

An Investigation of Dimensions of Cognitive Appraisal in Emotion Using the Repertory Grid Technique¹

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Two studies examining dimensions of cognitive appraisals in emotion are reported. In study 1, a simplified version of the repertory grid technique was used to empirically determine dimensions of appraisal perceived as salient by individuals. Subjects were presented with a subset of the possible pairings of appraisal-characterized situation descriptions for each of 23 common emotions, and were asked to indicate attributes on which the compared situations differed. Evidence for at least 10 potential dimensions of cognitive appraisal was obtained, with those related to valence, causality/agency, social relationship aspects, and temporal aspects being mentioned most frequently. Although all dimensions were at least roughly comparable to appraisal dimensions postulated by previous investigators, some of them have only been given marginal attention so far, and several proposed dimensions could not be recovered. Study 2 was performed to validate and further clarify the appraisal dimensions suggested by the first investigation, using a grid with columns prelabeled by items designed to assess these dimensions. Most of the dimensions could be validated; together, they permitted the correct statistical classification of 64% of the individual emotion ratings. The results attest to the usefulness of the

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repertory grid technique in investigations of dimensions of emotional appraisal. The article concludes with a number of suggestions for further research using this method.

The basic tenet of cognitively oriented emotion theorists is that certain kinds of cognitions, often called *cognitive appraisals*, play a crucial role in emotional states (e.g., Arnold, 1970; Averill, 1982; Frijda, 1986; Lazarus, Kanner, & Folkman, 1980; Oatley & Johnson-Laird, 1987; Ortony, Clore, & Collins, 1988; Roseman, 1979; Schachter, 1964; Scherer, 1984; Smith & Ellsworth, 1985; Weiner, 1986). Although these theorists are divided on the issue of the precise nature of the relation between appraisals and emotions, they generally agree (1) that most emotion types are associated with different kinds of appraisals, and (2) that these emotion-specific appraisal types are "composed" out of a limited number of basic features, components, or values on dimensions. Guided by these assumptions, several authors have in recent years attempted to specify the basic dimensions of appraisal (e.g., Frijda, 1986; Kemper, 1978; Ortony, Clore, & Collins, 1988; Roseman, 1979; Scherer, 1984; Smith & Ellsworth, 1985; Solomon, 1976; Weiner, 1986), and a number of investigations aimed at establishing these dimensions by empirical means have been performed. The studies reported in this article are a further attempt in this direction, using a method which, to our knowledge, has not previously been used for this purpose.

The major kind of method used in prior investigations of dimensions of emotional appraisal (see Lazarus & Smith, 1988, and Scherer, 1988, for more differentiated reviews) consisted of examining, mostly within a correlational design, the associations between subjects' appraisals of, and their emotional reactions to, real, remembered, or imagined situations (e.g., Covington & Omelich, 1984; Ellsworth & Smith, 1988; Folkman & Lazarus, 1985; Frijda, 1987; Frijda, Kuipers, & ter Schure, 1989; Graham, Doubleday, & Guarino, 1984; Reisenzein, 1986; Roseman, 1984; Smith and Ellsworth, 1985, 1987; Smolenaars & Schutzelaars, 1986/1987; Weiner, Graham, & Chandler, 1982; Weiner, Russell, & Lerman, 1978, 1979). Although this approach has its undisputable merits, it is subject to a number of limitations. In particular, the logic of the method entails that the potential appraisal dimensions examined in the studies cited were those, and only those, which were regarded as important by the investigators. It is therefore possible (1) that important dimensions of appraisal were overlooked simply because no scales were included to assess them (Smith & Ellsworth, 1985, p. 814); and (2) that the use of predesigned scales resulted in dimensions which are not naturally used by people for the appraisal of emotion-eliciting events. These could either be dimensions which play no role at all in the

process of appraisal, or dimensions which, although related to those actually used by subjects for the appraisal of events, represent them in a biased or "unnatural" way (see also Smith and Medin, 1981).³

To overcome these problems, it is often recommended to have subjects make direct similarity ratings or classifications of the objects (in the present case, e.g., remembered emotion-eliciting events), which are then subjected to multidimensional scaling analysis (see, e.g., Dixon, 1982; Gigerenzer, 1981). While this method gives subjects the freedom to use any dimension they wish in the rating task, it has its own significant drawbacks. The subjects may base their similarity judgments on only the most salient dimensions and may use inconsistent criteria to judge different pairs of objects; moreover, the obtained dimensions are frequently difficult to interpret (cf. Smith & Ellsworth, 1985). Furthermore, they again do not necessarily represent the subjects' cognitive constructs in a natural way.

It would therefore be desirable to have at one's disposal a method which elicits the important, naturally used dimensions of appraisal in an unconstrained way, but is at the same time sensitive to subtler distinctions as well as readily interpretable. One method which has been developed with precisely these purposes in mind and which has been used with some success in other areas is the repertory grid technique originally proposed by Kelly (1955). In study 1 of this article, a simplified version of this method was used to examine (a) whether subjects use dimensions of appraisal which have hitherto been overlooked and (b) whether the dimensions proposed by previous investigators are indeed naturally used. In study 2, we attempted to both validate and further clarify the appraisal dimensions suggested by the first investigation, using a modified grid with columns pre-labeled by items designed to assess these dimensions.

³Apparently important dimensions may even emerge if the rating scales are not directly applicable to the given object domain at all. Smith and Ellsworth (1985) regard this as impossible, since such scales "will produce unsystematic ratings, and thus can not 'create' a nonexistent dimension" (pp. 814-815). However, it is well known that motivated subjects will try to answer in a meaningful way nearly any scale they are presented with, even if doing so necessitates highly metaphorical interpretations (cf., e.g., Osgood's semantic differential scales; see also Hörmann's [1981] discussion of the phenomenon of "sense constancy"). Any literal interpretation of such ratings is therefore apt to be misleading.

It is also worth recalling that the statistical methods frequently used to analyze the data from the rating studies (in particular, exploratory factor analysis and multidimensional scaling) presuppose additional, rarely checked, and often unrealistic assumptions, which can result in biased and unnatural representations of the subjects' cognitive constructs (see, e.g., Armstrong, 1967; Gigerenzer, 1981; Smith & Medin, 1981).

STUDY 1

Method

Subjects

Twenty-two subjects, half of them female, participated in the study. All subjects were students at the Free University Berlin who responded to posted advertisements in which volunteers for an unspecified “psychological experiment” were sought. The subjects were paid DM 15 for participation.

Procedure

Grid Technique. A modified version of Kelly’s (1955) grid technique was used (see also, Adams-Webber, 1979; Fransella & Bannister, 1977). The subjects were presented with a large sheet of paper divided into 24 rows and 17 columns. Lines 2 to 24 of column 1 contained descriptions of 23 emotion-eliciting events, one for each of the 23 emotions. The remaining 16 columns were left empty except that, in each one, two rows were marked by a circle. The subjects were asked to begin by considering the two situations marked in column 2 and to indicate a pair of concepts (henceforth referred to as an *attribute*) denoting opposed features or qualities with regard to which the two situations differed. It was pointed out to them that in addition to graded antonyms (e.g., positive–negative) and complementary concepts (e.g., event caused by others–event caused by self) (cf. Lehrer, 1974; Lyons, 1977), word pairs denoting simply the presence versus absence of a quality (e.g., concerns me–does not concern me) could also be used. Once an attribute had been determined, it was to be written in the topmost line of the current column and its values were to be marked by a + and a –, respectively. Next, the two compared situations were also marked by a + and a – in their corresponding rows, denoting, respectively, the positive vs. negative value of the attribute. Subsequently, the subjects were to consider the remaining 21 situations, indicating for each one whether the positive attribute value was present (+) or the negative one was present (–), or whether the attribute was not applicable to the situation (indicated by a blank). The latter option was included because of the possibility that some of the concepts mentioned would have a restricted range of applicability. For example, the attribute *positive versus negative interpersonal relationship* is obviously not applicable (except perhaps in a metaphorical sense) if the situation involves no interaction between the story protagonist and another person. After the subjects had completed

the ratings for the first column, they were to repeat the procedure for the second one, in which a new pair of situations was contrasted and for which a new attribute was to be found, and so on until the allotted time of 1 h was used up or the subjects could not think of any further discriminating attributes. For those subjects who produced more than 16 attributes within the allotted time, a second grid sheet with an additional 16 comparisons had been prepared. The comparisons that were used had been selected (separately for each subject) at random from the 253 possible nonredundant pairwise comparisons between the 23 emotional scenarios, with the restriction that each of the situations was to appear at least once in a comparison. The whole procedure was illustrated to the subjects by an example from a different object domain (physical objects).

Apart from the fact that situations rather than persons (roles) were compared, the present procedure differed from Kelly's (1955) original grid technique in that pairs rather than triads of situations had to be considered at a time; qualitative as well as gradably antonymous concept pairs were explicitly permitted; and the option *not applicable* was included.

Emotions and Scenarios. The scenarios were selected from among the best-discriminated third of a total of 460 (20 for each of 23 common affects) which had been obtained in a previous study (Reisenzein Hofmann, 1990). In this study, 27 subjects were individually interviewed for episodes in which they had experienced one of 23 common emotions as the dominant affect. Each interview was designed to elicit the participant's subjective appraisals of the situation, rather than mere "objective" descriptions of what had happened. The following emotion categories were included (the original German terms are listed in parentheses): *anger/rage* (Ärger/Wut), *anxiety/fear* (Angst/Furcht), *contempt* (Verachtung), *disappointment* (Enttäuschung), *discontentment/dissatisfaction with self* (Unzufriedenheit mit mir selbst), *disgust/revulsion* (Ekel/Abscheu), *embarrassment* (Verlegenheit), *envy* (Neid), *gratitude* (Dankbarkeit), *guilt* (Schuld), *hope* (Hoffnung), *hopelessness/resignation* (Hoffnungslosigkeit/Resignation), *jealousy* (Eifersucht), *joy/happiness* (Freude), *loneliness* (Einsamkeit), *love* (Liebe), *pity/sympathy* (Mitleid/Mitgefühl), *pride* (Stolz), *relief* (Erleichterung), *remorse/regret* (Reue), *sadness/sorrow* (Traurigkeit), and *surprise* (Überraschung). The subjects' reports were condensed into short stories. Information other than about eliciting events (as appraised by the subjects) – e.g., emotion terms and metaphors, reported physiological symptoms, expressive or instrumental reactions, or responses from social partners – was eliminated from the stories. An example of an emotion scenario follows:

[*Regret/remorse*]: I reproach a colleague of my living community in harsh words for not having washed the dishes. Later I realize that it was not his turn to wash the

Table I. Classification of Attributes, Study 1

	Number
1. <i>Focus of the eliciting event</i>	
I am concerned–somebody else is concerned	2
Concerns me–doesn't concern me	2
My–other's predicament	3
2. <i>Importance of event</i>	
Important–unimportant event	3
Existential event–no existential event	2
I am indifferent–not indifferent	4
Affected–distanced	4
Superficial–deep feeling	3
Has important effects–no important effects	1
Reparable–irreparable	1
Hard to digest–easy to digest	1
3. <i>Valence of eliciting event</i>	
Positive–negative situation/event	6
Good luck–bad luck	2
Gain–loss	6
I get/find something–I lose something	3
Success–failure	5
Up–down	3
Construction–destruction	2
Problem solution–no solution	3
Expected positive–negative event	2
Positive/negative event in a specific domain (job, close relationship)	3
Positive/negative event caused by other	2
Satisfied–dissatisfied	4
Positive–negative feeling	7
Positive–negative feeling directed at self	2
Strain–alleviation of strain	1
Desired–undesired difficult situation	1
Negative–neutral	3
4. <i>Temporal aspects of the eliciting event</i>	
Future event–present or past event	2
Positive/negative future event–present/past	5
Positive/negative event present–past	4
State–change of state	3
Beginning–end (of event/relationship)	7
Unique–lasting situation	7
5. <i>Expectedness, familiarity</i>	
Expected–unexpected	4
Usual–unusual	2
Familiar–unfamiliar	3
Unambiguous–ambiguous situation	2
Old–new situation/emotion/relation	6
6. <i>Perceived control over a situation</i>	
Diverse (e.g., changeable–not changeable, in my power–not in my power; helpless–self-assured)	10

Table 1. Continued

	Number
7. <i>Causality, agency, intentionality</i>	
Emotion or event caused by others–by self	8
Positive emotion/event caused by others–by self	7
Negative emotion/event caused by others–by self	7
More complex antonyms (e.g., somebody else harms me–I harm myself; I hurt others–others hurt me; others benefit me–I hurt myself; others are successful–I fail)	11
Intentional–unintentional	2
Willed–not willed	3
8. <i>Responsibility, blame, moral evaluations</i>	
I am guilty–not guilty	5
My own fault–other's fault	7
I am responsible–not responsible	2
Both responsible–one only responsible	1
Right, proper, just–wrong, improper, unjust	3
9. <i>Activity–passivity</i>	
Activity–passivity	3
Own initiative–no own initiative	5
Attempt to solve problem–no attempt	4
10. <i>Social relationship aspects</i>	
Alone–group	8
Abandoned–sheltered	2
Closeness–distance to other	6
Openness–reserve	5
Positive–negative relationship	5
Trust–no trust	6
Understanding from other–no understanding	3
Understanding–no understanding for other	2
11. <i>Direction of emotion</i>	
Directed at self–at other	2
Joy/anger/discontentment directed at self–at other	4
12. <i>Motivational tendencies</i>	
Diverse (e.g., want to be alone; want to escape; want to impress others; want to help)	8
13. <i>Specific situations</i>	
Job–private	3
Specific positive or negative situations (e.g., positive relationship event– positive job event; loss versus rejection; physical versus psychological harm)	7
Material gain–human gain/loss	3
14. <i>Real–unreal</i>	
Real–irreal	3
Fantastic–possible	3
Childhood–adulthood	3
Reality–wishful thinking	1
Sum	278

dishes this day and that he had the least time of all to do so, and I wish that I had not offended him.

Results by Reisenzein and Hofmann (1990) document that the scenarios used in the present study can be regarded as adequate typical (subjective) eliciting events for the different emotions. Forty-seven subjects were presented with the 460 descriptions together with a list of the 23 emotion names, and were asked to indicate the emotion most likely experienced by the story protagonist. Mean recognition accuracy for all 460 stories was 65% (64% if corrected for chance), and 84% (83%) for the stories included in the present study.

Results

The 22 subjects produced a total of 367 attributes to describe perceived differences between the compared situations ($M = 16.7$; $SD = 3.3$). Of these, 34 were pairs of labels for specific emotions and were discarded. Nine more referred to “positive versus negative feelings”; these were retained since they were considered as being but alternative ways of expressing one’s general personal evaluation of the situation (cf. Smith & Ellsworth, 1985; Traxel & Heide, 1961). The remaining 333 attributes were classified by the authors into categories according to the following procedure. In a first step, attributes were grouped together if their labels were literally the same or differed only with regard to word form (e.g., adjective versus noun). Subsequently, these categories (many of which contained only a single attribute) were grouped into larger ones according to semantic similarity. The kind and number of the superordinate categories were suggested by both the data and a consideration of the appraisal dimensions which have been proposed by various cognitive emotion theorists. Fifty-five (17%) of the 333 attributes could not be classified into larger categories, either because they were idiosyncratic or because their meanings remained unclear. The remaining 278 fell into one of the 14 categories shown in Table I.⁴ The proposed classification is of course not the only possible one. In particular, some of the categories could be further subdivided, especially the causality/agency/intentionality, responsibility/blame/moral evaluation, temporal aspects, and social relationship aspects categories; and some of the attributes could be differently grouped. For example, several theorists

⁴For purposes of reliability estimation, the 367 attributes were reclassified by a student familiar with our research into the 16 categories (the 14 of Table I plus the “emotion name” and “unclassifiable” categories). The chance-corrected proportion of agreement between the two codings, as expressed by Cohen’s (1960) kappa, was .79. Low agreements occurred only for the categories *specific situations* (.52) and *unclassifiable* (.63) and were due to the fact that the student classified fewer attributes into these categories than did the authors.

Table II. Summary of Attribute Classification, Study 1

Category	Number of concepts	% Responses	% Responses from different subjects	Comparable dimensions proposed by ^a
1. Focus of the eliciting event	7	2.5	100	(K) W (F) O
2. Importance of event	19	6.8	63	(R) W (SC) SE F (O)
3. Valence of eliciting event	55	19.8	38	K R W (SC) SE F O
4. Temporal aspects of event	28	10.1	57	(K) SC SC F F O
5. Expectedness, familiarity	17	6.1	71	SC (SE) F O
6. Perceived control	10	3.6	70	(W) SC (SE) F
7. Causality, agency, intentionality	38	13.7	37	W SC SE F O
8. Responsibility, blame, moral evaluation	18	6.5	61	(R) (W) (SC) SE F O
9. Activity-passivity	12	4.3	75	(SE)
10. Social relationship aspects	37	13.3	43	S K (O)
(11. Direction of emotion)	6	2.2	67	
(12. Motivational tendencies)	8	2.9	75	(R) F
(13. Specific situations)	13	4.7	54	
(14. Real-unreal)	10	3.6	70	
Sum	278	100.0		
Average			63	

^aS = Solomon (1976); K = Kemper (1978); R = Roseman (1979, 1984); W = Weiner (1982, 1986; see also Brown & Weiner, 1984); SC = Scherer (1984, 1988); SE = Smith & Ellsworth (1985, 1987); F = Frijda (1986; 1987; Frijda et al., 1989); O = Ortony, Clore, & Collins (1988; see also Ortony, 1988). Initials in parentheses indicate that the assignment of an author to a category is tentative.

subsume responsibility under causality/agency and propose moral judgments (e.g., of fairness, legitimacy, or deservedness) as a separate category. (We grouped responsibility differently because, although related to causality/agency, the concept is semantically distinct and involves notions of accountability and blame [see e.g., McGraw, 1987]). In addition, the classification of a few attributes is not unique since they involved the simultaneous contrast of more than one basic feature (e.g., others are successful—I fail). Readers who feel dissatisfied with aspects of the proposed classification may wish to concentrate on the subordinate categories listed in Table I, which are literal or close to literal recordings of the attributes named by the subjects, and decide for themselves which appraisal dimension, if any, they might be taken to reflect. We believe, however, that the main conclusions that can be drawn from the data are not much affected by different meaningful groupings of the attributes.

The results for the main categories are further summarized in Table II. Four of the categories can be discarded as candidates for basic dimensions of emotional appraisal (these are shown in parentheses in column 1 of Table II): the real-unreal distinction (3.6% of the 278 classifiable attributes), because it was most likely due to the peculiarities of one scenario (anxiety) describing a childhood experience (fear of ghosts); the specific situations category (4.7%) because it distinguishes situations on a very concrete level; the motivational tendencies category (2.9%), because it refers to motivational tendencies arising from appraisals rather than to appraisals themselves; and the direction of emotion category (2.2%), because it also reflects a natural consequence of appraisals. This leaves 10 potential dimensions of appraisal. As can be seen from Table II (columns 2 and 3), the most frequently mentioned ones were, in this order, valence (or evaluation), causality/agency, social relationship aspects, and temporal aspects of the eliciting event; these were followed by importance of the eliciting event, responsibility/blame/moral evaluation, expectedness/familiarity, activity-passivity, perceived control, and focus of the eliciting event.

The data reported in column 4 of Table II show that on average, only 63% of the attributes within each category were obtained from different subjects. However, this does not mean that, if a subject contributed more than one attribute to a category, these contributions were completely redundant. Rather, closer inspection of these attributes shows that they typically either expressed different subtypes of the basic appraisal dimensions (e.g., positive-negative, success-failure, loss-gain) or else resulted from a combination of two or more basic attributes (see e.g., the *complex antonyms* listed in the causality/agency category of Table II). The relative lack of redundancy of the attributes provided by each subject is also reflected in the rating data. We computed, separately for each subject, the

nominal scale association statistic lambda (symmetric) (see Hays, 1973) among the attributes provided by the subject. For most subjects, the distribution of the lambda coefficients was extremely right-skewed, that is, there were many low but very few high coefficients (the average lambda score ranged from .08 to .41 for different subjects with $M = .20$ and $SD = .09$). It is therefore evident that the subjects' ratings were fairly non-redundant, reinforcing the conclusion suggested by the labeling data.⁵

Discussion

A comparison of the obtained categories with the appraisal dimensions postulated by various cognitive emotion theorists is contained in Table II, columns 1 versus columns 5–12. It must be stressed that this comparison is only approximate because similarly named dimensions differ somewhat between various theorists and vice versa, and because some dimensions are not very precisely defined to begin with. Keeping this reservation in mind, it may be said that all of the categories suggested by this study are at least roughly comparable to one or more of the appraisal dimensions postulated by at least one of the theorists considered. The best agreement among authors exists concerning *valence*, *causality/agency*, and *responsibility/blame/moral evaluation*; to a lesser degree, agreement is also present concerning *importance*, *expectedness/familiarity*, and *perceived control*. Four of the authors cited have at least implicitly proposed *focus of the eliciting event* as a further dimension of appraisal, but empirical evidence for this dimension is so far scarce (cf. Frijda et al., 1989, study 2). *Temporal aspects* of the eliciting event, which were frequently mentioned by our subjects, have been proposed as separate appraisal dimensions by only three of the theorists listed in Table II; and these stress primarily the presence–future distinction. Other theorists subsume the latter dimension under, or even replace it by, an expectancy, probability, or certainty dimension (e.g., Roseman, 1979; see also Pekrun, 1984; Price, Barrell, & Barrell, 1985; Reizenzein, 1985), for which there was little direct evidence in the present data (it may however be said that it is indirectly reflected in the ex-

⁵An attempt was also made to recover the categories suggested by the analysis of the verbal data from the ratings. Lambda coefficients were computed among all 278 classifiable attributes, and the resultant association matrix was subjected to a hierarchical cluster analysis using the average linkage algorithm (Wishart, 1978). Although local clusters of semantically similar concepts were obtained, the overall clustering solution was not interpretable. However, this negative result was hardly surprising: (a) Many attributes listed in the same category were combinations of more basic features; therefore, high statistical association between the attributes within the same category cannot generally be expected; (b) some of the categories are heterogeneous; and (c) the subjects made rather different use of the option to rate an attribute as *not applicable* to a particular pair of situations; this response option accounted from 2.6 to 58% of the total responses of different subjects ($M = 28$, $SD = 16$).

pectedness/familiarity category). As to the *activity-passivity* distinction, its status is somewhat dubious. At first, we thought that it might refer to the subjects' reflections concerning the effort needed to deal with the emotion-eliciting event or its consequences and could therefore be identified with Smith and Ellsworth's (1985, 1987) anticipated effort dimension. A reexamination of the ratings of the emotion scenarios on the attributes subsumed under this category suggested, however, that they referred to the person's active involvement versus passivity in the events *leading up to the emotion*. Inasmuch as action implies causality and intentionality, this attribute could therefore perhaps also be subsumed under the causality-agency rubric. Finally, attributes broadly classifiable as descriptive of the *relationship to social partners* were prominent in this study. Again, such characteristics have been explicitly postulated as potential appraisal dimensions by only a few of the authors considered in Table II (in particular Solomon, 1976, and Kemper, 1978; but see also Mees, 1985 and, from a motivational perspective, De Rivera, 1977). It seemed possible at first that these attributes were used by our subjects to denote dispositional attitudes toward the social partners involved in an emotion-eliciting episode which already existed before the occurrence of that episode; if so, they should not be regarded as components of occurrent appraisals, but of their cognitive-evaluative antecedents. However, an examination of the scenario ratings on the attributes subsumed in this category suggested that they reflected for the most part occurrent cognitive-evaluative reactions to other people involved in the emotion-eliciting events.

As concerns the further dimensions of appraisal proposed by the cognitive emotion theorists considered here, they either could not be recovered at all or the evidence for them was only marginal. These include goal-path obstacle (Smith & Ellsworth, 1985); anticipated effort (Smith & Ellsworth, 1985; 1987; Frijda et al., 1989); focality-globality, interestingness, and self-esteem (Frijda, 1986; 1987; Frijda et al., 1989); impact and accessibility (Frijda, 1987); task difficulty (Smith & Ellsworth, 1987); certainty (Frijda, 1986; Roseman, 1979; Smith and Ellsworth, 1985; but recall the above comment) and attentional activity (Smith & Ellsworth, 1985, 1987). The last-mentioned dimension is however most likely not a dimension of *appraisal* at all, as observed by Smith himself (Lazarus & Smith, 1988; see also Frijda et al., 1989). The lack of evidence for the dimensions just mentioned is particularly noteworthy because some empirical evidence for them has been reported in at least one prior study. No evidence was also found for further dimensions proposed by Frijda (1986) and Solomon (1976). As the reader may verify for him or herself, these conclusions are hardly dependent on our particular grouping of the attributes; there is no better evidence for these dimensions on the individual item level (cf. Table I).

However, these findings must be interpreted with care. Some of these dimensions (in particular, focality–globality, interestingness, and impact) may simply not have emerged because emotions for which they are believed to be particularly relevant were not included in the present study. It is also possible, as one reviewer of this article suggested, that the use of only one scenario for each emotion may have prevented these dimensions from emerging (although it should be recalled that we used prototypical examples). More generally, it could be argued that these further dimensions are not very salient to subjects and that the grid technique is not well suited to elicit such low-salience dimensions, and/or that some appraisals are not consciously accessible to subjects at all (but note that the latter kind of appraisals should not be accessible to *any* kind of method that relies on self-reports). More definitive answers to these issues will have to await the results of further research.

Keeping these reservations in mind, the results of the present study can be summed up as follows. On the one hand, they confirm previous theorizing and research by demonstrating that several of the postulated dimensions of appraisal are also spontaneously mentioned as salient characteristics of emotion-eliciting events by adult subjects. On the other hand, the results lend some credit to our suspicion, voiced in the introduction, that prior research on cognitive appraisals in emotion may have committed errors of both omission and commission: (1) Evidence was obtained for the potential relevance of additional dimensions of appraisal, which so far have only received marginal attention (in particular, focus of event, social relationship aspects, and perhaps also further temporal aspects [beginning–ending], as well as activity–passivity); and (2) several further dimensions proposed by various theorists were not supported.

STUDY 2

To validate the appraisal dimensions suggested by the results of study 1 as well as to clarify their nature and interrelation, a second study was performed. The participants of this study were again presented with a grid sheet, but otherwise than in the first investigation, the grid columns were prelabeled by items designed to assess the appraisal dimensions suggested by study 1. Also in contrast to study 1, the participants were not asked to judge concrete emotion-eliciting situations, but to indicate how they *generally* appraised the eliciting state of affairs when experiencing a particular emotion (cf. Frijda, 1987). This instruction was used because it should, ideally, urge subjects to consider what is common to the situations conducive to a particular emotion; this way, the checking of features

idiosyncratic to specific situations may be avoided and, as a result, clearer associations between emotions and patterns of appraisal might be obtained.

Study 2 also introduced a methodological innovation aimed at overcoming a perceived weakness of prior empirical investigations of a comparable kind (e.g., Frijda 1987; Frijda et al. 1989; Smith & Ellsworth, 1985, 1987), namely, that the *objects* of emotional appraisals (that which is appraised as positive, important, controllable, etc.) were not very precisely specified to the subjects. That is, typically the subjects were asked to indicate their appraisals of the total “emotional situation.” However, most emotion-eliciting situations are complex, that is, they have a number of different aspects, which may become the objects of different appraisals and may thereby lead to different emotions (see e.g., Folkman & Lazarus, 1985; Reisenzein & Hofmann, 1990; Schwartz & Weinberger, 1980; Smith & Ellsworth, 1987). Asking subjects to judge the total “emotional situation” can therefore result in their checking of appraisal components which are irrelevant to the target emotion, although perhaps relevant to a different one. As Frijda et al. (1989, p. 225) note, the resulting “mixtures” of appraisal judgments are likely to blur the associations between particular emotions and patterns of appraisal. Hence, it would be desirable to identify more precisely the objects of the appraisals relevant to a given emotion prior to the judgment task.

This goal can be achieved in different ways. If the structure of the situation to be appraised is known in advance to the investigator, the appraisal items can be formulated at the outset such that they refer to the relevant aspect of the situation (e.g., “How responsible is the person *for his present state of need?*” [Reisenzein, 1986]). However, if the structure of the situation is not known in advance, such as when specific remembered events or, as in the present study, those generally conducive to a particular emotion are to be judged, a different method is needed. Our approach to this problem was guided two simple ideas, namely: (1) Emotions are usually themselves object-directed or representational mental states (e.g., if one is angry, one is typically angry *about* something; cf. Brentano, 1874/1955; Gordon, 1974; Searle, 1983); and (2) this something – the object of the emotion – is either (a) identical with the object of the appraisals associated with that emotion, or (b) is at least closely related to the appraisal object. Hence, by specifying the object of an emotion, it is possible to specify the object of the appraisals associated with that emotion. For more details the reader is referred to the Method section below.

Method

Subjects

Twenty-two volunteer subjects, 10 of them male, from the same population as in study 1 participated.

Procedure

Specification of Appraisal Objects. We assume that the object of the majority of the emotions included in the present study is most naturally viewed as a state of affairs, which is identical with the object of most appraisals associated with that emotion (cf. Gordon, 1974). Therefore, for these emotions, the first column of the grid sheet contained a statement of the form *If I [am/feel] [emotion term] [preposition] something (X) . . .* (e.g., *if I feel proud of something [X] . . .*; *if I am happy about something [X] . . .*). The remaining columns of the grid were labeled by possible completions of these statements designed to assess the different appraisal dimensions. Most of these items were formulated such that they referred to the state of affairs X (e.g., *. . . then X is something important–unimportant to me*; see below for more detail). An exception was made only for the items used to assess the quality of interpersonal relationship, which referred directly to the social partner (e.g., *. . . then I feel close to–distant from the other person*).

The appraisal objects for the emotions contempt, envy, gratitude, jealousy, love, and pity were specified in a slightly different way, because the objects of these emotions are more naturally construed as persons rather than as states of affairs, whereas, as mentioned, most cognitive appraisals require states of affairs as objects. However, these emotions are usually elicited by a state of affairs which *involves* the object of the emotion (the other person), and which constitutes the object of these “propositional” appraisals. Therefore, the items for these emotions were formulated as follows: *If I feel contempt for [am envious of/jealous of/grateful to/love/feel pity for] somebody because of something (X) . . .*

Appraisal Variables. Similar to the format used in study 1, the appraisal dimensions were assessed by nominal scales. Each scale had four categories which covered, respectively, the following possibilities: (a) The appraisal component is present for the emotion in question (e.g., X is important, X is positive); (b) the appraisal component is absent or its opposite present (e.g., X is unimportant, X is negative); (c) both are possible

depending on the concrete situation; and (d) the attribute is irrelevant or not applicable to the situations typically conducive to the emotion.

In all, 19 items were constructed to cover the categories listed in Table I and II. More than one item was constructed for several of the categories because, as mentioned, some of them appeared heterogeneous and because we wanted to give special consideration to potential “new” and/or somewhat unclear dimensions suggested by study 1. Two items were constructed for the temporal aspects category (*X is something present–future* and *X is beginning–ending*); two for the expectedness/familiarity category (*X is something I expected–something I did not expect* and *X is known/familiar–unknown/novel to me*); two for the causality/agency/intentionality category (*X was caused by me–by somebody or something else* and *I had wanted X to happen–I had not wanted X to happen*); two for the responsibility/blame/moral evaluation category (*I–somebody or something else can be held responsible for X* and *X is morally good/just–morally bad/unjust*); and six for the social relationship aspects category. The first of the latter items asked for whether *X involves versus does not involve another person/other people*, whereas the remaining items asked for the perceived quality of the relationship to the social partners (if such were involved) which existed once the event had occurred (*there is a positive–negative relationship to other[s]*; *I am together with–separated from other[s]*; *I feel close to–distant from other[s]*; *I am open to–inaccessible to other[s]*; and *I trust–don’t trust others[s]*). The remaining appraisal categories were assessed by the following items: *I–somebody else is primarily affected by X* (focus), *X is important–unimportant to me* (importance); *X is desirable/positive–undesirable/negative* (valence); *X can–cannot be changed or controlled by me* (control); *X was caused by me–by somebody or something else* (causality); *I tried–did not to try to bring about or prevent X* (activity).

The grid sheet was handed out to the subjects together with a separate sheet containing detailed instructions. The subjects were asked to complete the grid within 1 week, answering only 3–4 columns or rows per day.

Results

Structure of Appraisal Variables

To clarify the structure of the appraisal variables, lambda coefficients were computed between all pairwise combinations of the 19 nominal scales, and the resulting matrix of association coefficients was subjected to a hierarchical cluster analysis using the average linkage algorithm (Wishart, 1978). (In these, as in all further analyses, the response options [c] and [d]

Table III. Statistical Classification of Emotions, Study 2

	% Correctly classified emotions	% Correctly classified, Reisenzein & Hofmann, 1990 (study 1)	% Correctly classified, Frijda et al., 1989 (study 2)
Anger/rage	59	74	37 (Rage)
Anxiety/fear	64	77	33 (Anxiety)
Contempt	82	51	47
Disappointment	64	71	33
Discontentment/dissatisfaction with self	50	62	— ^a
Disgust/revulsion	45	88	10 (Disgust)
Embarrassment	41	55	—
Envy	91	68	—
Gratitude	77	77	—
Guilt	50	55	70
Hope	82	85	40
Hopelessness/resignation	64	59	—
Jealousy	41	62	47
Joy/happiness	77	69	50 (Joy)
Loneliness	41	76	—
Love	50	52	83
Pity/sympathy	86	79	—
Pride	91	77	43
Relief	64	81	53
Remorse/regret	59	32	53 (Regret)
Sadness/sorrow	64	58	53 (Sorrow)
Shame	23	40	37
Surprise	96	51	67
Mean	63.5	65.2	47.3
SD	19.3	14.5	17.1

^aNote: Emotions not studied by Frijda et al. (1989).

of each variable were combined into a single category because [d] was rarely used.) Similar to the results obtained in study 1 for individual subjects, the distribution of the lambda scores was extremely right-skewed, indicating that the variables were fairly independent of one another ($M = .04$, $SD = .11$). This was confirmed by the results of the cluster analysis. There were only three clusters containing appreciably associated variables. The first cluster combined the causality and the responsibility items ($\lambda = .55$); the second cluster incorporated, unexpectedly, all five items designed to assess the quality of interpersonal relationship (*positive-negative relationship*, *together-separated*, *close-distant*, *open-inaccessible*, and *trust-no trust*; mean interitem association = $.39$); and the third cluster joined, also unex-

pectedly, the valence item with the item designed to assess intentionality (*I had wanted X to happen—I had not wanted X to happen*; $\lambda = .32$). Probably the wording of the latter item was not suited to distinguish it clearly from the valence item. For purposes of a more parsimonious description of the results, it was decided to retain the 13-cluster solution containing the clusters focus, importance, valence, presence–future, beginning–ending, expectedness, familiarity, causality–responsibility, moral judgment, activity, other-involvement, and positive versus negative quality of relationship.

Prediction of Emotions

To examine how well the appraisal variables differentiated between the emotions, the 19 nominal-scale variables were first transformed into two binary dummy variables each, and the resulting 38 variables were then entered as predictors in a discriminant analysis, with the 23-category nominal scale formed by the emotion categories serving as the criterion (note that the discriminant procedure takes automatically care of the interdependencies among the variables). The percentage of the 22 cases per emotion category which were correctly classified by the discriminant procedure are listed in Table III, column 2. On average, 63.5% of the emotions were correctly classified ($SD = 19.3$), with accuracy ranging from a low of 23% (shame) to a high of 96% (surprise). The corresponding chance-corrected kappa values (Cohen, 1960) are only negligibly lower ($M = .62$, $SD = .20$, $min = .20$, $max = .96$). For comparison purposes, column 3 of Table III lists the percentage of appraisal-characterized emotion scenarios which were correctly classified by subjects in the investigation by Reisenzein and Hofmann (1990, study 1). These data may be regarded as a baseline of discrimination against which the adequacy of the appraisal model can be judged. As can be seen, the average accuracy of classification obtained in the present study is only slightly below that baseline. Furthermore, cases which were misclassified by the discriminant procedure were typically closely located to the centroid of the correct emotion category. If all misclassifications which were second closest to the centroid of the correct group are also counted as correctly classified, then average classification accuracy increases to 82%.

Essentially the same results were obtained when a stepwise discriminant analysis was used (62% correctly classified; kappa = .60). Thirty-two of the 38 dummy variables were retained in this analysis, among them at least one member of each of the binary variable pairs which rep-

resented the original variables in the analysis. This indicates that all of the appraisal variables provided an independent, significant contribution to emotion prediction. All of the 19 original variables also discriminated significantly between the emotions when considered separately. The order of predictive capacity, as indexed by asymmetric lambda (with the 23-category emotions variable serving as the criterion), was roughly as follows: valence, causality–responsibility, presence–future, focus, relationship quality, expectedness, familiarity, control, other-involvement, activity, moral evaluation, importance, beginning–ending.

Emotion-Specific Appraisal Patterns

The appraisal patterns characterizing the emotions were in general plausible and, as far as overlap in emotions and appraisal dimensions exists, similar to those reported in previous investigations (e.g., Frijda et al., 1989). For example, according to the subjects' opinion, if one is *proud of something* (X), then X is something positive or desirable (100% of the subjects), for which oneself can be held responsible (86%); furthermore, X is frequently an important (68%) and present (63%) state of affairs which concerns primarily oneself (59%), which is modifiable (59%), which one has attempted to obtain or to prevent (50%), which is familiar (41%), and which is morally right/just (36%). If one feels *gratitude toward someone because of something* (X), then X is a positive/desirable state of affairs (100%) for which somebody or something else can be held responsible (82%); frequently, X is in addition important (59%), one likes the other person involved (50%), and X is present (46%).

Discussion

Replicating results of prior studies, we found that valence, causality–responsibility, time of event (presence–future), importance, expectedness, familiarity, perceived control, and moral evaluation are relatively independent attributes which contribute significantly and independently to emotion differentiation. The same was also found to hold for five further attributes: *focus of the event*, *beginning–ending*, *activity–passivity* (with regard to the event leading up to the emotion), *other-involvement*, and *quality of interpersonal relationship*. All of these attributes can, in addition, be plausibly regarded as cognitive–evaluative dimensions (rather than as, e.g., motivational tendencies) which reflect perceived characteristics of the eliciting state of affairs, and there is empirical evidence (from study 1) for believing

that they are spontaneously used by subjects to differentiate emotion-eliciting situations.

Although all of these 13 candidates for dimensions of appraisal deserve further critical discussion, space restrictions force us to concentrate on those which were specifically suggested by the present investigation. Of these, we feel most certain about the relevance of focus and relationship quality. *Focus*, which contrasts emotions such as pity and remorse (which are typically elicited by a state of affairs that concerns primarily others) with emotions such as anxiety, discontent, and embarrassment (which are typically elicited by a state of affairs that concerns primarily oneself), has been proposed, at least implicitly, by several theorists (cf. Table II), and is intuitively plausible; that is, it is reasonable to think that it should make an important difference to one's emotions whether an event is believed to affect primarily oneself or other people (or, more generally, other objects). Focus might be regarded as representing an analogue, on the effects side, to the important causality/agency/responsibility dimension. Just as we inquire into the origins of an event, asking whether we or somebody/something else has caused it (and can therefore, typically, be held responsible for it), so we inquire into the effects of an event, asking whether it affects primarily us or someone/something else.

Concerning the attributes subsumed under *relationship quality*, they may be interpreted as reflecting primarily, although certainly not exclusively, an occurrent *positive or negative evaluation of a person* or an occurrent *liking* versus *dislike* of another person crucially involved in an emotion-eliciting event, to be distinguished from the evaluation of the event itself. This dimension was found to be of particular importance to those emotions which, as noted earlier, seem to have people rather than states of affairs as objects: Gratitude, love, and pity are typically characterized by liking for the other person (see also Weiner [1980] for corresponding data concerning pity), whereas jealousy, envy, and contempt are typically characterized by dislike. In addition, liking for the other frequently also occurs in joy, and dislike in anger (if another person is involved in the eliciting event). Hence, many emotions seem to typically involve two evaluations having different objects: (a) the evaluation of an eliciting state of affairs in which another agent is crucially involved (e.g., by having caused that state of affairs or by being primarily affected by it), and (b) probably as a consequence of this initial evaluation, a second evaluation of the other person as a whole, or at least as (dis)likable in a certain respect. This suggests that, with regard to objects, one should distinguish between at least two types of evaluations relevant to emotions: evaluations of states of affairs (which subsume as special cases actions by others), and evaluations of objects, in particular of

persons.⁶ (For related, although not quite identical proposals, see Mees, 1985, and Ortony et al., 1988).

Concerning the remaining candidates for additional appraisal dimensions, we are much less certain. The *beginning–ending* dimension was found to contrast surprise (beginning) with relief, guilt, and remorse/regret (ending); but even for these emotions, from 50 to 60% of the subjects thought that the dimension was irrelevant. A similar variable (onset versus offset or withdrawal of a stimulus) has been proposed as being important to emotions by behavioristic emotion theorists (e.g., Millenson, 1967; Mowrer, 1960; see Baltes & Reizenzein, 1985, for a review). *Activity–passivity* contrasted guilt, discontentment, and pride (activity) with disgust and surprise (passivity), but again, with the exception of surprise, from 50 to 60% of the subjects regarded this dimension as irrelevant to even these emotions. Activity–passivity seems to differentiate between emotions which frequently have one's own actions as objects and those which more typically don't; as mentioned, it may perhaps be regarded as being equivalent to intentionality (Weiner, 1986). We suspect that these two attributes represent relatively common, but by no means central or even essential, components of the cognitive appraisals associated with the mentioned emotions.

Finally, concerning the attribute *other-involvement*, although it was rather consistently used to characterize jealousy, contempt, envy, and pity, it may be questioned whether it should at all be regarded as a dimension of appraisal. This, at least, is suggested if we accept a further requirement which, we believe, a proposed dimension should fulfil to qualify as a dimension of *appraisal*, namely, that it can be plausibly construed as reflecting a judgment or evaluation which subjects *actually make* (at least implicitly) during the appraisal process. It seems at least doubtful to us whether people, when confronted with an emotion-eliciting event, evaluate it specifically as to whether other people participate in it or not and, depending on the outcome of this judgment, experience different types of emotion.⁷

The accuracy of statistical classification found in study 2 is clearly better than the 42% (38% if corrected for chance) correct classification

⁶The object of this evaluation may also be the self, as in self-pity, self-contempt, etc. Such self-directed affects were, however, not the focus of the present investigations.

⁷The same concern arises for other proposed dimensions of cognitive appraisal, in particular, for the dimensions of *focality–globality* (Frijda, 1987; Frijda et al. 1989; Solomon, 1976), referring to whether the eliciting states of affairs is something specific (as in fear) or something more unspecific and diffuse (as in anxiety and moods more generally), and *self-esteem*, referring to whether the event increases or decreases one's self-esteem (Frijda et al., 1989). It seems at least doubtful to us whether people, when confronted with an emotion-eliciting event, themselves judge (if only implicitly) whether this event is specific or diffuse, or enhances versus decreases their self-esteem and, depending on the outcome of this judgment, experience different emotions.

reported by Smith & Ellsworth (1985) and the 36% and 43% reported by Frijda et al. (1989, studies 1 and 2, respectively). This remains true even when the three questionable variables beginning–ending, activity, and other-involvement are excluded from the set of predictors (60% correctly classified). It is tempting to attribute these differences to the inclusion of the further appraisal dimensions, as well as to our attempt to specify more precisely the objects of appraisal. Some support for the influence of the first-mentioned factor does exist: Average classification accuracy dropped to 52% ($\kappa = .50$) if only those appraisal variables which were also examined by Frijda et al. (1989, study 2) were used as predictors in the discriminant analysis (focus, valence, causality–responsibility, importance, expectedness, control, familiarity, time of event, and moral evaluation). The remaining differences may be solely due to the fact that more emotions (32) were included by Frijda et al. and thus there is no clear evidence for the effectiveness of the second factor. However, it would be worthwhile to examine this question further by comparing a group of subjects receiving the instructions used in our study with another group receiving standard appraisal instructions.

GENERAL DISCUSSION

A general reservation that is necessary with regard to the results of the studies reported in this article concerns the fact that in neither study did we investigate actually occurring emotional episodes; instead, written scenarios were used in study 1, and general beliefs about emotion-appraisal relations were assessed in study 2. Both of these methods, particularly the second one, tap first and foremost people's folk psychological beliefs or implicit theories about emotion-appraisal relations. In order to claim that the data reflect, if in a somewhat biased way, the truly existing relations between cognitions and emotions – as we and other researchers using similar methods surely would like to do – we must assume that the pertinent parts of naive psychology are, by and large, correct. This claim can be defended on both empirical and theoretical grounds. Empirically, there exists evidence from several studies in which appraisals and emotions in realistic situations were examined (e.g., Covington & Omelich, 1984; Folkman & Lazarus, 1985; Smith & Ellsworth, 1987); the results of these studies provide little support for the skeptic's worry that folk psychology may be greatly distorted in this regard. Theoretically, one can argue that beliefs about appraisal-emotion relations belong to the most central part of the naive psychology of emotion; indeed, we would agree with those philosophers and

psychologists who hold that appraisals belong to the defining or at least central features of (many) emotions and thus help to constitute their identity (e.g., Brentano, 1874/1955; Frijda et al., 1989; Johnson-Laird & Oatley, 1989; Peters, 1970; Schachter, 1964; Searle, 1983; Solomon, 1976; Stumpf, 1899; see also Reisenzein & Schönplflug, in press). The problem of studies using remembered or imagined situations may therefore not so much be that folk psychology is grossly at fault with regard to emotion-cognition relations, but that the methods traditionally used in these investigations (cf. the beginning of this paper) have some inherent limitations in eliciting the relevant parts of folk-psychological knowledge. It is hoped that the grid technique proposed in this article may serve as a valuable adjunct to these methods.

Several improvements and extensions of the method suggest themselves. Future studies might include a postexperimental interview to further clarify the intended meaning of the various attributes used by the subjects. Rather than using situation descriptions, memories of emotion-eliciting episodes could be investigated, and perhaps even emotions occurring in vivo (if they are compared with a memory-based standard). Our experiences with the method suggest that the number and range of emotions studied simultaneously could still be increased. Conversely, by restricting one's attention to a subsample of closely related emotions, the cognitive distinctions associated with the more fine-grained discriminations between affects could be investigated. Finally, the method could be adapted to examine in more detail other kinds of mental states associated with emotions, such as action tendencies (which, as noted, were already mentioned spontaneously by the participants of our study 1).

While the present studies were directed at group results, the data from study 1 point to the possibility that noteworthy interindividual differences in appraisal systems might exist; future studies might therefore also focus on this issue. In fact, in clinical contexts, the grid method has been primarily used to examine the construct systems of single individuals. One particularly interesting question which arises in this context concerns the relation between individual differences in appraisal systems, on the one hand, and subjects' ability to discriminate between emotions, on the other (see Reisenzein & Hofmann, 1990). It would also be interesting to know whether there exist differences in appraisal systems between different groups of individuals, e.g., between clinical and nonclinical cases, particularly if such differences were associated with differences in individuals' emotional experience. Kelly (1955) has suggested that too undifferentiated a personal construct system might be conducive to psychological disorders (see also, Bannister & Fransella, 1971). While Kelly did not directly refer to construct systems related to

emotional appraisals, his reasoning may perhaps be extended to the latter. If so, the use of the grid technique in clinical contexts might be usefully extended to the examination of individuals' systems of emotional appraisal.

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