The Structure of Feelings

Roy D'Andrade

James Boster

University of Connecticut

Phoebe Ellsworth

University of Michigan

At present, there is only partial consensus concerning the taxonomy of emotions. In part this is due to the fact that different methods have been used to construct the taxonomies. These methods include the semantic analysis of emotion words (Roseman 1984; Wierzbicka 1992; Heider 1991), the analysis of emotion word similarity ratings (Romney et al. 1997; Russell 1983), the use of facial expressions or other communicative gestures to identify emotions (Darwin 1872; Ekman 1993), ratings of self or others with respect to emotional states (Barrett 2004), associations between situations and emotion (Smith and Ellsworth 1985; Boster 2005), as well as introspection, which although not currently used as a research method, still probably influences our understandings. Currently under development are methods based on the identification of the activation of neural structures. Each method has tended to produce different classifications. Even the distinction between emotions and those feeling states which are not emotions is controversial. Lazarus, for example, distinguishes between pre-emotions (*curiosity*), contentless excitement (*enthusiastic*), functional mental confusion (*perplexity*), ambiguous positive (*elated*) and negative states (*upset*), complex states (*grief*), borderline emotions (*hope*) and emotions proper (*anger, fear, sadness, happiness,* etc.) (Lazarus 1991). The lack of consensus in the field can be illustrated by pointing out that most of the emotion terms in the Shaver study of the prototype approach to emotions (Shaver et al 1987) would probably not be considered emotion terms by Lazarus; for example, *tenderness, lust, amusement, zeal, pleasure,* etc.

This study attempts to add to the development of a comprehensive taxonomy by expanding the range of lexical items from just *emotions* to a variety of *feeling* states. Feelings form a more general class of subjective experience than emotions since they include a wide variety of internal states not normally considered to be emotions, such as feeling dizzy, feeling puzzled, feeling out of it, etc. For example, the lexical frame "I feel ___" can be filled in by a large number of feeling terms, such as "I feel great," "I feel down," "I feel peculiar," "I feel sad," etc. Interestingly, even external events can be used to fill this frame. That is, in English, one can say "I feel rejected" to describe a *feeling* although "rejected" refers to an external event, not an internal state. The phrase "I feel rejected" is elliptical; the complete expression means something like " I feel the way someone feels when they have been rejected."

It may be objected that many of the items generated by the frame "I feel _____" are not affective states because they do not correspond to emotion words or emotional states signaled by facial expressions. By an affective state we simply wish to refer in a non-technical way to a general class of non-localized subjective sensations. To say some feeling is not an affect because it is not an emotion word or related to a facial expression simply asserts what has been assumed. It may be that future research will find independent criteria, such as neurological processes, that distinguish among various affective states. But until such criteria are available, there is no compelling reason to restrict the analysis of affective states to just those feelings that are lexicalized as emotion

words. In this paper we attempt to analyze the structure of feeling states, including emotions, leaving the question of which states are true emotions aside.

Method

Research was conducted in three stages. In stage 1, using the frame "I feel ____," a sample of University of Connecticut students and faculty produced over 700 terms using the procedure of free listing. Removal of ambiguous and synonymous terms by the authors from the list of terms resulted in a total of 400 feeling terms.

There are a number of problems inherent in such a sampling process. While physical objects can be defined and counted, feelings cannot be effectively counted because of the lack of boundaries and the difficulty of distinguishing one entity from another. Indeed, some emotion theorists question the very idea of categorically distinct emotions. (Ellsworth and Scherer 2003; Ortony and Turner 1990). The technique we used was to collect many feeling terms and then remove the obviously redundant items. But at the end of the day one still does not know whether or not great areas of feeling remain unsampled, nor how many distinct items there are in the sample. Some aspects of this problem are discussed below.

To investigate the relations among the 400 feeling items, in stage 2 we analyzed associations between feelings and situations. For example, it is an item of cultural knowledge that people feel sad when a pet dies. Such a situation-feeling association implicitly contains folk knowledge about the appraisals that give rise to feelings and

emotions - it instantiates the abstract criteria (loss of a beloved object) that give rise to a particular feeling (sadness). Assuming that similar situations elicit similar feelings, investigation of the association between situations and feelings provides a way of analyzing the joint organization of feelings and appraisals.

Affectively charged situations were elicited by asking a sample of fifteen University of Connecticut undergraduates "What makes you feel ____?" Eight groups of ten respondents were given sets of fifty feeling terms derived from stage 1. Several hundred situations were generated. After removal of ambiguous, similar, and idiosyncratic situations by the authors the sample was reduced to 125 situations.

Finally, in stage 3, using the sample of situations generated in stage 2 and the sample of feeling terms generated in stage 1, respondents were asked which situations were likely to elicit which feelings. To do this the 125 situations were put into question form. For example:

When bad things just don't stop, I feel _____

When something unexpected happens, I feel _____

When I am treated well, I feel ____

The intersection of 400 feelings by 125 situations produced a matrix of 50 thousand cells. The 50 thousand cells were divided into 50 blocks, each block consisting of 40 feeling terms and 25 situations. For each situation, groups of 40 respondents were

asked to select from among 40 feeling terms in that block, the feelings that would be aroused by that situation. For example, the first frame for the first block was "When I give help to someone who really needs it, I feel ___." Respondents then selected from the 40 feeling terms in that block all the feelings that they judged fit the frame, giving a simple yes or no answer. Across all blocks the most frequent feeling, selected by 31 respondents, was *like a good person*.

Although we scheduled 30 respondents for each block, fifteen hundred respondents in all, due to attrition some blocks ended up with fewer than 30 respondents. (There ended up being a total of 1055 respondents, for an average of 21 per cell.) The frequencies of the cells in each block were normalized so that each block had the same mean number of responses. Thus the frequency score for a given feeling could theoretically range from 40 to zero. In fact, the highest frequency was 39 (*When I'm sitting on the beach watching the waves, I feel relaxed*.) Fifty-one percent of the cells were zeros.

The 400 feeling terms were intercorrelated across the frequencies for the 125 situations and the correlation matrix subjected to a principal components analysis and Varimax rotation. A principal components analysis of the situations turned out to have almost identical results of the analysis of feelings. Only the principal components analysis of feelings is reported here.

Results

Nineteen interpretable factors were found accounting for 70% of the variance. Unrotated, the first factor, accounting for 22% of the variance, was a clear good-bad dimension running from feeling *negative, upset, down,* and *unhappy* to feeling *good, happy, great,* and *wonderful*. This general positive-negative dimension typically accounts for the greatest amount of variance in emotion research (Frijda 1986; Smith and Ellsworth 1985). The second unrotated factor, accounting for 8% of the variance, was marked at both ends of the dimension by negative feeling states, with feeling *insulted, offended, bitter* and *resentful* at one end and feeling *jittery, anxious, restless,* and *nervous* at the other. This dimension is more unusual, although not unprecedented. For example, Bower (1981), using a different method, found a fear-anger opposition as the second major dimension.

Standard factor scores for the situations for the nineteen factors were computed. In the three figures below, the feelings with the top loadings for each factor are presented along with the situations that had their highest factor scores on that factor. An attempt has been made to label each factor with the feeling term that is most general to the factor and corresponds most closely to a traditional emotion term, along with a paraphrase that attempts to summarize the common meaning of the group of appraisal frames. Figure 1 presents the seven positive feeling factors. Although the first factor contains the term *happy*, for our data, *happy* was not the highest loading term, and the factor seems more appropriately labeled feeling *appreciated* since feeling *special, valuable, liked,*

appreciated and *loved* had the highest loadings. The situations that have high scores on this factor point to the importance of the interpersonal component, involving being treated well, having other people care about one, and interacting with someone one loves. The relation between the feeling of being liked and the emotion of being happy will be discussed at greater length below. It is interesting that the situation *when someone asks me for a big favor*, which has a strong factor score on this dimension, has been found to lead to positive feelings of *amae* in both Japanese and American respondents (Niiya et al n.d.) although Americans do not have the *amae* term.

Figure 1 about here

The other factors for positive emotions were less interpersonally oriented. Feeling *ecstatic* and feeling *relaxed* are almost pure positive affect dimensions marked by opposite degree of arousal. More unusual is the feeling *smart* factor, which has a clear and consistent set of top loading items involving doing things well. Although not lexicalized as an emotion in English, it corresponds closely to appraisals of certainty and control. The sixth positive factor, feeling *sexy*, is normally considered to be more of a physical than emotion state, although some informants dispute this. The last positive factor, feeling *compassionate*, contains terms usually considered to be complex

expressions of caring, somewhat like attitudes, rather than pure emotions (*empathetic, compassionate, sympathetic*).

Figure 2 presents seven factors that form a cluster of negative states: feeling *angry, disgusted, sad, ashamed, envious* and *guilty.* It also contains a factor, feeling *rejected,* which lacks emotion terms. The sadness situations, as predicted by appraisal theories, mostly involve circumstances beyond control. The feeling rejected situations are interpersonal, suggesting a social kind of negative state. It may be that social versus non-social forms an important appraisal dimension. One factor, *disgusted,* contains feeling terms for both physical sensations, such as *nauseous,* and emotion terms like *disgusted* (see Rozin and Fallon 1987 for an extended analysis of *disgust*).

Figure 2 about here

Figure 3 presents six factors that form a cluster of negative feelings involving appraisals of uncertainty and lack of control. Outside of the feeling *frightened* factor, the other five factors contain few standard emotions terms. The feeling *tired* factor contains physical feelings (*worn out, exhausted, drowsy*) with situations concerning lack of rest. Both the feeling *overwhelmed* and feeling *confused* factors contain no clear emotion terms, but do contain many terms that refer to distinct internal sensations (*overwrought,*

frazzled; puzzled, uncertain). Overall, this group of six factors seems to have as its common features uncertainty and loss of control. The feeling *jittery/anxious* factor is much less negative that the other feeling states in this cluster, and in fact has several positive situations, such as "When I expect good things to happen soon, I feel ___ and "When doing something well I feel ___." With respect to the correlations between factor groups, the feeling *jittery/anxious* factor is as close to the positive as the negative factors. Appraisal theory says that *hope* and *fear* are alike except with respect to positive versus negative valence, so vacillation between the two is common since they differ only in position along one dimension of appraisal. Similarly, the *surprise* cluster contains both positive and negative situations and feelings, since the valence appraisal dimension is not explicitly defined for this state.

Figure 3 about here

The grouping of the feelings factors into the three macro clusters presented in the three figures above is based on a second order analysis. Although Varimax produces orthogonal dimensions, if many of the clusters of variables in the hyperdimensional space are not orthogonal to each other factor then factor loadings will be correlated despite the fact that the factor axes are orthogonal. Such non-orthogonality in the distribution of factor loadings is an indication of second order factors. One solution to this problem is to

use non-orthogonal techniques of rotation. However, our experience has been that non-orthogonal methods of factor rotation are unstable; small changes in the selection of variables result in large changes in factor structure. The most robust technique we have found is to construct scales for each factor using unit weights for the highest loading variables on each factor. Once factor scales obtained, they are intercorrelated to obtain an estimate of the second order relations between the factors. Using this method, we performed an average link cluster analysis of the correlations between factor scales and obtained the three macro groups of factors displayed in figures 1, 2 and 3. The full cluster analysis is presented in Figure 4 along with the typical situations that go with each factor group.

Figure 4 around here.

It might be argued that the large number of factors found in our analysis and the large number of factors that are not prototypic emotions is due to the feelings by situations method we used. A more standard procedure would be to use self-ratings and correlate feelings across persons and rating times. We were fortunate in having access to a comprehensive set of self-ratings provided by Lisa Barrett which she used to test a series of hypotheses about the relation between emotional experience and semantic structure (Barrett 2004). By comparing her data with ours, we can compare method

effects. Barrett's sample consisted of 53 Pennsylvania State University undergraduates who filled out a seven point Likert scales (0 = not at all, 3 = a moderate amount, 6 = a great deal)] for their momentary emotional experiences for 88 emotion related adjectives twice a day for sixty consecutive days. A total of 7443 sessions were collected. Sixty of the adjectives were taken from the Positive Affect Negative Affect Schedule-Expanded from (PANAS-X; Watson and Clark 1994) and 28 addition items were taken from the affect circumplex (Larsen and Diener 1992).

The means across the 88 emotion terms varied greatly by session, ranging from a minimum of 0.1 to a maximum of 3.8. To control for the large amount of both individual and session level variation, the data was ipsatized by session to a mean of 0.0 and a standard deviation of 1.0. The correlations for the 88 adjectives across sessions were subjected to a principal components analysis and Varimax rotation. The unrotated first factor was the canonical good-bad factor, running from *pleased, happy*, and *glad* to *unhappy*, *miserable*, and *irritable*. The second factor was an activity factor, running from *energetic*, *excited*, and *lively* to *inactive*, *drowsy*, and *sluggish*. There was only one other bipolar factor running from *aroused* to *bored*. Fourteen clearly interpretable factors found accounted for 54% of the variance. Figure 5 presents the loadings for the fourteen factors. Figure 6 presents the average-link cluster analysis of correlations between factor scales using use unit weights for the highest loading variables on each factor. Each of the

bipolar factors were divided into separate scales, one scale for the items on the positive side and a second scale for the items on the negative side.

Figure 5 about here

Figure 6 about here

Discussion

Nine of the factors of the principal components analysis of Barrett's self-rating data correspond directly to the feelings by situations data: feeling *ecstatic/elated, surprised, jittery/anxious, frightened, relaxed, tired, angry, sad,* and *guilty*. However, the self-rating data does not distinguish feeling *guilty* from feeling *ashamed*, and lacks factors relating to *envy*, *sex*, *compassion*, *disgust*, *confusion*, *rejection*, and *overwhelmed*. On the other hand, the self-rating data has factors for *aroused-bored, interested, fearless, shy,* and *lonely* which are absent in the situations by feelings data. There is a partial match between the feelings by situation factor *appreciated* and the self-rating rating factor *happy*.

Part of the problem in trying to evaluate the difference between the feelings by situations data and the self-rating data is that each data set contains different samples of adjectives. But both analyses agree on two points. First, both analyses found a relatively large number of first order factors (21 versus 14), and second, both analyses contain a relatively large proportion of factors based on terms that are not normally considered emotions. Of the 24 distinct groups of feelings found in the two analyses, nine involve affective states which are not generally considered emotions. We conclude from these results that attempts to restrict research to pure emotion words unnecessarily truncates the description of human affective states, ignoring a large number of salient affective experiences simply because their descriptors do not correspond to English emotion terms. A better strategy, in our view, would be to open up the study of emotion to the experientially occurring wide range of feelings that are so important in human life.

A synthesis of the two data sets yield the following 23 potential feeling factors:

happy	fearless	lonely
appreciated	sexy	bored
elated	surprised	sad
compassionate	frightened	rejected
smart	tired	envious
relaxed	disgusted	guilty
energetic	overwhelmed	ashamed
interested	confused	

Missing from this list is a factor for feelings of humor. With the exception of *amused*, terms for this internal state do not occur frequency in the "I feel ___" frame. Also missing, we believe, is a frustration factor, as well as factors for feelings of silliness and for weirdness. Religious feelings are also not well represented in our sample. And romantic love, despite the extensive literature on the universal complex of appraisals, feelings and action tendencies involved in this emotion (Jankowiak 1992; Fehr 1994; Fisher 1992), is conspicuous by its absence Finally, remembering Jane Austen, there may be times and peoples and places in the world where feeling superior, prideful, arrogant, contemptuous, etc., is a distinctive, powerful, and common affective response with its own well constructed appraisal system. This feeling complex is certainly familiar to adolescent Americans. We suspect that the absence of these factors is primarily due to the absence of the relevant terms in our samples. Perhaps the only method of developing really adequate samples of feeling terms is through a lengthy process of post-research regret.

One issue which needs to be discussed concerns the relation between states like being happy and feeling appreciated. One position is that feeling appreciated is just a specific kind of happiness. The specific situations which most frequently elicited feeling happy in our data were:

When I am looking good

When other people care about me

When something good and unexpected happens

When I make other people laugh and feel good

When I give help to someone who really needs it

These situations cover a wide range of events. They have in common something good happening - either as an event that happens to oneself, or because one did something good. So one argument is that happiness occurs because something good happens, and being appreciated is just an example of something good happening. Therefore it is not a distinctive *feeling*, although it may involve a distinctive discrimination.

The counter position holds that feeling appreciated *is* a distinctive feeling. Introspectively, it can be argued, it feels different to be appreciated than to have some good and unexpected event happen. Both make one feel happy, but being appreciated has, in addition, a special quality to it in which one feels *special* and *important.* The large number of specific situations which focus on others response to oneself can be taken as an indication that at this feeling has a distinctive appraisal dimension involving social relatedness. The fact that feeling *happy* is correlated with feeling *appreciated* is, according to this hypothesis, not because feeling *appreciated* is a kind of happiness, but because the typical situation for being liked - others treating one well - instantiates more than one appraisal.

It is difficult to decide between these two hypotheses. Theoretically, appraisal theorists are committed to the proposition that distinctive appraisals give rise to different feelings. But when are two appraisals really different? Our indicator has been the presence of a factor in a principal components analysis. If our data had had two factors, one for feeling *happy* and one for feeling *appreciated*, there would be better evidence for the distinction. But because being appreciated and something good happening are, in the world, so often joint occurrences, the basic appraisals may normally be too commingled to give rise to separate factors.

It should be mentioned that different cultures, different life conditions, and different personal histories may result in the development of different situation by feeling complexes since emotional responses can be conditioned. At this time little is known about this kind of variation. Boster has used mapping from emotion terms to situations among the Waorani, a horticultural people of Amazonia (Boster 2005) He found the Waorani quite similar to Americans. It may be that when we have more complete appraisal by feeling clusters that we will find that most places, times and peoples have most of them. The work of Romney and associates on Japanese and American emotion terms (Romney et al 1997) found that of the total variability in similarity ratings for items in a domain, the greatest amount was universal (agreed upon by everyone), while cultural sources of variability were significant but quite small - approximately 6%. However, cultural differences in display rules for feelings and the cultural shaping of focal emotional events (Ellsworth 2003) are more likely to show greater variation by culture.

Finally, do our results tell us anything about human affective experience? Clearly many of the situation by feeling clusters are not basic emotions. But restricting investigations to basic emotions leaves out the important issue of how feelings are structured; the hypothesis that affective experience is structured by prototypic basic emotions is not supported by our data since many of the feeling factors, like feeling *rejected* and feeling *smart* have no clear links to basic emotions. If the factors we have found turn out to be stable and replicable, this is an important psychological fact. Our results indicate the structure of affective experience is more extensive than the standard list of emotion terms. Quoting from one of the authors:

> Are confusion, concentration, and worry emotions? Rozin and Cohen (2003) argue that either "facial expressions are used to a great degree to express things other than emotions or ... we should expand our category of emotions" (p 73). This suggestion presupposes the idea that there is a "category of emotions" distinct and distant from other categories of attention, thought, or uncertainty... Rozin and Cohen's either/or questions--Are these states emotions or are they something else?--frames the question in a way that separates emotional life from the rest of life, and ... seems to emphasize the rigid categories of psychological theory over the fluid realities of human experience. It is true that we do not think of concentration and confusion in the same way we think of fear, sorrow, and anger, but that does not mean that we think of them as devoid of emotion... The interesting question is not

> whether or not they are in or out of some predetermined domain of emotions but how they work (Ellsworth 2003:82-83).

It is important to note that the basic appraisal dimensions of attention/novelty, valence/pleasantness, agency/control, norm/self-concept compatibility, certainty/uncertainty, perception of a goal obstacle, and amount of effort/ability to cope found for basic emotions (Ellsworth 1994) appear to also be central to the organization of the entire range of feeling states.

In summary, we have found that, once one escapes from the boundaries of English emotion words, respondents report on a rich variety of feeling states generated by understood appraisals instantiated in a variety of situations. Natural language has rich resources for creating complex representations of emotional states. Use of the frame "I feel ___" has permitted exploration of some of this larger domain. Relating the expanded corpus of feeling terms to situations has provided a method by which the organization of both situations and feelings could be investigated. The situation by feeling data shows clearly the great importance of other people as a powerful source of affect. What needs to be added to this research is information about the action tendencies that form a third important domain in the functioning of emotion. Working out the systematic linkages between situations, feelings, and actions should provide a richer picture of the internal affective world of humans.

References Cited

Barrett, Lisa Feldman

2004 Feelings or Words? Understanding the Content in Self-Report Ratings of Experienced Emotion. Journal of Personality and Social Psychology 87:2:266-281.

Boster, James S.

2005 Emotion Categories across Languages. *In* C. LeFebvre and H. Cohen, eds. Categorization in the Cognitive Sciences. Amsterdam: Elsevier.

Bower, Gordon H.

1981 Mood and memory. American Psychologist, 36, 129-148.

Darwin, Charles

1965 The Expression of the Emotions in Man and Animal. Chicago: University of Chicago Press (originally published 1872).

Ellsworth, Phoebe, and Scherer, K. R.

2003 Appraisal Processes in Emotion. In Handbook of the Affective Sciences. R. J. Davidson, H. Goldsmith, and K. R. Scherer eds. Pp 572-595. New York: Oxford University Press.

Ellsworth, Phoebe

1994 Sense, Culture, and Sensibility. In Emotion and Culture: Empirical Studies of Mutual Influence. H. Markus and S. Kitayama eds. Pp 23-50. Washington: American Psychological Association.

2003 Confusion, Concentration, and Other Emotions of Interest: Commentary on Rozin and Cohen." *Emotion* 3, no. 1 (2003):81-5.

Ekman, Paul

1993 Facial Expressions and Emotion. American Psychologist 48:384-392.

Fehr, Beverly

1994 Prototype-based Assessment of Laypeople's views of love. Personal Relationships 1:391-398.

Fisher, Helen E.

1992. Anatomy of Love. New York: Fawcett Columbine.

Frijda, Nico

1986 The Emotions. Cambridge: Cambridge University Press.

Heider, Karl C.

1991 Landscapes of Emotion: Mapping three cultures of emotion in Indonesia. Cambridge: Cambridge University Press.

Jankowiak, William & Fischer, Edward F.

1992 A Cross-cultural perspective on Romantic Love. Ethnology 31:149-155.

Larsen, Randy J. and Ed Diener

1992 Promises and Problems with the Circumplex Model of Emotion. *In* Review of Personality and Social Psychology 13:25-59, M. Clark ed.

Niiya, Yu, Phoebe C. Ellsworth, and Susumu Yamaguchi

n.d. Amae in Japan and the U.S.:Cultural Comparisons of Hypocognized Emotion.

Ortony, Andrew, and Terrence J. Turner

1990 What's basic about basic emotions? Psychological Review 97:315-331.

Plutchik, Robert

1980 Emotion: A Psychoevolutionary Synthesis. New York: Harper and Row.

Romney, A. Kimball, Carmella C. Moore, and Craig D. Rusch

1997 Cultural Universals: Measuring the Semantic Structure of Emotion Terms in English and Japanese. Proceedings of the National Academy of Science 94:5489-5494.

Roseman, Ira J.

1984 Cognitive Determinants of Emotion: A Structural Theory. *In* Review of Personality and Social Psychology: Vol 5. Emotions, Relationships, and Health. P. Shaver ed. Pp. 11-36. Beverly Hills. CA: Sage.

Rozin, Paul and April E. Fallon

1987 A Perspective on Disgust. Psychological Review 94:23-41.

Russell, James A.

1983 Pancultural Aspects of the Human Conceptual Organization of Emotions. Journal of Personality and Social Psychology 45:1281-1288.

Smith, Craig A. and Phoebe C. Ellsworth

1985 Patterns of Cognitive Appraisal in Emotion. Journal of Personality and Social Psychology 48:4: 813-838.

Wierzbicka, Anna

1992 Talking about Emotions: Semantics, Culture, and Cognition. Cognition and Emotion 6:3/4:289-319.