NATURAL LANGUAGE CONCEPTS OF EMOTION

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ABSTRACT

Such everyday words as emotion, anger, fear, and love have led a controversial existence in the study of emotion. Some writers have been skeptical of their value and advised ignoring them. Others have relied on them, criticizing any treatment of emotion that failed to coincide with the everyday concepts labeled by these words. This controversy can be clarified by distinguishing two roles for everyday concepts. In one role, they are indispensable; they are the topic of study. The appropriate approach to words in this role is descriptive: how is emotion defined? In the second role, they are used as scientific concepts in the study of the phenomena referred to by the everyday words. The appropriate approach to words in this role is prescriptive: how should emotion be defined? Or should it even be used at all? When these, like most human concepts, are seen as overlapping and ill-defined, their use in this second role is at least questionable. Scientists need not accept everyday concepts as scientific concepts in their theories, nor as standards against which their theories must be evaluated. And perhaps they should not.
INTRODUCTION

How can such general terms as emotion, anger, and love be defined? And what role should such words and their definitions play in a scientific study of emotion? My hope in this article is to advance the discussion of such issues.

Traditionally, the general terms of our language were thought to denote classes of objects or events, each member of which possessed features that were necessary and sufficient to define membership in that class. According to this classical view, to know the sense of a general term, to have the concept associated with it, was to know the necessary and sufficient features. A definition was therefore to be had by philosophical discussion. Or, because the defining features were also there in the objects, by empirical investigation.

Today, writers in various disciplines have become skeptical of this classical view. Wittgenstein’s (1953) analysis of the concept of game is the most famous argument, but considerable psychological research now reinforces these arguments (Mervis & Rosch, 1981; Smith & Medin, 1981). Rosch’s (1975) proposal of a prototype account as an alternative to the classical view is likewise the most famous, but there is now a healthy competition among general non-classical accounts (Smith & Medin, 1981).

Rosch’s proposals have inspired a singularly useful re-examination of some of the major concepts in personality and social psychology, including the self, intelligence, personality trait, and psychiatric diagnostic categories (Brown, 1980; Buss & Craik, 1983; Cantor & Mischel, 1977, 1979; Horowitz, Wright, Lowenstein, & Parad, 1981; Neisser, 1979; Rogers, Kuiper, & Kirker, 1977; Wiggins, 1980). I believe that the ordinary language concepts of emotion, anger, fear, and so on can also benefit from such re-examination in light of Rosch’s analysis, and that doing so raises important questions about the way in which these concepts are now used in the psychology of emotion.

THE EMOTION LEXICON VIEWED FROM A PROTOTYPE PERSPECTIVE

It is helpful to begin by picturing the domain of emotion terms as an inclusion hierarchy, as shown in Figure 1. At the topmost, or superordinate, level is the word emotion. At the middle level, emotion is divided into fear, love, anger, and other prototypical and less prototypical emotions from angst to zest. Many of the middle-level categories may be further divisible, forming a subordinate level.

At the heart of the prototype perspective is the notion of resemblance. The concept emotion is understood not by a set of defining features, but by a set of prototypical, or exemplary, cases of emotion. A middle-level category, or a particular event, is a member of the class of emotions by sufficient
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Figure 1. Partial Inclusion Hierarchy of Emotion Concepts

Supordinate Level

Middle Level

Subordinate Level

Emotion

Love

Anger

Fear

Others

Fetal Love

Rage

Romantic Love

Appetite

Panic

Anxiety
resemblance to the prototypes: fear, love, anger, happiness, etc. Members thus resemble each other in overlapping and criss-crossing ways that vary in kind and number. Resemblance being a matter of degree, the number of categories at the middle level is indeterminate, events vary in the extent to which they are emotions, and no sharp boundary separates emotions from nonemotions.

Middle-level categories of emotion are understood, again not as a set of defining features, but by one or more prototypical, or exemplary, cases of that type of emotion. This might be accomplished in various ways (Smith & Medin, 1981); for example, the prototypical case of, say, fear might be thought of as a fear script (Abelson, 1981). To know the meaning of a middle-level term like fear would be to know an ideal case of fear, an ordered sequence in which context, physiological events, behavioral events, and mental events unfold and are casually connected. Actual sequences are said to be fear to the extent they resemble the fear script. Of course, actual events will often fail to match the script in various ways and to various degrees. If enough elements in the actual sequence are absent or altered or out of order, we are unlikely to call it fear. But the border is fuzzy, and there exist cases in which so few of these elements occur that one is unsure whether the label fear is appropriate or not.

In a recent series of studies, the feasibility of this line of thinking was explored empirically (Fehr & Russell, 1984; Fehr, Russell, & Ward, 1982; Russell & Bullock, 1986a). As hypothesized, happiness, love, anger, fear, awe, respect, envy, and other middle-level categories could be reliably ordered from better to poorer examples of emotion. In turn, this goodness-of-example (prototypicality) score for each emotion term was found to predict how readily it comes to mind when subjects are asked to list emotions, how likely it is to be labeled as an emotion when asked what sort of thing it is, how readily it can be substituted for the word emotion in sentences without their sounding unnatural, the degree to which it resembles other middle-level emotion categories in terms of shared features, and the speed with which subjects can verify that it is indeed a type of emotion. In short, converging sources of evidence showed that the concept of emotion has what Rosch called an internal structure—the ordering by typicality of members within the category—and that the internal structure predicts various indices of the cognitive processing of emotion concepts.

Middle-level emotion categories—anger, fear, sadness, and so on—also show signs of internal structure. For example, in a series of studies, we examined how adults categorize the message conveyed by emotional facial expressions (Russell & Bullock, 1986a). As predicted, facial expressions varied in their degree of exemplariness. Some expressions were prototypical examples, others were intermediate examples, and still others were very poor examples of a particular category. There were also borderline cases where subjects could not decide whether a particular facial expression was or was not a member of a particular category.
Of course, these demonstrations of internal structure do not logically entail the negation of the classical view. Rather, the cases here are empirical ones: The existence of internal structure is not accounted for by the classical view. Prototype theory gives an account of internal structure and of how a person can understand a concept without knowing necessary and sufficient features for it. Also, damaging to the classical view was a further finding. The subjects in these studies failed to list necessary and sufficient features of emotion. When asked, the subjects listed such features as increase in heart-rate, perspiration, tears, widening eyes, and obsessive concern with a situation—what are neither necessary nor sufficient: Clear cases of such prototypical emotions as happiness and sadness exist with none of these features.

The closest we come to a logical refutation of the classical view were results of a study in which subjects were asked what is and what is not an emotion. If a person either explicitly or implicitly knew necessary and sufficient features for, say, the concepts of pride and emotion, there would be no ambiguity in deciding whether pride is an instance of emotion—just as anyone who knows the meanings of the words square and parallelogram knows that squares are parallelograms. The question would simply be whether the set of features defining pride included the set of features defining emotion. But subjects in our studies could not decide whether pride is an emotion. Some decided yes, others decided no. Note that the issue here is not the perceptual one of identifying a proud person when we see one. Rather, the issue is one of meaning: whether, by definition, instances of pride are also instances of emotion.

From this evidence, I am led to conclude that in using the word emotion, people do not know a classical definition for it. But couldn’t one exist, nonetheless? Perhaps we should ask experts rather than college undergraduates. First, whatever experts may or may not know, the evidence just reviewed indicates that people who know the meaning of the words emotion and pride (and surely this can be said of college students) do not know necessary and sufficient features for those words. Therefore, necessary and sufficient features do not constitute the meaning of emotion. Second, I see no reason to suppose that the experts know a classical definition. Although philosophers and psychologists have tried for centuries, no one has listed features for emotion that are accepted as necessary and sufficient. Moreover, experts disagree over specific cases. Although Hume (1739-40/1980) analyzed pride as a prototypical emotion, several of my colleagues have denied that pride is an emotion. Ekman, Friesen, and Simons (1985) recently wrote an article entitled “Is the startle reaction an emotion?”, a question on which, they point out, “emotion theorists have disagreed” (p. 1416). After arguing that startle is not an emotion, they acknowledge that “S.S. Tomkins does not regard our findings as a challenge to his claim that startle is an emotion” (p. 1424). Again, whether or not pride and startle are emotions cannot be decided by the meaning of the terms pride, startle, and emotion, even if we rely on the meanings given these terms by experts.
TWO ROLES FOR EMOTION CONCEPTS

Such words as emotion, anger, love, fear, and happiness, together with their associated concepts, play two importantly different roles in psychology, roles that must be carefully distinguished. In one role, everyday emotion concepts are themselves a topic of study. Like human concepts concerned with any domain of knowledge, concepts concerned with emotion are mental phenomena, legitimate topics in the study of human cognition. What is their nature? How are they acquired? What is their function in mental operations?

In another role, emotion concepts are not topics in the psychology of cognition but are tools in the psychology of emotion. Everyday emotion words and their associated concepts are pressed into scientific service as psychologists attempt to describe and explain the events to which these words refer. Here everyday concepts are used as scientific concepts, playing a role in psychologists’ measures and theories about the emotional lives of people.

Psychology is the curious discipline that includes the same concept in both these roles. Botanists are interested in scientifically useful ways to categorize plants, and it is not their business to study, how ordinary people categorize plants. Anthropologists are interested in how ordinary people (of different cultures) categorize plants, and it is not their business to find scientifically more useful ways to categorize the plants. When it comes to emotions, psychologists are interested both in how people define emotion itself.

The proper approach to a concept of emotion is playing. The approach in the first role is descriptive. How do children understand it? The approach in the second role is prescriptive. How is emotion defined? How should it be used as a folk concept? How does a psychologist describe emotional mental life, and suggests for other topics, when using the psychologist’s job is to describe improvements for the other hand, when using the psychologist’s job is to describe improvements for other topics. The traditional way of thinking about emotion in others concerns, emotional states of others. The teacher with how individuals conceptualize a proper characterization of emotion in psychological events.

In one series of studies, M. is a psychological topic of “emotion” I am advocating. This topic has been defined by some as hierarchical vs. multidimensional; by proponents of these various categories, people as inaccurate, by proponents of these various categories, people as inaccurate, categories of emotion have been properly defined. The findings by when anger, fear, and the rest
Natural Language Concepts of Emotion

are interested both in how people conceptualize the phenomena and in the phenomenon of emotion itself.

The proper approach to a concept such as anger depends on which of these two roles it is playing. The appropriate approach to emotion concepts used in the first role is descriptive: How is the concept of emotion defined? How do children understand it? The appropriate approach to emotion concepts used in the second role is prescriptive: How should the concept of emotion be defined? Or should it be used at all? For example, when studying anger as a folk concept, the psychologist’s job is to describe and explain this aspect of mental life, and suggestions for its improvement would be out of place. On the other hand, when using anger in its role as a scientific concept, the psychologist’s job is to describe and explain the events referred to, and suggestions for improvements over the folk way of conceptualizing those events are very much in order. Anger may or may not be the best concept for the job. When used in the second role, emotion concepts are like scientific concepts in any domain: They must be subject to criticism, analysis, alteration, and improvement. In the next two sections, I shall discuss emotion concepts in each of these roles.

Descriptive Role

What do people understand by such words as emotion, anger, and fear? Answering this question is a legitimate and traditional pursuit for philosophers and psychologists, and a prototype perspective suggests one possible answer. Indeed, the first section of this article must be construed as just that. As such, the statements there are to be taken as empirically testable hypotheses about one area of human cognition. Those hypotheses, in turn, have implications for other topics. The traditional social psychological topic of the “recognition” of emotion in others concerns, in part, how one person conceptualizes the emotional states of others. The topic of emotional experience may have to do with how individuals conceptualize their own emotional states. More generally, a proper characterization of everyday emotion concepts is needed in the study of any topic where emotion concepts are used or where they play a causal role in psychological events.

In one series of studies, Merry Bullock and I re-examined the social psychological topic of “emotion recognition” from the non-classical perspective I am advocating. This topic has a history of controversy: dimensions vs. categories; people as inaccurate vs. people as accurate judges of emotion; hierarchical vs. multidimensional structures of emotion. The findings advanced by proponents of these various positions appeared to conflict because, we believe, categories of emotion had been presupposed to be nonoverlapping and properly defined. The findings became much more understandable and orderly when anger, fear, and the rest were thought of, instead, as overlapping and
fuzzy. The fuzzy nature and overlapping nature of emotions results which are shown in Figure 2 (photographs of facial expressions ordered as specified by a circumplex). The ordinate is the degree to which a facial expression is either sad or angry. Categorization can be based on either-or decision, and all three emotions are applicable to many of the same sad angry faces. Subjects to make yes-or-no choices regarding whether the facial expression represented by each photograph is a sad angry face or not. The results of these choices are shown in the internal structure of the categories of Sadness, Disgust, and Anger.

Children's abilities to "recognize" facial expressions of emotion were approached from a prototype theory. Preschoolers were asked to make either-or choices regarding whether the behavior was then evaluated against a behavioral checklist which in many cases, there was one right answer. When preschoolers were mainly inaccurate in their categorizations, systematic when they categorized (1985; Russell & Bullock, 1986b). Disgust and Anger categories of emotion were overlapped by members to varying degrees of sadness.

Various methods have been used to develop multidimensional scaling of emotion. Analysis of self-descriptions of emotional events, I mention this example, here, but simply to make the point that the question of how people, usually, the phenomena referred to. The issue for the most part taken themselves. The actual phenomena referred to is the topic of the next section.

In this section, I shall try to refine the words for emotions as theoretically referred to by those words. Psychologists of emotion need to define these concepts in terms of the everyday folk concepts in...
fuzzy. The fuzzy nature and overlap of categories is illustrated by some of our
results which are shown in Figure 2. Along the abscissa, 14 different
(photographs of) facial expressions of emotion, labeled A through N, are
ordered as specified by a circumplex model of emotions (Russell, 1980). On
the ordinate is the degree to which the expression is a member of sad, disgusted,
or angry. Categorization can be seen to be more a matter of degree than an
either-or decision, and all three category labels were also at least somewhat
applicable to many of the same expressions. The common practice of forcing
subjects to make yes-or-no choices, or to choose one label from a list of “basic”
emotions may therefore have been responsible for the appearance of conflict
and disagreement.

Children’s abilities to “recognize” emotions via facial expression can similarly
be approached from a prototype perspective. Previously, children had been
asked to make either-or choices or to choose one label per expression. Their
behavior was then evaluated against a criterion in which it was assumed that
there is one right answer. Whereas previous research had concluded that
preschoolers were mainly inaccurate, we found much that was orderly and
systematic when they categorized facial expressions (Bullock & Russell, 1984,
1985; Russell & Bullock, 1986b). Like adults, preschoolers behaved as if their
categories of emotion were overlapping and fuzzy, with facial expressions being
members to varying degrees of several categories.

Various methods have been brought to bear on the descriptive task:
multidimensional scaling of emotion words or emotional stimuli, factor
analysis of self-descriptions of emotional state, protocols of remembered
emotional events. I mention this evidence not with any hope of discussing it
here, but simply to make the point that all such evidence bears directly on
the question of how people, usually young adults of our culture, conceptualize
the phenomena referred to. The researchers who gathered this evidence have
for the most part taken themselves to be investigating an entirely different
matter: the actual phenomenon of emotion. Whether or not they did so is the
topic of the next section.

Prescriptive Implications

In this section, I shall try to raise questions about the use of our everyday
words for emotions as theoretical terms in a scientific psychology of the events
referred to by those words. I first argue for a relatively weak thesis:
Psychologists of emotion need not accept everyday folk concepts in this role.
I then argue for a much stronger thesis: Psychologists of emotion should not
accept everyday folk concepts in this role.
Folk Concepts Need Not Be Accepted

Must psychologists accept everyday folk conceptions of emotion? One argument for a yes reply might run as follows: The evidence advanced so far tells us that emotions are fuzzy and, therefore, fuzzy concepts are just what is needed to conceptualize those events. On this point, especially, I want to be clear: That emotion concepts are fuzzy does not imply that the events referred to are fuzzy. I do not know what it would mean to say that a particular event is fuzzy.

As Neisser (1979) pointed out, it is the everyday concept, not reality, that is organized around prototypes. Unicorns, centaurs, and telepathic persons would undoubtedly turn out to be fuzzy categories with poorer, better, and prototypical examples and the rest. Yet facts about real unicorns, centaurs, or telepathic persons cannot be inferred from the structure of these everyday categories. To take another example, the number of elements in a set can be described in a precise way (1, 2, 3, and so on) or in a vague way (few, some, many). Some languages lack the precise method and provide only an imprecise one. It would be unfortunate if scholars speaking such a language inferred that the number of elements in a set was intrinsically fuzzy and could not be specified any more precisely than what is provided by their native tongue. Similarly, the English language provides us with fuzzy concepts in the domain of emotion, but the nature of emotional events cannot be inferred directly from the nature of those concepts.

Each English word for a type of emotion is embedded in a conceptual network. In a manner analogous to the way a scientific construct takes its meaning (sense) from the nomological network in which it is embedded (Cronbach & Meehl, 1955), a word such as anger or guilt takes its meaning (sense) from the cognitive network in which it is embedded.

While wisdom may have accumulated in our everyday concepts, scientists must not be obligated to employ those everyday concepts in their study of psychological processes. Of course they could do so if that happened to be a useful way of conceptualizing. It would be equally unfortunate if we took properties of our everyday conceptualization as limiting the way scientists can conceptualize this domain. Each concept must be analyzed and its usefulness determined through actual scientific practice. Scientists need not keep everyday folk concepts when developing new scientific theories. In fact, they need not keep traditional scientific theories. Physicists were under no obligation to continue to employ the concept of cholerie in their theory of heat. Natural sciences typically begin with concepts borrowed from everyday language, but just as typically come to abandon them. This appears to be happening now in the study of facial expressions of emotion. At one time, Ekman (1972) sought to describe emotional facial expressions in terms of natural language categories such as surprise, fear, disgust, sadness, anger, and happiness. Ekman’s more recent work with facial expressions has been able to develop an observational system derived from anatomical observation of specific muscle movements.

In summary, when attempting to conceptualize those events. As concepts (i.e., one that defines the emotion) must not be dismissed out of hand. The rest must be analyzed and evaluated against the standards of orthodoxy.

I take the thesis of this section to mean that many of the criticisms leveled specifically, any criticism to the everyday concepts and usage of treatment of emotion, theorists by the everyday manner of speaking subject to the criticism that it is or whatever. Much of the criticism just of this nature. For example, in a type of conscious experience, a feeling is by citing envy as a counterexample to say of a person that he is envious and vehemently deny the fact. However, if concepts such as envy, Brady (1970) provided behavioral criticized as not what “most people

Such debates confuse two quite different questions: (A) What set of phenomena roughly refer to the word emotion? (B) How should phenomena be referred to? (A) and (B) Emotion should be defined and some critics fail to distinguish the statement A implies statement B.

There is a sense in which both the analyses are correct. Critics may be correct to say that theorists have not properly captured the emotional behavior. Current psychological analyses are descriptive analyses of the types of behavior not detract from James’ or Brady’s statements. Provided we...
Recent work with facial expressions, however, has gone beyond these categories. He has been able to develop an objective classification for facial patterns. His system is derived from anatomical studies of facial musculature and relies on observation of specific muscle movements.

In summary, when attempting to conceptualize the events referred to as emotions a psychologist need not be tied to the folk psychology of our ancestors. Psychologists can modify or even reject our everyday way of conceptualizing those events. A theory that modifies or rejects everyday concepts (i.e., one that defines new concepts and coins new labels for them) must not be dismissed out of hand. *Emotion*, anger, fear, happiness, and the rest must be analyzed and evaluated against scientific standards—not against the standards of orthodoxy.

I take the thesis of this section to be an obvious point, but if it is granted, many of the criticisms leveled at writers on emotion are unwarranted—specifically, any criticism to the effect that the new theory is discrepant with everyday concepts and usage of words. In an effort to be precise in their treatment of emotion, theorists have sometimes tried to abandon or to refine the everyday manner of speaking. The proposed theory is then just as inevitably subject to the criticism that it is not really about emotion, or love, or anger, or whatever. Much of the criticism directed at competing theories is, in fact, just of this nature. For example, William James (1884) defined emotion as a type of conscious experience, a feeling. Averill (1980) criticized James’ account by citing envy as a counterexample and noting that “it is perfectly meaningful to say of a person that he is envious, even though that person might sincerely and vehemently deny the fact. Such a statement would not be meaningful, however, if concepts such as envy referred specifically to feelings” (p. 137). Brady (1970) provided behavioral measures of emotion which Plutchik (1980) criticized as not what “most people would call measures of emotion.”

Such debates confuse two questions: (A) What do ordinary people mean by the word *emotion*? (B) How should scientists conceptualize and study that set of phenomena roughly referred to by the word *emotion*? Which is to say: Writers confuse two claims: (A) Emotion is defined in such and such a way, and (B) Emotion should be defined in such and such a way. That some theorists and some critics fail to distinguish these two may stem from the belief that statement A implies statement B—a belief in the thesis under attack here.

There is a sense in which both the theorists and their critics can be considered correct. Critics may be correct when they say that James, Brady, or other theorists have not properly captured the everyday concept of emotion. It may be simply incorrect to say that the everyday word *emotion* means feeling or behavior. Current psychological theories are overly simplistic when taken as a descriptive analysis of the everyday concept of emotion. But this fact need not detract from James’ or Brady’s analysis of some of the phenomena included within that concept. Provided we take them to be offering prescriptive analyses
of emotion as a phenomenon, there is much to be said for each of their accounts. Thus, I suggest that we try translating most theorists as saying (not that emotion is this or that process but) that we should study this or that process if we want to understand emotion phenomena. The study of psychophysiological responses, behavior, and mental processes have proceeded with considerable success without any solution to the question whether what was being studied was really emotion. As prescriptive analyses, behavioral, biological, cognitive, and physiological theories may be incomplete. But each has been useful and, together, they are complementary rather than contradictory.

Folk Concepts Should Not Be Accepted

I now turn to an argument that psychologists should not use everyday language concepts as scientific concepts. Their use is standard practice in the psychology of emotion, and I shall argue that this practice has been as much a problem as a help. I believe that our everyday concepts of emotion should serve as a rough guide to delimiting the range of phenomena to be studied, or as a seed of hypotheses to be tested. As evidence is accumulated, these phenomena will come to be re-grouped and distinguished in a way that meets scientific standards.

There has been no shortage of theories or research on emotion, but so far we have not been able to integrate them into a psychology of emotion. Different theories seem to compete with rather than to complement one another. Each theory has its small group of adherents. Research only rarely serves to settle the disputes among competing camps. I believe that one reason for this quagmire has been that psychological treatments of emotion have been on the horns of a dilemma—a dilemma resulting from the use of natural language concepts of emotion, which are inherently fuzzy, for a task that demands clarity. To illustrate, let us reconsider several of the contentious issues.

How can emotion, fear, anger, sadness, and the like be defined? If they are prototype-organized concepts, then no simple verbal definition is possible. Two persons may be equally afraid and share few, if any, specific properties. They are said to be afraid because the properties each does possess demonstrate a resemblance to the prototypical case of fear. Emotion, as a superordinate category, is even less likely to be definable. The various types of emotion may only share a family resemblance.

Is fear a mental, physiological, or behavioral event? A definition in terms of any one of these will handle many, perhaps most, cases. But, as critics have argued, there always seem to be exceptions. Any one such feature may be absent in cases we would label fear. Those theorists who define emotion as including all three of these as components are even more restricted to the prototypical cases, since such a definition would exclude the less exemplary cases in which any one component is absent.
What is the essence of an emotion? Perhaps the most far-reaching implications of the prototype view of the concept emotion is that there may be no essence to emotion. We see someone trembling and fleeing. To say that the person is having an emotion is not to discover a new event in addition to the features that we've already seen. It is to observe a resemblance between this case and the hypothetical ideal case of fear. As Neisser (1979) pointed out, “resemblance is an external fact and not an internal essence” (p. 223).

Is it legitimate to infer emotion in nonhuman animals: love in human infants, guilt in dogs, anger in birds, fear in fish, or happiness in insects? The nature of our everyday concepts means that any clear-cut answer to such questions would be arbitrary. As we move farther from the prototypical cases of emotion, which would seem to be in adult humans, our inclination to use emotion labels declines. There is no sharp dividing line, only a lessening resemblance to the prototypical cases. Of course, more information can be gathered about the states of infants, dogs, etc. And such information will increase or decrease the resemblance to the prototypical cases. But such information cannot give a definitive answer to the original question because the original question is stated in terms of everyday natural concepts. Scientific precision cannot be built on resemblances. Insisting on everyday concepts of emotion in psychology would mean that developmental and comparative psychology are condemned to asking unanswerable questions.

What are the laws that govern emotion? Theorists have had great difficulty stating laws that are applicable to all emotions. For example, Hume (1739-40/1980) proposed that emotions are always about something—i.e., in philosophical terms, emotions have objects: you fear something, love someone, and are angry with someone. Unfortunately, some emotions don't always have objects—sadness, excitement, depression, serenity, anxiety, for example, can occur for no known reason: They need not be about anything in particular. From the prototype view, there may be no statements that are universally true of emotions as commonly defined. If all events called emotions possessed the same defining features, then we might expect them all to follow the same rules, to operate according to the same laws. But if, as I suggest, these events resemble one another more in the way that family members do, then the chances of discovering general laws that apply to all members of the domain seem diminished.

Psychologists seeking laws of emotion have probably kept in mind certain prototypical cases. Thus, Schachter and Singer (1962) supposed that emotion necessarily involves heightened physiological arousal plus cognitive inferences concerning the cause of that arousal. Most prototypical emotions (anger, anxiety, excitement) may include both these elements. Still, some don't: Some lack the cognitions (emotions of unknown causes), others lack the arousal (sadness, depression, serenity). Even for the emotions that do appear to involve arousal, the picture is not always clear. James (1894/1950) and Schachter and Singer (1962) supposed that physiological arousal cues were necessary for
emotion. To explore this idea, they examined cases of patients who, for one reason or another, had no internal feedback from autonomically innervated activity. Testimonials from these patients are informative. Some claimed to experience real emotions, some did not. We can probably say that these patients simply weren’t sure whether what they were experiencing was a case of emotion or not. Since some features of emotion were present but others absent, what they were experiencing were simply borderline cases.

What is the domain of events that must be explained by any theory of emotion? James, Watson, Tomkins, Schachter, and others have proposed theories of emotion. Before we can evaluate any such theory, we must know which events the theory purports to explain and which events are to be considered outside its scope. The answer may seem obvious. Often both the theorist and the critic assume that the domain of events to be explained is precisely the domain referred to by the everyday word emotion. If the boundary surrounding the everyday concept emotion is blurry, then this assumption can lead to difficulties. The theorist and the critic may not include exactly the same set of events under the heading of emotion. A deeper issue is whether the domain so defined is the most likely domain for a scientific theory: Does the everyday word emotion cut nature at the joints?

What are the different types of emotion? Everyday middle-level concepts of emotion—fear, anger, love, happiness, and so on—provide the theorist with a ready-made system of classification. Clearly, the theorist needs some system of classification, but whether the everyday system is best for scientific purposes remains to be seen. As with the superordinate concept of emotion, the boundaries surrounding anger, fear, and so on seem to be blurry. Moreover, fear, anger, disgust, etc. appear to be overlapping rather than mutually exclusive categories; the same event may fall into more than one of these categories.

How can emotions be assessed? For many years, an operational definition was thought to be the proper way to assess an emotion. If the prototype characterization of anger, fear, and so on is correct, then no single operation can hope to define these concepts. If no one feature is necessary and sufficient, then no one feature exists that can be used as the sole index. Consider an operational definition of fear as a specific physiological index of arousal. The advantage of this measure is that it can be made more and more precise, and will, therefore, allow precise relationships with other variables (namely the causes and consequences of that particular physiological response). The problem is validity: Improvements in the precision of physiological measurement marginally help improve its validity as a measure of fear. A person who is not afraid but is exercising or drinking too much coffee would score too high, and be falsely classified as afraid. A person who is afraid but inhibits physiological arousal, or who takes too much valium, would score too low, and be falsely classified as unafraid.

As an alternative, multiple operations are now widely advocated. This advice is consistent with the thesis that the concepts to be measured are understood in terms of many features, no one operationalism is a difficult strategy.

More important, in attempting to lose scientific precision. To illustrate with two component scores: an index of physiological arousal, and an index of emotional experience, a person showing intermediate values on both physiological and emotional measures of arousal. The difference in the physiological arousal and emotional arousal scores reflects the causes and consequences of the emotion.

The advantage of a two-component operationalism is its ability to capture the essence of the emotion. But it still misses in a few cases: the attempt to fake fear by claiming to lose. To capture the everyday world, more components. As we do so, the domain becomes more ambiguous and less likely to correspond to a single concept.

The use of an everyday concept is in measurement: There is a single concept that is ambiguous and allows for a wide variety of responses. A single operation is unambiguous in itself, but it may not correspond well to the everyday concept. As measurement becomes more precise, the operationalism, but to point to the systems not from tactics of measurement, but by the way we have been trying to measure.

In summary: Writers on the concept of emotion are not definable in terms of operational characteristics, but by the way we have been trying to measure. The natural language concepts will be to precise measurement. These concepts.
examined cases of patients who, for one back from autonomicallv innervated its are informative. Some claimed to We can probably say that these patients are experiencing was a case of emotion were present but others absent, what derline cases.

must be explained by any theory of chachter, and others have proposed uate any such theory, we must know explain and which events are to be r may seem obvious. Often both the domain of events to be explained is everyday word emotion. If the boundary on is blurry, then this assumption can ritic may not include exactly the same notion. A deeper issue is whether the main for a scientific theory: Does the joints?

everyday middle-level concepts of nd so on—provide the theorist with a rly, the theorist needs some system of system is best for scientific purposes nate concept of emotion, the bound- seem to be blurry. Moreover, fear, pping rather than mutually exclusive more than one of these categories.

my years, an operational definition was emotion. If the prototype characteri- ct, then no single operation can hope e is necessary and sufficient, then no sole index. Consider an operational al index of arousal. The advantage of and more precise, and will, therefore, iables (namely the causes and conse- response). The problem is validity: lical measurement marginally help a person who is not afraid but is exer- core too high, and be falsely classified its physiological arousal, or who takes d be falsely classified as unaflaid.

re now widely advocated. This advice epts to be measured are understood

in terms of many features, no one of which is necessary and sufficient. Multiple operationalism is a difficult strategy, and few studies live up to its demands. More important, in attempting to capture the everyday concept we may be losing scientific precision. To illustrate, consider a measure of fear that is the sum of two component scores: a self-report fear questionnaire, scored 0 to 5, and an index of physiological arousal, also scored 0 to 5. Total scores of 0 and 10 would be clear, but any other score is ambiguous. Consider a total score of 5, which would be assigned to three quite different individuals: (a) a person claiming maximum fear but showing no physiological arousal, (b) a person showing intermediate values on both the self-report questionnaire and the physiological measure, and (c) a person claiming no fear, but showing maximum physiological arousal. The emotional states of these three are quite different, are unlikely to have been caused in a similar fashion, and are unlikely to lead to similar behaviors. As a consequence, the index that assigns these three persons the same score is unlikely to correlate highly with other variables representing the causes and consequences.

The advantage of a two-component measure is that it comes closer than either component alone to capturing the meaning of the everyday word fear. But it still misses in a few cases: Consider individuals who for some reason attempt to fake fear by claiming it and work themselves into a sweat doing so. To capture the everyday word fear more closely, we would need to add more components. As we do so, the index so constructed becomes more ambiguous and less likely to correlate highly with other variables.

The use of an everyday concept as a scientific concept thus presents a dilemma in measurement: There is a trade-off between precision and validity. A single operation is unambiguous and is capable of yielding precise relations to other variables, but it is minimally valid in the sense that it cannot capture the everyday concept well. As more operations are added, the resultant score comes to approximate the everyday concept more closely, but becomes imprecise, ambiguous, and allows only weak relationships to other variables. My purpose here is not to decide between operationalism and multiple operationalism, but to point to the dilemma we face in either case. The dilemma stems from tactics of measurement but from the nature of the concepts we have been trying to measure.

In summary: Writers on the topic of emotion typically assume that our natural language concepts will serve as scientific concepts. My purpose in this section has been to question this idea. Our natural language concepts of emotion are not definable in terms of necessary and sufficient features, have not promoted the formulation of precise laws, and do not lend themselves to precise measurement. These are not promising qualities for scientific concepts.
CONCLUSION

Human beings divide the world into kinds. Our initial divisions correspond to superficial similarities. Panda bears, koala bears, and brown bears are animals that look alike. So we call them by the general term bear. Some of our everyday classes stand up to scientific scrutiny well. Ancient categories of water and gold remain pretty decent categories for chemists. Other categories don't: Color, like beauty, is in the eye of the beholder. Science unearths deeper similarities and reclassifies. Rather than classified as bears, koalas are put with wombats and kangaroos as marsupials. Moral: An everyday concept must be carefully scrutinized before it is accepted as a scientific concept.

Human beings divide up the psychological world into kinds. Persons are extraverts or introverts, sane or insane; insane persons are neurotic or psychotic. And so on. In the realm of emotions, human beings—at least adults in our culture—distinguish emotions from nonemotions and divide the emotions into fear, anger, sadness, etc. What are we as scientists to do with the rich language of emotion concepts we inherit from our culture?

We have two tasks, and I believe that failure to distinguish them has resulted in needless squabbling and confusion. One of our jobs is to describe this set of concepts—just as an anthropologist describes any system of folk classification. Whether well- or ill-defined, these concepts are themselves something to be studied, for they probably influence the way an individual thinks, perceives, remembers, acts, and experiences. In this descriptive task, we have to describe everyday concepts as they are.

Another, and altogether different, task is prescriptive. How should we, as scientists, describe and categorize the phenomena ordinary folk call emotions? Can we just borrow the folk concepts of emotion, anger, sadness, etc.? Our prescriptive task is to find scientific concepts for the events referred to by those everyday words. Here we, as scientists, must be free to criticize, modify, or even reject the everyday way of thinking. There is no more fundamental question for a science than how to specify the entities and properties in its domain. If a science proposes laws, like “if X then Y,” then it must propose the Xs and the Ys. Each science must search for the natural kinds in its domain. As science progresses, it moves from the superficial similarities that are the basis of folk concepts, to deeper similarities.

Much writing on the psychology of emotion tells us more about how emotional phenomena are described, than about how they should be described. Much is written analyzing our everyday terms. Dictionaries are consulted. Studies are carried out asking subjects to rate the similarity between emotion words, to fill out questionnaires on their mood, or to categorize facial expressions. Such methods rely on our everyday way of classifying, and the evidence obtained thus bears on our descriptive task. These methods cannot tell us how the phenomena of emotion are actually experienced.
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tell us how the phenomena of emotion should be described. Rather, they provide hypothesis that can be tried out.
Proposals of scientific concepts and taxonomies of emotional phenomena should not be criticized just because they fail to coincide with our everyday concepts. In Behavioral and Brain Sciences, Panksepp (1982) proposed that four neurological systems underlie emotional phenomena. He named the systems rage, fear, panic, and expectation. Lazarus (1982) criticized him by saying “expectancy is difficult for me to view as an emotion.” If we listened to the critics, we would be forever bound to ancient concepts.

REFERENCES


Natural Language Concepts of Emotion