The Concept of Love Viewed From a Prototype Perspective

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Even if superordinate concepts (such as fruit, vehicle, sport) are prototypically organized, basic-level concepts (such as apple, truck, hockey) might be classically defined in terms of individually necessary and jointly sufficient features. A series of 6 studies examined 1 basic-level concept in the domain of emotion, love, and found that it is better understood from a prototype than a classical perspective. The natural language concept of love has an internal structure and fuzzy borders: Maternal love, romantic love, affection, love of work, self-love, infatuation, and other subtypes of love can be reliably ordered from better to poorer examples of love. In turn, each subtype’s goodness as an example of love (prototypicality) was found to predict various indices of its cognitive processing. Implications for a scientific definition and typology of love are discussed.

Prototype theory has provided insights into concepts central to psychology, including behavioral act (Buss & Craik, 1983), personality trait (Cantor & Mischel, 1979), intelligence (Neisser, 1979), social situation (Cantor, Mischel, & Schwartz, 1982), and environmental setting (Tversky & Hemenway, 1983). The theory has inspired important new approaches to psychiatric diagnosis (Cantor, Smith, French, & Mezzich, 1980) and personality assessment (Broughton, 1984). The studies reported in this article are part of a larger project designed to explore the applicability of prototype theory to the domain of emotion concepts.

We had two related purposes. The first was to use the tools of prototype theory to throw light on the elusive concept of love. We shall have something to say about both the definition of and typologies of love. The second purpose concerned prototype theory itself. Prior demonstrations of a prototype structure in concepts focused on superordinate concepts, such as fruit, vehicle, or emotion. Would the same results occur, we asked, for basic-level concepts, such as apple, truck, or love? We shall begin with the second issue.

Traditionally, the general terms of a language were thought to denote categories of objects or events, each member of which possessed features that were each necessary and together sufficient to define membership in that category. According to this classical view, to know the meaning (sense) of a general term (i.e., to have the concept associated with it) was to know at least implicitly these necessary and sufficient features. A definition could therefore be formulated by philosophical discussion or—because the defining features were also in the objects or events—by empirical investigation.

Although some writers continue to defend the classical view (Armstrong, Gleitman, & Gleitman, 1983; Harnad, 1987; Osherson & Smith, 1981), considerable psychological research reinforces a growing skepticism over its plausibility as an adequate account of most concepts used in everyday speech and thought (Mervis & Rosch, 1981; Smith & Medin, 1981). Rosch’s (1975, 1977, 1978) proposal of a prototype account as an alternative to the classical view was followed by various nonclassical accounts (Kahneman & Miller, 1986; Lakoff, 1987; Medin, 1989; Neisser, 1987; Smith & Medin, 1981). Indeed, in one account, concepts are thought of not only as ill-defined but as varying from one person to the next, and, for the same person, from one time to the next (Barsalou, 1987). We make no attempt in this article to differentiate within this family of nonclassical accounts. Rather, our purpose is to continue to specify through empirical means the properties of emotion concepts.

In previous research, we have compared the classical with the prototype view in the domain of emotion (Fehr, 1982, 1988; Fehr & Russell, 1984; Fehr, Russell, & Ward, 1982; Russell, 1991; Russell & Bullock, 1986), but we are not alone in this interest. Indeed, writers as far back as William James (1890/1950, 1902/1929) have viewed emotion concepts in a way more compatible with a prototype than a classical perspective. Averil...
...the physiological significance both of prototypes and of the basic level (Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976), and yet there is insufficient evidence on whether basic-level concepts are themselves prototypically or classically organized.

Evidence of prototype structure found at one level of a hierarchy does not show that concepts at other levels of even that same hierarchy must be so structured. That fruit is organized around prototypes and has fuzzy borders does not show that apples and oranges are so organized. Newport and Bellugi (1978) analyzed American Sign Language, which sharply distinguishes superordinate-, basic-, and subordinate-level categories. Their analysis suggested that only superordinate concepts lack common features shared by all members. At the basic level, features are shared by all or most members. At the subordinate level, features are likewise shared by all or most members, but these same features are also shared with members of contrasting categories.

Therefore, one purpose of the present research was to begin to examine empirically whether basic-level categories have internal structure and fuzzy boundaries. Earlier, we had hypothesized that they do—such is a corollary of viewing anger, fear, and love as scripts (Fehr & Russell, 1984), for the notion of script extends to episodes the notion of prototype. More generally, we hope to offer evidence that should address the concerns of those who continue to defend a classical view in the domain of emotion (Johnson-Laird & Oatley, 1989; Ortony, Clore, & Foss, 1987).

Concept of Love

Love can be studied as a relationship, as an attitude, as an experience, and so on. In this article, we focus on love as an emotion. Indeed, love is a prototypical emotion—it received the highest prototypicality rating of any emotion in the Fehr and Russell (1984) study. Love is an important emotion, although sometimes forgotten—it has even been omitted from some psychologists' lists of the emotions (Ekman, 1972; Izard, 1977; Tomkins, 1984).

In this article, we examine not cases of love, but the natural language concept of love. Love has been defined in a variety of ways. As Brehm (1985, p. 90) commented:

Lysak, Rule, and Dobbs (1989) considered aggression a superordinate concept, having a fight with your wife a basic-level concept, and throwing down your gloves a subordinate-level concept. We suspect that because of its relatively long name, having a fight with your wife is more likely a subordinate-level category, and that throwing down your gloves is more likely a feature than another level of categorization. In any case, what is important here is not so much the correct particular level in the hierarchy but the idea that concepts at different levels of the hierarchy may not all be structured in a prototypic way.

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Social scientists have had as much trouble defining love as philosophers and poets. We have books on love, theories on love, and research on love. Yet no one has a single, simple definition that is widely accepted by other social scientists.

Different writers have pointed to different features of love as defining: frustrated desire (Freud, 1922/1951), erogenous stimulation (Watson, 1924), rewarding interactions (Centers, 1975), and acts that achieve reproductive success (Buss, 1988). Rubin (1970) defined love as “a constructed experience built with feelings, ideas, and cultural symbols” (p. 104). Swensen’s (1972) definition of love focused on behaviors such as shared activities, disclosing intimacies, and so on.

Similarly, psychologists have yet to agree on a typology of love. Love has been said to consist of two (Hatfield & Walster, 1978; Maslow, 1955), three (Kelley, 1983), seven (Kemper, 1978), or eight (Sternberg, 1986) subtypes.

Failure to agree on a definition or a typology of love suggests that psychologists are unsure what to include under the heading of love. From a prototype perspective, the inability to achieve consensus is understandable: There may be no small set of criterial features common to all and only instances of love. There may be no fixed number of subtypes into which love can be divided. One purpose of our research was to explore empirically just this line of thinking. After describing that research, we shall then discuss the relationship of our findings to a scientific definition and typology of love.

Overview

Six studies were conducted, aimed at establishing that subcategories of love vary in their degree of membership in love, that degree of membership predicts important indices of cognitive processing of members, that no sharp boundary separates members from nonmembers, and that members share a family resemblance to one another.

In the first study, subjects were asked to list whatever subtypes of love they could think of. In this way, subjects generated a portion of the next lower, or subordinate, level in the hierarchy of emotion. The ease with which subcategories of love came to mind also provided one measure of their degree of membership within the category of love. Twenty of these subcategories were then selected for analysis in the remaining studies. These studies explored other predicted consequences of graded membership: direct ratings of the degree to which each subcategory is an example of love (Study 2), reaction time to verify sentences concerning its membership in the category love (Study 3), the probability of its inclusion in the category love (Study 4), subjective ratings of how natural or peculiar it sounds in sentences about love (Study 5), and the family resemblance pattern of features listed for the types of love (Study 6). All together, these six studies yielded eight separate ways of mapping the internal structure of the concept of love. Because internal structure is best demonstrated through a convergence of these operations, comparison of one with another is postponed until a final section.

Subjects in these studies were students at the University of Winnipeg who volunteered their participation. From one sample, we estimated their mean age as 20.6 years, with a range of 17 to 47. In each study, roughly half were men, half women.

Study 1: Free Listing of Subtypes of Love

Subjects were presented with the concept of love and asked to list as many subtypes as came to mind.

Method

Subjects (N = 84) read the following instructions (adapted from Fehr & Russell, 1984, Study 1):

This questionnaire is part of a larger project on the sorts of things we have in mind when we hear and use words. In this study, we’re concerned with types within a general category. For example, if asked to list types of the category CHAIR, you might write: rocking chair, recliner, lawn chair, kitchen chair, stool, bean bag chair, and so on.

The category we’re interested in is LOVE. Please list as many types of LOVE as come to mind. Stop after a few minutes or 20 items. Remember that there are no right or wrong answers—just give us your opinion.

Results and Discussion

Subjects generated an average of 8.69 responses each. In summarizing the responses, we treated syntactic variants (e.g., familial love, family love, and love of family) as identical responses. This grouping left a total of 216 different items. Of these, 123 were mentioned by only one subject and 93 by more than one. These 93 items appear in Table 1, along with the frequency with which they were mentioned. As can be seen, the subtypes of love so generated varied widely in how readily they came to mind. At one extreme was friendship listed by over 60% of the subjects. At the other extreme were the 123 items each listed by only one subject. Between these extremes was no clear break between those available and those unavailable from memory. The gradual change in availability is consistent with the idea of internal structure—that prototypical members shade gradually into nonprototypical members and then into nonmembers with no sharp boundary to be found.

Twenty target subtypes of love were selected from Table 1 for further analysis in the subsequent studies. These were the 10 terms listed most frequently, along with another 10 chosen from across the entire range of frequency; the 20 items are listed in Table 2.

Study 2: Prototypicality Ratings

In this study, subjects directly rated the goodness-of-example (prototypicality) of each of the 20 target subtypes of love chosen in Study 1.

Method

Subjects (N = 92) read the following instructions (adapted from Fehr & Russell, 1984, Study 3):

This study has to do with what we have in mind when we hear and use words. Consider the word “red.” Close your eyes and imagine a true red. Now imagine an orangish red. Imagine a pu-
Subjects rated each of the 20 target subtypes of love (listed in Table 2) on a scale ranging from 1 (extremely poor example of love) to 6 (extremely good example of love). For half the subjects, the 20 terms were presented in reverse order.

### Results and Discussion

Mean prototypicality ratings for the 20 target subtypes of love appear in Table 2. Two indices showed the reliability of these means: (a) separate means calculated for the two orders of presentation were highly correlated, $r = .95$; and (b) the intraclass correlation coefficient (which is equivalent to the average of all possible split-half reliability coefficients) was .98. Of course, individual prototypicality ratings were not as reliable as these aggregates (Barsalou, 1987). The mean correlation between two raters across the 20 terms was .35.

“Simone de Beauvoir once wrote that men and women have different concepts of love, and that’s why they fail to understand one another. I don’t doubt that this is true” (Solomon, 1988, p. 69). Consistent with this idea, previous studies have found sex differences in beliefs and feelings about love. For example, women are more likely to endorse pragmatic beliefs about love, men more romantic ones (Peplau, 1983). Women are more likely than men to report emotional symptoms of love, such as

<table>
<thead>
<tr>
<th>Type of love</th>
<th>Prototypicality</th>
<th>Mean reaction time</th>
<th>No. errors</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal love</td>
<td>5.39</td>
<td>1.53</td>
<td>0</td>
</tr>
<tr>
<td>Parental love</td>
<td>5.22</td>
<td>1.55</td>
<td>0</td>
</tr>
<tr>
<td>Friendship</td>
<td>4.96</td>
<td>1.55</td>
<td>0</td>
</tr>
<tr>
<td>Sisterly love</td>
<td>4.84</td>
<td>1.46</td>
<td>1</td>
</tr>
<tr>
<td>Romantic love</td>
<td>4.76</td>
<td>1.53</td>
<td>0</td>
</tr>
<tr>
<td>Brotherly love</td>
<td>4.74</td>
<td>1.49</td>
<td>0</td>
</tr>
<tr>
<td>Familial love</td>
<td>4.74</td>
<td>1.51</td>
<td>1</td>
</tr>
<tr>
<td>Sibling love</td>
<td>4.73</td>
<td>1.57</td>
<td>0</td>
</tr>
<tr>
<td>Affection</td>
<td>4.60</td>
<td>1.47</td>
<td>1</td>
</tr>
<tr>
<td>Committed love</td>
<td>4.47</td>
<td>1.39</td>
<td>0</td>
</tr>
<tr>
<td>Love for humanity</td>
<td>4.42</td>
<td>1.61</td>
<td>0</td>
</tr>
<tr>
<td>Spiritual love</td>
<td>4.27</td>
<td>1.47</td>
<td>0</td>
</tr>
<tr>
<td>Passionate love</td>
<td>4.00</td>
<td>1.62</td>
<td>0</td>
</tr>
<tr>
<td>Platonic love</td>
<td>3.98</td>
<td>1.57</td>
<td>1</td>
</tr>
<tr>
<td>Self-love</td>
<td>3.79</td>
<td>1.81</td>
<td>1</td>
</tr>
<tr>
<td>Sexual love</td>
<td>3.76</td>
<td>1.34</td>
<td>0</td>
</tr>
<tr>
<td>Patriotic love</td>
<td>3.21</td>
<td>1.64</td>
<td>1</td>
</tr>
<tr>
<td>Love of work</td>
<td>3.14</td>
<td>1.78</td>
<td>1</td>
</tr>
<tr>
<td>Puppy love</td>
<td>2.98</td>
<td>1.65</td>
<td>2</td>
</tr>
<tr>
<td>Infatuation</td>
<td>2.42</td>
<td>1.63</td>
<td>2</td>
</tr>
</tbody>
</table>

Note. Prototypicality ratings were made on a scale ranging from 1 (extremely poor example of love) to 6 (extremely good example of love). Reaction times are reported in seconds. Number of errors refers to the number of subjects responding "false" when presented with the statement "X is a type of love," when X is the type listed. The maximum possible number of errors was 20.
failing euphoric, having trouble concentrating, or feeling as though floating on a cloud (Dion & Dion, 1976; Hendrick, Hendrick, Foote, & Slapion-Foote, 1984). And women love
their partners more companionably, whereas men love theirs
more passionately (Traupmann & Hatfield, 1981). However, in
our data, men and women did not differ significantly (α = .05)
in which subtypes of love they rated as better or poorer exam-
pies of love. In fact, men's and women's prototypicality ratings
were highly correlated, r = .94. In a related finding, men's and
women's ratings of prototypicality of various features of love
were also highly correlated (Fehr, 1988). Thus, although men
and women may differ in their beliefs about love, or in how they
experience love, they seem to have the same concept of love.

For the remaining studies, a decision was required as to
which subtypes of love should be considered central and which
should be considered peripheral. A median split of the proto-
typicality of the prototypicality of love was used to divide central from peripheral emotions. In fact, men's and women's prototypicality ratings were highly correlated, r = .94. In a related finding, men's and women's ratings of prototypicality of various features of love were also highly correlated (Fehr, 1988). Thus, although men and women may differ in their beliefs about love, or in how they experience love, they seem to have the same concept of love.

Study 3: Reaction Time to Verify Category Membership

Rosch (1973) found not only that subjects could reliably rate
how well an example of the concept bird were patients, eagles,
chickens, and penguins, but that these prototypicality ratings
predicted how long subjects took to verify that they were birds.
Central members were verified faster than peripheral members.
Similarly, Fehr et al. (1982) found that the prototypic-
ality ratings of various emotions predicted how long subjects
took to verify that they were emotions.

The purpose of the present study was to test this prediction
for the relationship between the basic and the subordinate level
of categorization. Subjects were predicted to verify a statement
like “Maternal love is a type of love” more quickly than a statement
like “Patriotic love is a type of love.”

Method

Subjects (N = 27) were asked to respond “true” or “false” to 80 state-
ments in the form of “X is a type of Y.” The general categories (Y) of
interest were love and fruit. The types of love were the 10 central and 10 peripheral types as determined in Study 2. The 20 types of fruit were
taken from Rosch (1975) and included to replicate her reaction
time findings and to provide filler items for the task. Eighty sentences
were needed so that the proportion of true and false statements was
equal.

The pool of statements consisted of (a) 10 true statements concerning prototypical types of love, such as “Maternal love is a type of love”; (b) 10 true statements concerning peripheral types of love, such as “Patriotic love is a type of love”; (c) 10 false statements concerning prototypical types of love, such as “Romantic love is a type of boat”; (d) 10 false statements concerning peripheral types of love, such as “Sexual love is a type of cheese”; (e) 10 true statements concerning prototypical fruit, such as “Apple is a type of fruit”; (f) 10 true statements concerning peripheral fruit, such as “Tomato is a type of fruit”; (g) 10 false statements concerning prototypical fruit, such as “Pear is a type of vehicle”; and (h) 10 false statements concerning peripheral fruit, such as “Olive is a type of dance.”

The 80 statements were presented on a computer screen in a differ-
ent random order for each subject. The following instructions (adapted
from Fehr et al., 1982) appeared on the screen:

This is a simple study of the “belongingness” of items into catego-
ries. You will be presented with a series of statements of the form
“X is a Y.” Your task is to respond True or False to each statement
as fast as you can. So, for example, if the statement “Car
is a type of vehicle” appeared on the screen, you would press the
“T” key for TRUE. If the statement “Car is a type of vegetable
appeared, you would press the “F” key for FALSE. Try to respond as
quickly and as accurately as you can.

Subjects were first presented with four practice statements (two true
and two false) to familiarize them with the task (e.g., “Hockey is a type
of game” and “Soccer is a type of book”). Reaction times to the prac-
tice items were not recorded. Next followed the 80 statements. Subjects
spent approximately 10 min on this task.

Results and Discussion

Reaction times were analyzed only for correct responses. A
response was considered correct if the subject responded “true”
to a true statement or “false” to a false statement, whether pro-
totypical or peripheral.

The statements of primary interest were the 20 true state-
ments concerning love. Mean reaction time and number of
errors for each subtype appear in Table 2. Over 90% of the
subjects responded correctly to each statement, although for the
more peripheral subtypes of love the beginnings of disagree-
ment can be seen. Over half of all errors occurred in response to
the four most peripheral subtypes.

Dependent sample t tests showed a significant difference for
reaction times to true love statements, t(26) = 2.30, p < .05,
such that the category membership of prototypical instances
was verified more quickly than that of peripheral instances
(1.51 vs. 1.62 s). The difference in reaction time between protot-
ypical and peripheral true love statements was not significant,
t(26) = 1.99, p > .10 (1.64 vs. 1.65 s).

There was also a significant difference for reaction times
to true fruit statements, t(26) = 4.68, p < .001, such that the cate-
gory membership of prototypical instances was verified more
quickly than that of peripheral instances (1.38 vs. 1.57 s). The
difference in reaction time between prototypical and periph-
eral false fruit statements (1.52 vs. 1.60 s) was not significant,
t(26) = 1.94, p > .07.

Study 4: Fuzzy Borders

Internal structure and a classical definition are not mutually
exclusive. Armstrong et al. (1983) showed that paradigm cases
of classically definable concepts, such as odd number and plane
geometric figure, have an internal structure. This demonstra-
tion seems to leave no method of distinguishing concepts that
are classically definable from those that are not.

Fehr and Russell (1984) proposed a method. Classically
definable concepts have precise borders, whereas emotion, fruit,
and the like do not. A direct challenge to the classical
view is therefore the demonstration that membership is proba-
listic rather than all or none. We thus offered evidence to show that subjects can agree on which cases are and which are not odd numbers but cannot agree for emotion, fruit, or vehicle. The present study addressed the question of whether love has sharp or fuzzy borders.

Study 3 had provided data on the question of whether the boundaries of love are sharp or fuzzy, but the results were not clear. On one hand, there was the expected disagreement found in the peripheral cases. On the other hand, at least 90% of the subjects agreed that each of the 20 target subtypes was a type of love. This degree of consensus might have occurred because subjects were asked to make quick judgments in a context where no responses went largely to absurd filler items such as "Is infatuation a type of fruit?" In this context, "Is infatuation a type of love?" may have seemed more reasonable than it otherwise would.

The present study examined a broader range of potential subtypes. Subjects were given 30 subtypes and as much time as they wanted to answer each question. A separate group of subjects provided prototypicality ratings for these 30. No absurd filler items were presented.

Method

Membership ratings. Subjects (N = 118) read the following instructions:

Sometimes when we use a word, we don't mean it really. Other times, we do. To take an extreme example, metaphors aren't to be taken literally. As in: "Sally is an iceberg" or "Tom is a volcano." Sally is not a genuine iceberg, nor Tom a genuine volcano. We know that koala bears are not genuine bears. Road apples are not genuine apples. A bird-of-paradise is a flower, not a bird. Yet a penguin, even though it can't fly, is a real bird. Something can be a genuine case, however unusual or atypical. Picture a tiger: a yellow-striped, four-legged, sharp-eyed adult tiger. Yet we know that an albino, three-legged, blind, baby tiger is nonetheless a genuine tiger.

In this study, we're interested in your opinion about what are genuine cases of love and what are not. On the next page is a list of possible cases. Consider each in turn, and please judge whether it is or is not a genuine case of love.

Don't worry about why you feel one way or the other. You may decide that all are genuine. Or you may decide that none are. Just give us your opinion.

Next followed a list of 30 possible types of love. Fifteen were taken from Shaver et al.'s (1987) cluster of subtypes of love. The remaining 15 were selected from responses obtained in Study 1 in such a way as to include a range of availability but to place an emphasis on the less available items in order to have a good sample of potential borderline cases. Thus, each of the 30 items had some claim to being a genuine case of love, but the sample did not overrepresent prototypical cases, as had been done in the target sample used in Study 3.

Prototypicality ratings. Subjects (N = 21) not included in the study just described rated all 30 items in the same random order, following a procedure identical to that of Study 2.

Results and Discussion

The majority of subjects judged that romantic love is a type of love—only 2% disagreed with the majority decision. Most judged that lust is not a type of love—only 13% disagreed with the majority decision. But most cases fell between these extremes. The percentage of subjects who denied that each item is a genuine case of love is shown in Table 3. The median percentage was 55. For 15 of the 30 candidates presented, at least one third dissented from the majority. The results of Table 3 show that a sample of college-educated native speakers do not agree among themselves on what is and what is not included in the category of love.

Subjects' judgments were not random, however. The probability of a candidate's being judged a genuine case of love correlated .96 with its mean prototypicality rating. When the word love appeared in the item (e.g., puppy love), many subjects still denied that it was a type of love. This finding implies that content-based representations rather than logically structured categories mediated their judgments.

Study 5: Substitutability for the Category Name

Asked to give us a sentence about emotion, one subject wrote: "Sometimes emotion is hard to control." Substituting for the word emotion a prototypical type of emotion produced a sentence that sounded quite natural (Fehr & Russell, 1984)—for example, "Sometimes anger is hard to control." However, substituting a peripheral emotion produced a sentence that often sounded rather peculiar—for example, "Sometimes respect is hard to control." Such effects had been expected because the
more prototypical members are more representative of, and closer to the meaning of, the superordinate category name. Rosch (1977) had earlier found similar results for sentences about fruit, vehicles, and other superordinate categories.

In the present study, we asked whether something similar would happen with sentences about basic-level categories, specifically with sentences about love. One group of subjects first gave us 10 sentences, and we took another 10 from psychology textbooks. Another group of subjects was then asked to judge how peculiar or natural they found the sentences that resulted when the 20 target terms were substituted for the word love.

Method

Phase 1. Subjects (N = 37) were asked to generate sentences containing the word love. Ten of these sentences were selected for use in this study (Sentences 1 to 10 in Table 4). An additional 10 sentences were taken from recently published textbooks for courses in introductory or social psychology (Sentences 11 to 20 in Table 4).

Phase 2. Subjects (N = 400) read the following instructions (adapted from Fehr & Russell, 1984, Study 4):

This questionnaire is part of a larger project on the sorts of things people have in mind when they hear and use words. In this study, we're interested in how peculiar or how natural certain sentences sound. For example, the sentence "A bowl of apples makes a nice centerpiece for the table" probably sounds quite natural to most people. On the other hand, a sentence like "A bowl of watermelons makes a nice centerpiece for the table" sounds rather peculiar. In this study, we're not interested in sentences about fruit. We're interested in sentences about love.

Below is a series of sentences—some make a lot of sense, others make some sense, and some may make no sense at all. Your task is to read each sentence to yourself and rate how natural or peculiar it sounds to you. Don't spend time wondering if your answer is right or wrong. There are no right or wrong answers. So, just base your answer on your first impression from reading the sentence.

Subjects then rated each of 20 sentences on a scale ranging from 1 (very peculiar) to 6 (very natural sounding). The 20 sentences were drawn from a pool of 400 sentences formed by substituting the 20 subtypes of love in place of the word love in the 20 sentences listed in Table 4. Twenty sentences were drawn for each subject in such a way that each subtype of love and each sentence frame appeared only once.

Results and Discussion

Consider the following sentence: "Love has to be worked at and strived for to be truly achieved." Substitution produced some sentences that sounded natural and others that sounded peculiar (e.g., "Friendship has to be worked at and strived for to be truly achieved" and "Infatuation has to be worked at and strived for to be truly achieved").

The naturalness of the resulting sentence was expected to depend on how prototypical was the subtype of love substituted. In the example above, substitution of a prototypical subtype, friendship, yielded a sentence that subjects thought

<table>
<thead>
<tr>
<th>Sentence</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Love is a giving process, understanding the other, and realizing the other's faults.</td>
<td>.81***</td>
</tr>
<tr>
<td>2. Commitment and caring are important components of love.</td>
<td>.79***</td>
</tr>
<tr>
<td>3. Love has to be worked at and strived for to be truly achieved.</td>
<td>.61**</td>
</tr>
<tr>
<td>4. Love is a very happy state—most of the time.</td>
<td>.48*</td>
</tr>
<tr>
<td>5. Love varies with the person and with the relationship.</td>
<td>.45*</td>
</tr>
<tr>
<td>6. Love is tender and vulnerable no matter who shares it.</td>
<td>.42</td>
</tr>
<tr>
<td>7. Love is something shared intensely by two people.</td>
<td>.31</td>
</tr>
<tr>
<td>8. Love is a feeling one gets in a special relationship with another person.</td>
<td>.17</td>
</tr>
<tr>
<td>9. Love is very painful if not reciprocated.</td>
<td>.13</td>
</tr>
<tr>
<td>10. Love may be both happy and sad, good and bad.</td>
<td>-.04</td>
</tr>
<tr>
<td>11. Love is one of the most important human emotions, yet it is poorly understood.</td>
<td>.70***</td>
</tr>
<tr>
<td>12. In our culture, we learn about love from childhood on.</td>
<td>.60**</td>
</tr>
<tr>
<td>13. Given the importance of love in promoting happiness and making the world go 'round, it may be surprising that psychologists have only recently begun systematic research on this topic.</td>
<td>.33</td>
</tr>
<tr>
<td>14. The phenomena of love are not easy to pin down scientifically.</td>
<td>.14</td>
</tr>
<tr>
<td>15. Most of the time love does not involve intense physical reactions. Instead, it can be viewed as a particular sort of attitude one person has toward another person.</td>
<td>.05</td>
</tr>
<tr>
<td>16. Love is an emotion and, like the other emotions, may be seen as having both physiological and psychological components.</td>
<td>.03</td>
</tr>
<tr>
<td>17. The emotions that accompany love are complex and far from being clearly understood.</td>
<td>-.13</td>
</tr>
<tr>
<td>18. One of the difficulties in discussing love is that it means so many things to so many people.</td>
<td>-.17</td>
</tr>
<tr>
<td>19. If you go to movies, listen to records, or read novels, you are constantly exposed to people's views of love.</td>
<td>-.36</td>
</tr>
<tr>
<td>20. Love is merely an intense form of liking.</td>
<td>-.45*</td>
</tr>
</tbody>
</table>

Note. The first 10 sentences were written by undergraduate students. The second 10 sentences were taken from psychology textbooks.

* p < .05.  ** p < .01.  *** p < .001.
sounded natural (\(M = 4.45\)), whereas substitution of a peripheral subtype, infatuation, yielded a sentence that sounded peculiar (\(M = 1.95\)). Correlations between mean naturalness ratings for the subtypes of love and their prototypicality ratings obtained in Study 2 are shown for each of the 20 sentence frames in Table 4.

The resulting correlations were generally in the expected positive direction, but were stronger for some sentences than for others. The sentences constructed by students yielded correlations between naturalness and prototypicality that were generally high, average \(r = .61\). The range of correlations was similar to that found with the same task for other concepts (e.g., Fehr & Russell, 1984). In contrast, sentences taken from psychology textbooks showed little if any relation between naturalness and prototypicality, average \(r = .10\). In fact, four of the textbook sentences yielded correlations that were negative. Consider “Love is merely an intense form of liking.” Substituting a peripheral type of love yielded a more natural sounding sentence than did substituting a prototypical type: Puppy love, the least prototypical type of love we included, received the highest mean naturalness rating (5.10), whereas maternal love, the most prototypical type of love, received the lowest (2.20). If substitutability can be taken as an indication of the core meaning of the concept, then statements about love that students find in their textbooks can be far removed from their own conceptualizations of love.

To derive an index of internal structure from these data, a “substitutability” score was computed by averaging across the 20 sentences the naturalness ratings that each subtype of love received. These scores are given in Table 5.

Table 5
Substitutability, Family Resemblance, and Common Features Scores for 20 Types of Love

<table>
<thead>
<tr>
<th>Type of love</th>
<th>Substitutability</th>
<th>Family resemblance</th>
<th>Common features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maternal love</td>
<td>3.94</td>
<td>135</td>
<td>13</td>
</tr>
<tr>
<td>Parental love</td>
<td>3.94</td>
<td>144</td>
<td>17</td>
</tr>
<tr>
<td>Friendship</td>
<td>4.63</td>
<td>145</td>
<td>17</td>
</tr>
<tr>
<td>Sisterly love</td>
<td>3.69</td>
<td>122</td>
<td>12</td>
</tr>
<tr>
<td>Romantic love</td>
<td>4.53</td>
<td>109</td>
<td>12</td>
</tr>
<tr>
<td>Brotherly love</td>
<td>3.90</td>
<td>143</td>
<td>18</td>
</tr>
<tr>
<td>Familiar love</td>
<td>4.08</td>
<td>121</td>
<td>12</td>
</tr>
<tr>
<td>Sibling love</td>
<td>3.95</td>
<td>129</td>
<td>13</td>
</tr>
<tr>
<td>Affection love</td>
<td>4.48</td>
<td>101</td>
<td>10</td>
</tr>
<tr>
<td>Committed love</td>
<td>4.40</td>
<td>124</td>
<td>17</td>
</tr>
<tr>
<td>Love for humanity</td>
<td>4.06</td>
<td>61</td>
<td>6</td>
</tr>
<tr>
<td>Spiritual love</td>
<td>3.89</td>
<td>67</td>
<td>7</td>
</tr>
<tr>
<td>Passionate love</td>
<td>4.35</td>
<td>85</td>
<td>10</td>
</tr>
<tr>
<td>Platonic love</td>
<td>3.99</td>
<td>100</td>
<td>11</td>
</tr>
<tr>
<td>Self-love</td>
<td>3.62</td>
<td>49</td>
<td>7</td>
</tr>
<tr>
<td>Sexual love</td>
<td>4.13</td>
<td>65</td>
<td>10</td>
</tr>
<tr>
<td>Patriotic love</td>
<td>3.36</td>
<td>74</td>
<td>7</td>
</tr>
<tr>
<td>Love of work</td>
<td>3.53</td>
<td>61</td>
<td>8</td>
</tr>
<tr>
<td>Puppy love</td>
<td>3.91</td>
<td>41</td>
<td>3</td>
</tr>
<tr>
<td>Infatuation</td>
<td>3.68</td>
<td>41</td>
<td>5</td>
</tr>
</tbody>
</table>

Note. Substitutability ratings were made on a scale ranging from 1 (very peculiar) to 6 (very natural sounding); the scores are means computed across 20 sentences. Common features refers to the number of features the subcategory of love shared with love itself; features of love were taken from Fehr's (1988) list. Family resemblance is a weighted average of features shared with other subcategories.
Results and Discussion

We are not interested in different kinds of fear, but in different kinds of love. When thinking about each type of love, you might ask yourself: What manifestations are there of it? What thoughts do you have about it? How do you show it? In what circumstances are you apt to be aware of it? It might help to imagine that you're explaining the meaning of each type of love to a foreigner or to someone who has never experienced it. Include the obvious. Tell how it comes about and what happens after. But emphasize a description of how one feels and acts.

Try not just to free associate. If a particular kind of love makes you think of someone you know, don't write down the person's name. We're interested in what is common to instances of love.

Subjects were given as much time as they wished to list the attributes for each of 10 subtypes of love presented in random order. Which 10 of the 20 target subtypes were presented varied from one subject to the next such that each subtype of love was described by 20 subjects.

Results and Discussion

The total number of responses generated was 2,333. Creating family resemblance scores required a decision as to which of these responses represented the same attribute and which represented different attributes. Three judges coded the responses. The criterion adopted was the conservative procedure used by Fehr (1988), in which only identical or synonymous responses are combined. Next, for each target subtype, attributes mentioned by only one subject were eliminated. Judges' coding of the remaining attributes yielded a final list of 205 distinct attributes, which thus had been listed by two or more subjects for at least one subtype. Each of the 205 attributes was then weighted by the number of subtypes for which it had been listed. For example, a weight of 14 was given to “caring” because it was listed as an attribute for 14 of the 20 subtypes. This, in fact, was the highest weight obtained. The next most common attributes and their weights were helping (12), bond (11), sharing (10), feel free to talk about anything (9), understanding (9), respect (8), and closeness (7). A weight of 1 was given to attributes that were listed (by two or more subjects) for only one subtype of love: “act immaturely,” listed only for puppy love; “playfighting,” listed only for brotherly love; and “worrying,” listed only for maternal love.

Finally, for each type of love a family resemblance score was calculated as the sum of the weighted attribute scores listed for that type of love. These scores appear in Table 5. Family resemblance scores for prototypical subtypes were higher for love than for peripheral subtypes, r(18) = 8.31, p < .001.

We also expected that more prototypical subtypes would bear a greater family resemblance to the general category love. In other words, maternal love would have more features in common with love than would puppy love. It was possible to test this prediction because Fehr (1988) had asked subjects to list the features of love, and those features had earlier been coded with the same procedure used here. We tabulated the number of features each of the 20 types of love had in common with the features that had been listed for love. The results are also shown in Table 5. As expected, prototypical subtypes had more features in common with love than did peripheral subtypes, r(18) = 5.63, p < .001.

Convergence of Measures of Internal Structure

This series of studies produced eight operations thought to correlate with internal structure: (a) frequency in a free listing task (Study 1), (b) direct ratings of prototypicality (Study 2), (c) reaction time to verify membership (hypothesized to correlate negatively with internal structure) (Study 3), (d) probability of membership (Study 3), (e) probability of membership (Study 4), (f) substitutability into sentences about love (Study 5), (g) family resemblance score (Study 6), and (h) number of features shared with love (Study 6).

Each of these variables is influenced by factors other than internal structure, and therefore internal structure is best demonstrated by a convergence of these operations. Correlations between the eight operations, calculated across types of love, are shown in Table 6. All values were in the predicted direction, most reliably so. In fact, all operations except frequency of free listing were highly intercorrelated.

The correlations involving frequency of free listing, although low, were similar to those obtained in other studies. For example, rated prototypicality and frequency of free listing correlate .35 for emotions (Fehr & Russell, 1984), .35 for features of love (Fehr, 1988), .37 for features of wisdom (Holliday & Chandler, 1986), and .19 for features of persons in different occupations (Dahlgren, 1985).

Fehr and Russell (1984) had found family resemblance scores to be the weakest correlate of internal structure for emotion. In contrast, in the present study, family resemblance was one of the best. Family resemblance cannot be put to rest as a possible mediator of typicality effects in the domain of emotion.

The pattern of results obtained here was the one predicted from prototype theory. The basic-level concept of love has an internal structure: Subtypes of love can be reliably ordered from better to poorer examples of love. In turn, a subtype's rank in this internal structure predicts its availability in a free listing task, the speed with which it is verified as a type of love, how readily it can be substituted in sentences about love without their sounding unnatural, the extent to which it resembles other types of love, and the probability of its being considered a genuine type of love. The last finding is especially important in establishing that the concept of love lacks precise boundaries and therefore speaks strongly against the hypothesis that love is classically defined. More generally, these results provide an alternative account of how a person can use and understand the concept of love without knowing necessary and sufficient features for it. Our results therefore failed to support the suggestion that basic-level categories are classically defined.

Scientific Definitions and Typologies of Love

Contrasts of Folk and Scientific Concepts

Psychologists have offered various definitions and typologies that attempt to specify what is to be included under the term love. Psychologists' offerings appear to conflict with the present results. We first outline the differences and then, in the final section, we discuss what should be the relationship between folk and scientific concepts.

Psychologists have attempted to specify one or two necessary and sufficient features for love. To consider just one example, Johnson-Laird and Oatley (1989) recently argued that love can be defined as follows: to love is "to experience internal happiness in relation to an object, or person, who may also be the object of sexual desire" (p. 60). From a prototype perspective,
happiness is likely to be only one of many features that characterize love—and perhaps not the most characteristic feature, either. Our subjects did not list happiness as one of the features of most types of love. The characteristics shared by most but not all types of love were caring, helping, establishing a bond, sharing, feeling free to talk, understanding, respect, and closeness. Thus, sentences about love sound peculiar when Johnson-Laird and Oatley's definition is substituted: The command “love thy neighbor” would thus translate as “experience internal happiness in relation to thy neighbor.” Johnson-Laird and Oatley’s definition implies that if internal happiness in relation to an object or person is experienced, then, by definition, love is experienced. In other words, a loveless but happy relationship, as in, say, a pleasant business association, would be a contradiction in terms. Johnson-Laird and Oatley’s definition also implies that if love is experienced, then happiness must be experienced. In other words, an unhappy love relationship, as in, say, unrequited love, would be a contradiction in terms. In short, Johnson-Laird and Oatley’s definition fails to capture the ordinary language concept of love.

Similarly, the typologies of love advocated by psychologists appear to conflict with the present results. First, they differ in number. Scientists have typically listed a small number of types of love. Two types of love, companionate and passionate, are recognized by many social psychologists (Hatfield & Walster, 1978). Two types were also described by Maslow (1955): D-love (deficiency love) and B-love (being love). D-love is based on need and dependence, whereas B-love is based on autonomy and giving of oneself to the other. Three types of love were described by Kelley (1983): passionate, pragmatic, and altruistic. Three types were listed by Shaver et al. (1987): affection, lust, and longing. Five types of love were described by Fromm (1956): brotherly love, motherly love, erotic love, self-love, and love of God. Six styles of love were described by Lee (1977): erotic (passionate love), ludic (game-playing love), storgic (companionship love), manic (possessive, dependent love), pragmatic (logical, practical love), and agapic (altruistic love). Seven types of love were described by Kemper (1978), based on whether each person is high or low in power and in status: romantic love, brotherly love, charismatic or discipleship love, infidelity, infatuation, adulation by fans, and parent-infant love. Eight types of love were described by Sternberg (1986), based on the presence or absence of each of three components: intimacy, passion, and commitment.

The resulting types of love are liking (intimacy present), infatuation (passion present), empty (commitment present), romantic (intimacy plus passion), companionate (intimacy plus commitment), fatuous (passion plus commitment), consummate (intimacy plus passion plus commitment), and nonlove (the absence of the components).

In contrast, our subjects listed a great many different types of love (just as laypeople listed many more features of love than have scientists, Fehr, 1988). Of course, one could question whether many of the types of love listed in Table 1 are, in fact, different types of love. One could argue, for instance, that the list in Table 1 could be subjected to cluster analysis and thereby organized into a much smaller number of clusters. And, indeed, it could. But doing so might impose order and boundaries where they did not before exist. The number of clusters appears to be arbitrary (a notion consistent with the varying numbers of types of love plausibly delineated by psychologists). Consider just six items from our list: infatuation, puppy love, love at first sight, lust, passionate love, and romantic love. How might these be clustered? No two are identical, and therefore six types could be created. But some are more similar than others, and therefore several clusters could be created within this set. All contrast with companionate love, and therefore they could all be included in one cluster. Thus, one, two, three, four, five, or six clusters could reasonably be formed. Each such clustering would capture some, but no single clustering would capture all, of the overlapping and cross-cutting features of similarity in the domain of love.

Undoubtedly, the folk typology of love is more organized.
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than is implied by a list. We would suggest that love is organized around several prototypes: love of a parent for a child, love between romantic partners, love between old friends, love between siblings. Other subtypes of love then resemble the prototypes to varying degrees. For example, love of God is often thought of in terms of love of a parent, and love for humanity in terms of love for one's brother. But prototypes of love are not equivalent to a typology with a fixed number of types. Prototypically is graded, and more prototypes would have to be added as more cases are considered.

Psychologists' typologies can be divided into two types: those in which the divisions are specified by abstract features and those in which the divisions are specified by the type of love object. An example of the former is Sternberg's, where types of love are based on the presence or absence of three components of his triangular theory: intimacy, passion, and decision/commitment. An example of the second type is Fromm's, where five love objects are specified: brother, mother, sex partner, self, and God. In contrast, the folk typology seems to freely mix these two forms. Some of the subjects' responses were objects of love, but other responses might more accurately be described as features of love. For example, sharing, giving, intimacy, honesty, and trust, all given here as types of love, were also given as features of love (Fehr, 1988).

The folk concept of love also differs from psychologists' concept in focus. Psychologists generally only consider love between two human beings, especially love of the boy-meets-girl variety. In much of the research on love, subjects are asked to respond with reference to a romantic partner. For example, Hendrick and Hendrick (1986) designed scales to measure Lee's (1977) various love styles in which subjects are instructed to complete the scale with their current spouse or dating partner in mind (a past partner if they are not currently dating). (Lee [1988] saw his styles of love as applicable to homosexual relationships as well.) Kelley's (1983) descriptions of passionate, pragmatic, and altruistic love are framed largely in terms of adult heterosexual relationships, as are many of Sternberg's (1986) types of love.

Our subjects included many types of love that are not shared between two human beings: love of pets, love of life, love of nature, patriotic love, spiritual love, love of God, love of sports, love of art, love of food, love for humanity, love of money, love of beauty, and so on. Although some psychologists have written about a few of these types—Fromm, for example, included self-love and love of God—most scientific typologies exclude them. Further, even in love between two human beings, the emphasis is different. Our subjects, of course, mentioned various forms of romantic love, but overall put less emphasis on it. Companionate love (friendship) was the more frequently mentioned type and was rated as more prototypical than was passionate love. (Features associated with companionate love were rated as more prototypical of love than were features associated with passionate love [Fehr, 1988]). Our subjects also put more emphasis on familial love than on romantic love. Subjects listed maternal, parental, sisterly, and brotherly love and love of grandparents. Many of these were listed frequently and also received among the highest prototypicality ratings. Social psychologists have neglected familial love, although several mentioned maternal love (Fromm, 1956) and parent-infant love (Kemper, 1978) in their typologies. Fromm and Kemper also considered brotherly love as a type of love, although not so much in the familial sense, but meaning love for one's fellow human beings.

Conversely, some types of love described by social scientists were not mentioned by our subjects: Maslow's (1955) deficiency love and being love; Lee's (1977) ludic (game-playing) love and pragmatic love; Kemper's (1978) discipleship love, infidelity, and adulation by fans, and Sternberg's (1986) empty love, fatuous love, consummate love, and nonlove. Although these may represent cases laypersons would consider outside the domain, most are more likely peripheral types of love that do not come readily to mind.

To summarize, whereas psychologists have looked for one or two defining features of love, the folk definition of love is complex and provides no sharp boundary between love and other, related experiences. The folk typology of love is more encompassing than most experts' typologies. Whereas experts focus on love between heterosexual adults, laypeople focus on less romantic forms, including love between family members and many kinds of noninterpersonal types of love. Although some experts have mentioned types of love that were not mentioned by laypersons, this was a much rarer occurrence.

Scientists doing research on love are probably subscribing to a much narrower concept of love than are their subjects. Other evidence was consistent with this hypothesis. Recall the 10 sentences about love (Table 4) taken from psychology textbooks. Although these 10 are not a systematic sample, they do suggest that psychologists, in their use of the word love, have drifted far from ordinary usage. For example, Sentence 16 asserted that love has "both physiological and psychological components." Subjects found that this sentence makes sense for romantic love but little sense for other, even prototypical, cases of love: parental, filial, and sibling love.

Psychology of Love

What should be the relation between the common concept of love and scientists' definitions and typologies of love? Different answers to this question could be proposed. At one extreme would be the position that science should ignore completely ordinary language concepts. (From this viewpoint, discrepancies between scientific and lay conceptions are irrelevant to science.) At the other extreme is the position that the everyday concept of love is essential to the experience of love, and, therefore, the scientific study of love is the study of the concept of love. (From this viewpoint, discrepancies between scientific and lay conceptions demonstrate serious shortcomings in the scientific account.) A middle position between these extremes might be that scientific analysis correctly depends on everyday concepts, which are precipitates of accumulated wisdom but can tidy up, organize, and improve these concepts. (From this viewpoint, discrepancies can be tolerated, but scientists cannot stray far.) In this section, we hope to contribute to an understanding of these issues. We believe that none of these positions is adequate. Rather than viewing them as competing alternatives, we attempt to integrate them from a broader perspective.

Scientific definitions and typologies of love have been generally aimed simultaneously at two goals: (a) to capture the mean-
ing of love as everyone understands it and (b) to provide a conceptual framework for scientific study of the phenomena referred to by the word love. From the classical view, these two goals could be achieved simultaneously: The everyday concept of love already has scientifically desirable features of precise boundaries and common features. This assumption is challenged by prototype theory and by the empirical findings, such as those reported in this study, inspired by it. If the concept of love as commonly understood lacks precise boundaries, then its scientific status must be reexamined.

The two goals may require distinct analyses. One, a descriptive analysis, aims to describe the everyday conception of love. Love, as a concept, is a worthy and legitimate topic in the psychology of social cognition. The prototype analysis offered in this article is a descriptive analysis of the everyday concept of love. The second analysis, a prescriptive one, aims to prescribe a conceptualization of those phenomena referred to by the word love. Those phenomena are a worthy and legitimate topic in the psychology of emotion.

A descriptive analysis concerns the concept, not the event, of love: A mother worries whether she loves her children enough, a man questions whether his spouse loves him, a teenager wonders whether she is feeling is true love or just a passing fancy. Many believe that an unloved child is doomed—courts have thus declared that "to be unloved is so debilitating a disease no person subject to this experience should be required to use the universal knowledge that maliciousness is wrong and the human ability to control malevolence" (Kagan, 1989, p. 11). These worries and wonders and beliefs are tied to the everyday concept of love. The natural language concept of love guides people's official and unofficial interpretation of some of life's major and minor events, and that concept must be understood—as it is.

The analogy here is to the concepts of witch and devil, which played significant roles in the lives and deaths of people of the 17th century. A descriptive analysis of witch and devil would clarify their role in the thought of the time. Attempts to tidy up or improve these concepts would be inappropriate. Similarly, a descriptive analysis of love and emotion would aim to clarify their role in today's thought. To tidy up or improve the concept of love would defeat the purpose of a descriptive analysis. Prototype theory is as applicable to concepts such as witch or devil and unicorn or centaur as it is to emotion, vehicle, or love, for these are all equal in their status as concepts, whatever their merits or demerits from a scientific perspective.

A prescriptive analysis concerns those events referred to by the word love: A mother loves her child, a husband loves his wife, and a miser loves his money. A prescriptive analysis seeks to understand such phenomena. Because prototype theory concerns concepts, not events, it has no direct bearing on a prescriptive analysis. Scientific psychology cannot rely on folk psychology any more than scientific physics or chemistry relies on folk physics and folk chemistry. Nevertheless, prototype theory can play an indirect role.

First, one possibility is that the ordinary concept of love plays a causal role in events of love. If so, then a prescriptive analysis requires an adequate descriptive analysis. Nevertheless, the distinction between concepts and events must not get lost, for the concept would be a causal antecedent to the event.

Second, folk concepts and beliefs can provide hypotheses to be tested. In this case, the scientist would assume neither the truth nor the falsity of folk conceptualizations.

Third, analysis of the concept of love can help free scientists from hidden assumptions and confusion. For example, in stating the topic of the prescriptive analysis we assumed that the phenomena to be analyzed were only those referred to by the word love, but this assumption may be just what is hindering scientific progress. Scientific analysis could decide to draw different boundaries.

There is a tendency to assume that all cases called by the same name, love, share certain essential features. According to the classical theory they do, and of course they might. Nevertheless, prototype theory suggests that these cases need share no more than a resemblance to one another. As Medin (1989) stated, "Despite the overwhelming evidence against the classical view, . . . people adopt an essentialist heuristic, namely, the hypothesis that things that look alike tend to share deeper properties" (pp. 1476–1477). That is, scientists and nonscientists alike have taken the classical view for granted.

Why are these experiences all called by the same name—love? Prototype theory asks one to consider an alternative to the classical answer that they all share a common essence. This particular set of diverse experiences is called love by an historical process. Vygotsky (1962) described some concepts as chains, where each element shares some features with its neighbor, but no common principle characterizes the entire set. The historical evolution of the concept of love may be such a chain. Thus, one must consider carefully the observation of Solomon (1977) on the cultural and historical specificity of the concept of love: "The French, for example, have many distinctions between the various forms of intimacy that we more cold-blooded Angli cans clumsily summarize with the clearly inadequate concepts of 'love' and 'like'" (p. 281).

Our suggestion therefore is to view the classical definitions and typologies offered by various theorists as prescriptive. No classical definition or rigid taxonomy will provide an accurate descriptive analysis; therefore, set aside the question of whether a particular definition or typology coincides with the everyday concept of love. Instead, take the definition as delimiting precisely a range of phenomena that may be explained by one set of scientific hypotheses. Then test those hypotheses through empirical means.

To illustrate, let us return to Johnson-Laird and Oatley's definition—"to experience internal happiness in relation to an object or person." For purposes of a prescriptive analysis, it is irrelevant that this definition fails to capture the everyday concept of love. So, set aside the question of whether all and only such experiences are properly labeled love, but focus on this set of experiences. Next, consider Freud's definition of love as frustrated desire. Set aside the question of whether all and only these experiences are properly labeled love, or whether they coincide with the cases selected by Johnson-Laird and Oatley. So interpreted, each definition might be a first step in a scientifically useful analysis of a set of phenomena that do share enough features in common that they can be analyzed together.

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