience of losing your baggage on a flight or having to wait for it?" (yes/no). "If so, was the baggage eventually found and returned?" (yes/no). "Do you think that it depends on the efforts or the efficiency of the baggage retrieval service whether your baggage is found, or is that mostly due to chance?" (Service, Chance, Both). The underlying assumption in creating a coping ability variable on the basis of these ques-

tions was that the participants who had experience with losing baggage and getting it back and who believed that the service might solve their problem would evaluate their coping and adjustment ability as relatively high. In consequence, the answers to these questions were combined to form a coping ability variable with, at one extreme, participants who never experienced the loss of luggage or never got their baggage back, and, on the other extreme are participants for whom losing and recuperating luggage is a well-known phenomenon and who believe that the service can efficiently solve their problem (the recoded, composite variable, ranging from 1 to 6, was reversed to have high perceived coping ability represented by the higher end of the scale).

For the *compatibility with standards check,* the degree of concordance between the situation and external standards was assessed by the question: "Do you think that most people regard it as quite normal and excusable to have to wait for delayed baggage?"(categories: 1 = yes, most likely; 2 = probably; 3 = not at all, most people would find it abnormal). Thus the higher end of the scale is interpreted as perceived norm violation or norm incompatibility.

Clearly, this kind of indirect questioning requires more inferences and makes more assumptions than direct questions on appraisal dimensions. In that sense, it is less "clean" and there might be some disagreement about the extent to which certain questions really index a particular appraisal check. However, it was felt that these disadvantages of this procedure are outweighed by its advantages, particularly that the questions are more meaningful to the participants, and thus elicit more valid responses.

Subjective feeling state was measured for two different points in time, before and after having interacted with the agent. For each of these time points, the participant was asked to rate his or her feeling state. The questions were "How did you feel when you realized that your baggage would probably not be delivered with that of the other passengers, before you went up to the baggage retrieval office?" and "How do you feel now?", respectively. Participants were requested to answer these questions by rating their feeling state on five emotion categories labelled as: Angry/Irritated; Resigned/Sad; Indifferent; Worried/Stressed; In good humor (using 7-point scales labeled at the extremes 0 = "not at all" and 6 = "very much"). Clearly, since both measures were obtained after the actual interaction, they cannot be considered to be independent. For the sake of economy, only the first term in the pairs above will be used in most of the paper.

Evaluation of Agent and Service. The participant's evaluation of the agent that served him or her as well as of the baggage retrieval service in general were assessed by the following questions: "What is your impression of the agent who served you?" (the responses were noted verbatim and

Table III. Presence and Intensity of Emotional Experiences

	Before Interaction with Agent			After Interaction with Agent		
	% Not felt	Mean	SD	% Not felt	Mean	SD
Anger	44.50	3.46	1.77	62.70	3.29	1.71
Resignation	37.30	3.49	1.61	52.70	3.33	1.77
Indifference	49.10	3.16	1.64	47.30	2.97	1.51
Worry	38.20	3.12	1.82	52.70	2.77	1.63
Good Humor	33.60	3.58	1.72	21.80	3.90	1.62

Note. % Not felt = percentage of participants reporting a scale value of 0 (zero) for the emotion; mean and standard deviation (SD) computed for participants with scale values greater than 0, i.e., those reporting to have felt the emotion to varying degrees.

later coded into the following three categories: 3 = positive, 2 = neutral, 1 = negative) and "Are you content with the help you have been getting from this service?" (categories: 3 = very much, 2 = quite, 1 = not at all).

Personal Background. Information about nationality, age, and sex of the participants was obtained at the end of the interview.

RESULTS

The presentation of the results is organized with respect to the questions enumerated in the introduction.

Type and Intensity of Emotions Felt. Table III provides information about the participants' self-reported feeling states for the five emotion categories before and after the interaction. For each point in time, the percentage of those participants reporting not to have felt the emotion at all (scale value 0), as well as the mean and the standard deviation of the ratings of those reporting to have felt the emotion to varying degrees are shown. The data show that all emotion states are reported by a sizeable number of participants. Closer inspection of the data show a rather flat distribution over the intensity values, which explains the high variance in intensity.

Since participants could check as many different emotions as they considered necessary, one can expect the occurrence of different emotion blends. The data show indeed a massive amount of emotion mixtures or blends with widely varying intensities of the different constituents. Given the wide variability of these blends, it is difficult to report these data in the form of simple indices. Figure 1 shows the nature and frequency of the blends in graphical form. In constructing the graph, cases were consecutively sorted (in the following order: anger, worry, resignation, indifference, good humor—from the most negative to the most positive). The respective intensities of all 5 emotions for all of the participants were then displayed using a cumulative area

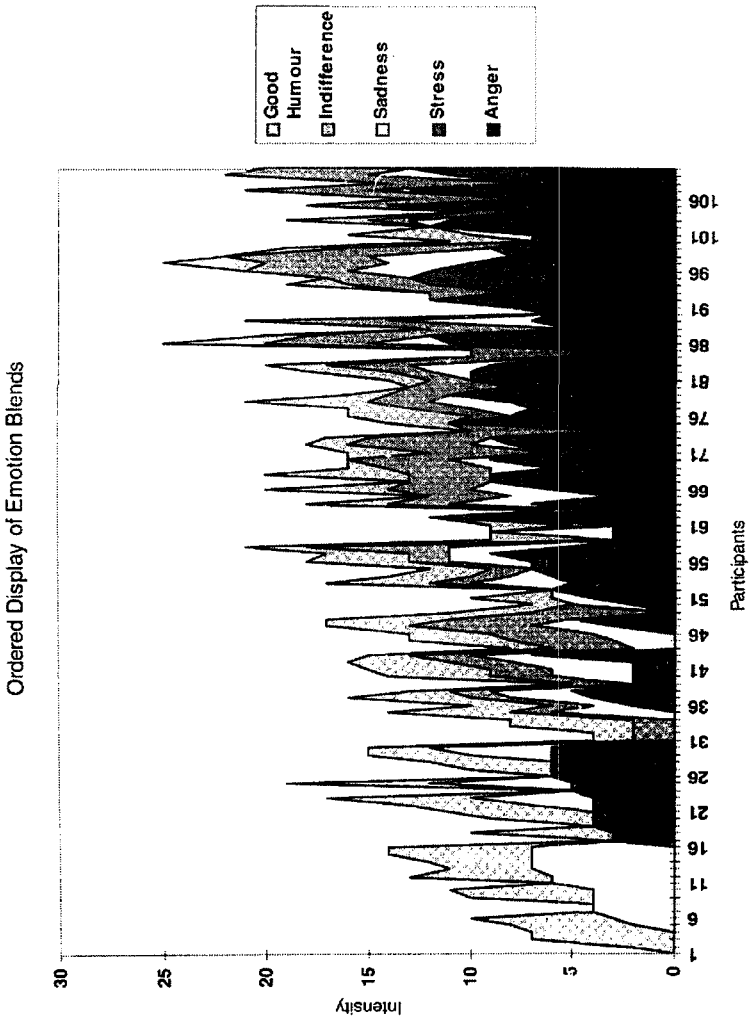

Fig. 1. Sorted cumulative area graph of emotion blends.

display. For example, if a participant had checked all 5 emotions with maximal intensity (6), the area column for that person would have reached the maximal value of 30, with five parts of 6 units in length. This sorting resulted in the ordering of the participants from low to high overall intensity and from more positive emotion blends to ever more negative ones. The graph shows that good humor or indifference virtually never occur by themselves, rather, they are generally blended with at least one more negative emotion. The first third of the graph (cases 1 to 31) shows clusters of either resignation or worry with good humor added in. The importance of the good humor constituent of the blend diminishes with the increasing importance of negative emotions (to the right of the graph). In these cases, indifference seems to take the role of good humor. One possibility is to conceive of these constituents of the reported blends as regulation or emotional coping mechanisms used by the participants to balance their negative affect with good humor or a "stiff upper lip." As one might expect, there is a rather consistent worry constituent for the large majority of the participants, irrespective of the nature of the blend. About half of the participants show an anger constituent. As the latter becomes more intense, the good humor constituent is less pronounced. Overall, the data shown in Figure 1 attest to the prevalence of emotional blends over simple, or "pure," emotional states, at least in realistic, nonlaboratory settings (cf. Ellsworth & Smith, 1988a,b; Scherer & Tannenbaum, 1987). Figure 1 also shows a tendency of overall intensity of the emotion blends to increase with rising intensity of the anger constituent.

To simplify the analyses of emotional change over the course of the interaction, it is desirable to create categories or clusters of participants with comparable patterns of emotion blends. Both factor analyses and cluster analyses of the emotion states were performed to determine potential clusters. As one might expect, both analyses yielded two factors or clusters, one for good humor and indifference, and the other for anger, resignation, and worry. A cluster analysis *across cases* yielded a very large number of clusters and the resulting categories were not suitable to perform further analyses with a limited number of emotion blend classes. Therefore, based on the results of these analyses and on the qualitative interpretation of Figure 1, a classification of the blends into "dominant" emotional states was performed. Firstly the categories of "indifferent" and "in good humor" were combined (by computing the mean) to a new variable "good spirits," since it was felt that "in good humor," rather than being a positive emotion, is indicative, like "indifferent, of the participant not feeling or not wanting to admit an entirely negative emotion. Secondly, each participant was classified with respect to having reported either a dominant "pure" emotion or one of three "emotion blends." "Pure" dominant emotions (angry/irritated = anger; resigned/sad = resignation; worried/stress = worry; and

good spirits) were assigned when the participant had reported one of the emotion categories with an intensity of at least one scale-point higher than *all* of the other emotions. One of the following three "blends" were assigned when the two constituent emotions were within two intensity scale-points of each other and higher than *all* of the other emotions: anger/worry, resignation/worry, anger/resignation.

The margins in Table IV show the distribution of the 110 participants over these categories for the report of the feeling states before and after the interaction with the agent.

Appraisal Predictions of Subjective Feeling States. One of the major aims of this paper is to examine the degree to which the appraisal dimensions obtained in the interview with the participants accounts for the nature of the resulting emotional state and whether the observed patterns conform to the appraisal theory predictions (see Table I). As in earlier studies in this research tradition (Ellsworth & Smith, 1988a,b; Frijda, Kuipers, & ter Schure, 1989; Gehm & Scherer, 1988), multiple regression analysis was used to determine to what extent the emotional state reported can be accounted for by different appraisal dimensions. Only the data for the ratings of the emotional state *before* the interaction are used for the following analyses.

The results of full model analyses, including all predictors, can be found in Table V, showing the regression parameters for the *indidual components* of the emotion blends (i.e., the *raw* emotion ratings). The first row for each emotion shows the regression of the appraisal dimensions described in the Method section on the raw emotion ratings (ranging from 0 to 6). The results show that the goal conduciveness check is by far the most important predictor, with perceived high obstructiveness of the loss leading to anger and worry and low obstructiveness to indifference and good humor. These results confirm the predictions for this dimension, except in the case of resignation where the beta is in the right direction without reaching significance. The only other effect that approaches significance is also in accordance with predictions: anger is likely to be present and more intense if the event is seen as incompatible with norms. A somewhat elevated beta for high coping ability in the case of good humor is in the direction of the predictions but does not reach significance. No effects are found for the appraisal dimensions of unexpectedness, external causation, and coping ability. Relatively strong R^2s and high overall significance levels for the complete equation are found for worry, anger, and good humor. The appraisal predictors explain little of the variance for resignation and indifference, the full model equations not reaching significance.

In an attempt to evaluate to what extent more objective variables that were measured in this study might contribute to the prediction of the resulting emotional state over and above the subjective appraisal, we entered

Table IV. Change in Dominant Feeling States from Before to After the Interaction with the Agent

	Dominant feeling state after the interaction								
	Anger	Resignation	Worry	Good spirits	Anger/ Resignation	Anger/ Worry	Resignation/ Worry	Total before	Percent
Dominant feeling state before									
Anger	2					2	3	8	7.3
Resignation		7	1	1		1	8	18	16.4
Worry	1	1	2	1	1		3	9	8.2
Good spirits		1		22				23	20.9
Anger/resignation		1			2		3	6	5.5
Anger/worry	1	1	2	3		2	4	13	11.8
Resignation/worry	1	1	2	10	1		18	33	30.0
Total after	5	12	7	37	5	5	39	110	
Percent	4.5	10.9	6.4	33.6	4.5	4.5	35.5		100.0

Note. rows = before; columns = after.

Table V. Regression of Appraisal Variables on Ratings of Emotional State Before the Interaction

	Unexpectedness	Goal obstructiveness	External causation	Coping potential	Norm incompatibility	R^2	p
Anger							
Raw/Linear	0.01	**0.40**	-0.04	-0.06	*0.16*	0.21	0.0002
Binary/Logistic	0.00	**0.27**	0.00	0.00	*0.11*	-	0.0003
Intensity/Linear	-0.10	**0.28**	0.01	-0.02	0.05	0.10	ns
Resignation							
Raw/Linear	-0.10	0.19	0.00	-0.09	0.06	0.06	ns
Binary/Logistic	0.00	**0.13**	0.00	0.00	0.00	-	ns
Intensity/Linear	-0.09	0.08	-0.13	-0.01	0.14	0.05	ns
Indifference							
Raw/Linear	-0.03	**-0.25**	0.03	0.09	0.15	0.09	0.09
Binary/Logistic	0.00	**-0.15**	0.00	0.00	0.00	-	ns
Intensity/Linear	0.14	-0.15	0.04	-0.04	**0.28**	0.10	ns
Worry							
Raw/Linear	0.08	**0.54**	0.04	-0.07	-0.01	0.31	0.0001
Binary/Logistic	0.00	**0.32**	0.00	0.00	0.00	-	0.0005
Intensity/Linear	-0.02	**0.49**	-0.04	-0.04	0.08	0.25	0.003
Good Humor							
Raw/Linear	-0.03	**-0.34**	0.10	0.13	-0.09	0.17	0.002
Binary/Logistic	0.00	*-0.11*	0.00	0.00	0.00	-	ns
Intensity/Linear	0.02	**-0.42**	**0.22**	0.14	-0.06	0.27	0.0007

Note. Raw/Linear = betas for linear regression of appraisal dimensions on raw emotion scores (0-6); Binary/Logistic = betas for logistic regression of appraisal dimensions on dichotomized emotion rating (0 vs. 1; i.e., dropping the intensity); Intensity/Linear = betas for linear regression of appraisal dimensions on intensity-only emotion scores (1-6; with participants reporting 0 for the respective emotion treated as missing values). Bold betas: $p < .05$; Italic betas: $p < .10$.

type of travel (business vs. tourism) and final destination (the airport being the final destination, generally "home", or not) into the regression models. Only in one single case was a sizeable increase in R^2 with a significant beta weight observed: Anger being higher when the loss occurred en route (yielding an R^2 increase of .07). In all other cases, adding these variables did not significantly improve the prediction.

The regression of the appraisal predictors on the raw emotion ratings confounds two aspects of the issue: (a) whether a given participant said to have experienced or not a specific emotion and (b) the intensity of this experience. To study the respective contribution of the appraisal dimensions to the prediction of these two different aspects, the raw ratings were decomposed into two variables, a binary 0-1 variable indicating whether or not the person had experienced the respective emotion, and a 1-6 intensity variable for those participants who had experienced the respective emotion (treating the cases with 0 as missing observations).

Logistic regressions were run for the binary variables. The results are shown in the second rows (for each emotion) in Table V. The third rows show the results of linear regressions for the intensity variables (ranging from 1-6). Again, full models were estimated. These analyses basically confirm the results of the linear regressions on the raw ratings. There is little explanation of the variance for resignation and indifference but a reasonable proportion of variance explained, yielding significant overall models, for anger, worry and good humor. However, there are striking differences between the logistic (on-off) and the linear (intensity) regressions for the three emotions. Whereas the appraisal dimensions predict both the sheer occurrence *and* the intensity of worry, for anger they mostly explain occurrence and for good humor mostly intensity. In other words, the appraisal of the baggage loss situation as highly obstructive and incompatible with norms produces the onset of anger, without predicting the intensity of this feeling. Conversely, the presence or absence of good humor cannot be predicted by the appraisal dimensions whereas the intensity of good humor, once elicited, seems to depend on low obstructiveness and perceived external causation of the event (probably also on high coping ability, although the respective beta is not significant).

In the spirit of an exploratory analysis of the relationships between the appraisal dimensions and the emotion ratings, a nonlinear canonical correlation analysis (using Optimal Scaling by Alternating Least Squares, via the OVERALS procedure in SPSS) of the raw emotion ratings (occurrence and intensity) was performed. The three dimensional solution is shown in Figure 2. This way of plotting the data confirms the regression results discussed above and suggests that some of the predicted patterns that did not reach significance in those parametric analyses receive some

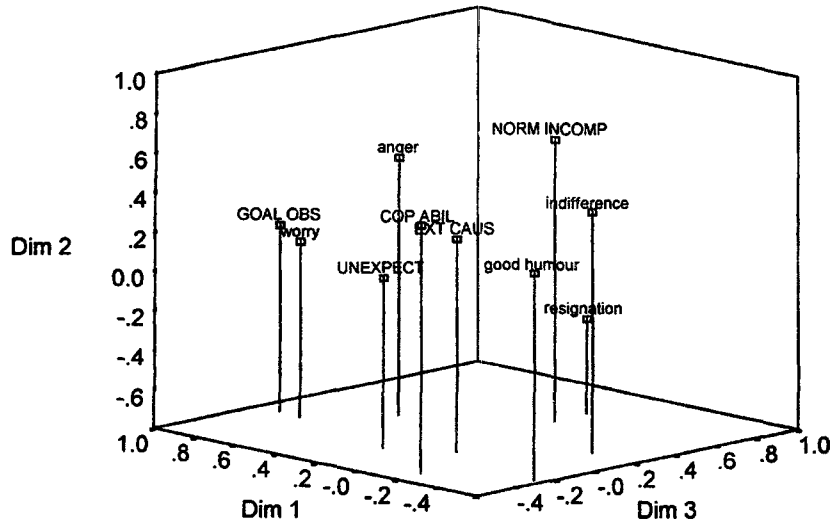

Fig. 2. Component loadings in a three-dimensional solution produced by nonlinear canonical correlation of appraisal dimensions and emotion ratings.

tendential support by the proximity patterns. For example, as predicted (see Table I), anger and good humor are closer to coping ability than the other emotions and worry is closest to unexpectedness.

Change Following Reappraisal. It had been expected that the interaction with the agent would tend to change the subjective feeling state. Table IV shows the direction of the changes for the dominant emotion categories in a sort of "affect migration matrix." The results show a complex pattern of changes, three of which stand out in the table: (1) Participants who started off in good spirits rarely lose them during the interaction. A sizeable number of individuals develop good spirits during the course of the interaction, changing over from an initially negative emotion. These "mood improvers" mostly come from the resignation/worry blend category. (2) Individuals reacting with pure or blended anger mostly remain within the negative mood categories; they seem to be difficult to placate in the interaction. (3) The ranks of the resignation/worry category are filled by participants who before the interaction had indicated pure negative states or anger blends.

While the data in Table IV reveal significant changes in the *type* of emotion felt, they do not address the issue of intensity changes. Therefore, the *raw* feeling states rating for the periods before and after the interaction were correlated. The data are shown in Table VI. High correlations between the same feeling states (*r* values in the diagonal) can be considered as in-

Table VI. Correlations of Raw Feeling State Ratings After the Interaction with the Corresponding Ratings Before the Interaction and with the Rating of the Service

	Raw feeling state after interaction				
	Anger	Resignation	Indifference	Worry	Good humor
Raw feeling state rating before the interaction					
Anger	.68**	.31**	−.17	.30**	−.30**
Resignation	.19*	.61**	−.07	.19	−.14
Indifference	−.22*	−.07	.72**	−.11	.26**
Worry	.39**	.28**	−.02	.58**	−.24*
Good humor	−.34**	−.25**	.19*	−.25**	.75**
Rating of service					
Satisfaction with service	−.25**	−.24*	.07	−.16	.10
Impression of agent	−.18	−.06	−.06	.00	.20*

*$p < .05$.
**$p < .01$.
***$p < .001$.

dicative *of the persistence* of the intensity in a particular feeling state. Such persistence is particularly high in the cases of good humor, indifference, and anger. The off-diagonal *r*'s give an indication of the probability that a certain pre-interaction feeling state will affect the intensity of another type of state after the interaction. While there are significant correlations within both the positive and the negative emotion groups, showing some cross-spreading, these are relatively low.

It was assumed that the changes in feeling state would be due to a reappraisal of the situation due to the interaction. Such reappraisal should be more pronounced for those individuals who declare themselves satisfied by the service and who have a positive impression of the agent with whom they interacted. The correlations between the post-interaction raw feeling states and the evaluation of the service and the agent are shown in the last two rows of Table VI. The significant negative correlations for post-interaction anger and resignation with the satiefaction with the service show that participants tended to be less angry and/or sad if they were satisfied with the performance of the retrieval service. Post-interaction good spirits correlate positively with a positive impression made by the agent. There are no significant correlations with the feeling *change scores* (post- minus pre-interaction ratings).

DISCUSSION

Type and Intensity of Emotional Reactions. The results show that the situation of one's luggage being lost upon arrival in an airport reliably pro-

duces emotional states amenable to empirical investigation. Participants in the present study responded to the situation with complex emotional reactions that, for the purposes of verbal report, required the use of several different emotion labels. While we had expected that many participants would report to have experienced more than one type of emotion at the same time in response to the eliciting situation, we were surprised by the strong extent of emotion blending reported by the participants in this study in response to what seemed a relatively prototypical situation. This is additional evidence that emotional upsets in real-life settings seem consistently to produce affect states which can be labeled only by using multiple emotion terms (see Scherer & Tannenbaum, 1986).

A conclusion to be drawn from this accumulating evidence is that emotion psychologists need to develop more appropriate methods to study and analyze emotional blends, particularly in the domain of appraisal theory. While the research paradigms using recall or imagination of emotional experiences via a single eliciting emotion term or constructed scenarios focus on relatively pure emotion states, the study of real-life events or experimental inductions are likely to elicit much more complexly blended states that require special methods for measurement and analysis. One might think of the development of more sophisticated, integrative scales for the rating of blended emotions, focussing the respondents' attention on the need to describe a *blend* rather than individual states. Similarly, the analysis of such blends needs to be further refined. In this paper, we have presented a sorted cumulative area graph as a first approximation to a more adequate representation of emotion blends. What is still missing is an appropriate classification technique that allows to identify salient clusters. The approach used here, identifying *dominant* states or pair-blends on the basis of decision rules, may not be the optimal solution to the problem.

Most importantly, the nature of emotion blends needs to be addressed more seriously on a theoretical level. For example, a first reaction to Figure 1 is often to wonder why it is that, in very many cases, negative and more positive emotions co-occur in a blend. One possible answer is that the more positive emotions, in the present case indifference or good humor, have a *regulatory* function in the blend. In other words, they could be consequent to the elicitation of a purely negative emotion, trying to control or weaken the intensity of the negative emotion or generating acceptable social displays, and yet be subjectively perceived by the person as coincident with the original emotion. Obviously, one possibility is that participants in emotion research reporting on their feelings with standard scales integrate over fairly large periods of time, thus producing apparent blends that would not occur if a more fine-grained temporal resolution was chosen (see Edwards,

in preparation, for the importance of choosing precise time points for the reporting of emotional processes).

Testing Appraisal Theory Predictions. With respect to the factors determining the emotional feeling state of the participants, the present data show that the important determinants of emotion elicitation and differentiation must be sought in the subjective evaluation of events. The most important factor in determining the participants' emotional reaction to loss of baggage is the subjectively evaluated importance of the loss in the context of the pertinent goals and plans at the moment. This result closely corresponds to appraisal theory predictions concerning the role of the goal conduciveness of an event in eliciting and differentiating an emotional reaction (Smith & Ellsworth, 1985; Frijda, 1986; Roseman, 1984; Scherer, 1984, 1988). The objective nature of the travel, particularly the case of the final destination of the flight not being the city in which the airport is located, while explaining some variance over and above the subjective appraisal, does not appreciably add to the discrimination of the resulting emotions.

On the whole, both the major assumption of appraisal theory—similar events eliciting differential emotions depending on the nature of subjective appraisal—as well as some of the specific predictions are supported by the present data (none of which contradicts the theoretical expectations). However, one could argue that the confirmation of the predictions is weak since only the goal conduciveness and the norm compatibility dimensions significantly contributed to the explanation of variance in the emotion ratings. We want to argue for a different interpretation of these findings. So far, appraisal theorists have implicitly assumed that all of the appraisal criteria are equally important and that they are all equally variable in all situations. These assumptions may be in need of revision. To begin with, the various appraisal criteria or dimensions postulated by the different theorists may be of differential importance, requiring specific weighting with respect to emotion prediction (Scherer, 1997). Thus, the novelty or expectedness dimension seems much less decisive for the nature of the ensuing emotion than goal conduciveness or coping potential. In addition to the appraisal dimensions being of differential importance *globally* (across all situations), this is even more true *locally,* i.e., for specific situations or contexts.

This is particularly true when the range or variability of the assessments on a dimension are constrained by the context. For example, in the situation studied here, luggage loss, it is difficult to attribute the causality other than externally (except in the few cases where one might have checked in much too late, or forgot to close the lid of the suitcase, etc.). In consequence, causal attributions are unlikely to vary over participants, consequently explaining little of the variance. The same is true for the coping ability dimension—it is difficult to see what one can do other than

reporting the loss—again restraining the range of variation of the evaluations on the criterion and thus accounting for little variance. Thus, one should not consider the data of the present study as disappointing since they do not show the *full* profiles that are theoretically expected. Rather, they would seem to suggest that appraisal theorists need to start being concerned with local constraints on the variability of appraisals and their potential effects on emotion elicitation and differentiation.

Another major lesson emanating from the present data set is the importance of differentiation between the occurrence or onset of an emotion and its intensity. Until recently (Sonnemans, & Frijda, 1995), emotion psychologists have rarely focussed on intensity. Most appraisal research has tended to combine onset and intensity by using scales starting (explicitly or implicitly) with 0 and ending with an upper scale value for intensity (as we have done in this study). However, the decomposition of the two aspects performed in the present analysis clearly shows that it may be necessary to postulate different appraisal mechanisms for the elicitation or onset of a specific emotion and for the ensuing intensity. As shown in the present data, for anger the predicted appraisal profile explains only onset, for good humor only intensity. This might be partly linked to the issue of whether the reported emotion is part of the *initial* reaction or is already part of the *regulation or control* reaction (see above). In any case, it would seem that appraisal theory might benefit from both conceptual and empirical attention to the issue of predicting onset vs. intensity.

Most importantly, appraisal theories need to evolve from a state of dealing only with a limited number of "pure" emotions to being able to predict more complex patterns of emotion mixtures or blends. Given that the number of cases in which "pure" emotions are reported as a reaction to a standard naturalistic situation is rather low (see above), the application domain of such theorizing would seem rather limited. In addition, appraisal theory may need to address the issue of regulation (which could lead, as argued above, in part to the reporting of blends) more directly than has been the case to date (see Parkinson, 1996, 1997).

In general, appraisal theory needs to overcome its dependence on a standard research paradigm.[4] In the case of many appraisal theories the standard paradigm consists of requesting the recall of prototypical situations by means of "pure" emotion labels (see introduction). Obviously, this paradigm privileges the recall of emotional events that have elicited a relatively pure emotional experience. A phenomenon-based rather than a paradigm-driven approach (see Scherer, 1992) is likely to correct possible

[4]By paradigm, in this case, we mean a standard research operation or manipulation used consistently in a particular research tradition (the "insufficient justification" paradigm in dissonance research being a famous example).

biases in either the development or the testing of theories. In consequence, it seems highly desirable to study emotion-antecedent appraisal processes increasingly in the context of naturalistic situations.

Emotional Change Following Reappraisal. Only a very modest and preliminary evaluation of the process of emotion was possible in the situation studied here (with the added complication that both the pre- and the post-interaction measures of subjective feeling state had to be obtained in the course of one interview). In spite of these limitations, the results indicate the utility of studying emotional change over time. Studies with better control of the timing of the assessment and measurement of intervening reappraisal processes are likely to provide important insights into the dynamic nature of the appraisal process. Of particular interest is the effect an initial emotional reaction may have on further appraisal and reappraisal. It seems possible that appraisal biases having produced specific emotional states may be consolidated by the nature of the emotional reaction, in the sense that the affect state further encourages biased appraisal (see Keltner, Ellsworth, & Edwards, 1993). An example for such vicious circles is fear produced by event appraisal affected by paranoid thinking which may encourage further unrealistic appraisal. With respect to this possibility, it is interesting to see the perseverance of anger in the participants studied here. The present data also produced some evidence that the emotional change can be attributed to the appraisal of new information, in this case the perceived effcacy of the retrieval service.

In conclusion, the present study has demonstrated the feasibility of studying a rather standardised emotion-eliciting situation in a naturalistic context. The promise of this approach to study emotion-antecedent appraisal in ecologically valid settings seems obvious. As briefly mentioned above, the mere fact of having to adopt an approach directly based on the phenomenon under investigation, rather than relying on a standard research paradigm, widens the perspective for both theorising and research and provides the necessary corrective against the self-insulation tendencies that all theory-driven research is prone to exhibit.

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