PROTOTYPE ANALYSIS OF THE CONCEPTS OF LOVE AND COMMITMENT

by

BEVERLEY ANNE FEHR

B.A. (Hons), University of Winnipeg, 1980

M.A., University of British Columbia, 1982

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

in

THE FACULTY OF GRADUATE STUDIES
(Department of Psychology)

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA

October, 1986

© Beverley Anne Fehr, 1986

5

In presenting this thesis in partial fulfilment of the requirements for an advanced degree at the University of British Columbia, I agree that the Library shall make it freely available for reference and study. I further agree that permission for extensive copying of this thesis for scholarly purposes may be granted by the head of my department or by his or her representatives. It is understood that copying or publication of this thesis for financial gain shall not be allowed without my written permission.

Department of

Psychology

The University of British Columbia
2075 Wesbrook Place
Vancouver, Canada
V6T 1W5

Date

Oct 6 / 86

Abstract

Psychologists have yet to agree on a definition of the concepts of love and commitment. Attempts at a classical definition, whereby a concept is defined in terms of a necessary and sufficient set of criterial attributes, have not met with success. The purpose of this research was to test the feasibility of viewing the concepts of love and commitment from a prototype perspective, as well as to shed light on the relation between these concepts. According to the prototype view, people's knowledge of many natural language categories is structured around a prototype--a list of features or attributes that are typical of the concept, but which do not constitute a set of defining features. Some features of a concept are more central than others, and neighboring concepts share features in overlapping, and criss-crossing ways. Boundaries between concepts therefore are blurry and ill-defined.

The feasibility of conceptualizing the everyday concepts of love and commitment as prototypes was tested using Rosch's approach. Six studies were conducted. The purpose of the first four studies was to explore and validate the prototype structure of the concepts of love and commitment. The purpose of the last two was to discover whether the prototype structure of love and commitment had implications for how the dynamics of interpersonal relationships are perceived. In Study One,

subjects were asked to list the features of love and/or commitment. In Study Two, another group of subjects rated these features according to how central (prototypical) they were to each concept. As predicted, subjects found it meaningful to rate the extent to which each feature was a good or poor characteristic of love [commitment]; they agreed with one another in their responses. Moreover, centrality ratings were positively correlated with frequency of free listing in Study One. The centrality of features of these concepts was then shown to affect certain dependent measures important in psychological research. In Study Three memory for central and peripheral features was examined. It was found that subjects were able to remember veridically both central and peripheral features that had been presented. However, as predicted, subjects demonstrated a bias toward remembering central, but not peripheral, features that had not been presented. In Study Four, prototypicality effects in the use of natural language were investigated. Consistent with predictions, it sounded peculiar to preface central features with hedges like "sort of", while it sounded natural to hedge peripheral features. The rationale was that hedges serve a kind of "distancing from the prototype" function in everyday language.

The purpose of Studies Five and Six was to examine whether the prototype structure of love and commitment influenced how

people assess whether a relationship is moving toward, or away from, increased love or commitment. In Study Five, subjects were presented with a series of relationship types that varied in how loving or committed they were. It was hypothesized that central features would be seen as increasingly more applicable as a relationship increased in love [commitment], whereas the applicability of peripheral features would not vary systematically as a function of the type of relationship being rated. The results conformed to predictions. In Study Six, subjects were presented with a description of a loving and committed relationship. It was expected that violations of central attributes would be perceived as contributing to a greater decrease in love or commitment than would violations of peripheral features. Again, results supported predictions.

The secondary theme, the relation between the concepts of love and commitment, was addressed in some way in each of these studies. There are four major views on the relation between the concepts of love and commitment: that they are identical, completely independent, largely overlapping but partially independent, and that commitment is a component of love. From a variety of findings obtained across the six studies, it was concluded that the layperson's conception of these concepts fits best with the view that they are largely overlapping but partially independent concepts.

Overall, the results from these studies suggested that people need not be able to define "love" or "commitment" in order to use these concepts in a predictable and orderly way. Prototype methodology was successful in uncovering the content and structure of the concepts of love and commitment, and in elucidating the everyday person's view of the relation between these concepts.

TABLE OF CONTENTS

Abstract	ii
List of Tables	viii
List of Figures	ix
Acknowledgments	x
Introduction	1
The Search for a Definition of Love	3
The Search for a Definition of Commitment	7
Is a Classical Definition Possible?	10
The Prototype View	14
Can Love and Commitment be Conceptualized as Prototypes?	22
The Relation between the Concepts of Love and Commitment	25
Overview of the Present Study	29
Part I Prototype Structure of the Concepts of Love and Commitment	32
Study One: Free Listing of the Features of Love and Commit- ment	32
Study Two: Centrality Ratings of the Features of Love and Commitment	54
Study Three: Memory for the Features of Love and Commit- ment	67
Study Four: Use of Hedges as Evidence of Prototype Struc- ture	86

Summary	92
Part II Prototypes of Love and Commitment in the Analysis of Interpersonal Relationships	94
Study Five: Applicability of Central and Peripheral Features to Loving and Committed Relationships	97
Study Six: Violations of Features of Love and Commitment	110
General Discussion	126
Are Love and Commitment Prototypically Organized Con- cepts?	126
Why Study the Layperson's Concept of Love and Commit- ment?	130
Relation Between the Concepts of Love and Commitment	134
A General Concept of Love and of Commitment: Fact or Fiction?	142
Types of Love and Commitment	143
Clinical Implications of a Prototype Analysis of the Concepts of Love and Commitment	147
Future Directions	148
Conclusion	153
References	156
Appendices	191

LIST OF TABLES

Table 1. Free listing of features of love and commitment	169
Table 2. Centrality ratings as a function of form of questionnaire	171
Table 3. Mean centrality ratings of the features of love and commitment	172
Table 4. Memory for central and peripheral features	174
Table 5. Mean peculiarity ratings of the features of love and commitment	176
Table 6. Types of relationships	178
Table 7. Mean impact ratings of violations of the features of love and commitment	180
Table 8. Correlations among measures of the prototype structure of the concepts of love and commitment	182

LIST OF FIGURES

Figure 1. Relation between the concepts of love and commitment	183
Figure 2. Number of features generated for love and for commitment	185
Figure 3. Applicability of central and peripheral features to types of loving relationships	187
Figure 4. Applicability of central and peripheral features to types of committed relationships	189

Acknowledgments

I would like to express my gratitude to my advisor and friend, Dan Perlman, for the support and encouragement he so generously provided from the inception of this project to its completion. The writing of this thesis was greatly facilitated by his penchant for wearing his editor's cap. I would also like to thank the members of my committee: Jennifer Campbell for her invaluable methodological and conceptual input, which extended far beyond the call of duty; and Lawrence Ward for his incisive comments and suggestions. Finally, I wish to thank Ross for his unconditional demonstration of these concepts during the ups and downs that characterized my academic study of them.

INTRODUCTION

"Love and marriage go together like a horse and carriage--you can't have one without the other". The words of this old song are relevant to the contemporary issue of how love and commitment are related. Traditionally, commitment to a loving relationship was defined as marriage. While not everyone agrees that "you can't have one without the other", few would disagree that love and commitment are of crucial importance in people's lives. Researchers have found the concepts of love and commitment useful in characterizing interpersonal relationships, and, particularly, in thinking about what draws individuals together to form and maintain relationships.

Kelley (1983) lists a number of reasons why the concepts of love and commitment deserve scientific attention. First, the kinds of questions people ask about their own close relationships almost invariably involve love and commitment issues (e.g., "How can I be sure my partner loves me?" "What can I do to get my partner to make a commitment to our relationship?"). A second reason Kelley gives is that the analysis of these concepts "takes us deeply into the personal and interpersonal processes involved in the formation and continuation of close heterosexual relationships"(p.267). Finally, he states that an analysis of love and commitment can serve to illustrate the problems that arise when complex phenomena with rich everyday associations are dismembered for scientific or conceptual analysis.

Indeed, the search for a definition of "love" and of "commitment" carried out in psychology and other related disciplines has been marked with conflict, confusion, and disagreement. Such a singular lack of success raises the question of whether a definition of the words love and commitment is even possible--or rather, a definition in the classical sense whereby concepts are defined by a necessary and sufficient set of criterial attributes.

Recently, psychologists have begun to explore an alternative form of definition known as the prototype view. Prototypes are defined as the clearest cases or best examples of a category. Within the prototype view, category members can be ordered in terms of their degree of resemblance to the prototypical cases. Membership in the category is a matter of degree, rather than all-or-none as in the classical view, and there are no sharp boundaries separating members from non-members. The prototype view may shed light on how people use and understand the concepts of love and commitment without being able to define them.

The purpose of the research to be reported here was to test the possibility that the everyday concepts of love and commitment may be better understood from the prototype view. In other words, this research attempts to describe a form of folk knowledge or everyday way of thinking. It does not attempt to tell psychologists how they should categorize the phenomena commonly referred to by the words "love" and "commitment".

Kelley (1983) convincingly argues that the phenomena to

which these concepts refer have much in common, and, in many cases, are intimately related. On the other hand, he also asserts that love and commitment can and should be distinguished. Not everyone agrees with Kelley's position on the relation between the concepts of love and commitment. Some prefer to treat these concepts as identical, others see them as completely independent, and still others see commitment as a component of love. A prototype analysis can provide an interesting perspective on this controversy by revealing the layperson's view of the relation between these concepts. Thus the purpose of the research to be reported here was not only to explore the prototype structure of the concepts of love and commitment, but also to elucidate the everyday view of the relation between these concepts.

An assumption that is implicit in a prototype analysis of a concept is that attempts at defining the concept in a classical sense have been unsuccessful. In the next section, definitions of love and of commitment are considered, and the question is raised, "Is a classical definition of these concepts possible?"

The Search for a Definition of Love

Love is elusive and difficult to define. As the popular song of some years back says it, "Who can explain it, wise men don't even try!" But where wise men shy away, there are always fools who are willing to make the attempt (Swensen, 1972, p.86.).

Contrary to the words of the song, wise men and women have made many attempts to define love. When tracing the history of how love has been conceptualized, writers typically begin with the ancient Greeks and end with current social science definitions (e.g., Brehm, 1985). With regard to social science definitions of love, Brehm comments that:

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(p.90).

There is tremendous variety in the sorts of definitions of love offered by social scientists. Watson (1919) defined love as an innate emotion elicited by cutaneous stimulation of the erogenous zones. According to Freud (1922/1951), the desire for sexual union is at the core of emotion, and when that desire is blocked, one compensates for the resultant frustration and disappointment by idealizing the other person and falling in love with him or her. Fromm (1956), in the Art of Loving, regarded love as a device we employ to reduce our sense of emotional isolation and loneliness.

More recently, Rubin (1970) declared that "love is an attitude held by a person toward a particular other person, involving a predisposition to think, feel, and behave in certain ways toward that other person"(p.265). According to Centers (1975):

Love on the part of one individual for another is the response or response evoked in the first individual through his experiencing of rewards, pleasure, or need gratifications as products of his interactions with the other (p.45).

For Swensen (1972), love is behavior. His analysis of love revealed behaviors such as giving gifts, shared activities, self-disclosure of intimate personal information, etc. According to Skolnick (1978), love is "a constructed experience built with feelings, ideas, and cultural symbols" (p.104). It is difficult to imagine what emotion would not fit this definition. Similarly, definitions of love in terms of affect (feeling, emotion), physiological arousal, and cognition (e.g., Lasswell & Lasswell, 1976) are so broad that it is difficult to imagine what in psychology (e.g., attitudes, motives) would not be an emotion, so defined.

Researchers like Hatfield and Walster (1978) prefer to dichotomize the concept and define each type separately:

Passionate love is a wildly emotional state, a confusion of feelings: tenderness and sexuality, elation and pain, anxiety and relief, altruism and jealousy. Companionate love, on the other hand, is a lower-key emotion. It's friendly affection and deep attachment to someone(p.2).

Another approach to the conceptualization of love is to speak of the components of love. For example, Rubin (1973) lists

three: caring, needing, and intimacy. Lee (1977) muses:

Perhaps the reader will expect me to begin by defining my terms. What do I mean by "love" or "loving"? There's the rub! The fictional and non-fictional literature is strewn with conflicting definitions of love(p.173).

He prefers to speak of styles of loving rather than add to the confusion by offering yet another definition.

We have seen love defined as an emotion, as behavior, an attitude, a response, a constructed experience, as physical passion, and so on. Lasswell and Lobsenz (1980) comment that:

while we believe in love, we can seldom agree on what love is. The rich fabric of language runs threadbare when confronted even with the basic task of differentiating among the various kinds of feelings encompassed in that single word(p.2).

Berscheid and Walster (1978) make the same point in their well-known book on interpersonal attraction when they say:

One might think it would be easy for scientists to devise a formal definition of interpersonal attraction. The words "like" and "love", "dislike" and "hate" are among the most frequently used in the English language. Everyone knows what they mean... yet scientists have found it impossible to agree on a single definition of attraction"(p.1).

Lasswell and Lobsenz are emphatic in stating why this may be the case. In their words, "The fact is that by its nature love

has never been and cannot be susceptible to a single precise definition"(1980, p.2).

The Search for a Definition of Commitment

In his classic book on commitment, Keisler (1971) observed that "[The word] commitment... is in the everyday language of our society, with all the emotional overtones, special meanings and hidden implications that suggests"(p.25). He goes on to say:

Actually, very little experimental work has been done on commitment, in spite of the popularity given the term. Part of the problem has been pinning down a clear definition of commitment (p.26).

Again, we find a potpourri of definitions. One general class of definitions seems to involve the notion of engaging in (or pledging to engage in) a consistent line of activity. Most of the writers offering this kind of definition come from the cognitive dissonance tradition. For example, J.W. Brehm and Cohen (1962) stated that:

We assume that a person is committed when he has decided to do or not do a certain thing, when he has chosen one (or more) alternatives, when he actively engages in a given behavior. Any one or a combination of these behaviors can be considered a commitment(p.7).

Similarly, Keisler defined commitment as "the pledging or bonding of the individual to behavioral acts"(p.29). Rubin

(1973) accepted this definition, stating that:

Commitment... may be defined as the pledging of oneself to a line of action, whether it be the fight for a political ideology or the struggle for intimacy with another person(p.160).

Becker (1960, 1964), a sociologist, also viewed commitment as pursuing a consistent line of action across a variety of situations.

Within a more explicitly relationship-oriented context, Hinde (1979) states that:

The term commitment is used here in a general sense to refer to situations in which one or both parties either accept their relationship as continuing indefinitely or direct their behavior towards ensuring its continuance or towards optimizing its properties (p.132).

Levinger (1980) defines commitment as "the avowal of an intent to maintain a relationship over some period of time"(p.531). Leik and Leik (1977) conceive of commitment as an absorbing state. They say "We define interpersonal commitment as an unwillingness to consider any exchange partner other than that (those) of the current relationship"(p.301).

Within the exchange tradition, Rusbult (1980a,1980b) speaks of commitment as feelings of psychological attachment, and intent to maintain a relationship. According to her investment model, commitment is influenced by three variables: satisfaction, alternatives and investments. Drawing on the work

of Thibaut and Kelley (1959), she asserts that an individual will be satisfied with a relationship to the extent that it provides high rewards, low costs, and exceeds their comparison level for alternatives. Thus, to the degree that people are satisfied with a relationship, they should become more committed to maintaining the relationship. People will also become more committed if they perceive that they have poor alternatives to the current relationship. Finally, to the extent that individuals have invested inextricable resources (e.g., time, money, emotional energy) in the relationship, they will be more committed to it.

In the realm of marital relationships, Rosenblatt (1977), like Levinger, defines commitment as "an avowal or inferred intent of a person to maintain a relationship"(p.74) and Dean and Spanier (1974) speak of commitment as "the strength of an individual's desire and determination to continue a particular marital relationship"(p.113).

As was the case with love, some writers prefer to divide the concept into two types. Johnson (1982), for example, does not define commitment per se, but rather speaks of two types of commitment: personal and structural. Personal commitment refers to "an individual's dedication to the maintenance of a line of action"(p.53), while structural commitment refers to "external constraints which come into play as a consequence of initiation of action and which make it difficult to discontinue, should one's sense of personal commitment decline"(p.53). Similarly, Hinde (1979) differentiates between exogenous commitment, where

relationship continuity is imposed from outside, and endogenous, where commitment is sought from within.

Thus, once again we see a concept being classified as a variety of things: behavior, a state, an intention, etc. Johnson notes that:

... the concept of commitment has arisen frequently in discussions of courtship and marriage, but has not as yet been pinned down to the extent that it could be used effectively in research in that area(p.395).

This sentiment is echoed by Hinde (1979) who observes that "one of the most important aspects of some relationships, but one least studied, concerns the extent to which participants are committed to it"(p.131). Johnson (1973) suggests why commitment in relationships is rarely studied:

The concept of commitment, although in common use among sociologists and psychologists has not been subject to conceptual specification or empirical grounding which is necessary to transform it from an intuitively appealing idea into a viable scientific variable(p.395).

Is a Classical Definition Possible?

The prototype analysis of love and commitment to be offered here will not provide psychologists with a definition of these phenomena. But the fact that experts have been unable to agree on definitions of these terms suggests that laypeople may not base their use of the words "love" and "commitment" on a

classical definition. The experts' arguments also suggest that they have assumed that such a classical definition can be found. This may be because concepts have traditionally been thought of as defined by a set of necessary and sufficient criterial attributes. Category membership is therefore an all-or-none phenomenon--any instance which meets the criterion is a member, other things are non-members. Boundaries between categories are thus clearly defined. Because each member must possess the particular set of attributes that is the criterion for category inclusion, all members have a full and equal degree of membership, and therefore are equally representative of the category. The traditional, classical view of concepts fosters the assumption that a precise definition of love and commitment is both necessary and possible. This assumption about the nature of concepts seems to have been implicit in the search for a definition of love and of commitment. This assumption has not been accepted by everyone, however.

William James (1929) opened his book The Varieties of Religious Experience with the comment that "most books on the philosophy of religion try to begin with a precise definition of what its essence consists of"(p.26). Adhering to this tradition, James attempted to define personal religious experiences. He discovered that for each component or attribute he proposed, he could readily generate an example of a religious experience in which that particular component was absent. Moreover, the issue of how personal religion could be distinguished from one's conscience or morality was problematic. After much debate, James

tentatively suggested that religious experiences might be characterized by solemnity, seriousness, and tenderness. However, he discovered that again qualifiers were necessary. For instance, "If glad, we must not grin or snicker... If sad we must not scream or curse"(p.38). Finally, James was compelled to conclude that:

...do what we will with our defining, the truth must at last be confronted that we are dealing with a field of experience that cannot be sharply drawn. The pretension, under such conditions to be rigorously "scientific" or "exact" in our terms would only stamp us as lacking in understanding of our task. Things are more or less divine, states of mind are more or less religious, reactions are more or less total, but the boundaries are always misty, and it is everywhere a question of amount and degree (p.38).

In light of his original purpose, namely defining religion, James' final statement on the matter was, "the word religion cannot stand for any single principle or essence, but is rather a collective name."(p.26).

Similarly, Wittgenstein (1953) attempted to define "games". He speculated that a game could be defined as an event in which there is competition between players. However, consider children playing ring-around-the-rosey. This is a game in which there is no competition between players. He then speculated that games might rather be defined as requiring skill. However, the skills

required to play chess, hide-and-seek, and tennis seem very different in nature, and there are games of chance that require no skill at all. Each definition seemed inadequate; Wittgenstein found that for every example supporting a particular definition, an equal number of counterexamples could be found. Like James, he eventually concluded that a concept like "game" cannot be explicitly defined. He illustrated this point with the following analogy:

In spinning a thread we twist fibre on fibre and the strength of the thread does not reside in the fact that some one fibre runs through the whole length, but in the overlapping of many fibres (p.32).

The absence of a defining feature or set of features precludes the establishment of a game/nongame boundary. If a concept like "game" could be defined by a necessary and sufficient set of features, then any instance that possessed the criterial features would be a game, and any instance that did not possess the criterial features would not be a game. Boundaries between games and nongames would therefore be well defined. However, as Wittgenstein demonstrated, the concept "game" does not possess a set of necessary and sufficient criterial attributes. Different games share different attributes that vary in kind and number. Some attributes are also common to neighboring concepts resulting in indistinct between-category boundaries. Wittgenstein argued that a concept with blurred edges is, however, no less a concept than one in which the

boundaries are sharply defined.

The Prototype View

One alternative to the classical view of concepts is subsumed under the rubric "prototype theory". James alluded to much of what is now called "prototype theory" in The Varieties of Religious Experience, although Wittgenstein is generally credited as the founding father of this view. In the 18th century Bishop Berkeley raised questions concerning the role of prototypes in psychological processes, stimulating modern day psychologists to investigate this issue empirically. Eleanor Rosch and her colleagues have been mainly responsible for rekindling an interest in this area.

According to Rosch (1973), categories are composed of a "core meaning" which consists of the clearest cases or best examples of the category. These clearest cases or best examples are referred to as prototypes. Category members differ in terms of degree of resemblance to the prototypical cases. This means that all category members are not equivalent, and can be ordered in terms of how representative they are of the category. Exemplars that are the most representative of the category share the greatest number of attributes with all other members of the category. Less typical exemplars have fewer attributes in common with the prototypical cases and also have a greater proportion of attributes in common with other, neighboring categories. Boundaries between categories are therefore ill-defined. Consider, for example, some of the qualities ordinarily treated

as attributes in classifying animals: "coat" (fur, feathers), "oral opening" (mouth, beak), and "primary mode of locomotion" (flying, on foot). Mervis and Rosch (1981) point out that robins and sparrows, prototypical members of the category "bird" share all of these qualities: feathers, beak, and flying. Turkeys are less prototypical exemplars of the category. Turkeys do not share the "primary mode of locomotion" attribute with robins and sparrows. Penguins are even less representative of the category "bird" and do not share the feathers and flying attributes with sparrows and robins.

As this example illustrates, prototypes can also be described in terms of the attributes or features which constitute them. For example, Davis and Todd (1985) state that:

The research of Rosch... suggests quite strongly that people's knowledge of category membership is structured around a prototype--a list of features or attributes that are typical of the class but which do not constitute a set of necessary and sufficient conditions to define the category (p.17).

Similarly, Horowitz, de S. French, and Anderson (1982) offer the following definition:

A prototype is a theoretical notion consisting of the most common features or properties of members of the category. All of these properties characterize at least some members, but in actual practice, no one property is either necessary or sufficient for membership in the category (p.185).

In the same way that some members of a category are more prototypical than others, it has been demonstrated that some features of a concept are more prototypical than others. For example, Horowitz et al. report that features like "feels separate from others, different", "feels unloved, not cared for", "thinks 'I want a friend'" are prototypical features of loneliness.

The classical view of concepts, in contrast, advocates distinct category boundaries, and a specifiable set of necessary and sufficient criterial attributes. Each exemplar is therefore equally representative of the category. The classical view of concepts typically has been implicit in the concept formation paradigm, in which subjects learn the criterial attributes for a concept, e.g., blue and circle. If the target subset consists of the conjunction "blue circle", with size as an irrelevant attribute, it does not make sense to ask if the large or small circle is a better example of the concept "blue circle".

However, it is not necessary to choose between the classical view and the prototype view--both may be correct in representing something of the way in which we think about some concepts. Undoubtedly some categories and some kinds of processing of categories are all-or-none phenomena. Something either is or is not a one dollar bill; someone either is or is not pregnant. Similarly, one would probably not say that a particular person is "sort of" the Prime Minister of Canada. On the other hand, categories like dollar bills and Prime Ministers may not be representative of the majority of concepts.

The notion that prototypes play a role in psychological processing of some concepts has been supported amply through research. These early studies in cognitive psychology generally involved creating the prototypes of categories, like geometric forms. Subjects were then presented with deviations of the prototype, to see how they classified them (as well as the prototype which they had not seen) and/or how easily they learned or remembered them. The idea of there being a prototype for a category is not new; Bishop Berkeley raised this issue a long time ago:

In his mind's eye all images of triangles seemed to have rather specific properties. They were equilateral or isosceles or right triangles, and he searched in vain for a mental image of the "universal triangle". Although it is easy to define what we mean by a triangle, it is not clear what the "perfect" triangle looks like. We see lots of different kind of triangles; from this variety what do we create in our mind as the basis of recognizing a triangle? (Cited in Calfee, 1975, p.222).

The speculation invited by Berkeley's search for the "perfect triangle" culminated several centuries later in what has itself become a prototypic experiment by Posner, Goldsmith and Welton (1967). These investigators created the prototype of a triangle and other forms, and then presented subjects with distortions of the prototypes. It was found that subjects could

classify the distortions of a particular type into a common category. Patterns derived from another prototype were grouped together. In a subsequent classification task, the original prototypes were included in the set of stimuli to be grouped. Subjects classified the prototypes (which had not been previously presented) as accurately as the distortions that they had grouped in the first task.

Franks and Bransford (1971) constructed a series of figures, one card consisting of the prototype, and the remainder "transformations", which varied in the number of deviations (distance) from the prototype. Subjects were required to reproduce the transformations during the "training phase" of the experiment. A subsequent recognition task included the prototype (not previously seen) and the transformations. The investigators discovered that subjects "recognized" the unseen prototype with greater probability than its previously seen transformations. Moreover, they did so with a greater degree of confidence. It was also found that the recognition ratings were related to transformational distance, with the prototype most frequently recognized, transformations of one permutation next, and so on.

Reed (1972) conducted several studies involving artificial faces in which the features (e.g., eye placement, length of nose, height of forehead) were varied. In a typical problem, subjects were asked to classify these schematic faces into one of two rows of faces. According to Reed, "the dominant strategy was to form an abstract image or prototype to represent each category and to classify test patterns on the basis of

similarity to the prototypes"(p.401).

In reviewing these studies, Bourne, Dominowski, and Loftus (1979) comment that "the stimulus material on which conceptual problems have been structured is relatively simple, highly dimensionalized, and artificial" (p. 205). They advocated a shift from studies in which the prototypes were intentionally created by the experimenters to the domain of natural concepts.

Rosch and her associates have been instrumental in articulating and re-kindling an interest in the approach to categorization of natural language concepts suggested by James, Wittgenstein, and the modern day psychologists mentioned. Initially, Rosch's research focused on color categories (Heider, 1971, 1972). In a series of studies, she demonstrated that there are salient areas of the color space (focal colors) which are given the shortest names and are named most quickly across languages. Focal colors are also most accurately recognized across cultures and are paired with their corresponding names with the fewest errors. A developmental study by Mervis, Catlin, and Rosch (1975) revealed that foci for color become established and stabilized earlier than boundaries, and focal judgments are more stable than boundary judgments.

Rosch then extended her work to semantic categories for everyday objects (Rosch 1973, 1974, 1975a, 1975b, 1978a, 1978b, 1981; Rosch & Mervis 1975; Rosch, Mervis, Gray, Johnson, & Boyes-Braem 1976a, 1976b; Rosch, Simpson & Miller 1976). (See Mervis & Rosch, 1981, for a review of this literature). In this research, representativeness of category members was measured

through subjects' ratings of goodness-of-example for natural language categories like fruit, sport, vehicle, bird, and so on. Reaction times in a category verification task were shorter to prototypical exemplars (Rosch, 1973). Priming (prior presentation of the category name) facilitated recognition for highly typical but not for less typical exemplars (Rosch, 1975b). It was also demonstrated that typical exemplars share the most attributes, while less typical exemplars have fewer attributes in common with the prototypical cases, and also have a greater number of attributes in common with adjacent categories (Rosch & Mervis, 1975).

Some of the major concepts in psychology have recently been re-conceptualized in light of the prototype view of concepts. Cantor, Smith, French, and Mezzich (1980) addressed a problematic aspect of psychiatric diagnosis--namely that many patients do not fit into one and only one category. Some patients appear to be prototypical examples of schizophrenia, depression, or other diagnostic categories, but other patients are rather poor examples. From a prototype view, the blurry boundaries of the diagnostic categories can be viewed as orderly and predictable, rather than problematic. Empirical evidence on diagnostic judgments supported hypotheses derived from the prototype view of these categories.

Cantor and Mischel (1979a) have also applied this view to an analysis of personality types. Extraversion, for example, can be formulated in terms of a "prototypical extravert". These researchers also presented subjects with statements about

various personality types (Cantor & Mischel, 1977). In a subsequent recognition task, subjects "recognized" highly prototypical statements that had not been previously presented with greater certainty than statements of intermediate degrees of typicality that they had seen.

Neisser (1979) argued that no single ability or single mental process can serve as an adequate definition of intelligence. He suggested that the concept of intelligence is a category which is organized in terms of a prototype. Actual persons resemble the "intelligence" prototype to varying degrees and along varying dimensions. Thus two equally intelligent persons could be quite different in their actual mental skills. One intelligent person might be extremely good at solving the Rubik's cube and cross-word puzzles but mediocre in telling jokes and filling out income tax forms. Another equally intelligent person might have these attributes in reverse.

Cantor, Mischel and Schwartz (1982) conducted a prototype analysis of psychological situations like parties, work, therapy sessions, etc. They found that people shared relatively orderly and easily retrievable prototypes for 36 categories studied. Naive perceivers agreed about person-situation matches, and shared knowledge of the most prototypic behaviors and personality types associated with different types of situations. Similarly, Tversky and Hemenway (1983) constructed a hierarchy of environmental scenes (e.g., school, home, beach, mountains) based on the prototype approach. Broughton (1984) used the prototype approach as an organizational principle for combining

items into personality scales. He found that the prototype strategy outperformed traditional strategies (e.g., empirical, factor analytic) in predicting peer ratings from a fraternity sample.

Fehr and Russell (Fehr, 1982; Fehr & Russell, 1984; Fehr, Russell & Ward, 1982) documented the lack of agreement on definitions of emotion, and suggested that emotion may be a prototypically organized concept. They found that the prototype approach worked well when applied to the domain of emotion concepts. They argue that rather than attempting to define emotion in terms of a set of necessary and sufficient criterial attributes, emotion may best be thought of in terms of the best examples of the category. Emotions like happiness, sadness, love, fear were found to be most representative of the concept, while members like boredom, respect, worry and so on were found to be peripheral members.

While it may appear that virtually every concept is a candidate for a prototype analysis, concepts like intelligence, emotion, etc. have certain features in common. First, attempts at a classical definition of these concepts have been unsuccessful. Second, these concepts tend to be in the layperson's vocabulary. Each of these statements seems true for love and commitment, which suggests that they, too, might be amenable to a prototype analysis.

Can Love and Commitment be Conceptualized as Prototypes?

How might the concepts of love and commitment be

conceptualized from a prototype perspective? In approaching such an issue, the lesson that can be learned from James (1929) warrants lengthy quotation:

let us not fall immediately into a one-sided view of our subject, but let us rather admit freely at the outset that we may very likely find no one essence, but many characters which may alternately be equally important in religion. If we should inquire for the essence of "government", for example, one man might tell us it was authority, another submission, another police, another an army, another an assembly, another a system of laws; yet all the while it would be true that no concrete government can exist without all these things, one of which is more important at one moment and others at another. The man who knows government most completely troubles himself least about a definition which shall give their essence. Enjoying an intimate acquaintance with all their particularities in turn, he would naturally regard an abstract conception in which these things were unified as a thing more misleading than enlightening and why may not religion be a conception equally complex? (p.27).

Substituting "love" or "commitment" for "religion" in this quotation is evocative. As was argued earlier, attempts at defining these terms have not been particularly successful or

illuminating, but have met the same fate as the search for definitions of games and religious experiences. The thesis of this research is that the concepts of love and commitment lack a classical definition and are organized as prototypes, with no clear boundary separating these concepts from related concepts.

What are the implications of re-conceptualizing love and commitment the way that concepts like intelligence, psychiatric diagnosis, personality types, emotion, and so on have been conceptualized? If love and commitment are prototypically organized, one would expect that neither would possess a set of necessary and sufficient set of criterial features. Rather, features would vary in the extent to which they came to mind, and no single feature or combination of features would be criterial. Further, some of these features would be considered more central to each concept than would others. These features would tend to be more salient in memory than peripheral features, and this gradient of centrality should be evident in natural language use.

On the other hand, if love and commitment are classically defined concepts, one would expect that each would consist of a necessary and sufficient set of criterial features. Thus no one feature would be considered more central than another, and the boundaries between the concepts would be well-defined.

It seems that looking at love and commitment as concepts with blurred edges could be potentially useful. Wittgenstein (1953) commented:

One might say that the concept "game" is a

concept with blurred edges. But is a blurred concept a concept at all? Is it even always an advantage to replace an indistinct picture by a sharp one? Isn't the indistinct one often exactly what we need? (p.34).

The Relation between the Concepts of Love and Commitment

A prototype analysis of love and commitment can also serve to elucidate how the layperson views the relation between these concepts. Rosenblatt (1977) lists "Relationship of commitment to love, marital satisfaction, and other such measures of heterosexual relationship" as a topic urgently in need of research attention. Again, the literature offers a wide range of views on the relation between these two concepts. At one end of the continuum, Money (1981) comes close to equating the two when he defines love as "the personal experience of and manifest expression of being attached or bonded to another person"(p.218). In a multidimensional scaling analysis of types of heterosexual relationships, Forgas and Dobosz (1980) found love and commitment to be one of three basic dimensions underlying various heterosexual relationships. Desirability and sexuality were the other two. The love and commitment dimension included relationships such as flirting and one-night sexual encounters at the negative end, while marriage (a relationship considered high in both love and commitment) anchored the other end. Thus, Forgas and Dobosz, too, see love and commitment as highly similar, if not identical, concepts.

Kelley (1983) takes exception to the result that love and commitment appear in combination as one of the dimensions that discriminates between relationships. He points out that the relationships considered in their study precluded making a distinction between love and commitment. For instance, there were no examples of long term relationships which might have involved love but lacked the stability of commitment and therefore ended. Conversely, their list of relationship types did not contain examples of relationships which endured without positive affect, such as a longlasting marriage that remains committed despite the absence of love.

After an incisive review and analysis of the love and commitment literature, Kelley suggests that these concepts are partially independent, but largely overlapping. In fact, more than 25 years ago, Thibaut and Kelley (1959) argued for the partial independence of these concepts:

the individual may be greatly dependent on the dyad without its being attractive to him to a commensurate degree--without his being satisfied with the relationship. In other words, a member's dependency on the group [dyad] is not necessarily highly correlated with his attraction to the group, his "morale" or satisfaction from belonging to it (p.23).

Berscheid and Walster (1978) agree with Thibaut and Kelley's position that attraction and association are not synonymous. They state that, "this is why the extent to which one spends time

with another is an imperfect measure of interpersonal attraction"(p.25).

Rusbult (1980a; 1980b) argues that an individual's commitment to maintaining a relationship varies as a function of his/her satisfaction with it. However, because commitment may be produced by poor alternatives or large investments in addition to satisfaction, she maintains that one could be dissatisfied with a relationship but still remain deeply committed to it. Thus, like Thibaut and Kelley, she thinks satisfaction with a relationship (or positivity of affect, attraction, or love) and commitment to it can be, but are not necessarily, strongly correlated.

In an investigation of attachment and autonomy in lesbian relationships, Peplau, Cochran, Rook, and Padesky (1978) found that scores on a modified Rubin's Love Scale correlated .50 with scores on a dyadic attachment scale constructed by the authors. This result is certainly not incompatible with the view that love and commitment are related, but not identical.

Thus we have encountered the point of view that love and commitment are essentially the same thing, followed by a consideration of the view that these concepts are moderately correlated or largely independent. The other anchor of this continuum is the view that love and commitment are orthogonal. Rosenblatt comments, "In my current thinking, commitment is different from and perhaps even independent of love, attraction, intimacy, the quality of communication in a relationship, and marital satisfaction"(1977, p.75). Solomon (1981) emphatically

declares that:

Love is not a "commitment", has nothing to do with commitment, indeed is the very antithesis of commitment, as that term is used so much today. Love is an emotion; a commitment is a promise (whether to oneself or someone else) to do something--or to continue to do something--whatever one's feelings. If you're in love, you don't need to make a commitment; if you need a commitment it has nothing to do with love (p.xxxiii).

Recently, Sternberg (1986) proposed a new theory of love in which commitment is a component of love, along with intimacy and passion. Sternberg sees his decision/commitment component as referring to the initial decision that one loves someone else as well as the long-term commitment to maintain that love. The intimacy component consists of feelings that engender the experience of warmth in a relationship, which includes feelings of closeness, connectedness, and bondedness. The passion component refers to drives that lead to romance, physical attraction, and sexual activity. These three components form the vertices of his triangular theory of love.

The four views of the relationship between the concepts of love and commitment can be visually depicted as Venn diagrams (See Figure 1). A prototype approach, which is concerned with the everyday use of natural language concepts, can shed light on these hypotheses on the relation between the concepts of love and commitment. If the everyday person views these concepts as

practically identical, they should share virtually the same set of attributes. If they are seen as completely independent, they should have no attributes in common. In order for these concepts to be considered largely overlapping, one would expect them to share a large number of features, but each concept would also possess some unique features. Further, if these concepts are considered partially independent, one would expect that they would share some, if not a considerable number of, central attributes. Finally, if commitment is a component of love, then the features listed for commitment should be a subset of those listed for love. However, love should also possess other, additional features.

Overview of the Present Study

To recapitulate, the lack of agreement concerning definitions for love and commitment suggests that these concepts might be prototypically organized rather than definable in the classical sense. Moreover, it is anticipated that a prototype analysis of these concepts can answer another important question, namely, "How do people view the relation between these concepts?". Thus, the first part of this thesis consists of a set of exploratory studies to test the feasibility of viewing love and commitment as prototypically organized concepts. One of the merits of the Roschian approach is that through her research with natural language categories, she has provided a framework that can be applied to new areas. Rosch does not spell out specific hypotheses, but rather offers a general approach that

must be specified through empirical means in any particular domain. The exploratory nature of this research must, therefore, be emphasized.

Two kinds of studies will be conducted in this investigation. The first set will be concerned with the prototype structure of the concepts of love and commitment. In other words, it is expected that certain attributes will be more central to the concept than will others, and that the degree of centrality will affect performance in a variety of tasks. In Study One, subjects will be asked to list features of love and/or commitment. In Study Two, another group of subjects will rate the features according to degree of centrality. In Study Three it is expected that central attributes will be more salient in memory than will peripheral attributes. In Study Four, it is anticipated that centrality effects will be evident in natural language use. Specifically, it is predicted that it will be considered appropriate to preface peripheral, but not central, features with hedges like "sort of". It is from the convergence of several measures that the prototype structure of a concept is demonstrated. If these measures converge, the case that love and commitment are prototype concepts can be made with greater confidence.

The second set of studies will examine whether or not the central attributes of love and commitment play a central role in the layperson's conception of interpersonal relationships. In other words, are central attributes more important than peripheral attributes in verbal reports of the factors

associated with both increases and decreases in relationship closeness? In Study Five, it is predicted that central attributes will be seen as more applicable to the relationship as it becomes more loving or more committed, whereas the applicability of peripheral attributes will not vary systematically as a function of the degree of love or commitment in the relationship. Finally, Study Six examines the impact of violations of central and peripheral features of love and commitment. It is expected that violations of central features will be perceived as having a more devastating consequence on a relationship than will a violation of peripheral features.

Subjects in these studies will be university undergraduates. This group was targeted for study because according to Erikson (1963), the formation of intimate relationships is the central developmental task during this phase of the lifespan. Thus the concepts of love and commitment are presumably salient for these students. Consistent with the Roschian tradition, they are referred to as "laypersons" in the sense that they are non-experts in the scientific study of love and commitment.

PROTOTYPE STRUCTURE OF THE CONCEPTS OF LOVE AND COMMITMENT

As was mentioned in the introduction, prototypes can be described by the sets of characteristics or attributes constituting them. The description of a prototype, then, corresponds to a kind of flagging of central attributes. This flagging differs from the identification of criterial features, however, in that instances of the concept are not expected to share all features identified in the prototype. For example, Horowitz et al. (1982) varied the number of prototypic features included in a description of a lonely person. They found that the most common adjective chosen by subjects to describe this hypothetical person was "lonely". Thus, subjects did not need all the features identified in the prototype to correctly classify the hypothetical person as being lonely. However, the more prototypic features of loneliness the descriptions contained, the greater the probability that the person was identified as such.

The purpose of the first phase of this project was to explicate the domains of love and commitment beginning with a prototype attribute generation procedure. Thus, the first study involved eliciting lists of features or attributes of these concepts. This preliminary study was essential as a foundation for subsequent phases of the research program and provides interesting descriptive information of value in and of itself.

Study One: Free Listing of Features of Love and Commitment

In deciding exactly how to elicit the features of the

concepts of love and commitment, several methodological cum conceptual issues were considered. In a recent study of prototypes of members of different occupations, Dahlgren (1985) found that subjects listed different features depending on the instructions they were given. When asked to list "characteristics common to and characteristics common of" hospital employees, subjects gave more attributes that Dahlgren classified as "functional" (types of the concepts, e.g., "nurse"). Asking subjects to define the terms yielded more internal attributes like personality traits or educational level, which she classified as "internal" (e.g., "medical training"). Finally, asking for "ways of recognizing" category members produced more "perceptual" attributes (external, observable characteristics, e.g., "wears white").

While the specifics of Dahlgren's results (e.g., that subjects can be led into generating perceptual features) may not be relevant to concepts like love and commitment, the general finding that different instructions may elicit different responses can not be easily dismissed. In this study, it was thought that two potential sources of bias might be (a) whether subjects generated features for only one or both concepts, and (b) whether the kind of example provided in the instructions as a model for their responses might elicit different kinds of features.

Subjects were asked to generate the attributes of either love or commitment, or both love and commitment. Asking respondents to generate attributes for both concepts is

obviously more economical. More importantly, presenting both concepts provides the subject with a clearer frame of reference, perhaps implicitly suggesting a comparison of these two concepts. Further, in this condition it was possible to ask subjects to make explicit comparisons between the two concepts. This was seen as a valuable source of information, particularly at the pilot stage.

The rationale for the love or commitment condition was that if subjects were asked to respond to both love and commitment, it might preclude them from listing love as an attribute of commitment (and vice-versa). It is equally plausible that just the opposite might occur--seeing commitment on the questionnaire might serve as a prompt to include it as an attribute of love (and vice-versa). Asking subjects to generate attributes of either love or commitment bypasses these potential problems. By removing the cue value of the other concept, it was possible to discover whether love would be listed spontaneously as an attribute of commitment, or commitment listed as an attribute of love.

To ensure the features obtained were not dependent on the specific example used, subjects were also given one of two examples in their questionnaires--terror or extraversion. The terror example was chosen because there was some precedent for using it (see Fehr & Russell, 1984). Of greater significance is the fact that this example seems to represent more of a "script" rather than a strict listing of attributes. Antecedents, physiological, cognitive, and behavioral components, and

consequences are included. In other words, the terror example tells a story:

- possible danger occurs--may be real like a bear;
may be imaginary like a ghost
- attention is focused on the threat
- heart beats quickly
- eyes open wider
- eyebrows lift
- palms and soles sweat
- thoughts race through the person's mind
- unpleasant sensations are experienced
- the person runs as fast as s/he can
- hands tremble
- relief is experienced after a few minutes

The extraversion example was chosen because it was amenable to being presented as a list of attributes, rather than in a script or story-like form. Further, it seemed to avoid a potential problem inherent in the terror example, namely that terror might be more closely related to love than to commitment (because they presumably share the same superordinate--emotion), thereby setting up a frame of reference for love but not for commitment. The concept of extraversion would not appear to share a superordinate with either love or commitment.

Thus, in light of these considerations, several versions of the questionnaire were ultimately constructed. They varied in terms of which concept or concepts were presented and the type of example given (see Appendix A). The goal of this

multiquestionnaire approach was to get a robust set of features, and to also collect data on whether the kinds of features generated were questionnaire-specific.

Method

Subjects

Subjects in this study were 141 students enrolled in a Developmental Psychology and a Social Psychology class at the University of British Columbia. The sample was comprised of 103 females and 37 males (one subject did not indicate gender), whose mean age was 22.39 years. The modal age was 21 years, with a range of 19 to 47 years of age. Participation in the study was voluntary.

Procedure

The basic stem of the questionnaire for the love and commitment group was adapted from Fehr and Russell (1984):

Love and commitment are members of a large class of global concepts that researchers have found useful in characterizing interpersonal relationships. This is a simple study to find out the characteristics and attributes of these two concepts. For example, if you were asked to list the characteristics of the concept extraversion [terror], you might write:

--liveliness	--vivaciousness
--sociability	--high activity level
--lots of energy	--eagerness
--impulsivity	--not afraid to take a dare
--friendliness	--can be domineering

--outgoingness	--exuberance
--boldness	--talkativeness
--enthusiasm	--joking around
--self-confidence	

When thinking about love or commitment, 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 you're explaining the word love or commitment to a foreigner or to someone who has never experienced it. So 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 "love" makes you think of your granny Smith, don't write "Granny Smith". We're interested in what is common to instances of love and commitment.

On the next page, subjects were instructed to list as many features of the concept as came to mind, but not to take more than about three minutes to complete the task. The order of love and commitment was counterbalanced across subjects. On the last page of the questionnaire, subjects were asked to "think about what love and commitment mean in relation to one another. In what ways are they similar? In what ways are they different? Take a few minutes to write down whatever thoughts come to

mind."

In the love or commitment condition, the questionnaire referred only to the target concept. In the commitment condition, when cautioning against free association, the Granny Smith example was replaced with, "If commitment makes you think of your partner, don't write your partner's name...".

The following number of subjects responded to each version of the questionnaire: Love and Commitment (Extraversion Example) N=20; Love and Commitment (Terror Example) N=24; Love (Extraversion Example) N=29; Love (Terror Example) N=23; Commitment (Extraversion Example) N=20; Commitment (Terror Example) N=25. This yielded 185 protocols in all--96 for love and 89 for commitment.

Results

First, the effects of type of example and effects of listing features for one or both concepts were assessed. Next, a final list of features for each concept was derived.

Terror vs Extraversion Example

In order to discover whether the terror example elicited a more script-like description compared to the strict attribute-list presented in the extraversion example, the protocols were scored by two judges (graduate students in psychology) blind to the example the subject received. Each questionnaire was rated on a scale of 1 to 7, where 1=definitely a set of attributes and 7=definitely a script (story). This

analysis was performed for the love and commitment protocols separately.

To assess the degree of inter-rater reliability, the scores of the two raters were correlated, $r=.86$. A high correlation indicates that the raters exhibited a high amount of agreement on whether the protocols appeared script-like or like a list of attributes. A high correlation would also be obtained if one rater consistently favored one end of the rating scale (e.g., consistently saw the protocols as more script-like). The mean rating of each judge therefore was computed: the mean rating for judge 1 was 5.368 (s.d.=1.337); mean rating for judge 2 was 5.222 (s.d.=1.47). Given the comparability of the means and the variability around the means, one can assume that both judges were using the scale in the same way.

In order to determine whether or not type of example used had an effect, the ratings of the two judges were averaged, and entered into a 2X2X2 analysis of variance in which the factors were type of example (terror/extraversion) by type of concept (love/commitment) by type of instruction (love or commitment/love and commitment). There were no significant main effects and no significant interactions (all F 's < 2.51 , p 's $> .10$; see Appendix B). Therefore the terror and extraversion questionnaires were combined for further analyses.

Transcribing and Judging Responses

The procedure for transcribing and judging the subjects' protocols occurred for the love and commitment attributes

separately. For each concept, the experimenter transcribed all words and phrases generated by the respondents. The responses were transcribed verbatim, or with minimal change (i.e., spelling, grammar, etc.) if necessary to clarify them.

The responses were then presented to a panel of three judges (all were graduate students in psychology, two had received extensive experience in this type of task when serving as judges for Holliday (1983)). First, they screened the responses for the presence of attributes or features of the concept in question. Statements referring to types of love or commitment, rather than features of the concepts were excluded, as were references to the superordinate category to which the concept belonged.

Such statements typically appeared as a kind of opening statement. For example, a respondent who mentioned types, did so in the following way:

Love--think of my boyfriend, and family, and close friends. Common to all:

- is a warmth felt towards all
- caring and empathy about them
- willingness to help
- happiness on seeing them unexpectedly, look forward to times together
- excited, "happy feeling" (S# 6)

Or as another respondent wrote:

...one can feel commitment toward a cause, occupation, person, etc. Commitment is:

- the devotion one expresses toward another person

--commitment can be a manifestation of love (S# 105).

Some respondents included a possible superordinate of the concept as part of their response. For example, one respondent wrote:

Love is a feeling which one person acquires for another person in which both parties end up feeling content, fulfilled, and happy. It is a sense of sharing, caring, and generally a feeling of peace with oneself through interaction with the other person (S# 32, emphasis added).

Similarly, someone else wrote:

Commitment is part of a special relationship. To me it means a special dedication to someone and putting your full attention and heart into something or someone (S# 133, emphasis added).

Superordinates were included in 19 of the 96 love protocols and in 2 of the 89 commitment protocols. Of the 96 love protocols, 15 included a reference to types of love (note that "friendship" was included as a feature of love whenever it was listed as an attribute as opposed to appearing embedded in a list of types of love), while of the 89 commitment protocols, 12 contained a reference to types of commitment. As noted previously, these were eliminated from further use.

Extracting Linguistic Units

Having culled the protocols of types and superordinates, the

next phase involved the actual coding of the features. The coding procedure used was adapted from Rosenberg and Jones (1972) and Rosenberg and Sedlak (1972). The first stage of their detailed editing process involves the extraction of linguistic units. Monolexemic types such as caring, sharing, and trust, were readily identified. Where a subject used a phrase, however, a judgment was necessary as to whether the particular phrase referred to a single feature, or could, in fact, be divided into two or more linguistic units (i.e., attributes). Phrases which were coded as single units were those in which the attribute was simply preceded or followed by some modifier or modifying phrase: "deep caring", "strong caring", "complete trust", "intense liking", and so on. Phrases which were coded as more than one linguistic unit were those in which each subpart could stand alone as a separate attribute of the concept: "having someone close to you that you care about", "compassion towards another accompanied by the desire to self-sacrifice if necessary", "feeling content and comfortable with someone". The total number of linguistic units extracted from the protocols was 654 for love and 436 for commitment. Each subject generated an average of 6.81 features for love, and 4.91 features for commitment.

Grouping Linguistic Units into Attribute Categories

Linguistic units which were judged as referring to the same attribute were grouped into one attribute category if they contained the same basic morpheme. The following categorization

rules were used:

1. Descriptions which were different grammatical forms of the same words were placed in a single attribute category (e.g., care and caring; being honest, honest, and honesty).

2. Descriptions which were accompanied by modifiers like: very, most, extremely, completely, intense, quite, rather, fairly, and so on were included in the same category as the unmodified feature (e.g., "lots of energy" was coded as "energy").

3. Attributes which were modified with terms like: at times, sometimes, slightly, a bit, tends to be, a little, and somewhat were placed in the same attribute category as the unmodified description. For example, "is sometimes scary" was included in the category "scary".

4. Any attribute modifying terms like "relationship", "person", "other", etc. was placed in the same category as the single-word attribute (e.g., "trust the other person" was included with "trust"; "being supportive in the relationship" was grouped with "supportiveness"; "sacrifice for the other" was coded as "sacrifice"). Exceptions to this were attributes like "concern for the other's well-being" and "put the other first". The meaning of these attributes was considered to be substantially changed (if not rendered incomprehensible) by excluding references to "other".

5. Words that were judged as identical in meaning were combined. The attempt was to be conservative, but not to treat words/phrases that were redundant as separate attributes. Thus

the final step consisted of collapsing across identical terms. For example, "giving things up for the other" was included with "sacrifice"; "seeing something through to the end" was classified as "perseverance"; "doing as you said you would", "being bound to your word", "you do what you say you are going to do" were all included in the category "living up to your word". In cases like the last example, the category name which appeared with the greatest frequency was chosen. Words like "concern", "caring" and "compassion" were considered not to be sufficiently identical to warrant combining; "giving and taking" and "giving" were kept separate; "hard work" and "takes effort" were treated individually; "physical attraction", "sexual attraction" and "sexual passion" were treated as different features.

This grouping procedure yielded a final list of 183 love attributes. Of these, 115 responses were idiosyncratic (i.e., mentioned by only one subject). These were discarded, leaving a final list of 68 love attributes. The attributes appear in Table 1, along with the frequency with which each was generated. The final commitment list consisted of 118 attributes, 78 of which were idiosyncratic. Table 1 shows the 40 nonidiosyncratic commitment attributes and the frequency with which each was generated. Love and commitment share 21 features.

Listing Features of Love and Commitment vs Love or Commitment

Finally, the number of subjects who listed love as an attribute of commitment and commitment as an attribute of love

was tallied. The responses of subjects in the love and commitment condition were compared with the responses of subjects who generated attributes for only one of these concepts. Six subjects who wrote only about love mentioned commitment, while 8 of the subjects who wrote about both concepts mentioned commitment when listing features of love. Nine subjects mentioned love as a feature of commitment when writing only about love, the same number mentioned love when writing about both concepts. These frequencies were not significantly different, $\chi^2(1) = .16$, $p > .10$. Thus, whether or not the name of the other concept was explicitly mentioned did not prompt or inhibit these subjects from mentioning love as a feature of commitment and vice-versa.

Discussion

First, the finding that the attributes generated were robust across type of example is encouraging, given the open-ended format employed in feature generation tasks of this nature. The fact that whether subjects listed features of one or both concepts did not have a significant effect on how often the concept was listed as an attribute of the other is also a welcome finding. The transcribing and judging process yielded a final list of 68 nonidiosyncratic love attributes and 40 commitment attributes, which is comparable in number to those reported by Holliday (1983). His final list of attributes (generated by 150 respondents for wisdom and by 50 respondents for the other categories) ranged from 54 for a perceptive person, 58 for a shrewd person, 60 for an intelligent person, 70

for a spiritual person, to 79 for a wise person. (There were 182 idiosyncratic responses for wisdom, compared to 115 for love and 78 for commitment in this study). The number of attributes gleaned in this study are also comparable to those reported by Dahlgren (1985). Subjects generated attributes for 20 members of a particular occupation: worker, employer, politician, and professional. The number of attributes generated for the members of each of the four groups ranged from 39 to 79.

According to the classical view, concepts can be defined in terms of a necessary and sufficient set of criterial attributes. What is obvious from Table 1 is that our respondents were unable to produce such a set of features. In fact, there is no single feature mentioned by all of the subjects for either concept. There is substantial variability in the extent to which certain features come to mind, ranging from 43.75% of the respondents who mentioned "caring" as a feature of love, to only 2.08% mentioning "admiration". Similarly, for commitment, 34.83% of the subjects mentioned "perseverance", while only 2.33% mentioned "contentment". In fact, except for the first four items in Table 1, the remaining items were mentioned by fewer than 20% of the respondents. Unfortunately, in studies using a comparable attribute-generation procedure, the frequency with which each attribute was listed is generally not reported (e.g., Dahlgren, 1985; Holliday, 1983). Schwartz and Shaver (1984) asked subjects to list the features of various emotions, including love. While they did not report frequency of listing, they mentioned that only features which were listed by at least

20% of the respondents were retained. This yielded a final list of 24 features for love--a much larger number than was listed by at least 20% of the subjects in this study. However, Schwartz and Shaver used a much broader coding scheme when compiling their final list of features. In their study, features were categorized according to whether they were cognitive, physiological, expressive, affective, or behavioral. Features like warmth, trust, and security were coded as a single attribute in the cognitive/affective category. In contrast, these features were treated as separate attributes here. Thus, how stringent one's coding scheme is probably affects the percent of subjects who are credited with having listed a particular feature. The relatively low consensus in this study underscores the fact that if there is a classical definition for either the concept of love or the concept of commitment, these subjects were certainly unable to produce it.

The Features of Love and Commitment

What are the features that came to mind for these men and women when asked to write about these concepts? For ease of description, the features of love and commitment will be treated as clusters or themes which characterized the responses. Not surprisingly, for love, one large "cluster" consists of features that are positive in affective tone. Thus, subjects write about feelings of happiness, warmth, caring, contentment, affection, intimacy, euphoria, and so on. Interestingly, there are also features in the love prototype that are negative in hedonic

tone--more than one respondent mentioned features like "scary" and "uncertainty". Social psychologists have touched upon this theme of a "dark side" of love when describing romantic or passionate love. Berscheid and Fei (1977) noted that while it seems reasonable that falling in love should be a consistently pleasant experience, there is an undercurrent of negative emotion which seems to accompany the growth of love. They document feelings of dependency (also mentioned by our subjects) and insecurity experienced by men and women involved in romantic relationships. Hatfield and Walster (1978) describe the feelings of ambivalence, anxiety, and jealousy that are a frequent concomitant of passionate love.

The prototype of love also includes behaviors such as laughing, gazing at the other, doing things for the other, and helping. Features like butterflies in stomach, an increase in heartrate, and sexual passion are part of the physiological aspect of love. There are also features which indicate a perception that the relationship will endure: commitment, security, longlasting, loyalty, a positive outlook, and so on.

Another theme in these features is a lack of inhibition when one is with the loved one: feel free to talk about anything, feel good about yourself, feel relaxed with the other, openness, and honesty are consistent with this theme. This is a reciprocal process in that one also accepts the other as s/he is. The feature "unconditional" also reflects this notion.

The features of love also include cognitive activities, such as ruminating (e.g., "think about the other all the time"), and

positive distortion (e.g., "see only other's good qualities"). There is also an "intellectual" side to love in which the other is respected, admired, and the partners have a lot in common. Aspects of love which could be termed "motivational" include: "want to be with the other", and "want best for other". The latter also alludes to a theme that could be described as altruism. Other altruistic features are: sacrifice, put other first, giving, concern for other's well-being.

Finally, there is a cluster of features that could be loosely described as social support: supportiveness, sharing, understanding, empathy, compassion, protectiveness, and comfort.

The features of commitment have a different flavour from the features of love. Whereas in the love prototype, the largest cluster appears to refer to the experience of positive affect, the commitment prototype is characterized by a theme of making a decision, and then following through on it. Features like perseverance, living up to your word, faithfulness, devotion, loyalty, reliable, responsibility, are consistent with this idea. The behavioral features of commitment also reflect this theme: give your best effort, hard work, work toward common goals, etc. Like love, there is a cognitive aspect to commitment that is "irrational"--"think about the other all the time". However, for commitment, the predominant theme is one of levelheadedness and rationality. Thus the relationship is seen as a conscious decision, a promise, a mutual agreement, a high priority, and so on.

The positively-toned affective features in commitment are

lated compared to the intensity of some of the emotions associated with love. Respondents mention feelings of contentment, affection, caring, liking, and so on. The one negatively-valenced feature is "feel trapped", and possibly "obligation".

Another group of features refer to the giving of social support: supportiveness, "being there" for the other in good and bad times, sharing, working out problems, and so forth. There is also the theme of an enduring relationship that was present in the love prototype, e.g., longlasting, and attachment. Consistent with love, the commitment prototype also refers to altruism: sacrifice, giving, put the other first. Unlike love, this apparent selflessness is tempered by considerations of equity, namely, "giving and taking".

Relation between the Concepts of Love and Commitment

Subjects who were asked to list features for both concepts were also asked to indicate any thoughts they had on the relation between love and commitment. While these data were not subjected to any formal coding scheme or content analysis, a few reflections are in order. First, some subjects chose to make a statement about whether the concepts necessarily co-occur. Twenty-two of the 41 respondents who completed this part of the questionnaire indicated that love and commitment occur together. These statements took a variety of forms. One view was that "you can't have one without the other". Some felt that love was a prerequisite for commitment, or that love makes commitment

easier. As one respondent wrote, "Love takes the drudgery out of commitment". Others felt that commitment was required for love to survive in a relationship. The opposite side of the coin was also endorsed--four subjects indicated that commitment and love can exist without each other. Five subjects indicated that love can exist without commitment, which presumably implies that the opposite is not true (i.e., that commitment can exist without love). A few subjects stated this implication explicitly. Conversely, seven subjects mentioned that one can have commitment without love. To sum up, it seemed that the majority of subjects felt that these concepts were closely related, although some respondents felt that they could also occur independently. Within the latter group, there was also the view that even though you can have one without the other, both "should" occur in a relationship, or that in "true" love, both are present.

As one subject wrote:

You can have commitment without love, and you can experience love without commitment. Love without commitment is based upon feelings and is up and down. Commitment without love is dry and empty. With a balance of love and commitment, a person can have an exciting relationship that makes it through the bad times (S#19).

Rather than explicitly state the relationship between love and commitment, some subjects differentiated the concepts along an underlying dimension(s). Four dimensions that were easily

extracted from these data were whether love or commitment is: 1. located in the individual vs. the dyad; 2. an emotion vs. cognition/behavior; 3. transient vs. permanent; and 4. characterized by one vs. multiple targets. Thus, some subjects mentioned that whereas love is something one feels within oneself, commitment is two-sided. It involves a mutual agreement between two people. Love was also described as being affective (e.g., a feeling or emotion) whereas commitment was more often described as a cognitive decision or a behavioral act. Love was frequently described as a more transient experience than commitment. Finally, more than one subject mentioned that while individuals can only "really" love one person, they can be committed to multiple causes.

The data from the feature listing task from both types of questionnaires provide additional information on the relationship between these two concepts. For example, a certain percentage of subjects did mention love as a feature of commitment (and vice-versa), which suggests that these concepts are not completely independent, as Solomon supposed. Moreover, these concepts share certain features. On the other hand, the fact that the majority of subjects did not spontaneously mention love for commitment, and commitment for love, speaks against the notion that the concepts are synonymous. Further, the finding that some, but not all, features are shared suggests that the concepts are not identical as Money and Fogas and Dobosz imply. While commitment shares about half of its features with love (love shares just less than a third of its features with

commitment), commitment still possesses 19 unique features. (See Figure 2.) Sternberg suggests that commitment is a component of love. If so, one would expect that more subjects would list commitment when asked to generate features of love, than vice-versa. Further, commitment does not share all of its features with love, while love also possesses unique features. Kelley's view, that love and commitment are overlapping concepts best seems to describe the view expressed by subjects in this study. Obviously love is a bigger concept than commitment, and it subsumes a substantial proportion of commitment, but not the whole thing.

What this study does not tell us is the degree of interdependence and interconnectedness laypersons perceive between these concepts. It is possible that even though laypersons believe the concepts overlap, they could still see love and commitment as largely independent. This would be the case if the unique features were considered most central to each concept, while the shared features were seen as peripheral. If the concepts are seen as moderately independent, one would expect no difference between centrality ratings of shared and unique features. Finally, if laypersons conceptualize love and commitment as only partially independent, then the unique features should be seen as less central to the concept while the overlapping features should be considered central.

Thus, this is essentially the same issue as that raised by Kelley. The answer provided by the prototype approach, however, is in terms of the laypersons' perceptions of the relationship

between love and commitment. Kelley was concerned with the actual relationship between love and commitment in people's close relationships. He believed they are partially independent. One wonders: Do lay people view this the same way? An attempt to answer this question is made in the next study. It also looks at whether frequently mentioned attributes are also considered most central to the concepts.

Study 2: Centrality Ratings of the Features of Love and Commitment

One of the major distinctions between the classical view of concepts and the prototype view concerns prototype structure. As mentioned earlier, according to the prototype view, categories have an internal structure. That is, categories are composed of a core meaning and members of the category may be considered differentially representative of the meaning of the category term. Representativeness may be operationally defined by means of a subject's ratings of how good an example an item is of its category. Rosch has obtained inter-subject consistency in such ratings. Individual subjects agree that some exemplars of a category are more representative than others, and different subjects choose the same examples as most representative of the category. For example, apples and oranges are consistently rated as better examples of fruit than are figs and raisins (Rosch, 1973) and happiness and sadness are better examples of emotion than are boredom and awe (Fehr & Russell, 1984).

Similarly, attributes can be rated according to how central

or peripheral they are to a concept. For example, Holliday (1983) asked college age, middle-aged, and elderly adults to rate a set of attributes of the concept of wisdom. He found that features like "have learned things from experience", and "good source of advice", were considered prototypical or central to the concept, while features like "quiet", "conservative", and "happy" were seen as nonprototypical or peripheral. Cantor and Mischel (1977) were interested in what features are central to certain personality prototypes. For extraversion, they found that attributes like "exuberant" and "outgoing" were considered central, while features like "energetic" and "impulsive" were only moderately related. Attributes like "neat" and "punctual" were seen as peripheral to the concept.

The purpose of this study was to discover which attributes of love and commitment were considered central to each concept, and which were considered peripheral. In other words, the purpose of this study was to discover the prototype structure of the concepts of love and commitment. If these concepts were classically defined, one would not expect subjects to see some attributes as more central to the concepts than others, because all attributes would be equally necessary in defining the concept. Gathering data on this issue also permits addressing the aforementioned question concerning people's conception of the relation between these concepts.

Method

Subjects

Subjects in this study were 172 undergraduate students

enrolled in two social psychology classes at the University of British Columbia. Responses to questions concerning age and gender revealed that 111 females and 56 males participated in the study. The mean age of the sample (based on 165 responses) was 22.98, the mode was 21 years, and the range was 19 to 50 years of age.

Materials

Two versions of each questionnaire were constructed in which the attributes were presented in different orders. Also, there was some question as to whether 68 attributes might be a prohibitively large number of attributes to rank. Therefore, a third version which contained only half of the attributes was constructed for love (see Appendix C). This condition also made the number of ratings per concept comparable (since subjects in the commitment condition rated only 40 attributes).

Procedure

Subjects received the following instructions:

The purpose of this questionnaire is to discover which features of LOVE [COMMITMENT] are most characteristic of the concept and which features are least characteristic. In an earlier experiment, subjects were given the concept "LOVE" ["COMMITMENT"] and were asked to list all the attributes or features they could think of in a few minutes. On the next page, you will see the features that were listed. The fact that each of these

attributes was listed by someone in our previous study indicates that each attribute probably is, to some degree, a part of LOVE [COMMITMENT]. Nevertheless, some features clearly seem more central to, or more important in, love [commitment] than others.

For example, if given a list of attributes for the concept of INTELLIGENCE, features like "having a high I.Q." or "getting straight A's in university" are probably good features. A feature like "ability to solve problems" is probably a moderately good feature. Features like "find it easy to fill out income tax forms" or "good at telling jokes" might be considered poorer features of intelligence. Note that while it's possible that most intelligent people can tell jokes extremely well, this feature probably is not most central when you think about what the concept of intelligence means.

For each of the features on the next page, we would like you to think about what the concept of LOVE [COMMITMENT] means, and ask yourself: "How central is this feature to love [commitment]?" Then rate how good or poor that feature is using an 8 point scale where 1=extremely poor feature of love [commitment], and 8=extremely good feature of love [commitment]. Please try to use the

entire scale when making your ratings--we're interested in discovering the relative importance of each of the features to the concept of love [commitment].

The commitment attributes were rated for centrality by 76 subjects, while 96 subjects rated the love attributes. Of the latter group, 52 rated all 68 attributes, while 44 rated only 34 of the love attributes (which yielded 22 complete questionnaires). This resulted in a total of 74 complete love questionnaires.

Results

To assess whether the particular questionnaire used had an effect on subjects' ratings a one-way ANOVA was performed on the centrality ratings of the love attributes across the three types of questionnaires and a one-way ANOVA was run on the centrality ratings of the commitment attributes on the two versions of the commitment questionnaire. There was no effect of type of questionnaire for either love or commitment (F 's < 1 , p 's $> .10$; see Appendix D). However, an analysis across attributes might not be sensitive enough to detect order effects (or as in the case of love, whether the number of attributes rated makes a difference). Therefore, in order to examine this issue more closely, an analysis of variance was performed on the mean ratings of certain single attributes across questionnaires. As can be seen in Table 2, there were no significant differences between centrality ratings for the features as a function of the form of questionnaire in which they appeared.

In addition, to get some indication of the reliability of centrality ratings, the mean centrality ratings for the features given by the two separate classes were correlated. This correlation was .93 for the love attributes (.85 based on ranks) and .92 for the commitment attributes (.86 based on ranks). The data sets were combined for further analyses. Table 3 shows the mean centrality rating for each of the love and commitment attributes. Because these features were intended for use in the remaining studies, it was necessary to decide which features should be considered central, and which should be regarded as peripheral to each concept. For love, it was decided to consider features with a mean centrality rating of 6.0 and higher on the 8-point scale as central, based on a median split of the centrality ratings. The remaining 34 items were considered peripheral. For commitment, the 20 features with a mean centrality rating of 5.75 or higher were considered central, while the remaining half were considered peripheral to the concept. While the split for each concept is higher than the midpoint of the scale, it is necessary to keep in mind that all the features were related, to some extent, to these concepts (i.e., they were all given by more than one subject in Study One). Therefore, one would not expect extremely low centrality ratings. In the Fehr and Russell (1984) study, mean prototypicality ratings ranged from 2.49 to 5.46 on a 6-point scale, and the cutoff point for an emotion to be considered prototypical was 4.55.

It was expected that attributes that are very central to a

concept would be more likely to come to mind in a free listing task than would peripheral attributes. Therefore, centrality ratings were correlated with frequency of generation in Study One. For love, the correlation between centrality and frequency was .36 ($p < .001$) (.39 based on ranks); for commitment a correlation of .52 ($p < .001$) (.67 based on ranks) was found.

There was some reason to believe that males and females might differ in terms of the features considered most important to love (see, for example, Peplau (1983)). Therefore, the men and women's centrality ratings were correlated. These correlations were very high for love, $r = .93$ (.89 based on ranks), and for commitment, $r = .89$ (.83 based on ranks). Thus in the remaining studies, the data for males and females were combined.

To test whether love and commitment are partially independent concepts, a 2X2 mixed analysis of variance was performed on the centrality ratings, with concept (love/commitment) as the between-subjects factor and type of attribute (shared/unique) as the within-subjects factor. As discussed in Study One, if love and commitment are only partially independent concepts, one would expect the shared attributes to be more central to each concept than the unique attributes. If the concepts are largely independent, unique attributes should receive higher centrality ratings than shared attributes. Finally, if love and commitment are partially independent and largely overlapping, one would expect the centrality ratings of the shared attributes for each concept

should be at least moderately, if not highly, correlated.

First, there was a main effect for concept, $F(1, 148)=5.15$, $p=.025$, such that overall, love attributes received significantly higher mean ratings than did commitment attributes (mean for love 5.91; mean for commitment 5.65). Second, there was a main effect for type of attribute, $F(1,148)=86.07$, $p <.001$, such that overall, shared attributes received higher centrality ratings than did unique attributes (mean for shared attributes 5.96; mean for unique attributes 5.59). This effect was tempered by a significant concept by attribute interaction, $F(1,148)=74.81$, $p <.001$ (see Appendix D). Simple effects analyses revealed that for love, shared attributes received a significantly higher mean rating compared to unique attributes, $F(1,73)=206.16$, $p <.001$ (6.26 vs. 5.55). For commitment, the difference between centrality ratings of shared and unique features was nonsignificant, $F <1$, $p >.10$ (5.66 vs. 5.63, respectively).

Finally, it was predicted that the centrality ratings of the shared features of love and commitment would be moderately to highly correlated. This correlation turned out to be quite high, $r=.75$ (based on ranks, .69).

Discussion

The first noteworthy feature of these data is that subjects were, in fact, able to rate the attributes of love and commitment according to how central they were to the concept. Moreover, subjects agreed with one another on these ratings; the

ratings were stable across classes and questionnaire types. The mere fact that our respondents found this a meaningful task lends credence to the hypothesis that love and commitment are prototypically organized rather than classically defined. For a concept to be classically defineable, each feature is individually necessary--thus no one feature should be considered more central to the concept than others.

Centrality Ratings of the Features of Love and Commitment

In terms of the actual centrality ratings assigned to each concept, love attributes received higher ratings than did commitment attributes. It may be the case that the concept of love is simply more salient to the particular age group under study than is the concept of commitment. In fact, there is some evidence to suggest that love becomes less important across the lifespan, while commitment becomes more important (e.g., Reedy, Birren, & Schaie, 1981). However, some other factor like size of concept could also be operating here. For example, centrality ratings for extraversion obtained by Cantor and Mischel (1977) are higher than those obtained for introversion. Like love, extraversion is simply a bigger concept (i.e., has more features) than is introversion. It may be that when the prototype of a concept includes a large number of features, the central ones become particularly salient. When there are a large number of features to keep in mind, the central ones might serve to "anchor" the concept and therefore assume greater importance.

Centrality ratings turned out to be modestly correlated with

frequency of free listing. These results are comparable to those obtained by other investigators using a similar task. For example, Dahlgren obtained a correlation of .29 between frequency of free listing of features of persons in particular occupations and prototypicality ratings of these features. While these correlations were not as high as those obtained when subjects are asked to list types of emotions (e.g., Fehr and Russell (1984) reported a correlation of .80 between frequency of generation and prototypicality ratings), they are nonetheless respectable in comparison with other attempts at correlating frequency of free listing of features with centrality ratings.

It is interesting to note which attributes these college-aged respondents thought were most central to love and to commitment. For love, "trust" emerged as the most central attribute, followed by "caring", "honesty", and "friendship". These results are somewhat discrepant with those reported by Steck, Levitan, McLane, and Kelley (1982). These authors presented subjects with versions of a love scale purportedly filled out by someone experiencing romantic love, which differed in how much items pertaining to care, need, and trust were endorsed. They reported that questionnaires in which caring items were rated highest, followed by need, and then trust were seen by their subjects as indicative of the greatest amount of love. In contrast, the results of the present study show trust to be most central, followed by caring, while "need each other" is relatively peripheral. The differences in these findings may be partly attributable to the fact that Steck et al.'s trust

component was comprised primarily of self-disclosure items. If one considers the feature "feel free to talk about anything" as more akin to self-disclosure than trust, then the results become somewhat more comparable, because "feel free to talk about anything" was ranked as less central than caring. But, it is still considered more central than need. However, of greater relevance to the findings obtained here, is the fact that Steck et al. also asked their subjects to indicate how similar each item was to their own conception of love. These results showed that care was most relevant, followed by trust, and then need. If one treats their trust component as self-disclosure, the results become consistent with those reported here.

How does the layperson's view of love, as uncovered here, map onto theories of love proposed by psychologists? Rubin (1973) sees love as consisting of three components: caring, attachment, and intimacy. Caring and intimacy are central to the layperson's view, while attachment is seen as less central. Rubin also sees liking as distinct from love. He argues that there are two dimensions underlying liking: affection and respect. Liking is considered to be a central feature of love, as are its proposed underlying dimensions.

Another issue of interest is to what extent the layperson's view of love maps onto the companionate/passionate love distinction made by Hatfield and Walster (1978):

Passionate love is a wildly emotional state, a confusion of feelings: tenderness and sexuality, elation and pain, anxiety and relief, altruism

and jealousy. Companionate love, on the other hand, is a lower-key emotion. It's friendly affection and deep attachment to someone (p.2).

Indeed, these data include features that depict passionate love: "miss the other when apart", "physical attraction", "touching", "sexual passion", "think about the other all the time", "euphoria", "heartrate incresses", "gazing at the other", "uncertainty", "scary", and so on. These data also include certain features descriptive of companionate love: "trust", "caring", "respect", "friendship", "loyalty", and the like. According to Brehm (1985), "Respect, admiration, and trust are all major aspects of companionate love. Indeed, interpersonal trust may be its single best defining characteristic" (p.93). What is surprising is that not one of the features that describe passionate love appears as a central feature of love--in fact these are features that receive the lowest centrality ratings. These data are inconsistent with the stereotype that college-aged students see love only in romantic terms. However, these results are consistent with Baum's (1972) study of engaged couples. When asked to define love and to indicate its most important component, the respondents were much more likely to use companionate terms (sharing, understanding, companionship, mutual support and affection) than romantic or altruistic terms.

With regard to the concept of commitment, features like "loyalty", "responsibility", "live up to your word", and "faithfulness" were considered most central. Features like "contentment", "security", "think about the other all the time",

and "feel trapped" were considered peripheral to the concept. Unfortunately, there has been virtually no research on the everyday person's conception of commitment, which precludes making comparisons between these findings and those of other studies.

The parallels between laypersons' and social scientists' definitions of commitment are not particularly striking. The everyday person does not differentiate between commitment freely chosen by the individual and commitment imposed on the individual by some external source (cf. Johnson's (1982) distinction between personal and structural commitment; Hinde's (1979) distinction between endogenous and exogenous commitment). The other main themes in the scientific literature are: the pledging of oneself to a line of action. The features "live up to your word", "a promise", and "conscious decision" are consonant with this theme. Definitions of commitment as an intent to maintain a relationship are not really represented in this feature list, nor are definitions which construe commitment as an unwillingness to consider an alternate exchange partner.

Relation between Love and Commitment

A comparison of the mean ratings of unique versus shared features revealed that shared attributes received significantly higher centrality ratings than unique attributes, particularly for the concept of love. This result suggests that laypersons' conceptualization of love and commitment complement Kelley's hypothesis that these concepts are partially independent. If the

unique features had received higher centrality ratings, then one would be compelled to conclude that the layperson sees these concepts as largely, rather than partially, independent, a finding that would conflict with Kelley's position. The fact that unique features of commitment "hold their own", that is do not receive significantly higher centrality ratings than shared attributes, suggests that from the layperson's perspective, commitment is not a component of love, even though it shares a large number of its features with love.

Study 3: Memory for the Features of Love and Commitment

If the concepts of love and commitment have a prototype structure, one would expect this structure to affect performance in various situations. One such effect occurs in memory recognition and recall tasks. In a recognition memory experiment, Cantor and Mischel (1977) presented subjects with descriptions of four fictional characters: an extravert, an introvert, and two controls (nonextraverts and nonintroverts). The character descriptions were composed of attributes that had been pre-rated on their degree of relatedness to the concepts of introversion and extraversion. In creating the introvert and extravert characters, they used attributes that were moderately related and unrelated to the concepts. For the control characters, attributes that were unrelated to either concept were presented. Cantor and Mischel predicted that for all characters, subjects would be more confident that they had seen presented (versus nonpresented) attributes.

However, they also posited that when subjects obtained consistent information about extraverted or introverted characters, the appropriate trait concept would be activated. Thereafter, the trait concept should function as an organizing prototype for processing further information. Thus it was also predicted that subjects would demonstrate a bias toward recognizing nonpresented but highly related features of the introvert and extravert characters, but not for the control characters. Their results supported both predictions.

In a subsequent study, Cantor and Mischel (1979b) explored the effects of prototypicality and personality on recall memory. They reasoned that if people process information in terms of relevant personality prototypes, then manipulating the centrality of the attributes of the stimulus characters should systematically influence the ease of information processing. Consequently, the amount and nature of the information recalled about these characters should be affected.

In addition, they were interested in the ways in which descriptions of their stimulus characters would be embellished if subjects were asked to give their impressions of the character's personality. In this study, subjects were presented with descriptions of three types of characters. Pure characters were described using only traits and behaviors that were prototypical of that personality type. Inconsistent characters were described by traits and behaviors of conflicting personality types (e.g., extravert and introvert). Finally, mixed characters were described using traits and behaviors that

were prototypical of two different, but nonconflicting prototypes (e.g., extravert and good Samaritan).

As expected, the most information was written and correctly recalled about pure characters and least about inconsistent characters. The effect of character consistency was also evident in the elaboration and richness of the personality impressions. For example, significantly greater numbers of new (nonpresented) items were included in the impression of the pure characters, compared to the mixed and inconsistent characters. These new items were quite consistent with the character's originally presented attributes.

The purpose of this study was to investigate both recognition and recall memory within a single study. Subjects were presented with either the love or the commitment attributes. The rationale was that because the two concepts share a considerable number of features, it would be confusing for subjects to be presented with the features of love and then have some of the same features appear again as attributes of commitment. Stated differently, looking at both concepts simultaneously would be equivalent to replicating the Cantor and Mischel (1979b) study, with only a mixed description condition.

Unlike the Cantor and Mischel (1977) recognition study, subjects in this study were presented with 10 prototypical and 10 nonprototypical statements. The rationale for predicting false recognition effects for central items is that the acquisition items have presumably "activated" the prototype, resulting in an inability to discriminate between very central

items that were and were not presented. Cantor and Mischel's acquisition items were statements rated as moderately related (mean rating of 2 to 2.5 on a 4-point scale for extraversion; mean rating of 1.5 to 2 for introversion) and unrelated (mean rating of less than 1.5) to the concepts. It is unclear why Cantor and Mischel chose to activate a prototype without using prototypical items. Therefore, in this study it was decided to operationalize activation of the prototype by presenting subjects with 10 randomly selected central items and 10 randomly selected peripheral items.

It was expected that like the Cantor and Mischel recognition study, subjects would veridically recognize both central and peripheral features that were presented. However, a main effect for centrality was expected for false recognition, such that central features which were not presented would be falsely recognized more often than peripheral features. The inclusion of recall memory was exploratory. On one hand, recall results might simply mirror recognition results. On the other hand, if subjects do not have the stimuli right in front of them (as in the case of recognition memory) but have to rely solely on their memory, there might be a bias toward recalling more central items. The predictions made for false recognition effects were also made for false recall.

Method

Subjects

Subjects in this study were 120 undergraduate students.

Sixty were in a Developmental Psychology class; 60 were in a Social Psychology class. Half in each class were presented with love attributes; half were presented with commitment attributes.

Materials

The experimental materials consisted of three booklets with different colored covers to reduce the probability that they would be confused. One booklet was labeled "STATEMENTS", another was labeled "QUESTIONNAIRE 1", and the other "QUESTIONNAIRE 2". The statements booklet consisted of 20 pages. One sentence was typed on the middle of each page. At the bottom of each page, the statement "Please do not turn the page until instructed to do so" appeared. Ten of the 20 statements were randomly selected central statements, the other half were randomly selected peripheral statements.

The 20 statements which appeared in the acquisition phase for half the subjects (who will be referred to as Group 1) appeared again in the recognition phase along with 20 new statements which were included to assess false recognition. For the other half of the subjects (who are referred to as Group 2), these 20 "new" statements were the acquisition items while Group 1's acquisition items became this group's "new" recognition items. This counterbalancing was done because the random selection of features could produce a set of features that was extraordinarily memorable or not at all memorable (due to item length, etc.). By making one group's acquisition items another group's recognition items, such effects should be easier to detect.

For the acquisition phase, each attribute was inserted into the sentence frame, "Chris and Pat's relationship is characterized by _____" (e.g., giving). For a few cases, the word "by" was replaced by "as" (e.g., "Chris and Pat's relationship is characterized as a promise"). Each statement was constructed so that it occupied no more than one line. While most of the attributes easily met with this constraint, a few attributes like "concern for the other's well-being" were shortened to accommodate this restriction. (This attribute was presented as "Chris and Pat's relationship is characterized by concern for each other"). The statements were presented in a different random order for each subject. The attributes seen by the subjects are presented in Table 4.

The booklet entitled "QUESTIONNAIRE 1" consisted of two pages. The first page contained the interference task instructions: "On this page, take a few minutes to list as many of the Canadian provinces as you can in alphabetical order". The second page contained the recall task instructions: "On this page, write down as many of the statements presented in the booklet about Chris and Pat's relationship as you can remember. Be as accurate as you can, but don't leave out any statements just because you can't remember the exact wording".

The "QUESTIONNAIRE 2" booklet contained 40 statements: The original 20 (10 central/10 peripheral) statements the subject had seen were randomly interspersed with 20 new statements (10 central/10 peripheral) that the subject had not seen in the acquisition phase. Subjects were given the following

instructions:

Below is a series of statements that you may or may not have seen in the booklet of statements you read earlier. For each statement, circle "YES" if you think the statement appeared in the booklet, and "NO" if you think the statement was not in the booklet. Then indicate how confident you are that you did or did not see the statement using a scale of 1 to 4, where 1=not at all confident and 4=extremely confident.

All three booklets were placed in a sealed envelope (see Appendix E).

Remaining materials consisted of a tape recorder and a stop watch. The verbal signals indicating when to turn the page and begin reading the next statement were pre-recorded. Because both recall and recognition memory were of interest, it was important that subjects were given enough time to read each statement, but not enough time to memorize each statement. Pilot testing revealed that 4 seconds seemed to be the optimal time for subjects to comfortably read each statement once and turn the page to the next statement. To ensure that each 4-second interval would be standardized across statements and across classes, the verbal signals of when to start reading the first statement and when to turn each page were tape recorded. A stop watch was used for timing the interference and recall tasks.

Procedure

Each subject received an envelope containing the three

booklets. The experimenter verbally gave subjects the following instructions:

In this experiment you will be reading a series of statements. Each statement describes some aspect of the relationship between two fictional people, Chris and Pat. I would like you to simply read each statement. Later, I'll ask you some questions about Chris and Pat's relationship.

The experimenter then showed the class a sample copy of the booklet of statements, pointing out the "Do not turn the page..." instruction. She then went on to say:

You will have a few seconds to read each statement.

The voice on the tape recorder will say, "Three, two, one, start". When you hear the word "START", read the statement on the first page of the blue booklet. When the voice says "TURN", turn the page and read the next statement.

The experimenter then asked if there were any questions, and repeated the last set of instructions, to ensure that the subjects understood the task. She then asked them to take the STATEMENTS booklet out of the envelope and started the tape recording.

This phase of the experiment took 1.33 minutes. After subjects had read all the statements, the experimenter asked them to return the statements booklet to the envelope (to preclude the possibility of subjects referring back to the statements during the memory tasks). They were then asked to

retrieve QUESTIONNAIRE 1 from the envelope. The experimenter signalled when they could begin working on the first page of the booklet. They were given one minute to work on the interference task. They were then instructed to go on to the next page (the recall task). Subjects were given three minutes to recall as much as they could. This appeared to be sufficient time for them to write down as much as they remembered. Finally, subjects were asked to return QUESTIONNAIRE 1 to the envelope, and to begin QUESTIONNAIRE 2 (the recognition task). They were given as much time as they wished to complete this questionnaire. The entire envelope was then handed in to the experimenter.

Results

Analysis of Presented Attributes: Recognition Data

In the recognition phase, subjects were presented with the central and peripheral features they had previously seen, and made a yes/no decision as to whether the item had been previously presented. For each subject, the number of yes's for presented central features and the number of yes's for presented peripheral features was tabulated. These data were entered into a 2X2 mixed ANOVA with group (1/2) as the between-subjects factor and attribute (central/peripheral) as the within-subjects factor. Love and commitment data were analyzed separately. It was expected that there would be no significant difference between recognition of central and peripheral attributes (i.e., that memory for these features would be veridical). Consistent with this prediction, for love there was no significant main

effect for attribute, $F < 1$, $p > .10$. The means indicated that recognition rates were quite high. The mean number of central features recognized out of 10 was 7.98, while the mean number of peripheral features recognized was 8.07. There was no significant main effect for group, $F < 1$, although a significant Group by Attribute interaction was obtained, $F(1,58)=9.22$, $p < .01$. Simple effects analyses revealed that subjects in Group 1 recognized significantly more peripheral than central features (8.40 vs. 7.60), $F(1,29)=7.07$, $p=.013$. Subjects in Group 2 recognized more central than peripheral features (8.37 vs. 7.73). However, this effect was nonsignificant, $F(1,29)=3.04$, $p=.09$.

For commitment, there was also no main effect for attribute, $F < 1$. Overall, 7.68 of 10 central attributes and 7.5 out of 10 peripheral attributes were correctly recognized. There was no main effect for group, $F(1,58)=3.41$, $p=.07$, and no significant group by attribute interaction, $F < 1$.

Analysis of Nonpresented Attributes: Recognition Data

Ten central and 10 peripheral nonpresented features were included with the 20 presented features to assess false recognition effects. These data were analyzed exactly as the presented features data. It was expected that unlike the veridical memory effects predicted for the correct recognition data, here subjects would show a bias toward recognizing central, but not peripheral, nonpresented features. For love, the results supported predictions. A significant main effect for

attribute was obtained, $F(1,58)=83.54$, $p < .001$. Of the 10 central items, an average of 4.00 were falsely recognized, whereas of the 10 peripheral attributes, only an average of 1.63 were falsely recognized. There was no significant main effect due to group, nor was there a significant Group by Attribute interaction, $F's < 1$.

The commitment results mirrored the love results--there was a main effect due to attribute, $F(1,58)=48.34$, $p < .001$, with subjects falsely recognizing more central than peripheral features (3.72 vs. 2.00). No other significant effects were found, $F's < 1$.

Thus, overall, the results supported predictions for veridical memory for presented features. Subjects correctly recognized at least 75 per cent of the features they had seen--both central and peripheral. The predicted false recognition effect for central versus peripheral features was strongly supported for both love and commitment.

Analysis of Presented Attributes: Recall Data

Subjects were instructed to recall as much as possible, but not to leave out any items simply because they failed to remember the exact wording of a statement. Therefore, two judges coded each subject's responses. The large majority of discrepancies between what the subjects read and what they recalled were of a syntactic nature (e.g., "They are physically attracted to each other" for "physical attraction"). The few instances of responses that were highly synonymous with what the

subject actually saw were decided by referring to the Study One raw data and ascertaining which synonyms had been allowed for a particular category. All of the judgments proved to be very straightforward--there were no cases in which the judges disagreed on how a response should be coded.

For each subject, the number of central attributes (out of a possible 10) correctly recalled was tabulated. These numbers were then entered into a 2X2 mixed ANOVA, with group (1/2) as the between-subjects factor and attribute (central/peripheral) as the within-subjects factor. Again, results were analyzed separately for love and commitment.

For love, there was a significant main effect for attribute, $F(1,58)=12.11$, $p < .001$, such that, overall, more peripheral than central features were recalled (4.00 vs. 3.22). This finding was rather surprising and unexpected. There was no main effect for group, $F < 1$. A significant Group by Attribute interaction was obtained, $F(1,58)=16.21$, $p < .001$. Simple effects analyses revealed that Group 1 subjects recalled significantly more peripheral than central features (4.43 vs. 2.60), $F(1,29)=36.48$, $p < .001$. Group 2 subjects recalled slightly more central than peripheral features, (3.70 vs. 3.38), although this effect was not significant, $F < 1$.

For commitment, there were no significant main effects due to group or attribute, nor were there any significant interactions, all F 's < 1.71 , p 's $> .10$. There was a tendency for subjects to recall more central than peripheral attributes (3.22 vs. 2.92).

Analysis of Nonpresented Attributes: Recall Data

Items that subjects recalled seeing, but which were, in fact, not presented were considered next. The two judges again coded the responses. For the love attributes, following the procedure established for the presented items, responses which were identical to, or syntactic variants of, the remaining 24 central attributes (subjects saw 10, therefore could only falsely recall 24) or the remaining 24 peripheral attributes were coded as such. The same procedure was applied to the commitment attributes, where subjects could falsely recall 10 central and 10 peripheral attributes. Idiosyncratic items (i.e., items that were not part of the prototypes of love and commitment as determined in Study One) were omitted from the analyses. The nature of these items will be discussed later.

The false recall data were analyzed in the same way as the correct recall data. For love, as predicted, there was a significant main effect for type of attribute, $F(1,58)=32.42$, $p < .001$, such that subjects recalled having seen more central than peripheral nonpresented features (.88 vs. .15). There were no significant main effects or interactions due to group, $F's < 1$.

Similarly, for commitment, there was a main effect for type of attribute, $F(1,58)=34.40$, $p < .001$. Subjects falsely recalled seeing more central than peripheral features (.77 vs. .08). There was also a significant main effect for group, $F(1,58)=8.15$, $p < .01$, such that, overall, subjects in Group 2

intruded more nonpresented features than did subjects in Group 1 (.60 vs. .25). A significant Group by Attribute interaction was also obtained, $F(1,58)=4.61$, $p < .05$. Group 2 subjects falsely recalled more central and more peripheral features (1.07, and .13, respectively) than did subjects in Group 1 (.47 and .03, respectively). Simple effects analyses showed that while both groups falsely recalled significantly more central than peripheral statements, the effect was stronger for Group 2, $F(1,29)=32.11$, $p < .001$, than for Group 1, $F(1,29)=6.92$, $p < .025$. (See Appendix F for summary tables for the analyses of variance conducted in this study.)

The recall data for presented attributes are not extremely clear cut. Recall data for the features of commitment mirrored the results obtained for recognition memory for both concepts. The recall data for presented love attributes is puzzling. False recall effects largely conformed to predictions.

Concerning the idiosyncratic items that were excluded from these analyses, for love there were 15 such intruded items (mentioned by at least one of the 60 subjects), excluding giving the category label, "love", (which will be discussed later). These included items like "characterized as a good relationship", "compatible", "consistency", "positive environment" and so on. For commitment, there were 26 intruded items, excluding the category name. These included responses like "willingness", "living in the same house", "spending time together", "sensitivity", "being" and so on.

The fact that some subjects gave the category name (even

though it was not presented) could mean that the manipulation of the prototype was, in fact, successful. Of the 60 subjects who received the love attributes, eight (13.3%) falsely recalled having seen the category name, "love", while only three subjects (5%) thought they had seen "commitment".

Ten subjects (16.7%) in the commitment condition falsely recalled seeing the category label (6 subjects in Group 1; 4 subjects in Group 2); while 11 subjects (18.3%) falsely recalled seeing "Love". Only one of the Group 1 subjects mentioned "love", while 10 of the subjects in Group 2 mentioned "love". One might expect this finding if subjects in Group 2 were presented with more shared attributes than subjects in Group 1--a preponderance of shared features would increase the probability that either love or commitment would be elicited. However, an examination of the features seen by subjects in both groups reveals that each group was presented with approximately an equal number of shared features.

Unfortunately, a meaningful discussion of these percentages is hampered by the confounding of category labels and attributes. As Mervis and Rosch (1981) point out, "red" is a color category. However, "red" is also an attribute of an object (e.g., "red ball"). In the same way, if a subject receives love attributes and mentions the word "love", s/he could be giving the category label. It is also possible that s/he construed the set of attributes as something other than love (e.g., commitment), and is listing "love" as a feature of that concept.

Discussion

Recognition Memory

First, it was predicted that subjects would correctly recognize both central and peripheral presented features of love and commitment. Generally, this hypothesis received support, although a significant group by attribute interaction was obtained for love, such that subjects in Group 1 correctly recognized more peripheral than central features. The overall finding that subjects can veridically recognize presented information--regardless of its centrality--is consistent with the findings reported by Cantor and Mischel (1977).

The predictions concerning false recognition effects were strongly supported by both the love and the commitment data. Subjects falsely recognized more nonpresented central features than peripheral features. Again, these results replicate those obtained by Cantor and Mischel. In conjunction, the correct and false recognition results suggest the co-existence of veridical and prototype-biased memory for the features of love and commitment.

Recall Memory

The inclusion of recall memory as a variable was exploratory, and firm predictions were made only for false recall effects. But first, the recall data for presented features will be considered. For love, there is the surprising result that more peripheral than central features were recalled, particularly for Group 1. The commitment results paralleled the recognition memory results: There was no significant difference between mean number of central and mean number of peripheral

features remembered. The false recall data supported the hypothesis that like recognition memory, recall memory would be biased toward intruding central features. For commitment, Group 2 falsely recalled more features--both central and peripheral.

The general conclusion to be drawn from this study is that both recognition and recall memory are accurate for both presented central and peripheral features (although, of course fewer features are recalled than recognized). This veridical memory effect co-exists with a bias-toward-the-prototype effect. There are some nuances in these data, which center around the group factor--a factor pertaining to the actual items seen by the subjects. The love items exerted a differential impact on memory--the peripheral items seen by Group 1 seemed particularly salient in memory. Subjects in this group recognized and recalled more peripheral than central features. There is no clear reason for this finding. One possible explanation resides in the amount of information that was presented. Even though item length was restricted to one line, there was still some variability in the length of these statements. An examination of Group 1's items reveals that 5 of the 10 central items are phrases, while only 2 of the peripheral items consist of more than one word. Thus, the enhanced memory effects for the peripheral features may be due to the fact that there was simply less to remember compared to the central features. An inspection of Group 2's items, however, does not corroborate this conjecture: 9 out of 10 central items were monolexic, compared to only 3 of the peripheral items. Thus here one would expect a

more pronounced memory effect for central items, yet this did not occur.

It may also be the case that because each subject received the features in a different random order (to control for systematic recency effects across features), through some chance occurrence, subjects in Group 1 received most of the peripheral items at the end. Such an occurrence is possible, although not very probable.

The two groups which received commitment items differed only on one occasion: Group 2 recalled more central and more peripheral nonpresented items, although the predicted bias toward central features was still obtained. Explanations in terms of recency effects, item length, etc., do not seem applicable here. All one can say is that for some reason, the Group 2 items triggered more false recall, although not more false recognition.

In conclusion, despite certain nuances, the results support the view that love and commitment function as prototypes which affect the organization of information in memory. It was expected that the appropriate concept would be activated when subjects were presented with its features. Thereafter, the concept should function as an organizing principle for processing further material, in which case it was expected that there would be a bias toward recognizing and recalling nonpresented but highly related features of the concept. It was uncertain whether recall memory would be veridical--it seemed possible that assimilation of the presented material with the

prototype might occur to an extent where subjects would not be able to differentiate presented from nonpresented items. However, subjects seemed able to make this distinction, even when they were not able to see the items (i.e., in the recall memory phase).

Cantor and Mischel comment that the overall level of accuracy in their recognition data argues against a model in the concept formation literature in which only a prototype, and not each presented item, is activated and stored in memory. Such a model was proposed by Bransford and Franks (1971), who presented subjects with sentences containing a partial idea. The sentences, in conjunction, formed a complex idea. They found that subjects were unable to discriminate novel sentences that were consistent with the idea from sentences they had actually heard during the acquisition phase. The authors concluded that, "In general, Ss did not store representations of particular sentences. Individual sentences lost their unique status in memory in favor of a more wholistic representation of semantic events" (p.348).

The data here are congruent with Cantor and Mischel's contention. The fact that support was obtained for both veridical and prototype-biased recognition and recall memory is consistent with Cantor and Mischel's claim that a memory set (as opposed to an impression-formation set) facilitated accurate memory. Thus subjects were accurate and inaccurate--accurate in that they remembered what they had seen, and inaccurate in that they thought they had seen nonpresented central features.

Study Four: Use of Hedges as Evidence of Prototype Structure

Lakoff (1973), a linguist, noted that logicians give truth conditions for predicates in terms of classical set theory. He observed that any attempt to limit truth conditions for natural language sentences to "true", "false" or "nonsense", would distort these concepts by portraying them as having sharply defined, rather than fuzzy boundaries. Lakoff commented that:

For me, some of the most interesting questions are raised by the study of words whose meaning implicitly involves fuzziness--words whose job it is to make things fuzzier or less fuzzy. I will refer to such words as "hedges" (p.471).

Most people would agree that the statement "A robin is a bird" is true. Replacing "robin" with "chicken" makes the sentence less true. Lakoff suggested that we use hedges in natural language to indicate degrees of truth or falsity. Translated into prototype terminology, one could say that we use hedges to indicate distance from the prototype, or degree of category membership. A robin is a very prototypical bird, a chicken is less so, and a penguin is only a borderline member. Thus, a sentence like, "A robin is sort of a bird" should be unnatural sounding because a robin is a bird, and is a very good bird at that. Substituting "penguin", however, should produce a natural sounding sentence. The hedge "sort of" communicates that while penguins are birds, they are not good examples of "birdness".

The purpose of this study was to discover whether the layperson uses hedges in a way that is consistent with what one would expect based on prototype theory. Subjects were given information about the relationship between two people--either that they love each other, or that they are committed to one another. The features of love or commitment were then presented in a sentence containing a hedge. It was expected that because hedges indicate degrees of fuzziness, sentences in which a peripheral attribute was prefaced with a hedge should sound quite natural, whereas hedging a central attribute should yield a peculiar sounding sentence. Naturalness ratings (as opposed to ratings of truth or falsity) were chosen because they seemed more likely to elicit a spontaneous, "gut" reaction to the sound of the sentence. This reaction presumably corresponds with or reflects the prototype structure of the concept being rated.

Method

Subjects

Subjects were 160 undergraduate students enrolled in a variety of classes: Developmental Psychology, Sex Differences, Biopsychology, and a Human Development class taught in the Family and Nutritional Sciences program.

Materials

Pilot testing revealed that subjects found it fatiguing to make too many judgments of this kind. Therefore, materials for this study consisted of eight forms of a questionnaire: three for commitment and five for love. (Five forms were required for

love because it possesses more features than commitment.) The three forms of the commitment questionnaire contained 13, 13, and 14 items. The five forms of the love questionnaire contained either 13 or 14 items as well. Three hedges from Lakoff's list of hedges (p.472) were chosen: kind of, sort of, and somewhat. These hedges were selected for the following reasons: The first and most important consideration was that the layperson understand the hedges. Given that this is a study of everyday language, it seemed inappropriate to use hedges that are probably not part of the layperson's vocabulary, and in fact may not even be understood (e.g., "mutatis mutandis", "quintessentially", "crypto-"). Second, it was necessary that the hedges selected were appropriate for use with features of concepts rather than types of concepts. This eliminated hedges like "a true", "all but a", "more of a _____ than anything else", and so on. The hedges "kind of", "sort of", and "somewhat" fit these criteria. Although other hedges would also have been suitable, three seemed to be an adequate number to provide some variety in the statements subjects read, while ensuring that each hedge be used for both central and peripheral attributes.

Thus each form of the questionnaire contained approximately an equal number of central and peripheral attributes, and each hedge was used an equal number of times with peripheral and central statements (obviously in the 13 item questionnaires this could not be achieved perfectly). For example, the central statement, "Pat sort of trusts Chris" appeared in one of the

love questionnaires, along with the peripheral statement, "Pat sort of admires Chris". Similarly, one of the commitment questionnaires contained the peripheral statement, "Pat is somewhat attached to Chris" as well as the central statement, "Pat is somewhat faithful to Chris" (see Appendix G).

Procedure

The following instructions appeared on the first page of each of the questionnaires:

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 containing hedges sound. Hedges are words like "sort of", "kind of", "somewhat", and so on. They serve as qualifiers in sentences. If it's not appropriate to use a qualifier, inserting a hedge in a sentence will yield a peculiar sounding sentence. For example, if told that Jane is an extravert, the sentence, "Jane is sort of outgoing" probably sounds peculiar to most people, because extraverts typically are outgoing--not just "sort of" outgoing. On the other hand, a sentence like "Jane is sort of impulsive", probably sounds rather natural, because extraverts can be impulsive, but aren't necessarily impulsive. Thus the use of the hedge, "sort of" is appropriate in this sentence.

In this study, we're not interested in sentences

about extraverts. Rather, we're interested in how peculiar or natural sentences about interpersonal relationships sound. Below is a series of statements about the relationship between two people who love [are committed] to each other, Chris and Pat. For some of these sentences, the use of a hedge is appropriate, and therefore, the sentence sounds natural. For other sentences, the use of a hedge is inappropriate, resulting in a rather peculiar sounding sentence. Your task is to read each sentence to yourself and rate how peculiar or natural it sounds to you. Don't spend time wondering if you are right or wrong. There are no right or wrong answers, so just base your response on your first impression from reading the sentence.

The top of the next page read, "Given that you know Pat and Chris love [are committed to] each other, some of these sentences about their relationship will sound very peculiar with hedges in them, while others will sound very natural. Rate how peculiar or natural each sentence sounds using the following scale:" Judgments were made on a 7-point scale where 1=extremely natural sounding and 7=extremely peculiar sounding. Each version of the questionnaire was completed by 20 subjects.

Results

The love and commitment data were analyzed separately by a one-factor repeated measures analysis of variance, with type of attribute (central/peripheral) as the factor. For love, there

was a significant main effect for type of attribute, $F(1,19)=71.39$, $p < .001$ (see Appendix H). The mean peculiarity rating across central attributes was 4.97, while the mean peculiarity rating across peripheral attributes was 4.13. Thus, as expected, central features were rated as less natural sounding when hedged than did peripheral features. For commitment, there was also a significant main effect for type of attribute, $F(1,19)=26.83$, $p < .001$ (see Appendix H). Again, peculiarity ratings were greater for central attributes than for peripheral attributes (5.09 vs. 4.46). The mean peculiarity rating for each attribute appears in Table 5.

Finally, the mean peculiarity rating for each love attribute was correlated with its centrality rating, $r=.52$ ($p < .001$). (Correlation based on ranks, .49). For commitment, centrality and peculiarity correlated .58 (.42 based on ranks).

Discussion

The results of this study indicate that the prototype structure of the concepts of love and commitment does, indeed, appear to be reflected in the natural language of the everyday person. Central attributes of love and commitment sounded significantly more peculiar when prefaced with a hedge than did peripheral attributes. For example, given that the subject knew that Pat loves Chris, the sentence "Pat sort of likes Chris" received a mean rating of 6.10 on a scale where 7=extremely peculiar sounding, while the sentence "Pat is sort of dependent on Chris" received a mean rating of 2.45. Given the information

that Pat is committed to Chris, the sentence, "Pat is kind of devoted to Chris", sounded rather peculiar (mean rating 6.20), while "Pat feels sort of trapped in the relationship" sounded quite natural (mean rating 2.35).

The prototype structure of everyday concepts is typically investigated using dependent measures such as: reaction time, memory, order and probability of free listing, and so on. It would seem that natural language itself would be an obvious arena for prototype researchers to look for prototypicality effects--given that this approach is concerned with everyday concepts in everyday language. However, their concern with natural language per se seems to have been largely confined to demonstrations that typicality effects are not mediated by familiarity or frequency of usage in the language (e.g., Hampton & Gardiner, 1983; Malt & Smith, 1982). In a sense, then, natural language has been seen as a source of possible confounding with prototypicality effects. However this study demonstrates that natural language is yet another domain in which prototypicality effects are evident.

Summary

In Studies One to Four, it was hypothesized that the concepts of love and commitment have a prototype structure. In other words, for each concept it was predicted that some attributes would be considered more central to the concept than others. Further, it was expected that this prototype structure would affect performance in a variety of ways. These effects

were found. Subjects considered some features to be more central to love and commitment than others. These centrality effects were evident in memory, natural language use, and in a free listing of features task. Central attributes were so salient in memory that subjects reported having seen them even when they were not presented. Also, prototypicality effects were reflected in natural language such that it sounded peculiar to hedge central, but not peripheral, features. Finally, central features were listed with greater frequency than peripheral features. This kind of triangulation of measures gives the researcher confidence in making the claim that the layperson's understanding of these concepts is prototypically organized.

PROTOTYPES OF LOVE AND COMMITMENT IN THE ANALYSIS OF INTERPERSONAL RELATIONSHIPS

Having established the prototype structure of the concepts of love and commitment, a significant next step is to discover whether the prototype structure of these concepts influences how people perceive the dynamics of interpersonal relationships. This includes a consideration of how people assess whether or not a relationship is progressing toward greater love or commitment. The opposite side of the coin is also of interest, namely what kinds of changes in a relationship lead to the perception that the relationship is no longer loving or committed?

As a relationship progresses from having little love/commitment to having a great deal of love/commitment, what kinds of changes occur in the properties or features of the relationship which lead to the appraisal that the relationship is a loving/committed one? One plausible answer to this question is that all loving relationships possess a substantial subset of the features identified in the prototype of love. As the relationship becomes more loving, the features of love are seen as more and more applicable to, or characteristic of, the relationship, regardless of the centrality of these features.

Consider, for example, the finding that care is central to the layperson's conception of love but security is peripheral. Now ask a subject how likely it is that increased caring would be associated with an increase in love. Then ask the subject how

likely it is that an increase in feelings of security would be associated with an increase in love. It is plausible that the subject will reply that increases in both caring and security are indicative of increased love.

On the other hand, from a prototype perspective, one might hypothesize that as a relationship becomes more loving, the central features of love become systematically more applicable to, or descriptive of, the relationship, while peripheral features would play a more mediocre role. They might be expected to be moderately applicable to most relationships, or if they vary, to do so in fairly random ways. The rationale is that central features are closer to the core meaning of the concept, and therefore, changes in the level of love in a relationship should be most evident in changes in the applicability of those features.

Thus, if the prototype structure of love and commitment has any relevance to people's conceptions of what happens in interpersonal relationships, one would expect that increases in central attributes such as caring should be weighted more heavily in a move toward greater love in a relationship than should increases in peripheral features like security.

Finally, it is also possible that while the concepts of love and commitment have a particular cognitive structure, people's actual experiences in relationships might override the effects of this structure. In other words, people's experiences might have such powerful effects that any absolute weighting of the features of love and commitment in cognitive representation

becomes irrelevant when addressing the dynamics of interpersonal relationships. For example, our subject may remember her dissatisfaction with a relationship where she perceived her partner cared alot for her, but nevertheless felt insecure in the relationship, and tell you that security is really very important as a relationship increases in love.

Another question worth examining is: "Do changes in the features of these concepts lead to changes in the perception of level of love or commitment in a relationship?" Specifically, the kinds of changes considered here are the violation or negation of features. Is it the case that all negative events have a significant negative impact on a relationship? If the prototype structure of these concepts is relevant to this issue, one would anticipate that a change in a central feature of love or commitment, such that the feature is no longer characteristic of the relationship, should be perceived as contributing to the demise of love or commitment in the relationship. On the other hand, changes in peripheral features should be seen as having a minimal effect on the level of love or commitment in a relationship.

Referring again to the earlier example, the perception that your partner no longer cares for you would probably have a pronounced negative impact on your perception of how much s/he loves you. However, if you no longer felt secure in the relationship, would this lead you to an equally dismal assessment of how loving your relationship is? Or, would a loss of security be less damaging than a loss of caring? Or, would

your response depend upon your previous experience in relationships?

The next set of studies attempts to demonstrate that the prototypes of love and commitment influence the everyday view of the dynamics of interpersonal relationships--both in terms of their enhancement, and in terms of their decline.

Study Five: Applicability of Central and Peripheral Features to Loving and Committed Relationships

Kelley et al.(1983) conceptualize the life of a dyad as a progression through different types of relationships from initial acquaintance to termination. They suggest that a relationship has moved to a new stage or level when a marked change in any relationship property occurs. Social psychologists have written about the kinds of changes that take place as relationships become close (See Perlman & Fehr, in press, for a review of this literature). A question that was raised earlier was: Are these changes of a quantitative or a qualitative nature? It may be that as relationships become more loving (or more committed), all of the features of love (commitment) are seen as more applicable to, or characteristic of, the relationship. There is some support for this view. In their review, Perlman and Fehr note that as relationships become close, the partners interact more often and for longer periods of time, they gain more knowledge of one another, they increase their investment in the relationship, and so on. Applied specifically to love and commitment in relationships, one would

expect that as a relationship becomes more loving [committed], the probability that the features of love [commitment] would be descriptive of the relationship would increase.

As discussed earlier, subjects' judgments might not be based on their cognitive representation of these concepts, but on their prior experiences. On the other hand, from a prototype perspective, one might expect that as relationships become more loving or more committed, the applicability of the features of love and commitment would be weighted differentially. Specifically, one would anticipate that the central features of these concepts would play an augmented role in signalling a move toward greater love or commitment in a relationship.

This hypothesis was tested here. Based on Kelley et al.'s view that one can describe the "career" of a dyad in terms of a progression through various types of relationships, subjects were presented with a large number of different relationships, and asked to classify them in terms of love and commitment. These relationships were then used to represent different levels of love and commitment in an attempt to discover changes in the applicability of the central and peripheral features as the relationships became more loving or committed.

This study was conducted in two phases. In the first phase, a group of subjects was presented with a large sample of dyadic relationships which reflected a wide variety of ways people relate to each other. Half were asked to rate the degree of love in each relationship, while the other half rated the degree of commitment in each relationship. These relationship types were

then classified as ranging from low to high in love or commitment. In the second phase, microcomputers were used to select randomly a relationship type and then pair it with a randomly selected central or peripheral attribute. By having the computer randomly select different types of relationships and attributes from each category, the generalizability of the experimental results is enhanced. The probability that the results are due to the particular types of relationships and/or attributes chosen is reduced.

To summarize, it was hypothesized that as relationships increased in love, the attributes that are most central to the concept of love would be seen as increasingly more applicable. Similarly, as relationships increased in commitment, the features central to the concept of commitment would be considered increasingly more applicable. Peripheral attributes were expected to remain relatively impervious to increases in either love or commitment. The concepts of love and commitment were considered separately here, although the same predictions were made for each concept.

Method

Subjects

Subjects were 90 undergraduates from the University of British Columbia. In the first phase, 30 subjects rated the relationship types for degree of love, and 30 subjects rated the relationship types for degree of commitment. These 60 respondents were students in a developmental psychology class

who volunteered their participation. In the second phase, 15 subjects rated the applicability of central and peripheral love attributes to the different types of love relationships; 15 rated the applicability of commitment attributes to types of committed relationships. These subjects were enrolled in a Research Methods course. They agreed to participate in the study following their laboratory assignment in the computer laboratory.

Phase 1: Rating Types of Relationships

Materials. Subjects were given a list of types of relationships which contained the Wish, Deutsch, and Kaplan (1976) list of 25 typical relations. The entire Wish et al. list was included with the following changes: "fiance and fiancée" was changed to "an engaged couple"; "master and servant" was replaced with "co-workers" (it was presumed subjects would not have personal experience with master-servant relationships). This list was supplemented with the Forgas and Doboos (1980) list of 25 relationship types. "A de facto relationship between two previously married people" was excluded because there was some doubt as to whether subjects would know the meaning of the words "de facto". Besides, the Wish et al. list included the more comprehensible category, "divorced husband and wife". Four additional types were added in an attempt to deal with Kelley's criticism of the Forgas and Doboos list--namely that they did not include examples of relationships which allowed subjects to distinguish between love and commitment. He pointed out that

they did not include either examples of long term, loving relationships that finally break up, or examples of relationships that endure without love. To represent the former case, "a high school dating relationship that breaks up once the couple has gone away to college" was included, while "an unhappy, but stable marriage" was added to represent the latter. Two additional types were included to tap the love/commitment distinction: "a middle-aged child caring for his/her elderly parent because s/he wants to" and "a middle-aged child caring for his/her elderly parent because s/he has to". The final list of relationships consisted of 53 types.

Procedure. Each subject received a questionnaire titled RELATIONSHIP TYPES QUESTIONNAIRE which contained the following instructions:

This study is part of a larger study on interpersonal relationships. On the next page, you will find a list of various kinds of interpersonal relationships that may or may not involve love [commitment]. For each one, ask yourself, "To what extent is this a loving [committed] relationship?" If you think that the relationship is definitely not a loving [committed] relationship, give it a 1 which means "not at all loving [committed]". If you think a particular relationship is definitely a loving [committed] relationship, give it a 9 which means "extremely loving [committed]". A 5 would mean the

relationship is moderately loving [committed]. Don't worry about why you think each relationship is or is not characterized by love [commitment]--just give us your opinion.

Results

The love and commitment ratings were analyzed separately in a one factor repeated measures of analysis of variance, with the 53 different relationships constituting levels of the repeated factor. For love, $F(1,52)=71.00$, $p < .001$; for commitment, $F(1,52)=46.18$, $p < .001$ (see Appendix J). Newman-Keuls post hoc comparisons were used to partition the types of relationships into groups which were significantly different from one another. Based on this analysis, it seemed appropriate to select groups of relationships from four levels of love/commitment: a high, medium high, medium low, and a low group. Within each of these levels, four relationship types were selected randomly. For love, the mean ratings of the relationships types selected within each of the four levels of love were: 8.54, 6.59, 4.43, and 2.36, respectively (ratings made on a scale where 1=not at all loving and 9=extremely loving). For commitment the mean ratings were: 8.57, 6.58, 4.40, and 2.33, respectively. The actual relationship types chosen for each of these groups for use in the second phase of the study appear in Table 6. For both the high and low groups, two of the four relationship types were the same for love and commitment. The random selection of relationship types also resulted in one of the relationship

types appearing in the medium-high group for both love and commitment.

Discussion

What kinds of relationships were considered loving and committed? For both love and commitment, the relationship types: husband and wife, parent and young child, a 25 year marriage, an engaged couple, and marriage after a long courtship received the highest mean ratings. The relationships which received the lowest love and commitment ratings were: business rivals, personal enemies, interviewer and job applicant, and a one-night sexual encounter. Some relationship types were rated higher in commitment than in love. For example, "business partners" received a mean commitment rating of 6.63 on the 9-point scale, compared to only 3.60 for love. Similarly, "guard and prisoner" was rated as a more committed than loving relationship (4.23 vs. 1.73), as was "psychotherapist and patient" (6.63 vs. 4.00). In cases where relationships were rated higher for love than for commitment, the differences between mean ratings tended to be smaller. "An affair with a married person" received a mean love rating of 4.97 compared to 3.50 for commitment. Similarly, "second cousins" was rated as more loving than committed (4.97 vs. 3.57), as was "a high school dating relationship that breaks up once the couple has gone away to college" (4.60 vs. 3.30). The mean love and commitment ratings of the 53 relationship types were highly correlated, $r = .85$ (.83 based on ranks).

Phase 2: Rating Applicability of Attributes to Relationships.

Materials. This phase of the study was conducted on Radio Shack TRS 80 Model III's and Model IV's microcomputers. A program was written that selected a relationship type from one of the classes of love or commitment relationships, and then selected either a central or peripheral attribute (based on the Study Two centrality ratings). The program was designed so that each subject rated the applicability of a randomly selected central attribute to all 16 relationship types and rated the applicability of a peripheral attribute to all 16 types, resulting in a total of 32 judgments.

Procedure. Subjects were ushered into the computer laboratory and seated. The following instructions appeared on the screen:

TYPES OF RELATIONSHIPS STUDY

This is a study to find out the kinds of attributes and behaviors that are characteristic of various types of relationships. The computer will provide you with a description of a particular interpersonal relationship. This will be followed by an attribute that may or may not apply to that relationship. Your task is to decide whether or not that attribute describes or is applicable to the relationship. For example, if the relationship presented was "dentist-patient", the attributes "ENJOY PARTYING TOGETHER" or "TALK TO EACH OTHER ABOUT ANYTHING" are

probably not very applicable to most dentist-patient relationships, while "POLITE, FORMAL SPEECH" or "YOU GIVE THE PERSON MONEY", are probably characteristic of most dentist-patient relationships.

If an attribute would probably be true for only 0-10% of all relationships of the kind rated, give it a score of 1 which means "not at all applicable". A score of 9 means "extremely applicable" --the attribute would apply to 90-100% of all relationships of the kind rated. When rating the relationships, keep in mind that we're interested in what you think typically occurs, not what you think is socially correct or morally proper.

When you are ready to begin, hit the ENTER key. If you have any questions, raise your hand and the experimenter will help you.

The computer then selected a type of relationship (in lower case letters) and an attribute (which appeared below the relationship type in upper case letters). This was followed by "To what extent is this attribute (printed below the relationship type) applicable to this relationship?"

1	2	3	4	5	6	7	8	9
not at all			moderately			extremely		
applicable			applicable			applicable		

Press the appropriate number, and then press ENTER."

Subjects rated the applicability of the attributes to either the love relationships or the commitment relationships. They spent approximately 10 minutes on the task.

Results

The data were analyzed in a 4X2 repeated measures analysis of variance with type of relationship (high/medium high/medium low/ low) and type of attribute (central/peripheral) as the within subject factors. The results were analyzed for love and commitment separately. A significant Relationship X Attribute interaction was predicted for each concept, such that as a relationship increased in love/commitment, central attributes would be seen as increasingly more applicable. For love, there was a significant main effect for type of relationship, $F(3,42)=19.06$, $p<.001$, such that as the relationships became more loving, the mean applicability ratings of the attributes increased. There was no main effect for attribute, $F(1,14)=2.55$, $p>.10$. The predicted Relationship by Attribute interaction was obtained, $F(3,42)=4.47$, $p<.01$ (see Figure 3; Appendix J shows the summary table for the analysis of variance). The mean applicability ratings for central features were 7.410, 6.808, 4.543, and 3.865 from high to low love relationships. The means for peripheral features from high to low love relationships were 5.870, 6.193, 4.762 and 4.327. Simple effect analyses revealed that while the applicability of

both central and peripheral love features increased as the relationships became more loving, this effect was stronger for central features, $F(3,42)=32.10$, $p < .001$, than for peripheral features, $F(3,42)=8.56$, $p < .025$. Mean applicability ratings for central and peripheral features were significantly different only for the high love relationships, $F(1,14)=12.90$, $p < .01$. (All other F 's < 2.06 , p 's $> .10$).

Similar results were obtained for commitment. There was a significant main effect for type of relationship, $F(3,42)=64.84$, $p < .001$, such that as the relationships became more committed, all attributes were seen as more applicable. No main effect for type of attribute was obtained, $F(1,14)=1.24$, $p > .10$. There was a significant Relationship by Attribute interaction, $F(3,42)=3.17$, $p < .05$ (see Figure 4; Appendix J shows the summary table for the analysis of variance). The mean applicability ratings of the central attributes were 7.334, 6.763, 4.499, and 2.382, respectively. The means for peripheral attributes were 6.554, 6.272, 3.979, and 3.276, from high to low commitment relationships. Simple effects analyses showed that while the applicability of both central and peripheral commitment features increased as the relationships became more committed, this effect was stronger for central features, $F(3,42)=56.87$, $p < .001$, than for peripheral features, $F(3,42)=29.68$, $p < .001$. Mean applicability ratings for central and peripheral features were different for both high and low commitment relationships, although these differences were only marginally significant--for high commitment relationships, $F(1,14)=4.41$, $p < .06$; for low

commitment relationships, $F(1,14)=3.37$, $p < .09$. (All other F 's < 1.5 , p 's $> .10$).

Discussion

It was hypothesized that as relationships become more loving or more committed, central features would be seen as increasingly more characteristic of the relationship than would peripheral features. Alternative hypotheses were that all features would be seen as increasing in applicability, or that subjects would base their responses on their own, idiosyncratic relationship experiences, thereby yielding little between-subject agreement.

The main effect for type of relationship indicated that, overall, both central and peripheral features of love and of commitment were seen as more applicable as the relationships became more loving or more committed, respectively. Thus, there was some support for the notion that as relationships grow from being characterized by little love/commitment to being very loving/committed, the relationship begins to illustrate the prototype to a greater extent.

There was also support for the view that central and peripheral features assume differential importance as a relationship increases in love or commitment. An examination of Figures 3 and 4 shows that the applicability of central attributes increases systematically as the relationships increase in love and commitment. Peripheral features did not exhibit the same regularity. For one, peripheral features, more

than central features, tended to be moderately applicable to all relationship types. This was particularly striking for commitment, where the range of mean applicability ratings on the 9-point scale only spanned 1.87 points compared to 3.55 for central features. (For love, these figures are 3.28 and 4.60, respectively). Central and peripheral features behaved most differently for the high and low relationship types. Thus, for relationships that were low in love or commitment, it is clear that subjects did not see central features as very applicable, while mean applicability ratings for peripheral features were higher. In contrast, the relationships highest in love and commitment received the highest applicability ratings for central features. Peripheral features were seen as less applicable, and in the case of love, the medium-high relationships received higher applicability ratings than did the high relationships.

What these results seem to indicate is that, while both central and peripheral features become more descriptive of the relationship as it increases in love or commitment, it is the central features that act as true barometers of a change toward increased love or commitment in a relationship. These results are consistent with those obtained by Dion and Dion (1976). They administered love, liking, and trust scales to couples who were classified as: casual daters, exclusive daters, engaged, and married. Casual daters had lower love scores compared to the other three groups. Married persons scored higher than casual daters on the trust scale. However, there were no differences in

liking between the groups. Thus, trust, a central feature, was most applicable to the most loving relationships, while liking, a peripheral feature of love, was equally applicable to all four groups.

Finally, it seemed possible that while laypersons structure their knowledge about the concepts of love and commitment in the same way (and thus agree on the centrality of features, exhibit memory biases toward the same sort of features, and use natural language in similar ways), this structure might not necessarily translate into the domain of conceptions of dynamics of interpersonal relationships. Because it was found that the prototype structure of these concepts affected subjects' judgments about the dynamics of interpersonal relationships, it seems likely that these perceptions have considerable importance for the course of people's "real world" relationship experiences.

Study Six: Violations of the Features of Love and Commitment

In the previous study, subjects were provided with types of relationships and asked to infer what attributes were associated with these relationships. In this study, another perspective was examined. Specifically, the following question was considered: "What repercussions do violations of relationship attributes have for evaluations of the level of love or commitment perceived to exist in a relationship?" It might be the case that violations of any of the features of love and commitment would be seen as seriously harming the relationship. On the other

hand, if the central attributes of love and commitment have a more pronounced impact on relationship experiences than peripheral attributes, one might expect a violation or negation of a central feature to threaten more seriously the status of a relationship. Again, a change in a peripheral feature might be expected to have only a minimal effect. Stated differently, violations of peripheral attributes might be considered "forgiveable", whereas violation of central attributes would be more likely to be seen as grounds for relationship dissolution. As in the previous study, the third possibility was that subjects' responses might be determined by their own experiences with the dissolution or deterioration of relationships.

To test this hypothesis, subjects were presented with a relationship scenario in which the partners were described as high in love and high in commitment. They were then asked to respond to a series of statements depicting various events that could occur in the relationship, and were asked to indicate what the repercussions of those events would be for the relationship. One group of subjects received only attributes unique to love and commitment, while another group received attributes shared by love and commitment.

It was expected that a violation of the central attributes of love would be seen as having a large effect on whether or not the relationship would continue to be loving, whereas a violation of the peripheral attributes of love would be seen as exerting a negligible influence. The same pattern of results was expected for commitment. Further, violations of the central

attributes of love were expected to have an effect relatively independently of violations of the attributes of commitment, and vice-versa.

In the case where attributes shared by love and commitment were used, it was predicted that an attribute would exert a differential effect on love and commitment if its centrality rating was significantly different for love and for commitment. For example, if an attribute was considered more central to love than to commitment, it was expected that a violation of the attribute would have a more significant impact on love than on commitment. The converse was predicted for attributes rated as more central to commitment. For features whose centrality ratings on love and commitment were not significantly different, no differential impact on love and commitment was anticipated.

Method

Subjects

Subjects were 234 undergraduates from the University of British Columbia enrolled in the following courses: Introductory Psychology, Social Psychology, Brain and Behaviour, and Behaviour Dynamics. Age and gender information were obtained only from the 54 Introductory Psychology students, 28 females and 26 males. Mean age of this group was 20.26 years, the mode was 19 years, and the range was 18 to 31 years. In all cases, students volunteered their participation.

Materials

The materials consisted of questionnaires containing unique

or shared attributes worded in the negative (e.g., Pat no longer cares for Chris). Subjects were asked to indicate how likely it was that each event would decrease love or commitment. The questionnaires for the unique attributes were constructed as follows: For commitment, there were only 18 attributes remaining once the 21 shared attributes and "love" were removed, while for love, there were 46 remaining attributes (the 21 shared, plus "commitment" were extracted). Because the subjects task was to rate the impact of a violation of both love and commitment attributes on either love or commitment, it was necessary to include approximately the same number of love and commitment attributes. (It did not seem like a psychologically meaningful task to give subjects 46 unique love attributes and only 16 commitment attributes and ask them to rate the impact of a violation of each attribute on commitment). Therefore, the love attributes were divided into three groups, with 15, 15 and 16 attributes per group to make the number comparable to the number of commitment attributes. Each group of love attributes was then randomly interspersed among the commitment attributes (see Appendix K). Each one of the three versions of the unique attributes questionnaire was rated by 30 subjects for love, yielding a total of 90 subjects. Each of the three versions also was rated by 30 subjects for commitment, which required another 90 subjects.

The shared attributes version consisted of the 21 attributes love and commitment have in common, worded in the negative (see Appendix K). Fifty-four subjects received the shared attributes

version of the questionnaire (27 rated love; 27 rated commitment).

Procedure

Subjects received a questionnaire titled "Relationship Events Questionnaire", which contained instructions and a description of a relationship that was depicted as both loving and committed. The questionnaire read as follows:

This is a simple study to find out the effects of various events on interpersonal relationships. Below you will read a short story about two people who are involved in a close relationship. You will be asked to give your opinion of how certain events will impact upon the relationship. Keep in mind that we're interested in what you think will happen, not what you think should happen.

"Pat and Chris love each other and are committed to one another. They began dating toward the end of their first year at U.B.C. and they will both be graduating in the spring. Pat and Chris enjoy doing things together and frequently go to movies, sports events, out for dinner and so on. They also spend many evenings together just watching TV or visiting with friends. Certain things could happen that would have little or no impact on their relationship. Other things could have a major impact".

On the next page, you will find a list of hypothetical events. While most of these events probably

would have an impact on their relationship, some probably would have a greater impact than others. For each one, think about the extent to which that event would cause a decrease in LOVE [COMMITMENT] in Pat and Chris' relationship. If you think the event would have no impact on love [commitment], give it a 1 which means "not at all likely". If you think it's extremely likely that an event would cause a decrease in love [commitment] in the relationship, give it a 9 which means "extremely likely". A 5 would mean that the event would probably have a moderate impact on love [commitment]. Please try and use the entire scale when making your judgments. Keep in mind that each event has nothing to do with the event before or after it-- in other words, treat each event separately.

For each version of the questionnaire, half of the subjects rated the impact of a violation of the attributes on love; the other half rated impact on commitment.

Results

The first set of analyses was concerned with the attributes unique to love and commitment. (Results of the questionnaire containing the shared features of love and commitment were analyzed separately). Subjects' ratings were analyzed in the context of a 2X2X2 mixed analysis of variance with type of concept (love/commitment) and type of attribute (central/peripheral) as within-subject factors and type of

impact rating (love/commitment) as a between-subject factor. A significant main effect for type of attribute was predicted such that violations of central attributes should have a greater impact than violations of peripheral attributes. Also, a three-factor interaction was expected between type of concept, type of attribute and type of impact rating. The central attributes of love were expected to have a greater impact on ratings of love than on commitment, while the central attributes of commitment were expected to have a greater impact on ratings of commitment than on love; peripheral attributes were expected to have generally less impact.

There was no main effect for type of impact rating, $F < 1$. It made absolutely no difference whether subjects were asked to rate impact on love or impact on commitment. There was a main effect for type of concept, $F(1,178)=15.75$, $p < .001$, such that overall, love attributes received higher impact ratings than did commitment attributes (mean rating 6.31 vs 6.13). The predicted main effect for type of attribute was obtained, $F(1,178)=461.35$, $p < .001$, such that violations of central attributes were seen to have a greater impact than violations of peripheral attributes (6.89 vs. 5.55). There was also an unanticipated significant Concept by Attribute interaction, $F(1,178)=43.86$, $p < .001$ (see Appendix L). Simple effects analyses showed that for love attributes, central features received much higher mean impact ratings than peripheral features (7.15 vs. 5.48), $F(1,178)=558.14$, $p < .001$. For commitment attributes, the same pattern was obtained, but the difference was less

pronounced--the mean impact rating for central features was 6.64 compared to 5.63 for peripheral features, $F(1,178)=203.13$, $p < .001$.

A second set of analyses examined the attributes shared by love and commitment. First, t -tests were done, comparing the mean centrality rating for love and for commitment of each attribute. The purpose was to enable classification of each attribute as either more central to love than to commitment, more central to commitment than to love, or no difference. It was expected that a violation of attributes with a mean centrality rating significantly higher on love than on commitment would have a greater effect on love than on commitment; that attributes that were not significantly different for the two concepts would not exert a differential impact on love and on commitment; and that a violation of attributes that were higher on commitment than on love would be seen as causing a greater decrease in commitment than in love.

T-tests between the centrality ratings of the shared features of love and commitment revealed that of the 21 features, 14 received significantly higher centrality ratings for love than for commitment, 6 features did not receive significantly different centrality ratings, and only for one feature, "responsibility", was the mean centrality rating higher for commitment than for love. This left only one feature in the "commitment greater than love" cell. Therefore, it was not appropriate to conduct the analysis of variance.

Because the format of the shared features questionnaire was

identical to the unique features questionnaire, it was possible to treat these data as another version of the questionnaire. Thus, the two data sets were combined and analyzed exactly as the unique features data were analyzed earlier. These results paralleled those obtained for the unique features. Again, it made no difference whether subjects were asked to rate impact on love or impact on commitment, $F < 1$. There was a main effect for type of concept, $F(1,232)=4.33$, $p < .05$, such that overall, love attributes received higher mean impact ratings than did commitment attributes (6.29 vs. 6.21). The predicted main effect for type of attribute was obtained, $F(1,232)=592.00$, $p < .001$, such that violations of central attributes were seen to have a greater impact than violations of peripheral attributes (6.90 vs. 5.60). A significant Concept by Attribute interaction was again obtained, $F(1,232)=62.55$, $p < .001$ (see Appendix L). Simple effects analyses revealed that for love attributes, central features received higher mean impact ratings than peripheral features (7.09 vs. 5.48), $F(1,232)=844.04$, $p < .001$. For commitment attributes, this difference was less pronounced, (6.71 vs. 5.71), although still statistically significant, $F(1,232)=319.42$, $p < .001$.

Despite certain nuances in these data, the predicted prototypicality effects were strongly supported. Thus, for the everyday person, a loss of a sense of caring, trust, honesty, respect, or a feeling that friendship is no longer a part of the relationship are all considered to seriously threaten or undermine the extent to which a relationship is seen as loving.

Whether or not one stops feeling euphoric, gazing at one's partner, seeing only the partner's good qualities or no longer feels dependent on the partner is not diagnostic of diminishing love in the relationship.

Commitment in a relationship is seriously endangered by disloyalty, failing to live up to one's word, unfaithfulness, no longer accepting the relationship as a responsibility and so forth. Feeling discontent, insecure, not constantly thinking about one's partner, etc. do not directly threaten the level of commitment in a relationship.

The mean impact that violations of each of the love attributes had on love appear in Table 7. These ratings were also correlated with centrality, $r=.85$ (.74 based on ranks). The mean impact ratings of violations of commitment attributes on commitment also appear in Table 7. Mean impact rating that violations of commitment had on commitment correlated .58 with centrality (.42 for ranks).

Discussion

Rating Impact of Love vs. Impact on Commitment

It did not make any difference whether subjects were asked to rate the impact of violations of love attributes on love or on commitment, nor if subjects were asked to rate the impact of violations of commitment attributes on commitment or on love. There are several possible interpretations for this finding. One potential explanation is that seeing both love and commitment attributes "activated" both the love and the commitment

prototypes, so that subjects rated violations of love attributes in terms of their impact on love and violations of commitment attributes in terms of their impact on commitment. In other words, seeing features may be so powerful in evoking the appropriate category label that the actual judgment the subject is asked to make becomes irrelevant.

The other plausible interpretation is that love and commitment are really so similar that even in the situation where subjects were presented with only unique attributes, they still were unable to distinguish between love and commitment. One potential way of resolving this issue might be to make type of impact rating a within-subject rather than a between-subject variable. The rationale for not doing so initially was that this might artificially force apart the love and commitment ratings, because there would be an implicit demand for subjects not to give the same response for both love and commitment. However, it may be the case that making type of impact rating a between-subject variable was too conservative a test of the hypothesis that unique attributes of love and commitment would exert an independent impact on the concepts of love and commitment, respectively. This may be particularly true if the conjecture about prototype activation overriding experimental instructions has any validity.

In the conclusion of his chapter on love and commitment, Kelley discusses the implications of the fuzziness and overlapping nature of the concepts of love and commitment for communication and attribution in close relationships. He states

that, "Expressions of love can be easily confused with expressions of commitment" (p.314). He goes on to say that the display of ardent affection stimulated by passionate feelings, for example, can be mistaken as an avowal of obligation to adhere to the partner. Kelley's succinct statement is consistent with the results of this study--subjects failed to differentiate between the two concepts. His statement also captures the importance of the implications of the prototype structure of these concepts for interpersonal relationships.

Impact of Violations of Love vs. Commitment Attributes

There was a significant main effect for type of concept, such that, overall, violations of love attributes were seen to have a greater impact than violations of commitment attributes. As was discussed in Study Two, love may be a more salient concept than commitment for college-age subjects. On the other hand, as was also mentioned earlier, the larger number of love features may elicit more polarized, or extreme, ratings. However, if one takes this result at face value, it would seem that the everyday person is more willing to tolerate deviations in commitment, or at least perceives such violations as less devastating for the relationship than violations of love.

Effect of Violations of Central and Peripheral Features

Finally, as expected, violations of central attributes had a bigger impact than did violations of peripheral attributes. When one examines the central attributes of love and commitment, one

discovers a rich source of information about what the layperson uses as specific clues in judging the decline of interpersonal relationships. For example, the central love statement "Chris and Pat's relationship is no longer characterized by caring" received a mean impact rating of 7.63 (on love) while the peripheral statement "When asked about her relationship with Pat, Chris says she no longer experiences an increase in heartrate" received a mean rating of 4.10. Similarly, for commitment, the fact that Pat no longer lives up to his word had a large negative impact (mean rating of 7.19), while being told that Pat no longer thinks about Chris all the time exerted a negligible influence (mean rating of 3.67).

As was mentioned in Study Two, the features of love that seem to match descriptions of companionate love are generally central to love (e.g., trust, caring, friendship). It is interesting to note that these features, if violated, were seen as causing a decrease in love. On the other hand, the more passionate-like features of love are largely peripheral to love, and these features, if violated, were not perceived as having a significant negative impact on love. When distinguishing between passionate and companionate love, Hatfield and Walster (1978) comment that, "Passionate love is a fragile flower--it wilts in time. Companionate love is a sturdy evergreen; it thrives with contact" (p.125). Similarly, Cunningham and Antill (1981) describe the development of love as beginning with eros, or passionate love. They maintain that increasing interdependence brings to light genuine conflicts of interest which must be

resolved in order for the relationship to progress further. These authors state that, "Acceptance of the differences which inevitably appear may dampen the flames of passionate or romantic love but leave a mature companionate love in its place" (p.35)

This view of passionate love as a transient aspect of the early stages of a loving relationship which then becomes supplanted by a more enduring, companionate love is consistent with the results obtained here. Violations of the more passionate-like features of love were seen as relatively inconsequential, while violations of the more companionate-like aspects of love were seen to seriously undermine the relationship.

Perceptions of Causes vs. Actual Causes of Relationship

Deterioration

It is important to keep in mind that this study has been concerned with what the layperson perceives as important in determining whether or not a relationship continues to be loving or committed. Whether these are factors that actually cause relationship breakdown is another question entirely. There is a literature which suggests that people are unable to provide causal explanations for events that occur in their lives. Nisbett and Wilson (1977) reviewed a number of studies in which subjects were asked to account for the cause of their behavior (which had been experimentally manipulated). They concluded that the accuracy of subjective reports is so poor that any

introspective access people possess is not sufficient to produce correct or reliable results. Instead of admitting that we do not know why we behaved as we did in a certain situation, Nisbett and Wilson argue that we invent a plausible story.

The kinds of issues raised by Nisbett and Wilson are often directed at personal relationships researchers when they ask subjects what caused their relationship to break up. Duck (1982) comments that, "It is noted that such accounts may reflect bias, idealization, self-interest and so on." He maintains that, "What is missed is the fact that such processes are not mere accidents or epiphenomena; they are probably crucial to the persons coming to terms with relationship dissolution... (p.27). Duck argues that such attributions should be examined very seriously, and their underlying dynamics explored in order to discover what they tell us about the process of relationship dissolution.

In summary, it is argued here that the phenomenology of the persons involved in a relationship should be a crucial consideration in the study of the dissolution of relationships. The layperson's prototype of what a loving and committed relationship is consists of a very rich, very complex constellation of features--some of which are considered more important or central than others. This kind of monitoring of what is and is not an important indicator of demise in love or commitment that goes on by the layperson deserves our attention--both in terms of learning more about the dynamics of interpersonal relationships from the layperson's perspective and in terms of the clinical implications of these warning signs.

In conclusion, Studies Five and Six represent a novel application of the prototype approach to the domain of interpersonal relationships. Although these studies are still confined to what goes on in people's minds, they demonstrate that the prototype structure of the concepts of love and commitment is relevant to laypersons' perceptions of the kinds of changes in the features or interpersonal qualities of relationships that signal a move toward or away from greater love or commitment. The gradient of centrality of the features of love and commitment was clearly reflected in subjects' responses to the kinds of events that contributed to enhanced and diminished love and commitment in a relationship. Thus, the prototypes of love and commitment do not exist in isolation, as purely semantic concepts. What these studies have shown is that the prototype structure of these concepts is apparent in the everyday view of the dynamics of interpersonal relationships.

An important direction for future research is to investigate how, if at all, the prototype structure of the concepts of love and commitment translates into the study of actual people in actual relationships. For example, a replication of Study Five is in order, where, rather than making judgments about various relationships, subjects would be people involved in these types of relationships and the judgments they would be asked to make would pertain to these actual relationships. Also, subjects who are in loving and committed relationships, whose relationships are deteriorating could be asked to provide an account of the kinds of changes in the relationship that led to this appraisal.

GENERAL DISCUSSION

The aim of the research reported here was to test the feasibility of viewing the concepts of love and commitment from a prototype perspective. The first major issue addressed was: Are love and commitment prototypically organized concepts? In other words, do these concepts have a prototype structure such that some features are seen as more central to each concept than others. The second major question concerned the relationship between the laypersons' prototypes of love and commitment: To what extent (and/or in what ways) are these concepts associated in people's minds? The answers to these questions will be discussed here. An analysis of the concepts of love and commitment also invites a consideration of several other, related issues. Why study the layperson's view of these concepts? Is it meaningful to talk about a general concept of love or of commitment? How are types of these concepts seen from a prototype perspective? Finally, the clinical implications of this research are discussed, followed by a consideration of future research directions.

Are Love and Commitment Prototypically Organized Concepts?

The prototype structure of a concept is demonstrated through a convergence of operations. The first step in this project was to ask respondents to list the features of the concepts of love and of commitment. In Study Two, subjects were asked to rate the attributes of love and commitment according to degree of centrality. It was expected that this prototype structure would

affect performance on various tasks. The dependent measures employed were:

1. Free listing of features.
2. Centrality ratings.
3. Memory for central and peripheral features.
4. Use of hedges in natural language as a reflection of prototype structure.
5. Applicability of central and peripheral attributes to types of loving and committed relationships.
6. Impact of violations of central and peripheral attributes.

Subjects in Study One were able to generate features for love and commitment, and subjects in Study Two found it meaningful to rate these features for centrality. Subjects in Study Three falsely remembered having seen central, but not peripheral, features that had not been presented. Subjects in Study Four rated sentences in which central features were hedged as more peculiar sounding than sentences in which peripheral features were hedged. In Study Five, both peripheral, and especially central, features were rated as being more applicable as relationships increased in love or commitment. Finally, in Study Six, violations of central features were seen as contributing to significantly greater decreases in love or commitment than violations of peripheral features. Thus, regardless of the method used, central features were seen as more significant than peripheral.

It might seem that in each study there was an implicit

demand for subjects to differentiate items along a dimension of prototypicality. For example, in Study Four, subjects were told that "For some of these sentences the use of a hedge is appropriate..." and were perhaps led to believe that some sentences should sound more peculiar than others. However, it is important to keep in mind that even though subjects were asked to differentiate between items, there was no suggestion given as to which might be the most central and peripheral items. Moreover, these demands were absent in Study Three, where the dependent measure was memory. In that study subjects were simply asked to listen to the statements. Fehr and Russell (1984) demonstrated that the same prototype structure emerges regardless of whether subjects are asked to differentiate between items on a questionnaire (as in some of the present studies), whether they are asked Yes/No questions and the dependent measure is per cent agreement, or whether subjects' reaction time to prototypical and nonprototypical statements is used. Thus, it is unlikely that subjects' responses across these six studies are attributable to demand characteristics in the experimental instructions as opposed to reflecting the prototype structure of these concepts.

In addition to looking at the results of these studies individually, it was important to determine to what extent these findings converge. In particular, it was possible to correlate the following measures: centrality ratings, frequency of free listing, naturalness ratings, and ratings of the impact of violations of features. These correlations appear in Table 8. An

examination of Table 8 reveals that centrality correlates significantly with frequency of free listing, peculiarity ratings of sentences containing hedges, and ratings of the impact of violations of central and peripheral attributes. In addition, these measures tend to intercorrelate fairly well, especially for love.

If love and commitment were definable in the classical sense, the features should not have varied in the extent to which they came to mind. Moreover, it would have been meaningless for subjects to rate features for degree of centrality, because within the classical view, each feature should be equally necessary in defining the concept. Similarly, if each feature was equally central to a concept, one would not expect that certain features would be more prone to memory biases than others. Nor would one expect that hedges would sound natural when prefacing some features, but not others. When asked about the factors associated with both increases and decreases in relationship closeness, again, from a classical perspective, certain features would not be seen as playing a more central role than others.

Based on the convergence of results obtained across these studies, it appears that the concepts of love and commitment are more amenable to a prototype, than a classical, conceptualization. Because little research has been done on this topic, these studies were highly exploratory. And yet the results could hardly have been more encouraging. The predictions derived from Roach's theory worked well when extrapolated to and

tested in the domain of love and commitment in interpersonal relationships.

The ease with which love and commitment lent themselves to a prototype conceptualization contrasts with their apparent resistance to be classically defined. It would appear that attempts to classically define the everyday words "love" and "commitment" are unlikely to succeed in the future. Yet the real gain from evidence uncovered here concerns not the explicit theory of experts, but the implicit theory of the layperson. This evidence provides a new and interesting picture of how people think about and use these concepts.

Why Study the Layperson's Conception of Love and Commitment?

Studies 5 and 6 were seen as an important, necessary extension of the prototype approach. These studies showed that the way people think about the concepts of love and commitment actually translates into how they viewed the dynamics of interpersonal relationships. The conceptions of love and commitment held by people are probably important in the way they act and feel in their closest relationships. Presumably, an adolescent girl's beliefs about love and commitment determine what she looks for in a dating relationship, how she assesses whether she is truly in love with a particular partner, and if she wants to be committed to him (e.g., Schwartz & Merten, 1980). Similarly, a husband's view of love is apt to affect what he does in his attempts to show love for his wife, and her understanding of love will affect how successful his attempts

will be.

As Kelley argues:

The scientific study of love must take these [lay] conceptions into account, and they in turn must be traced back to the more distal causes--the cultural norms and models of love--that they reflect (p.271).

A prototype approach is one way of analyzing the laypersons' conceptions of love and commitment. The prototype analysis of love and commitment conducted here not only confirms the assumption that the layperson's view of love and commitment affects his or her view of what goes on in interpersonal relationships, but demonstrated that it does so in very specific and predictable ways. The everyday view of love and commitment is rich and complex--the features which comprise these concepts are ordered along a gradient of centrality. This prototype structure is reflected in subjects' answers to questions such as which features are indicative of a close relationship, and which features, if violated, seriously harm a relationship.

However, the prototype approach is also subject to criticisms of the scientific investigation of lay concepts. Kelley expresses certain reservations about the study of the layperson's view of concepts like love and commitment. In his words:

Perhaps, most important is the fact that reliance on the common usage of love, as either a descriptive or explanatory concept limits our analysis to a particular time and place (p.272).

The extent to which prototypes of concepts like love and commitment are bounded by history and culture has not been investigated. Rosch (1973) studied color categories in a group of Stone Age people, the Dani, a culture which does not have color terms for hue. She found that color values which were prototypical of Western color categories were learned more quickly and remembered better than nonprototypical ones. Whether or not these findings with perceptual categories like color extend to social categories like love and commitment is tenuous.

Certainly the concept of love has undergone some major transformations across time. According to Brehm (1985), the ancient Greeks conceived of passionate, romantic love as undesirable torment. The Romans saw love as a game--to be played with great diligence, but not to be taken seriously. With the advent of courtly love in France in the twelfth century, a view of love developed that was very idealistic, very elegant, and at least, theoretically, nonsexual. For the next 500 years, it was the common assumption that passionate love, though desirable and enobling, was essentially unattainable. It was not until the 17th and 18th centuries that Europeans, especially the English, began to believe that a "happy ending" was possible for romantic passion in the union of love with marriage.

There is also some evidence which suggests that love may be viewed differently in different cultures. Triandis, Kilty, Shanmugan, Tanaka and Vassiliou (1972) compared the perceived antecedents and consequents of love across four cultures: American, Greek, Indian, and Japanese. While all cultures agreed

that affection and trust were antecedents of love, they disagreed on other antecedents. The consequents of love included friends, happiness, and joy in most cultures. Again, there was disagreement on other consequents.

Comparable studies have not been done for commitment. However, it seems clear that an analysis of the everyday concepts of love and commitment can never be history and culture free. What is less clear is whether a history-and culture-free analysis is necessarily a primary goal of the scientific study of love and commitment. In fact, Forgas and Dobosz (1980) called for "a way to survey and represent the relationship prototypes which are practised within a particular subcultural milieu" (p.663), suggesting that they do not regard the confinement of their research to a particular time and place a shortcoming of their work.

Nevertheless, the criticism that the prototypes of love and commitment, as uncovered in Studies One to Four, are not history and culture free is valid. However, just because the contents of a prototype may vary, does not necessarily invalidate the prototype approach. The prototype structure of natural language categories and their effects are likely to be widespread. The results of Studies Five and Six cast a yet another light on this issue. What these studies show is that these time-and place-bound prototypes can be used to predict what the everyday person sees as a marker indicating the degree to which s/he is interpersonally involved with others. The extent to which a particular relationship is seen as a loving or a committed

relationship is determined by which features are applicable to or characteristic of the relationship. These prototypes also allow one to predict the sorts of events that are taken as indicators of relationship breakdown. From an analysis of the layperson's historically and culturally bound view of love and commitment, we can learn general principles about how the dynamics of interpersonal relationships are viewed. The benefits of such an analysis by far outweigh the costs incurred in terms of time and place limitations.

Relation between the Concepts of Love and Commitment

An additional purpose of the studies reported here was to further explore the relation between the concepts of love and commitment. The four models of the relation between love and commitment were that: 1. the concepts are completely independent; 2. the concepts are synonomous; 3. commitment is a component of love; and 4. the concepts are largely overlapping, but partially independent. There are several findings across the six studies which speak to this issue. These include:

--Study 1: love and commitment have both shared and unique attributes

--Study 1: love shares roughly one third of its features with commitment, while commitment shares half of its features with love

--Study 1: the proportion of subjects who mentioned commitment when asked to write about love ranged from 11.53 to 18.18% (depending on whether subjects wrote only about love or

about both concepts), while 20% of the subjects listed love as an attribute of commitment

--Study 2: love was considered a central feature of commitment; commitment was considered a central feature of love

--Study 2: the shared attributes of love and commitment are considered more central to each concept than are the unique attributes

--Study 2: mean centrality ratings of the shared features of love and commitment correlated .75

--Study 3: among subjects who saw features of love, 13.3% falsely recalled having seen "love", while 5% thought they had seen "commitment"; for commitment, 16.7% thought they had seen "commitment" and 18.3% thought they had seen "love"

--Study 5: in the first phase, subjects' ratings of 53 types of relationships as to how loving or how committed they were correlated .85

--Study 6: it made no difference whether subjects were asked to rate the impact on love or commitment of violations of either features of love or commitment.

Which of these four models seem closest to the laypersons' conception? If the hypothesis that love and commitment are completely independent concepts was true, one would expect that:

--love and commitment would not share any features

--when asked to write about one of the concepts, the other concept would not be mentioned

--love would not be considered a central feature of commitment, and vice-versa

--subjects would not falsely recall having seen the other concept in a memory experiment

--ratings of how loving and committed various relationships are would not be highly correlated

--ratings of the impact of violations of the features of one concept would be independent of ratings of the impact of violations of the attributes of the other. Clearly this pattern of results was not obtained here.

In Sternberg's theory of love, commitment is a component of love, along with intimacy and passion. If the layperson's view of the concepts of love and commitment maps onto Sternberg's model, one would expect that:

--commitment should share all of its features with love, while love would also possess unique features

--when asked to write about commitment, subjects should mention love; when asked to write about love, fewer subjects should mention commitment

--commitment would be considered a central feature of love, although love would not necessarily be considered a feature of commitment

--centrality ratings of the shared features of love and commitment would be perfectly correlated

--in a memory study, subjects who saw commitment attributes would think they had seen love attributes, but subjects who saw love attributes would not necessarily think they had seen commitment (it would be just as likely that they would think they had seen features of intimacy or passion)

--subjects ratings of how loving or committed different relationships are would be moderately correlated

--subjects would not differentiate between the impact of violations of commitment attributes on love versus commitment, but would to some extent discriminate between impact of violations of love attributes on love versus commitment. Again, these predictions do not fit very well with the data obtained here.

This leaves two models: the view that love and commitment are virtually the same, and the view that they are related but partially independent concepts. If love and commitment are identical concepts one would expect:

--love and commitment would share virtually all the same features

--when asked to write about love, subjects would spontaneously mention commitment and vice-versa

--centrality ratings of the features of love and commitment would be perfectly correlated

--an equal number of subjects would falsely recall having seen "love" and "commitment" in a memory task

--subjects' ratings of how loving and committed different relationships are would be almost perfectly correlated

--it would make no difference whether subjects were asked to rate the impact of violations of either concept on the other concept.

On the other hand, if, as Kelley suggests, these concepts are partially independent but largely overlapping, one would

expect that:

--love and commitment would possess both shared and unique features

--when asked to write about both love and commitment, the other concept should come to mind in some, but certainly not all, cases

--the shared features of love and commitment would be considered more central to each concept than the unique features

--in a memory study, some subjects would falsely recall the name of the other concept

--measures of how loving and committed certain relationships are would be moderately to highly correlated

--subjects should be able to distinguish between the impact of violations of love versus commitment features on love versus commitment

Certainly the notion of considerable overlap is well supported by these data. In fact, the high correlations between mean centrality ratings of the shared features of love and commitment, and between ratings of love and commitment in different relationships, and the fact that it makes no difference whether subjects are asked to rate the impact of violations of love or commitment attributes on love or commitment, does raise a critical issue, namely to what extent can we refer to these concepts as even partially independent in light of correlations of this magnitude? When one looks to the literature for other empirical findings relevant to this issue, the results that love and commitment are very closely related

emerges with considerable consistency.

For example, Lund (1985) created a scale designed to measure commitment as a construct distinct from love. After eliminating half of the items because they correlated .70 with scores on Rubin's Love Scale, scores on the revised scale still correlated .67 with scores on the Love Scale. In a validation study, this correlation was .74 at time 1 and .76 at time 2. Similarly, Hatfield and Sprecher (1985) recently developed a passionate love scale. Scores on their scale correlated .87 for males and .73 for females with scores on a measure of commitment. Correlations of this magnitude are somewhat surprising, because it is generally believed that companionate love and commitment are more closely related than are passionate love and commitment. What is clear from both these studies, and from the results obtained here is that love and commitment are very closely related and in fact, correlations between measures of these concepts seem high enough to question the assumption of partial independence.

In defense of the notion of partial independence, the results of Study One showed that each concept possesses a set of unique features. Also, a majority of respondents do not mention love when asked about commitment, and vice-versa, suggesting that the concepts are somewhat independent. Similarly, a majority of subjects do not erroneously think they have seen love when presented with the features of commitment, and vice-versa. In Study Five, the apparent degree of overlap may have been artificially magnified by the finding that ratings of

different types of relationships according to degree of love or commitment correlated .85. This correlation may be excessively high because the relationship types to be rated included the Forgas and Doboaz (1980) list, which as Kelley pointed out, failed to include relationships that discriminated between love and commitment. Even though the few items which were included to measure love and commitment as distinct concepts seemd to do so, they were too few in number to exert much of an impact on the correlation.

In conclusion, Kelley's point of view on the relation between the concepts of love and commitment seems to be most consistent with the data on the everyday view of the concepts of love and commitment obtained here. A question that can be asked is whether the methodology employed here was biased toward finding that love and commitment are overlapping concepts. It might seem that a prototype analysis is necessarily skewed toward finding overlap, because within this view, concepts are pictured as having overlapping, blurry boundaries. However, an inspection of the methodology employed suggests that such an accusation is unfounded. For one, the subjects who generated the features of these concepts were given an open-ended format. Further, it was not possible for subjects who generated features for only one concept to be led into listing shared features. Thus, it was entirely possible that two completely different lists of features could have been generated for the two concepts, or that the features of one concept could have been completely subsumed by the features of the other. In fact,

Horowitz et al. (1982) reported that, in their research, the features of loneliness were almost entirely subsumed by the features of depression. These authors found for depression and loneliness what Sternberg theorized for love and commitment. Thus, a prototype analysis does not necessarily yield the finding that two concepts overlap.

Untangling the love-commitment relation is reminiscent of attempts to unravel the relation between loneliness and depression. Weeks, Michela, Peplau and Bragg (1980) maintain that research on loneliness has been hampered by its strong association with depression. They point out that the two states frequently co-occur, and that measures of the two states are substantially correlated. The inability to manipulate experimentally loneliness or depression makes it difficult to isolate the causal influence of one on the other. In a novel attempt at dealing with this issue, the authors combined a longitudinal design with structural equation methodology. They administered measures of depression and loneliness to undergraduates at two different times, separated by five weeks. Their results indicated that loneliness and depression were correlated but clearly different constructs: neither was a direct cause of the other, although both probably share common origins. Both were highly stable over the five week period.

Probably a similar conclusion can be reached regarding people's conceptions of love and commitment. These concepts are associated in people's minds. In everyday life, events do not occur as orthogonally as in 2X2 social psychological

experiments. Nonetheless, when examined carefully, differences can be found, and under limited conditions, these differences have a major impact.

A General Concept of Love and of Commitment: Fact or Fiction?

This brings to mind another issue, namely how useful is it to study the layperson's view of a general concept of love or commitment? The love one has for one's partner, a close friend, a parent, or a child, and the commitment one feels toward these people seem rather different in nature. Is it meaningful to ask people about love in general, or commitment in general? The fact that our subjects were able to list features of a generic concept of love or commitment without any apparent difficulty, and that they found it meaningful to rate the centrality of each feature suggests that it is. This notion is corroborated in studies which compare the factor structure of love across types of relationships.

Swensen (1972) administered his Love Scale to nearly 600 respondents who completed the scale with respect to five different persons: father, mother, closest sibling, closest same-sex friend, and closest opposite-sex friend (defined as one's spouse for married respondents). These responses were factor analyzed and six factors were extracted: verbal expression of feelings, self-disclosure, nonmaterial evidence of love, feelings that had not been verbally expressed, material evidence of love, and willingness to tolerate negative aspects of the loved one. Interestingly, a comparable, though not

identical, factor pattern emerged regardless of the age of the respondents or the relationship being rated. Thus the structure of love for one's parents, siblings, friends and so on was similar. What differed was the amount of love expressed in the various relationships, with the greatest amount of love being expressed for the closest opposite-sex friend (spouse) and the least amount felt toward one's siblings. Sternberg and Grajek (1984) replicated Swensen's study using different measures of love. They, too, found that the structure of love did not differ consequentially from one close relationship to another. They extracted a general factor of love which they describe as "one of interpersonal communication, sharing, and support" (p. 327). Again, what varied was the amount of love expressed in the different relationships. They concluded that, "whatever difference there may be among relationships, they are not primarily in the nature of the core of love that forms part of their basis" (p.327).

Comparable studies looking at conceptions of commitment across different relationships have not been done. However, as was mentioned earlier, subjects who participated in this research were able to generate features of, and to respond to questions about, a general concept of commitment.

Types of Love and Commitment

While there is justification for studying a general concept of love or commitment, this does not obviate the need for research on types of love and commitment. Generally, any

distinctions between types are done so at the conceptual level. Thus Berscheid and Walster distinguish between passionate versus companionate love; Johnson differentiates between personal commitment and structural commitment; and so on. Kelley (1983) suggests one might want to draw a distinction between commitment to a relationship and commitment to one's partner. The empirical study of types of love and commitment has received little attention, particularly for the concept of commitment. Research on this topic is warranted for several reasons. One context in which this research should be done concerns support for a prototype categorization of the concept of emotion, in general. In their study of emotion concepts, Fehr and Russell (1984) took "emotion" to be the superordinate level, while categories like "love", "anger", "happiness", "sadness", and so on were taken to be middle level. A shortcoming of this research is that although these studies supported the hypothesis that emotion is a prototypically organized concept, this conclusion is not entirely warranted until it has been demonstrated that prototypicality effects also occur at the subordinate level. By choosing the most prototypical emotion, love, and replicating the Fehr and Russell studies, one can put forth the notion that emotion is a prototype concept with greater confidence. This line of research would entail asking subjects to list types, obtaining prototypicality ratings of these types, and then conducting a series of studies demonstrating how the prototype structure of these concepts affects performance on various tasks (e.g., memory, reaction time to verify category membership,

natural language use, and so on). A triangulation of these measures would provide further insight into the prototype structure of the concept of love, and this finding would, in turn, have implications for making claims about the prototype structure of emotion.

The analysis just described for love is also important for commitment, not so much for supporting earlier claims about its structure, but for an elucidation of its types in its own right. There is little, if any, research on types of commitment.

While it is of interest to delineate types of love and commitment, one can also use prototype methodology to discover which kinds of love or commitment are considered most prototypical. In the same way that Fehr and Russell (1984) found that some types of emotions are more prototypical than others, some types of love and of commitment are presumably more prototypical than others. Which types are considered most prototypical may well be a function of the individual's significant life events at the time. Romantic love might be most central to the adolescent's conception, love for one's child most central to a parent's conception, and so on. Commitment to one's job may be most salient to the ambitious businessman whose family comes second to his career.

Not surprisingly, there has been little attention directed toward which features distinguish types of love or commitment from one another. In his discussion of the Sternberg and Grajek (1984) study, Sternberg (1986) suggests that the general factor of love that was extracted corresponds with the intimacy

component in his theory of love. He speculates that the passion and decision/commitment components may vary in different kinds of relationships. For example, the passion component probably plays a major role in romantic love, but not in love for one's parent. From a prototype perspective, one might expect that the central features would continue to be central across different types of love (commitment), while peripheral features might assume greater importance as a function of the kind of love (commitment) under consideration. For instance, "caring" may be considered central to love for one's lover, parent, sibling, and friend. However, "sexual passion", a peripheral feature of love, might be perceived as more central in romantic relationships. Similarly, a peripheral feature like "sacrifice" might assume greater importance in parental love. For commitment, "loyalty" is a central feature that could well pervade different types of commitment. The peripheral feature, "conscious decision" might well characterize commitment to one's romantic partner, while "hard work" might be central to commitment to one's employer.

Finally, an interesting question for future investigation concerns the relationship between the prototypicality of a category member and the centrality of its features. Rosch and Mervis (1975) found that the most prototypical category members share the greatest number of features. Less typical members have fewer attributes in common with other category members, and have more attributes in common with neighboring categories than do the prototypical cases. However, Rosch and Mervis did not obtain centrality ratings of the features they were studying. It may be

the case that the most prototypical kinds of love and commitment also possess the most central features.

Clinical Implications of a Prototype Analysis of the Concepts
of Love and Commitment

The concepts of love and commitment are salient in both happy and unhappy relationships. Swensen (1973) found that people who were dissatisfied with their marriages reported receiving less love from each other than did happy couples. Foire and Swensen (1977) replicated this finding, and also discovered that couples in distressed relationships reported receiving less love than they expected to receive.

Lasswell and Lasswell (1976) suggested that a critical issue in marital therapy is not the amount of love the partners feel for one another, but rather whether their conceptions of love are congruent. They present a case study in which the spouses subscribed to very different views of love. As Lasswell and Lasswell document, discrepancies in conceptions of love can lead to marital distress. They conclude that:

People are likely to expect others to love them
according to the meaning of love they themselves
have rather than recognizing that others have
invested this sentiment with different meanings
(p.214).

Rephrased in prototype terms, individuals in a relationship may have different prototypes for the concepts of love and commitment. From a clinical perspective, it would seem to be

worthwhile to highlight incongruencies in partners' conceptions of love and commitment. The role of the therapist would be to suggest ways of changing the partner's views to make them more congruent.

It would also be worthwhile to use prototype methodology to elicit conceptions of love and commitment held by people who are involved in distressed relationships and compare their conceptualization to those of couples enjoying satisfying, enduring relationships. It may be that one or both partners in a distressed relationship have a view of love or commitment that is impossible to achieve, or are placing undue emphasis on aspects of love or commitment that are considered peripheral to nondistressed couples. Or, it may be the case that people in unhappy relationships are astutely aware of the "normal" view of love and commitment, and feel distressed because they realize that their relationship is lacking one or more of the central features of love or commitment. According to Kelley (1979), lack of respect is one of the common causes of complaints about heterosexual partners. Interestingly, respect is a central feature of both love and commitment.

Future Directions

Some future directions have already been alluded to in the previous sections. An obvious next step is to replicate this research with other groups of respondents, in order to discover how conceptions of love and commitment change across the lifespan. The program of research reported here examined the

conceptions of love and commitment held by young adults, specifically university students. According to Erikson (1963), the formation of intimate relationships is the central developmental task during this phase of the lifespan. Indeed, anecdotal evidence corroborates the notion that these students would be at Erikson's Intimacy vs. Isolation stage. For one, students in these studies seemed eager to participate. Rarely did anyone refuse to complete a questionnaire, or to take part in a study. Generally, mass testing situations are beset with problems such as a lack of privacy or failure to take the task seriously (e.g., friends joking and talking, commenting on each other's questionnaire responses). In order to deal with potential difficulties of this nature, all sessions were conducted during class time--either with the instructor of the class present, or in the context of a guest lecture given by the experimenter following the experimental task. Thus, in all cases, the task was conveyed as one to be taken seriously. Of greater significance is the fact that these students appeared to be keenly interested in participating in these studies. In fact, in the vast majority of classes, a group of students would remain after the class to ask more questions, offer their theories of relationships, and so on. Clearly, love and commitment issues were very relevant to their lives.

The few studies on the topic of changes in love and commitment across the lifespan offer a potpourri of findings. There is support for the view that love declines over time (Swensen, Eskew, & Kohlhepp, 1981). Cimbalo, Faling, and Monsaw

(1976) found that while love declined, liking remained constant. Filsinger (1983) found that love remained constant over time, while level of liking for one's partner increased for wives. Traupmann and Hatfield (1981), on the basis of comparisons across several studies, concluded that despite an overall downward trend, levels of both companionate love and passionate love remained relatively high across the lifespan. Finally, Knox (1970) found evidence for a curvilinear relationship between stage of the life cycle (beginning with late adolescence and ending with retired married couples) and beliefs in romantic love. While Munro and Adams (1976) replicated Knox's finding for romantic love, they also found a concomitant linear increase in conjugal love.

Reedy, Birren and Schaie (1981) compared the importance placed on various components of love by young, middle-aged, and older married couples. They concluded that over time, satisfying love relationships are less likely to be based on intense companionship, communication, and sexuality, and more likely to be based on loyalty and commitment.

Part of the difficulty in forming an overall conclusion from these studies may stem from how love and commitment are conceptualized. Are romantic and passionate love the same thing? Are liking, conjugal love, and companionate love similar? A prototype analysis bypasses some of these problems. Subjects are not constrained by a particular definition or scale of love or commitment that may or may not be relevant to their experience. What the prototype studies have shown, without exception, is

that the layperson is able to produce a complex, well-elaborated account of his/her view of a concept. Moreover, going the second step and obtaining centrality ratings of the features yields a further increment in knowledge--one then discovers which features are seen as most central. This information lends itself readily to making comparisons of conceptions of love and commitment across the lifespan. It may be that the content of the prototypes does not change so much as what is considered central and peripheral.

Another area for future research concerns individual differences in conceptions of love and commitment. The purpose of the present research was to discover whether laypersons' conceptions of love and commitment were amenable to a prototype analysis. Given the exploratory nature of this research, the examination of individual differences in these conceptions was not a primary goal. Thus, in the studies reported here, the samples used were not balanced for gender, nor were data collected on other individual differences. However, a prototype analysis has the potential for uncovering the nature of individual differences in conceptions of love and commitment.

Dion and Dion (1985) maintain that personality and gender are important in the study of love because they are associated with subjectively different experiences or phenomenologies of love. In a review of the literature on gender differences in love, Peplau (1983) concluded that men are more likely to endorse romantic beliefs about love whereas women are more pragmatic. However, women are more likely to report emotional

symptoms of love such as feeling euphoric, having trouble concentrating, or feeling as though floating on a cloud ((e.g., Dion & Dion, 1975; Hendrick, Hendrick, Foote, & Slapion-Foote, 1984). Some authors have found that men fall in love more quickly (e.g., Kanin, Davidson, & Scheck, 1970), but that gender differences disappear as the couple becomes more committed (Rubin, Peplau & Hill, 1981). Finally, there is considerable evidence that women love their partners more companionately than they are loved in return (see Hatfield & Traupmann, 1981). None of these studies, however, have directly examined men and women's prototypes of love.

In Study Two, women and men's centrality ratings for love were highly correlated, suggesting that women and men share similar conceptions of love. This shared conception may reflect cultural influences common to both females and males. It may be the case that while men and women do not differ in their general concept of love, differences may emerge when considering specific types of love (e.g., romantic love).

Virtually no research has been done on gender differences in commitment. Beach and Broderick (1983) reported that among couples seeking marital therapy, the wives' level of commitment accounted for a significant amount of the variance in marital satisfaction before therapy, and in gains in marital satisfaction resulting from therapy. The results for husbands were largely nonsignificant. However, this finding may speak to the fact that their one-item measure of commitment was inadequate, rather than to the notion that men are impervious to

the level of commitment in their personal relationships.

In Study Two, males and females' centrality ratings for commitment were highly correlated. Again, it may be possible that men and women share the same general prototype of commitment, but that differences may be evident depending on the type of commitment studied. Clearly, an investigation of this area is long overdue.

Other individual differences in the experience of love have been explored by Dion and Dion. These include variables like: locus of control (Dion & Dion, 1973), and various dimensions of self concept like self-esteem, defensiveness, and self-actualization (Dion & Dion, 1975). Whether or not people who are different personality types also conceptualize love and commitment differently remains an intriguing question for future investigation.

CONCLUSION

There has been a shift in psychology toward a greater concern with cognitive processes. One consequence of this emphasis on cognition has been the legitimizing of the study of the thought processes of the layperson. Initially, these studies were directed at the everyday view of everyday concepts like fruit, vehicle, furniture, and bird. The purpose of the research reported here was to discover how people structure knowledge about concepts that have considerable significance in their lives--the concepts of love and commitment. It was found that even though people are unable to produce definitions of love and

commitment, their cognitive representation of these concepts is rich and complex. Consistent with what one would expect from a prototype perspective, some features of love and commitment were considered more central than others, and this prototype structure was shown to affect variables like frequency of free listing, memory, and natural language use. Moreover, the prototype structure of love and commitment had consequences for how the everyday person assesses whether a relationship is moving toward, or away from, greater love or commitment.

The studies conducted here, in concert, were able to shed light on another important issue, namely, how are the concepts of love and commitment related? It was found that the data across six studies were most consistent with Kelley's description of love and commitment as largely overlapping, yet partially independent, concepts.

The need for a descriptive analysis of close relationships is well-documented by Kelley et al. (1983). The prototype approach was successful in obtaining rich descriptive data on the everyday view of love and commitment. However, rather than simply providing a list of features of these concepts, these studies demonstrated the structure of these features, and how this structure affects the way these concepts are thought about, remembered, used in language, and in assessing the dynamics of interpersonal relationships. Studies Five and Six represented a significant next step--both in terms of extending the implications of the prototype approach, and in terms of advancing our knowledge of the dynamics of interpersonal

relationships.

In conclusion, theorists who write about love and commitment face a dilemma. As scientists, they have sought precisely defined descriptive and explanatory concepts, and definite, clear-cut answers to their questions. At the same time, they have attempted to be, or their critics have demanded they be, true to our everyday concepts of love and commitment.

Psychologists need not be bound by the folk concepts of love and commitment, but may alter or abandon them to create a set of technical concepts more useful for scientific purposes. Perhaps, new classically defined concepts can be formulated. Perhaps the fuzziness of everyday concepts can be eliminated by well-placed, arbitrary boundaries. The prototype analysis of the concepts of love and commitment as presented here is a descriptive, not a prescriptive, analysis.

What can be said is that the success of working within Rosch's framework contrasts with the frustration expressed by writers who have attempted to define these concepts from a classical perspective of criterial features, and that this prototype analysis has served to reveal properties of love and commitment previously overlooked.

References

- Baum, M. (1972). Love, marriage and the division of labor. In H. P. Dreitzel (Ed.), Family, marriage, and the struggle of the sexes (pp. 83-106). New York: Macmillan.
- Beach, S. R. H. & Broderick, J. E. (1983). Commitment: A variable in women's response to marital therapy. American Journal of Family Therapy, 11(4), 16-24.
- Becker, H. S. (1960). Notes on the concept of commitment. American Journal of Sociology, 66, 32-40.
- Becker, H. S. (1964). Personal change in adult life. Sociometry, 27, 40-53.
- Bourne, L. E. Jr., Dominowski, R. L., & Loftus, E. F. (1979). Cognitive processes. Englewood Cliffs, NJ: Prentice-Hall.
- Berscheid, E. & Fei, J. (1977). Romantic love and sexual jealousy. In G. Clanton & L. G. Smith (Eds.), Jealousy (pp.101-109). Englewood Cliffs, N.J.: Prentice-Hall.
- Berscheid, E., & Walster, E. H. (1978). Interpersonal attraction (2nd Ed.). Reading, Mass.: Addison-Wesley.
- Bransford, J. D. & Franks, J. J. (1971). The abstraction of linguistic ideas. Cognitive Psychology, 2, 331-350.
- Brehm, J. W. & Cohen, A. R. (1962). Explorations in cognitive dissonance. New York: John Wiley & Sons.
- Brehm, S. S. (1985). Intimate relationships. New York: Random House.
- Broughton, R. (1984). A prototype strategy for construction of personality scales. Journal of Personality and Social Psychology, 47, 1334-1346.

- Calfee, R. C. (1975). Human experimental psychology. New York: Holt, Rinehart & Winston.
- Cantor, N. & Mischel, W. (1977). Traits as prototypes: Effects on recognition memory. Journal of Personality and Social Psychology, 35, 38-48.
- Cantor, N. & Mischel, W. (1979a). Prototypes in person perception. Advances in Experimental Social Psychology, 12, 3-52.
- Cantor, N. & Mischel, W. (1979b). Prototypicality and personality: Effects on free recall and personality impressions. Journal of Research in Personality, 13, 187-205.
- Cantor, N., Mischel, W. & Schwartz, J. C. (1982). A prototype analysis of psychological situations. Cognitive Psychology, 14, 45-77.
- Cantor, N., Smith, E. E., French, R. D., & Mezzich, J. (1980). Psychiatric diagnosis as prototype categorization. Journal of Abnormal Psychology, 89, 181-193.
- Centers, R. (1975). Sexual attraction and love. Springfield, Ill.: Charles C. Thomas.
- Cimbalo, R. S., Faling, V., & Monsaw, P. (1976). The course of love: A cross-sectional design. Psychological Reports, 38, 1292-1294
- Cunningham, J. D. & Antill, J. K. (1981). Love in developing romantic relationships. In S. Duck & R. Gilmour (Eds.), Personal relationships. 2: Developing personal relationships (pp. 27-51). London: Academic Press.

- Dahlgren, K. (1985). The cognitive structure of social categories. Cognitive Science, 9, 379-398.
- Davis, K. & Todd, M. J. (1985). Assessing friendship: Prototypes, paradigm cases and relationship description. In S. Duck & D. Perlman (Eds.), Understanding personal relationships: An interdisciplinary approach (pp. 17-38). London: Sage.
- Dean, D. G., & Spanier, G. B. (1974). Commitment--an overlooked variable in marital adjustment? Sociological Focus, 7, 113-118.
- Dion, K. K. & Dion, K. L. (1975). Self-esteem and romantic love. Journal of Personality, 43, 39-57.
- Dion, K. K. & Dion, K. L. (1985). Personality, gender, and the phenomenology of romantic love. In P. R. Shaver (Ed.), Review of Personality and Social Psychology (Vol. 6, pp.209-239). Beverly Hills, CA: Sage.
- Dion, K. L. & Dion, K. K. (1973). Correlates of romantic love. Journal of Consulting and Clinical Psychology, 41, 51-56.
- Dion, K. L. & Dion, K. K. (1976). Love, liking, and trust in heterosexual relationships. Personality and Social Psychology Bulletin, 2, 187-190.
- Duck, S. (1982). A topography of relationship disengagement and dissolution. In S. Duck (Ed.), Personal relationships.4: Dissolving personal relationships (pp.1-30). London: Academic Press.
- Erikson, E. H. (1963). Childhood and society (2nd ed). New York: W. W. Norton.

- Fehr, B. (1982). Prototype categorization of emotion. Unpublished master's thesis, University of British Columbia, Vancouver.
- Fehr, B. & Russell, J. A. (1984). Concept of emotion viewed from a prototype perspective. Journal of Experimental Psychology: General, 113, 464-486.
- Fehr, B., Russell, J. A., & Ward, L. M. (1982). Prototypicality of emotions: A reaction time study. Bulletin of the Psychonomic Society, 20, 253-254.
- Filsinger, E. E. (1983). Love, liking, and individual marital adjustment: A pilot study of relationship changes within one year. International Journal of Sociology of the Family, 13, 145-157.
- Fiore, A. & Swensen, C. H. (1977). Analysis of love relationships in functional and dysfunctional marriages. Psychological Reports, 40, 707-714.
- Forgas, J. P., & Dobosz, B. (1980). Dimensions of romantic involvement: Towards a taxonomy of heterosexual relationships. Social Psychology Quarterly, 43, 290-300.
- Franks, J. J., & Bransford, J. D. (1971). Abstraction of visual patterns. Journal of Experimental Psychology, 90, 65-74.
- Freud, S. (1922/1951). Group psychology and the analysis of the ego (J. Strachey, Ed. and Trans.). New York: Liveright.
- Fromm, E. H. (1956). The art of loving. New York: Harper & Row.
- Hampton, J. A. & Gardiner, M. M. (1983). Measures of internal category structure: A correlational analysis of normative data. British Journal of Psychology, 74, 491-516.

- Hatfield, E., & Walster, G. W. (1978). A new look at love. Reading, Mass.: Addison-Wesley.
- Hatfield, E. & Sprecher, S. (1985). Measuring passionate love. Unpublished manuscript, University of Hawaii, Manoa.
- Heider, E. R. (1971). "Focal" color areas and the development of color names. Developmental Psychology, 4, 447-455.
- Heider, E. R. (1972). Universals in color naming. Journal of Experimental Psychology, 93, 10-20.
- Hendrick, C., Hendrick, S., Foote, F. H., & Slapion-Foote, M. J. (1984). Do men and women love differently? Journal of Social and Personal Relationships, 1, 177-195.
- Hinde, R. A. (1979). Towards understanding relationships. London: Academic Press.
- Hinde, R. A. (1981). The bases of a science of interpersonal relationships. In S. Duck & R. Gilmour (Eds.), Personal relationships. 1: Studying personal relationships (pp.1-22). London: Academic Press.
- Holliday, S. G. (1983). Psychological analysis of the concept of wisdom. Unpublished dissertation, University of British Columbia, Vancouver.
- Horowitz, L. M., de S. French, R., & Anderson, C. A. (1982). The prototype of a lonely person. In L. A. Peplau & D. Perlman (Eds.), Loneliness: A sourcebook of current theory, research, and therapy (pp.183-205). New York: John Wiley & Sons.
- James, W. (1929). The varieties of religious experience. New York: Longmans, Green & Co.

- Johnson, M. P. (1973). Commitment: A conceptual structure and empirical application. Sociological Quarterly, 14, 395-406.
- Johnson, M. P. (1982). Social and cognitive features of the dissolution of commitment to relationships. In S. Duck (Ed.), Personal relationships 4: Dissolving personal relationships (pp.51-73). London: Academic Press.
- Kanin, E. J., Davidson, K. R., & Scheck, S. R. (1970). A research note on male-female differentials in the experience of heterosexual love. Journal of Sex Research, 6, 64-72.
- Kelley, H. H. (1979). Personal relationships: Their structure and processes. Hillsdale, NJ: Erlbaum.
- Kelley, H. H. (1983). Love and commitment. In H. H. Kelley, E. Berscheid, A. Christensen, J. H. Harvey, T. L. Huston, G. Levinger, E. McClintock, L. A. Peplau, & D. R. Peterson (Eds.), Close relationships (pp.265-314). New York: W.H. Freeman and Company.
- Kelley, H. H., Berscheid, E., Christensen, A., Harvey, J. H., Huston, T. L., Levinger, G., McClintock, E., Peplau, L. A., & Peterson, D. R. (1983). Analyzing close relationships. In H. H. Kelley, E. Berscheid, A. Christensen, J. H. Harvey, T. L. Huston, G. Levinger, E. McClintock, L. A. Peplau, & D. R. Peterson (Eds.), Close relationships (pp.20-67). New York: W.H. Freeman and Company.
- Kiesler, C. A. (1971). The psychology of commitment. New York: Academic Press.
- Knox, D. H., Jr. (1970). Conceptions of love at three developmental levels. Family Coordinator, 19, 151-157.

- Lakoff, G. (1973). Hedges: A study in meaning criteria and the logic of fuzzy concepts. Journal of Philosophical Logic, 2, 458-508.
- Lasswell, T. E. & Lasswell, M. E. (1976). I love you but I'm not in love with you. Journal of Marriage and Family Counseling, 2, 211-224.
- Lasswell, M., & Lobsenz, N. M. (1980). Styles of loving. New York: Doubleday & Co.
- Lee, J. A. (1977). A typology of styles of loving. Personality and Social Psychology Bulletin, 3, 173-182.
- Leik, R. K. & Leik, S. A. (1977). Transition to interpersonal commitment. In R. Hamblin & J. H. Kunkel (Eds). Behavioral Theory in Sociology (pp.299-322). New Brunswick, N.J.: Transaction Books.
- Levinger, G. (1980). Toward the analysis of close relationships. Journal of Experimental Social Psychology, 16, 510-544.
- Lund, M. (1985). The development of investment and commitment scales for predicting continuity of personal relationships. Journal of Social and Personal Relationships, 2, 3-23.
- Malt, B. C. & Smith, E. E. (1982). The role of familiarity in determining typicality. Memory and Cognition, 10, 69-75.
- Mervis, C. B., Catlin, J., & Rosch, E. (1975). Development of the structure of color categories. Developmental Psychology, 11, 54-60.
- Mervis, C. B., & Rosch, E. (1981). Categorization of natural objects. Annual Review of Psychology, 32, 89-115.
- Money, J. (1980). Love and love sickness. Baltimore: Johns

Hopkins University Press.

Munro, B. & Adams, G. R. (1978). Love American style: A test of role structure theory on changes in attitudes toward love. Human Relations, 31, 215-228.

Neisser, U. (1979). The concept of intelligence. Intelligence, 3, 217-227.

Nisbett, R. E. & Wilson, T. D. (1977). Telling more than one can know: Verbal reports on mental processes. Psychological Review, 84, 231-259.

Peplau, L. A. (1983). Roles and gender. In H. H. Kelley, E. Berscheid, A. Christensen, J. H. Harvey, T. L. Huston, G. Levinger, E. McClintock, L. A. Peplau, & D. R. Peterson (Eds.), Close relationships (pp.220-264). New York: W.H. Freeman and Company.

Peplau, L. A., Cochran, S., Rook, K., & Padesky, C. (1978). Loving women: Attachment and autonomy in lesbian relationships. Journal of Social Issues, 34, 7-27.

Perlman, D. & Fehr, B. (in press). The development of intimate relationships. In D. Perlman & S. Duck (Eds.), Intimate relationships: Development, dynamics, and deterioration (pp.13-42). Beverly Hills, CA: Sage.

Posner, M. I., Goldsmith, R., & Welton, K. E., Jr. (1967). Perceived distance and classification of distorted patterns. Journal of Experimental Psychology, 73, 28-38.

Posner, M. I. & Keele, S. (1968). On the genesis of abstract ideas. Journal of Experimental Psychology, 77, 353-363.

Reed, S. K. (1972). Pattern recognition and categorization.

Cognitive Psychology, 3, 382-407.

Reedy, M. N., Birren, J. E., & Schaie, K. W. (1981). Age and sex differences in satisfying love relationships across the adult life span. Human Development, 24, 52-66.

Rosch, E. H. (1973). On the internal structure of perceptual and semantic categories. In T.E. Moore (Ed.), Cognitive development and the acquisition of language (pp.111-144). New York: Academic Press.

Rosch, E. (1974). Linguistic relativity. In A. Silverstein (Ed.), Human communication: Theoretical explorations (pp.95-121). Hillsdale, N.J.: Erlbaum Press.

Rosch, E. (1975a). Cognitive reference points. Cognitive Psychology, 7, 532-547.

Rosch, E. (1975b). Cognitive representations of semantic categories. Journal of Experimental Psychology: General, 104, 192-233.

Rosch, E. (1978a). Human categorization. In N. Warren (Ed.), Studies in cross-cultural psychology (Vol.1, pp.1-49). London: Academic Press.

Rosch, E. (1978b). Principles of categorization. In E. Rosch & B. B. Lloyd (Eds.), Cognition and categorization (pp.27-48). Hillsdale, N.J.: Lawrence Erlbaum.

Rosch, E. (1981, May). Prototype classification and logical classification: The two systems. Paper presented at a meeting of the Jean Piaget Society, Philadelphia.

Rosch, E. & Mervis, C. B. (1976). Family resemblances in the internal structure of categories. Cognitive Psychology, 7,

573-605.

- Rosch, E., Mervis, C. B., Gray, W. D., Johnson, D. M., & Boyes-Braem, P. (1976a). Basic objects in natural categories. Working Paper #40. Language Behavior Research Laboratory, University of California, Berkeley.
- Rosch, E., Mervis, C. B., Gray, W. D., Johnson, D. M., & Boyes-Braem, P. (1976b). Basic objects in natural categories. Cognitive Psychology, 8, 382-439.
- Rosch, E., Simpson, C., & Miller, R. S. (1976). Structural bases of typicality effects. Journal of Experimental Psychology: Human Perception and Performance, 2, 491-502.
- Rosenberg, S. & Jones, R. (1972). A method for investigating and representing a person's implicit theory of personality: Theodore Dreiser's view of people. Journal of Personality and Social Psychology, 22, 372-386.
- Rosenberg, S. & Sedlak, A. (1972). Structural representations of perceived personality trait relationships. In A. K. Romney, R. N. Shepard, & S. Nerlove (Eds.), Multidimensional scaling: Theory and application in the behavioral sciences (Vol.2, pp. 133-162). New York: Seminar Press.
- Rosenblatt, P. C. (1977). Needed research on commitment in marriage. In G. Levinger, & H. L. Raush (Eds.), Close relationships (pp.73-86). Amherst: University of Mass. Press.
- Rubin, Z.(1970). Measurement of romantic love. Journal of Personality and Social Psychology, 16, 265-273.
- Rubin, Z.(1973). Liking and loving. New York: Holt, Rinehart &

Winston.

- Rubin, Z., Peplau, L. A., & Hill, C. T. (1981). Loving and leaving: Sex differences in romantic attachments. Sex Roles, 7, 821-835.
- Rusbult, C. E. (1980a). Commitment and satisfaction in romantic associations: A test of the investment model. Journal of Experimental Social Psychology, 16, 172-186.
- Rusbult, C. E. (1980b). Satisfaction and commitment in friendships. Representative Research in Social Psychology, 11, 96-105.
- Schwartz, G. & Merten, D. (1980). Love and commitment. Beverly Hills, CA: Sage.
- Schwartz, J. C. & Shaver, P. (1984, August). A prototype approach to emotion structure. Paper presented at the American Psychological Association Conference, Toronto, Canada.
- Skolnick, A. (1978). The intimate enviroment: Exploring marriage and the family (2nd Ed.). Boston, Little, Brown.
- Solomon, R. C. (1981). Love: Emotion, myth and metaphor. Garden City, N.Y.: Anchor Press/Doubleday.
- Steck, R., Levitan, D., McLane, D., & Kelley, H. H. (1982). Care, need, and conceptions of love. Journal of Personality and Social Psychology, 43, 481-491.
- Sternberg, R. J. (1986). A triangular theory of love. Psychological Review, 93, 119-135.
- Sternberg, R. J. & Grajek, S. (1984). The nature of love. Journal of Personality and Social Psychology, 47, 312-329.

- Swensen, C. H., Jr. (1972). The behaviors of love. In A. Otto (Ed.), Love today (pp.86-101). New York: Association Press.
- Swensen, C. H. (1973). Scale of feelings and behaviors of love. In J. E. Jones & J. W. Pfeiffer (Eds.), The 1973 annual handbook for group facilitators (pp. 71-72). La Jolla, CA: University Associates Publishers.
- Swensen, C. H., Eskew, R. W., & Kohlhepp, K. A. (1981). Stage of family life cycle, ego development, and the marriage relationship. Journal of Marriage and the Family, 43, 841-852.
- Thibaut, J. W., & Kelley, H. H. (1959). The social psychology of groups. New York: John Wiley & Sons.
- Traupmann, J. & Hatfield, E. (1981). Love and its effects on mental and physical health. In R. W. Fogel, E. Hatfield, S. B. Keisler, & E. Shanas (Eds.), Aging: Stability and change in the family (pp. 253-274). New York: Academic Press.
- Triandis, H. C., Kilty, K., Shanmugan, A. V., Tanaka, Y., & Vassiliou, V. (1972). Cognitive structures and the analysis of values. In H. C. Triandis (Ed.), The analysis of subjective culture (pp.181-261). New York: John Wiley & Sons.
- Tversky, B., & Hemenway, K. (1983). Categories of environmental scenes. Cognitive Psychology, 15, 121-149.
- Watson, J. B. (1924). Hereditary modes of response: Emotion. In Psychology from the standpoint of a behaviorist (2nd ed., pp.194-230). Philadelphia: Lippincott.
- Weeks, D. G., Michela, J. L., Peplau, L. A., & Bragg, M. E.

- (1980). Relation between loneliness and depression: A structural equation analysis. Journal of Personality and Social Psychology, 39, 1238-1244.
- Wish, M., Deutsch, M., & Kaplan, S.J. (1976). Perceived dimensions of interpersonal relationships. Journal of Personality and Social Psychology, 33, 409-420.
- Wittgenstein, L. (1953). Philosophical investigations. New York: Macmillan.

Table 1

Free Listing of Features of Love and Commitment

LOVE		COMMITMENT	
<u>Feature</u>	<u>% Ss</u>	<u>Feature</u>	<u>% Ss</u>
*caring	43.75	perservance	34.83
happiness	29.17	*responsibility	28.09
want to be with other	28.13	living up to your word	23.60
friendship	22.92	*devotion	21.35
feel free to talk about		faithfulness	19.10
anything	19.79	obligation	17.98
warm feelings	16.67	*sacrifice	15.73
accept other the way s/he is	15.63	*honesty	14.61
*trust	14.58	love	14.61
commitment	13.54	*trust	13.48
*sharing	13.54	*helping	12.36
*think about the other all		*loyalty	12.36
the time	13.54	a promise	12.36
*sacrifice	13.54	"being there" for the other	
understanding	12.50	in good and bad times	11.24
*honesty	11.46	mutual agreement	11.24
*respect	11.46	*caring	10.11
*contentment	10.42	give your best effort	10.11
euphoria	10.42	*put other first	8.99
*put other first	9.38	*respect	8.99
sexual passion	9.38	*attachment	7.87
*supportiveness	9.38	attention focussed on other	6.74
*attachment	8.33	*concern for the other's well-	
closeness	8.33	being	6.74
*concern for the other's well-		*giving	6.74
being	8.33	*longlasting	6.74
empathy	8.33	reliable	6.74
heart rate increases	8.33	*sharing	6.74
*helping	8.33	work toward common goals	5.62
feel good about self	7.29	conscious decision	4.49
forgiveness	7.29	feel trapped	4.49
have a lot in common	7.29	giving and taking	4.49
miss other when apart	7.29	hard work	4.49
feel relaxed with other	6.25	*supportiveness	4.49
*giving	6.25	working out problems	4.49
*liking	6.25	a high priority	3.37
*security	6.25	*liking	3.37
unconditional	6.25	*security	3.37
interest in the other	5.21	*think about other all the	
intimacy	5.21	time	3.37
laughing	5.21	*affection	2.25
*loyalty	5.21	*contentment	2.25
*physical attraction	5.21	maturity	2.25
uncertainty	5.21		
*affection	4.17		

Table 1 (continued)

Free Listing of Features of Love and Commitment

LOVE

<u>Feature</u>	<u>% Sa</u>
butterflies in stomach	4.17
compassion	4.17
dependency	4.17
do things for other	4.17
excitement	4.17
kind	4.17
other is important	4.17
positive outlook	4.17
*responsibility	4.17
see only other's good	
qualities	4.17
touching	4.17
*devotion	3.13
energy	3.13
gazing at other	3.13
mutual	3.13
need each other	3.13
openness	3.13
patient	3.13
protectiveness	3.13
scary	3.13
sexual appeal	3.13
wonderful feelings	3.13
admiration	2.08
comfort	2.08
want best for other	2.08
*longlasting	2.08

Note: Percentages based on 96 protocols for love; 89 protocols for commitment.

* indicates features shared by love and commitment

Table 2

Centrality Ratings as a Function of Form of Questionnaire

CONCEPT	FEATURE	MEAN RATING			<u>F</u>
Love	mutual	5.27(FS)	6.00(FL)	6.00(FL)	1.65*
Love	loyalty	7.18(LS)	6.92(ML)	6.92(LL)	.45*
Commitment	honesty		5.89(FL)	6.20(ML)	.54*
Commitment	"being there"		6.60(ML)	6.44(LL)	.17*
	for other in good and bad times				

* $p > .10$.

Note: FS = First Item on Short Form of the Questionnaire

LS = Last Item on Short Form of the Questionnaire

FL = First Item on the Long Form of the Questionnaire

ML = Middle Item on the Long Form of the Questionnaire

LL = Last Item on the Long Form of the Questionnaire

Table 3

Mean Centrality Ratings of the Features of Love and Commitment

LOVE		COMMITMENT	
<u>Feature</u>	<u>Rating</u>	<u>Feature</u>	<u>Rating</u>
trust	7.500	loyalty	6.724
caring	7.284	responsibility	6.605
honesty	7.176	living up to your word	6.566
friendship	7.081	faithfulness	6.553
respect	7.014	trust	6.539
concern for the other's well-being	7.000	"being there" for the other	
loyalty	7.000	in good and bad times	6.526
commitment	6.919	devotion	6.421
accept other they way s/he is	6.824	reliable	6.342
supportiveness	6.784	give best effort	6.276
want to be with the other	6.784	supportiveness	6.263
interest in the other	6.689	perseverance	6.118
affection	6.676	concern about the other's well-being	6.066
closeness	6.649	honesty	6.053
understanding	6.608	love	6.053
sharing	6.581	respect	6.039
want best for other	6.581	caring	6.013
forgiveness	6.554	a high priority	5.908
intimacy	6.527	giving	5.882
other is important	6.459	a promise	5.776
openness	6.392	obligation	5.750
feel relaxed with other	6.365	sacrifice	5.711
liking	6.338	sharing	5.711
compassion	6.311	hard work	5.658
devotion	6.284	helping	5.618
giving	6.230	working out problems	5.618
happiness	6.216	conscious decision	5.408
feel free to talk about anything	6.189	attachment	5.382
do things for the other	6.135	liking	5.382
feel good about self	6.068	giving and taking	5.355
responsibility	6.041	maturity	5.289
warm feelings	6.041	longlasting	5.250
patience	6.000	mutual agreement	5.237
longlasting	6.000	work toward common goals	5.224
miss other when apart	5.986	affection	5.197
comfort other	5.946	put other first	4.987
attachment	5.892	attention focussed on other	4.961
sex appeal	5.865	contentment	4.645
touching	5.824	security	4.592
sexual passion	5.811	think about other all the time	3.829
need each other	5.797	feel trapped	2.487
mutual	5.784		
contentment	5.770		
put other first	5.703		
unconditional	5.689		

Table 3 (continued)

Mean Centrality Ratings of the Features of Love and Commitment

LOVE

<u>Feature</u>	<u>Rating</u>
wonderful feelings	5.622
physical attraction	5.581
laughing	5.473
sacrifice	5.432
helping	5.419
empathy	5.351
admiration	5.311
positive outlook	5.284
kind	5.135
protectiveness	5.108
have a lot in common	5.108
excitement	5.027
security	4.986
think about the other all the time	4.446
energy	4.284
heart rate increases	4.257
euphoria	4.122
gazing at the other	4.095
see only the other's good qualities	3.446
butterflies in stomach	3.405
uncertainty	2.878
dependency	2.811
scary	2.284

Note: Ratings made on a scale where 1=extremely poor feature of love [commitment] and 8=extremely good feature of love [commitment].

Table 4
Memory for Central and Peripheral Features

LOVE ATTRIBUTES

Group One Acquisition Items; Group Two False Recognition Items

Central

caring
interest in the other
accept the other the way s/he is
want to be with the other
affection
devotion
giving
do things for other
feel good about self
longlasting

Peripheral

touching
need each other
unconditional
laughing
sacrifice
excitement
kindness
uncertainty
miss other when apart
contentment

Group Two Acquisition Items; Group One False Recognition Items

Central

friendship
compassion
forgiveness
concern for each other
intimacy
closeness
patience
happiness
understanding
honesty

Peripheral

sexual passion
energy
physical attraction
admiration
positive outlook
gazing at each other
mutual
have a lot in common
think about the other
comfort the other

Table 4 (continued)

COMMITMENT ATTRIBUTES

Group One Acquisition Items; Group Two False Recognition Items

Central

responsibility
 a promise
 supportiveness
 respect
 faithfulness
 perserverance
 live up to your word
 trust
 caring
 "being there" for the other

Peripheral

affection
 maturity
 liking
 sharing
 contentment
 mutual agreement
 work toward common goals
 sacrifice
 conscious decision
 put other first

Group Two Acquisition Items; Group One False Recognition Items

Central

honesty
 perserverance
 concern for the other
 loyalty
 a high priority
 reliable
 giving
 obligation
 give best effort
 devotion

Peripheral

hard work
 think about the other
 security
 helping
 giving and taking
 feel trapped
 longlasting
 attention focussed on the other
 working out problems
 attachment

Note: There are only 20 central commitment items, and one of these items is "love", which was not an appropriate acquisition item. Thus one of Group One's acquisition items, "perserverance", was randomly selected for Group Two, to replace "love".

Table 5

Mean Peculiarity Ratings of the Features of Love and Commitment

LOVE		COMMITMENT	
<u>Feature</u>	<u>Rating</u>	<u>Feature</u>	<u>Rating</u>
trust	5.20	loyalty	5.55
caring	5.45	responsibility	5.50
honesty	5.60	living up to your word	4.50
friendship	3.70	faithfulness	5.50
respect	5.80	trust	6.00
concern for the other's well-being	4.15	"being there" for the other	
loyalty	5.10	in good and bad times	5.10
commitment	5.00	devotion	6.20
accept other they way s/he is	4.75	reliable	4.25
supportiveness	5.30	give best effort	4.60
want to be with the other	6.65	supportiveness	4.85
interest in the other	5.95	perseverance	4.70
affection	3.15	concern about the other's well-being	5.25
closeness	5.15	honesty	5.30
understanding	4.15	love	6.30
sharing	5.10	respect	4.90
want best for other	5.55	caring	6.30
forgiveness	4.40	a high priority	4.95
intimacy	5.20	giving	4.40
other is important	5.60	a promise	4.20
openness	4.70	obligation	3.45
feel relaxed with other	5.80	sacrifice	4.00
liking	6.10	sharing	5.10
compassion	3.90	hard work	4.40
devotion	4.65	helping	4.05
giving	4.00	working out problems	4.25
happiness	5.20	conscious decision	4.30
feel free to talk about anything	4.50	attachment	4.35
do things for the other	5.20	liking	6.10
feel good about self	4.10	giving and taking	4.70
responsibility	5.15	maturity	4.45
warm feelings	5.15	longlasting	5.55
patience	4.20	mutual agreement	4.10
longlasting	5.25	work toward common goals	4.05
miss other when apart	3.85	affection	5.55
comfort other	5.05	put other first	4.55
attachment	5.75	attention focussed on other	4.55
sex appeal	3.00	contentment	4.85
touching	4.95	security	4.20
sexual passion	3.05	think about other all the time	5.15
need each other	3.70	feel trapped	2.35
mutual	4.00		
contentment	5.25		
put other first	5.00		
unconditional	3.80		

Table 5 (continued)

Mean Peculiarity Ratings of the Features of Love and Commitment

LOVE

<u>Feature</u>	<u>Rating</u>
wonderful feelings	4.55
physical attraction	3.90
laughing	3.85
sacrifice	6.15
helping	4.35
empathy	4.80
admiration	4.05
positive outlook	5.10
kind	4.70
protectiveness	3.00
have a lot in common	5.50
excitement	3.15
security	3.85
think about the other all the	
time	4.95
energy	2.85
heartrate increases	3.70
euphoria	3.30
gazing at the other	3.55
see only the other's good	
qualities	5.60
butterflies in stomach	3.30
uncertainty	3.35
dependency	2.45
scary	2.90

Note: Ratings made on a scale where 1=extremely natural sounding and 7=extremely peculiar sounding.

Table 6
Types of Relationships

LOVE RELATIONSHIPS

High

- husband and wife
- an engaged couple
- marriage after a long courtship
- a middle-aged child caring for his/her elderly parent because s/he want to

Medium High

- close friends
- short, mutual first love
- a long, involved "going steady" relationship at school
- the continuation of a once personal relationship by letters and phone call from overseas

Medium Low

- a high school dating relationship that breaks up once the couple has gone away to college
- an irregular, occasional dating relationship for mutual entertainment between two young people
- a short, emotional holiday affair
- a school affair between teacher and pupil

Low

- salesperson and regular customer
- a one-night sexual encounter
- interviewer and job applicant
- political opponents

Table 6 (continued)

COMMITMENT RELATIONSHIPS

High

- parent and young child
- husband and wife
- an engaged couple
- a marriage of 25 years

Medium High

- a permanent but nonsexual relationship between two young religious people
- psychotherapist and patient
- a long, involved "going steady" relationship at school
- a boy/girlfriend living together after several months of dating

Medium Low

- a steady relationship where each goes out with members of the opposite sex
- a mainly sexual relationship with an older and more experienced person
- a salesperson and regular customer
- a "going steady" relationship maintained mainly to impress peers

Low

- interviewer and job applicant
- verbal and physical flirting at a party, without follow-up
- a one-night sexual encounter
- personal enemies

Table 7

Mean Impact Ratings of Violations of the Features of
Love and Commitment

LOVE		COMMITMENT	
<u>Feature</u>	<u>Rating</u>	<u>Feature</u>	<u>Rating</u>
trust	7.519	loyalty	7.333
caring	7.630	responsibility	5.519
honesty	7.185	living up to your word	7.189
friendship	7.133	faithfulness	7.944
respect	7.148	trust	8.037
concern for the other's well-being	7.741	"being there" for the other in good and bad times	7.367
loyalty	6.714	devotion	6.407
commitment		reliable	6.822
accept other they way s/he is	7.933	give best effort	6.800
supportiveness	6.481	supportiveness	6.444
want to be with the other	8.767	perseverance	5.667
interest in the other	6.967	concern about the other's well-being	7.778
affection	7.222	honesty	8.037
closeness	7.133	love	
understanding	7.633	respect	7.519
sharing	6.111	caring	7.704
want best for other	7.433	a high priority	7.300
forgiveness	6.600	giving	5.926
intimacy	7.100	a promise	6.044
other is important	7.967	obligation	5.011
openness	7.833	sacrifice	5.074
feel relaxed with other	7.567	sharing	6.148
liking	7.593	hard work	3.033
compassion	5.667	helping	5.296
devotion	6.741	working out problems	7.078
giving	6.074	conscious decision	4.989
happiness	7.633	attachment	5.444
feel free to talk about anything	6.633	liking	7.593
do things for the other	6.933	giving and taking	7.056
feel good about self	6.500	maturity	5.911
responsibility	4.852	longlasting	7.370
warm feelings	7.367	mutual agreement	7.089
patience	6.000	work toward common goals	5.922
longlasting	6.481	affection	6.481
miss other when apart	6.000	put other first	6.519
comfort other	6.867	attention focussed on other	6.711
attachment	6.185	contentment	6.630
sex appeal	6.933	security	5.444
touching	7.200	think about other all the time	3.667
sexual passion	5.967	feel trapped	2.811
need each other	6.833		
mutual	7.200		
contentment	6.444		
put other first	6.259		
unconditional	5.867		

Table 7 (continued)

Mean Impact Ratings of Violations of the Features of
Love and Commitment

LOVE

<u>Feature</u>	<u>Rating</u>
wonderful feelings	6.667
physical attraction	6.500
laughing	6.167
sacrifice	4.593
helping	5.185
empathy	5.567
admiration	5.300
positive outlook	7.200
kind	7.200
protectiveness	4.267
have a lot in common	6.667
excitement	6.167
security	5.556
think about the other all the time	4.630
energy	5.067
heart rate increases	4.100
euphoria	4.500
gazing at the other	4.633
see only the other's good qualities	3.533
butterflies in stomach	3.867
uncertainty	3.367
dependency	3.433
scary	2.800

Note: Ratings were made on a scale where 1=not at all likely that this event will decrease love [commitment] to 9=extremely likely that this event will decrease love [commitment].

Table 8
Correlations Among Measures of the Prototype Structure of the
Concepts of Love and Commitment

LOVE

	1	2	3	4
1. Centrality Ratings		.35**	.52***	.85***
2. Frequency of Free Listing	.38***		.31**	.31**
3. Peculiarity Ratings	.49***	.32**		.51***
4. Impact of Violations	.74***	.20*	.48***	

COMMITMENT

	1	2	3	4
1. Centrality Ratings		.52***	.55***	.58***
2. Frequency of Free Listing	.67***		.18	.09
3. Peculiarity Ratings	.44**	.14		.58***
4. Impact of Violations	.42**	.17	.59***	

* $p < .05$ ** $p < .005$ *** $p < .001$

Note: Correlations above the diagonal based on raw scores; correlations below the diagonal based on ranks.

Figure 1. Relation between the concepts of love and commitment.

}

MONEY(1981) **SOLOMON(1981)** **KELLEY(1983)** **STERNBERG(1986)**

Figure 2. Number of features generated for love and for commitment.

Figure 3. Applicability of central and peripheral features to types of loving relationships.

LOVE

Figure 4. Applicability of central and peripheral features to types of committed relationships.

COMMITMENT

Appendix A

The questionnaires used in Study One varied in terms of the type of example given (extraversion/terror) and whether subjects were asked to list features for love and commitment, or for only one of these concepts. The sample questionnaires included here illustrate each example used. The first questionnaire contains the love and commitment instructions; the second questionnaire contains the instructions used to elicit only the features of one concept (in this case, commitment).

Love and commitment are members of a large class of global concepts that researchers have found useful in characterizing interpersonal relationships. This is a simple study to find out the characteristics and attributes of these two concepts. For example, if you were asked to list the characteristics of the concept, extraversion, you might write:

- liveliness
- sociability
- lots of energy
- impulsivity
- friendliness
- outgoingness
- boldness
- enthusiasm
- self-confidence
- vivaciousness
- high activity level
- eagerness
- not afraid to take a dare
- can be domineering
- exuberance
- talkativeness
- joking around

When thinking about love or commitment, 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 you're explaining the meaning of the word love or commitment to a foreigner or to someone who has never experienced it. So 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 "love" makes you think of your granny Smith, don't write "Granny Smith". We're interested in what is common to instances of love and commitment.

Please remember that participation in this study is voluntary, and that you are free to withdraw at any time without fear of prejudicial actions or repercussions. If you complete this questionnaire, I will assume that you have given your consent to participating in this study.

Thank you for your participation. Your response is helpful and will be useful in guiding our research.

____Age

____Female

____Male

Please describe what LOVE is. Try to be as specific as you can.
List as many features as you can think of, but don't take more than
about three minutes to complete the task.

Please describe what COMMITMENT is. Try to be as specific as you can. List as many features as you can think of, but don't take more than about three minutes to complete the task.

Finally, think about what love and commitment mean in relation to one another. In what ways are they similar? In what ways are they different? Take a few minutes to write down whatever thoughts come to mind.

Commitment is a concept that researchers have found useful in characterizing interpersonal relationships. This is a simple study to find out the characteristics and attributes of commitment. For example, if you were asked to list the characteristics of the concept, terror, you might write:

--possible danger occurs--may be real like a bear; may be imaginary like a ghost

--attention is focused on the threat

--heart beats quickly

--eyes open wider

--eyebrows lift

--palms and soles sweat

--thoughts race through the person's mind

--unpleasant sensations are experienced

--the person runs as fast as they can

--hands tremble

--relief is experienced after a few minutes

When thinking about commitment, 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 you're explaining the meaning of the word commitment to a foreigner or to someone who has never experienced it. So 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 "commitment" makes you think of your partner, don't write your partner's name. We're interested in what is common to instances of commitment.

Please remember that participation in this study is voluntary, and that you are free to withdraw at any time without fear of prejudicial actions or repercussions. If you complete this questionnaire, I will assume that you have given your consent to participating in this study.

Thank you for your participation. Your response is helpful and will be useful in guiding our research.

____ Age

____ Female

____ Male

Appendix B

Summary Table of the Analysis of Variance on Judges' Ratings of Script vs. Attribute-List

SOURCE OF VARIATION	BY		SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
	CONCEPT	EXAMPLE INSTRUCT					
MAIN EFFECTS			1.538	3	0.513	0.272	0.845
CONCEPT			0.037	1	0.037	0.020	0.889
EXAMPLE			1.478	1	1.478	0.786	0.377
INSTRUCT			0.025	1	0.025	0.013	0.908
2-WAY INTERACTIONS			5.872	3	1.957	1.040	0.376
CONCEPT EXAMPLE			0.632	1	0.632	0.336	0.563
CONCEPT INSTRUCT			0.605	1	0.605	0.322	0.571
EXAMPLE INSTRUCT			4.717	1	4.717	2.507	0.115
3-WAY INTERACTIONS			1.834	1	1.834	0.975	0.325
CONCEPT EXAMPLE INSTRUCT			1.834	1	1.834	0.975	0.325
EXPLAINED			9.244	7	1.321	0.702	0.670
RESIDUAL			333.034	177	1.882		
TOTAL			342.278	184	1.860		

Appendix C

This appendix contains the centrality ratings questionnaires used in Study Two. The first questionnaire presents the features of love, followed by the version in which the features were listed in reverse order. The next two pages consist of the versions of the love questionnaire in which subjects rated only half of the love attributes. This is followed by the commitment questionnaire. Finally, the last page shows the version in which the commitment attributes were presented in reverse order.

LOVE QUESTIONNAIRE

The purpose of this questionnaire is to discover which features of LOVE are most characteristic of the concept and which features are least characteristic. In an earlier experiment, subjects were given the concept "LOVE", and were asked to list all the attributes or features they could think of in a few minutes. On the next page, you will see the features that were listed. The fact that each of the attributes was listed by someone in our previous study indicates that each attribute probably is, to some degree, a part of LOVE. Nevertheless, some of the features clearly seem more central to, or more important in, love than others.

For example, if given a list of attributes for the concept of INTELLIGENCE, features like "having a high I.Q." or "getting straight A's in university" are probably good features. A feature like "ability to solve problems" is probably a moderately good feature. Features like "find it easy to fill out income tax forms" or "good at telling jokes" might be considered poorer features of intelligence. Note that while it's possible that most intelligent people can tell jokes extremely well, this feature probably is not most central when you think about what the concept of intelligence means.

For each of the features on the next page, we would like you to think about what the concept of LOVE means, and ask yourself: "How central is this feature to love?" Then rate how good or poor that feature is using an 8 point scale where 1=extremely poor feature of love, and 8=extremely good feature of love. Please try to use the entire scale when making your ratings--we're interested in discovering the relative importance of each of the features to the concept of love.

If you complete this questionnaire, I will assume that you have given your consent to participating in the study.

Thank you very much for your help.

1	2	3	4	5	6	7	8
extremely	very	moderately	slightly	slightly	moderately	very	extremely
poor feature				:	good feature		

☐ mutual	☐ feel free to talk about anything
☐ unconditional	☐ sharing
☐ sacrifice	☐ caring
☐ responsibility	☐ concern for the other's well-being
☐ attachment	☐ euphoria
☐ friendship	☐ butterflies in stomach
☐ devotion	☐ dependency
☐ commitment	☐ thinking about the other all the time
☐ trust	☐ liking
☐ honesty	☐ happiness
☐ contentment	☐ want to be with the person
☐ energy	☐ respect
☐ intimacy	☐ putting the other first
☐ supportiveness	☐ missing the person when not together
☐ compassion	☐ touching
☐ affection	☐ laughing
☐ forgiveness	☐ gazing at the other
☐ openness	☐ sexual appeal
☐ patience	☐ scary
☐ excitement	☐ warm feelings
☐ giving	☐ heartrate increases
☐ security	☐ empathy
☐ protectiveness	☐ feel relaxed with other

1	2	3	4	5	6	7	8
extremely	very	moderately	slightly	slightly	moderately	very	extremely
poor feature				:	good feature		

☐ accepting the person the way s/he is	☐ understanding
☐ have alot in common	☐ closeness.
☐ doing things to make the other happy	☐ needing each other
☐ positive outlook	☐ sexual passion
☐ other is very important	☐ comfort
☐ makes you feel good about yourself	☐ interest in the other
☐ admiration	☐ longlasting
☐ want best for the other	☐ physical attraction
☐ uncertainty	☐ helping
☐ kind	☐ wonderful feelings
☐ seeing only the person's good qualities	☐ loyalty

☐ your age

☐ female

☐ male

1 2 3 4 5 6 7 8
 extremely very moderately slightly slightly moderately very extremely
 poor feature good feature

_____ feel free to talk about anything	_____ mutual
_____ sharing	_____ unconditional
_____ caring	_____ sacrifice
_____ concern for the other's well-being	_____ responsibility
_____ euphoria	_____ attachment
_____ butterflies in stomach	_____ friendship
_____ dependency	_____ devotion
_____ thinking about the other all the time	_____ commitment
_____ liking	_____ trust
_____ happiness	_____ honesty
_____ want to be with the person	_____ contentment
_____ respect	_____ energy
_____ putting the other first	_____ intimacy
_____ missing the person when not together	_____ supportiveness
_____ touching	_____ compassion
_____ laughing	_____ affection
_____ gazing at the other	_____ forgiveness
_____ sexual appeal	_____ openness
_____ scary	_____ patience
_____ warm feelings	_____ excitement
_____ heartrate increases	_____ giving
_____ empathy	_____ security
_____ protectiveness	_____ feel relaxed with other

1	2	3	4	5	6	7	8
extremely	very	moderately	slightly	slightly	moderately	very	extremely
poor feature					good feature		

_____ mutual	_____ openness
_____ unconditional	_____ patience
_____ sacrifice	_____ excitement
_____ responsibility	_____ giving
_____ attachment	_____ security
_____ friendship	_____ protectiveness
_____ devotion	_____ feel free to talk about anything
_____ commitment	_____ sharing
_____ trust	_____ caring
_____ honesty	_____ concern for the other's well-being
_____ contentment	_____ euphoria
_____ energy	_____ butterflies in stomach
_____ intimacy	_____ dependency
_____ supportiveness	_____ thinking about the other all the time
_____ compassion	_____ liking
_____ affection	_____ happiness
_____ forgiveness	_____ want to be with the person

_____ your age
_____ female
_____ male

1	2	3	4	5	6	7	8
extremely	very	moderately	slightly	slightly	moderately	very	extremely
poor feature					good feature		

☐ respect	☐ makes you feel good about yourself
☐ putting the other first	☐ admiration
☐ missing the person when not together	☐ want best for the other
☐ touching	☐ uncertainty
☐ laughing	☐ kind
☐ gazing at the other	☐ seeing only the person's good qualities
☐ sexual appeal	☐ understanding
☐ scary	☐ closeness
☐ warm feelings	☐ needing each other
☐ heartrate increases	☐ sexual passion
☐ empathy	☐ comfort
☐ feel relaxed with other	☐ interest in the other
☐ accepting the person the way s/he is	☐ longlasting
☐ have alot in common	☐ physical attraction
☐ doing things to make the other happy	☐ helping
☐ positive outlook	☐ wonderful feelings
☐ other is very important	☐ loyalty

_____ your age
_____ female
_____ male

COMMITMENT QUESTIONNAIRE

The purpose of this questionnaire is to discover which features of COMMITMENT are most characteristic of the concept and which features are least characteristic. In an earlier experiment, subjects were given the concept "COMMITMENT" and were asked to list all the attributes or features they could think of in a few minutes. On the next page, you will see the features that were listed. The fact that each of the attributes was listed by someone in our previous study indicates that each attribute probably is, to some degree, a part of COMMITMENT. Nevertheless, some of the features clearly seem more central to, or more important in, commitment than others.

For example, if given a list of attributes for the concept of INTELLIGENCE, features like "having a high I.Q." or "getting straight A's in university" are probably good features. A feature like "ability to solve problems" is probably a moderately good feature. Features like "find it easy to fill out income tax forms" or "good at telling jokes" might be considered poorer features of intelligence. Note that while it's possible that most intelligent people can tell jokes extremely well, this feature probably is not most central when you think about what the concept of intelligence means.

For each of the features on the next page, we would like you to think about what the concept of COMMITMENT means, and ask yourself: "How central is this feature to commitment?" Then rate how good or poor that feature is using an 8 point scale where 1=extremely poor feature of commitment, and 8=extremely good feature of commitment. Please try to use the entire scale when making your ratings--we're interested in discovering the relative importance of each of the features to the concept of commitment.

If you complete this questionnaire, I will assume that you have given your consent to participating in the study.

Thank you very much for your help.

1 2 3 4 5 6 7 8
 extremely very moderately slightly slightly moderately very extremely
 poor feature good feature

☐ concern for the other's well-being	☐ honesty
☐ reliable	☐ sharing
☐ feeling trapped	☐ trust
☐ faithfulness	☐ sacrifice
☐ giving	☐ liking
☐ mutual agreement	☐ hard work
☐ loyalty	☐ perseverance
☐ living up to your word	☐ a high priority
☐ putting the other first	☐ devotion
☐ responsibility	☐ a promise
☐ giving your best effort	☐ respect
☐ attention is focused on the other	☐ supportiveness
☐ working out problems	☐ attachment
☐ love	☐ helping
☐ maturity	☐ caring
☐ working towards common goals	☐ obligation
☐ longlasting	☐ affection
☐ think about the other all the time	☐ contentment
☐ giving and taking	☐ conscious decision
☐ "being there for the other in good and bad times	☐ security
☐ your age	
☐ female	
☐ male	

1	2	3	4	5	6	7	8
extremely	very	moderately	slightly	slightly	moderately	very	extremely
poor feature					good feature		

☐ honesty	☐ concern for the other's well-being
☐ sharing	☐ reliable
☐ trust	☐ feeling trapped
☐ sacrifice	☐ faithfulness
☐ liking	☐ giving
☐ hard work	☐ mutual agreement
☐ perseverance	☐ loyalty
☐ a high priority	☐ living up to your word
☐ devotion	☐ putting the other first
☐ a promise	☐ responsibility
☐ respect	☐ giving your best effort
☐ supportiveness	☐ attention is focused on the other
☐ attachment	☐ working out problems
☐ helping	☐ love
☐ caring	☐ maturity
☐ obligation	☐ working towards common goals
☐ affection	☐ longlasting
☐ contentment	☐ think about the other all the time
☐ conscious decision	☐ giving and taking
☐ security	☐ "being there" for the other in good and bad times
☐ your age	
☐ female	
☐ male	

Appendix D

Summary Table of the Analysis of Variance on Centrality Ratings of Love Features Across Questionnaires

SOURCE OF VARIATION	RATING BY ORDER		SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS			0.238	2	0.119	0.271	0.763
ORDER			0.238	2	0.119	0.271	0.763
EXPLAINED			0.238	2	0.119	0.271	0.763
RESIDUAL			31.193	71	0.439		
TOTAL			31.431	73	0.431		

Summary Table of the Analysis of Variance on Centrality Ratings of Commitment Features Across Questionnaires

SOURCE OF VARIATION	BY RATING ORDER		SUM OF SQUARES	DF	MEAN SQUARE	F	SIGNIF OF F
MAIN EFFECTS			0.065	1	0.065	0.117	0.733
ORDER			0.065	1	0.065	0.117	0.733
EXPLAINED			0.065	1	0.065	0.117	0.733
RESIDUAL			41.104	74	0.555		
TOTAL			41.169	75	0.549		

Summary Table of the Analysis of Variance on Centrality Ratings of Shared vs Unique Attributes

BETWEEN SUBJECT FACTORS ARE:

A - CONCEPT : 1 love , 2 commit

WITHIN SUBJECT FACTORS ARE:

B - ATTRIB : 1 SHARED , 2 UNIQUE

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	4.903	1.	4.903	5.145	0.025
S-WITHIN	141.043	148.	0.953		
B	10.358	1.	10.358	86.066	0.001
AB	9.004	1.	9.004	74.810	0.001
BS-WITHIN	17.813	148.	0.120		

Appendix E

This appendix contains the experimental materials for Study Three. First, a sample of the statements booklet is included. The first page depicts a sample love statement; the second page a sample commitment statement. The booklet labeled "QUESTIONNAIRE 1" consists of the interference task instructions, followed by the recall memory instructions. The booklet labeled "QUESTIONNAIRE 2" contains the recognition memory statements for love. This is followed by the recognition memory statements for commitment.

STATEMENTS

Chris and Pat's relationship is characterized by contentment.

PLEASE DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO

Chris and Pat's relationship is characterized by giving and taking.

PLEASE DO NOT TURN THE PAGE UNTIL INSTRUCTED TO DO SO

QUESTIONNAIRE 1

On this page, take a few minutes to list as many of the Canadian provinces as you can, in alphabetical order.

On this page, write down as many of the statements presented in the booklet about Chris and Pat's relationship as you can remember. Be as accurate as possible, but don't leave out any statements just because you can't remember the exact wording.

QUESTIONNAIRE 2

Below is a series of statements that you may or may not have seen in the booklet of statements you read earlier. For each statement, circle "YES" if you think the statement appeared in the booklet and "NO" if you think the statement was not in the booklet. Then indicate how confident you are that you did or did not see the statement, using a scale of 1 to 4, where 1=not at all confident and 4=very confident.

	DID YOU SEE THIS STATEMENT?		HOW CONFIDENT ARE YOU?			
	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by devotion.						
Chris and Pat's relationship is characterized by compassion.						
Chris and Pat's relationship is characterized by laughing.						
Chris and Pat's relationship is characterized by honesty.						
Chris and Pat's relationship is characterized by sacrifice.						
Chris and Pat's relationship is characterized by intimacy.						
Chris and Pat's relationship is characterized by touching.						
Chris and Pat's relationship is characterized by gazing at each other.						
Chris and Pat's relationship is characterized by giving.						
Chris and Pat's relationship is characterized by feeling good about themselves.						
Chris and Pat's relationship is characterized by sexual passion.						
Chris and Pat's relationship is characterized by a positive outlook.						
Chris and Pat's relationship is characterized by thinking about each other.						
Chris and Pat's relationship is characterized by needing each other.						
Chris and Pat's relationship is characterized by concern for each other.						
Chris and Pat's relationship is characterized by energy.						

	DID YOU SEE THIS STATEMENT?		HOW CONFIDENT ARE YOU?			
Chris and Pat's relationship is characterized by kindness.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by admiration.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by accepting the other as s/he is.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by understanding.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by closeness.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by contentment.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized as mutual.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized as unconditional.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by forgiveness.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by physical attraction.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by wanting to be with each other.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by comforting each other.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by happiness.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by uncertainty.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by patience.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by excitement.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by missing each other when apart.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by affection.	YES	NO	1	2	3	4

	DID YOU SEE THIS STATEMENT?		HOW CONFIDENT ARE YOU?			
	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by having alot in common.						
Chris and Pat's relationship is characterized by friendship.						
Chris and Pat's relationship is characterized as longlasting.						
Chris and Pat's relationship is characterized by caring.						
Chris and Pat's relationship is characterized by interest in each other.						
Chris and Pat's relationship is characterized by doing things for each other.						

Below is a series of statements that you may or may not have seen in the booklet of statements you read earlier. For each statement, circle "YES" if you think the statement appeared in the booklet and "NO" if you think the statement was not in the booklet. Then indicate how confident you are that you did or did not see the statement, using a scale of 1 to 4, where 1=not at all confident and 4=very confident.

	DID YOU SEE THIS STATEMENT?		HOW CONFIDENT ARE YOU?			
	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by honesty.						
Chris and Pat's relationship is characterized by perseverance.						
Chris and Pat's relationship is characterized by concern for each other.						
Chris and Pat's relationship is characterized by sacrifice.						
Chris and Pat's relationship is characterized by maturity.						
Chris and Pat's relationship is characterized by contentment.						
Chris and Pat's relationship is characterized by devotion.						
Chris and Pat's relationship is characterized by working toward common goals.						
Chris and Pat's relationship is characterized by respect.						
Chris and Pat's relationship is characterized by attachment.						
Chris and Pat's relationship is characterized by responsibility.						
Chris and Pat's relationship is characterized by caring.						
Chris and Pat's relationship is characterized by thinking about each other.						
Chris and Pat's relationship is characterized by loyalty.						
Chris and Pat's relationship is characterized by obligation.						
Chris and Pat's relationship is characterized by love.						

	DID YOU SEE THIS STATEMENT?		HOW CONFIDENT ARE YOU?			
	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by faithfulness.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by security.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by trust.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by being reliable.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by helpfulness.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized as a promise.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized as a high priority.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by liking.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized as a conscious decision.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by feeling trapped.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by living up to their word.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by sharing.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by giving.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by giving their best effort.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by putting each other first.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by supportiveness.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by "being there" for each other.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized as a mutual agreement.	YES	NO	1	2	3	4

	DID YOU SEE THIS STATEMENT?		HOW CONFIDENT ARE YOU?			
Chris and Pat's relationship is characterized by focussing attention on each other.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by affection.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by working out problems.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized by giving and taking.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized as longlasting.	YES	NO	1	2	3	4
Chris and Pat's relationship is characterized as hard work.	YES	NO	1	2	3	4

Appendix F

Summary Table of the Analysis of Variance for Recognition Memory for Features of Love

BETWEEN SUBJECT FACTORS ARE:

A - GROUP : 1 , 2

WITHIN SUBJECT FACTORS ARE:

B - ATTRIB : 1 CENTRAL , 2 PERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	0.081	1.	0.081	0.018	0.895
S-WITHIN	266.352	58.	4.592		
B	0.212	1.	0.212	0.127	0.723
AB	15.403	1.	15.403	9.221	0.004
BS-WITHIN	96.883	58.	1.670		

Summary Table of the Analysis of Variance for Recognition Memory for Features of Commitment

BETWEEN SUBJECT FACTORS ARE:

A - GROUP : 1 , 2

WITHIN SUBJECT FACTORS ARE:

B - ATTRIB : 1 CENTRAL , 2 PERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	9.075	1.	9.075	3.409	0.070
S-WITHIN	154.418	58.	2.662		
B	1.008	1.	1.008	0.609	0.438
AB	0.408	1.	0.408	0.246	0.621
BS-WITHIN	96.086	58.	1.657		

Summary Table of the Analysis of Variance for False Recognition Memory for Features of Love

BETWEEN SUBJECT FACTORS ARE:

A - GROUP : 1 , 2

WITHIN SUBJECT FACTORS ARE:

B - : 1 FCENTRAL , 2 FPERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	0.300	1.	0.300	0.070	0.792
S-WITHIN	248.667	58.	4.287		
B	168.033	1.	168.033	83.536	0.001
AB	0.300	1.	0.300	0.149	0.701
BS-WITHIN	116.667	58.	2.011		

Summary Table of the Analysis of Variance for False Recognition Memory for Features of Commitment

BETWEEN SUBJECT FACTORS ARE:

A - GROUP : 1 , 2

WITHIN SUBJECT FACTORS ARE:

B - : 1 FCENTRAL , 2 FPERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	1.008	1.	1.008	0.228	0.635
S-WITHIN	257.083	58.	4.432		
B	88.408	1.	88.408	48.336	0.001
AB	0.008	1.	0.008	0.005	0.947
BS-WITHIN	106.083	58.	1.829		

Summary Table of the Analysis of Variance for Recall Memory for Features of Love

BETWEEN SUBJECT FACTORS ARE:

A - GROUP : 1 , 2

WITHIN SUBJECT FACTORS ARE:

B - ATTRIB : 1 CENTRAL , 2 PERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	1.875	1.	1.875	0.804	0.374
S-WITHIN	135.217	58.	2.331		
B	21.675	1.	21.675	12.109	0.001
AB	29.008	1.	29.008	16.206	0.001
BS-WITHIN	103.817	58.	1.790		

Summary Table of the Analysis of Variance for Recall Memory for Features of Commitment

BETWEEN SUBJECT FACTORS ARE:

A - GROUP : 1 , 2

WITHIN SUBJECT FACTORS ARE:

B - ATTRIB : 1 CENTRAL , 2 PERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	1.200	1.	1.200	0.539	0.466
S-WITHIN	129.267	58.	2.229		
B	2.700	1.	2.700	1.702	0.197
AB	0.300	1.	0.300	0.189	0.665
BS-WITHIN	92.000	58.	1.586		

Summary Table of the Analysis of Variance for False Recall Memory for Features of Love

BETWEEN SUBJECT FACTORS ARE:

A - GROUP : 1 , 2

WITHIN SUBJECT FACTORS ARE:

B - ATTRIB : 1 FCENTRAL , 2 FPERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	0.033	1.	0.033	0.072	0.790
S-WITHIN	26.933	58.	0.464		
B	16.133	1.	16.133	32.416	0.001
AB	0.0	1.	0.0	0.0	0.999
BS-WITHIN	28.867	58.	0.498		

Summary Table of the Analysis of Variance for False Recall Memory for Features of Commitment

BETWEEN SUBJECT FACTORS ARE:

A - GROUP : 1 , 2

WITHIN SUBJECT FACTORS ARE:

B - ATTRIB : 1 FCENTRAL , 2 FPERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	3.675	1.	3.675	8.151	0.006
S-WITHIN	26.150	58.	0.451		
B	14.008	1.	14.008	34.403	0.001
AB	1.875	1.	1.875		
BS-WITHIN	23.617	58.	0.407	4.605	0.036

Appendix G

This appendix contains the instructions given to subjects in Study Four, followed by the five versions of the love questionnaire. Next, the three versions of the commitment questionnaire are presented.

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 containing hedges sound. Hedges are words like "sort of", "kind of", "somewhat" and so on. They serve as qualifiers in sentences. If it's not appropriate to use a qualifier, inserting a hedge in a sentence will yield a peculiar sounding sentence. For example, if told that Jane is an extrovert, the sentence "Jane is sort of outgoing" probably sounds rather peculiar to most people, because extroverts typically are outgoing--not just "sort of" outgoing. On the other hand, a sentence like "Jane is sort of impulsive", probably sounds rather natural, because extroverts can be impulsive, but aren't necessarily impulsive. Thus, the use of the hedge "sort of" is appropriate in this sentence.

In this study, we're not interested in sentences about extroverts. Rather, we are interested in how peculiar or natural sentences about interpersonal relationships sound. Below is a series of sentences about the relationship between two people who love each other, Chris and Pat. For some of these sentences, the use of a hedge is appropriate, and therefore the sentence sounds natural. For other sentences, the use of a hedge is inappropriate, resulting in a rather peculiar sounding sentence. Your task is to read each sentence to yourself and rate how peculiar or natural 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 response on your first impression from reading the sentence.

Thank you very much for your participation.

Given that you know Pat and Chris love each other, some of these sentences about their relationship will sound very peculiar with hedges in them, while others will sound very natural. Rate how peculiar or natural each sentence sounds using the following scale:

1	2	3	4	5	6	7
extremely						extremely
natural sounding						peculiar sounding

_____ Pat somewhat wants to be with Chris.

_____ Pat is kind of giving.

_____ Their relationship is sort of characterized by kindness.

_____ Pat is kind of committed to Chris.

_____ Pat kind of needs Chris.

_____ Pat sort of admires Chris.

_____ Pat sort of feels good about herself.

_____ Pat somewhat helps Chris.

_____ Pat kind of gazes at Chris.

_____ Pat sort of trusts Chris.

_____ Their relationship is characterized by being sort of responsible.

_____ Pat is somewhat physically attracted to Chris.

_____ Pat sort of shares with Chris.

_____ Their relationship is somewhat mutual.

Given that you know Pat and Chris love each other, some of these sentences about their relationship will sound very peculiar with hedges in them, while others will sound very natural. Rate how peculiar or natural each sentence sounds using the following scale:

1	2	3	4	5	6	7
extremely natural sounding						extremely peculiar sounding

_____ Pat kind of respects Chris.

_____ Pat feels sort of energetic.

_____ Pat kind of comforts Chris.

_____ Pat is sort of honest with Chris.

_____ Pat sort of understands Chris.

_____ Their relationship is somewhat characterized by wonderful feelings.

_____ Pat is somewhat intimate with Chris.

_____ Their relationship is somewhat characterized by touching.

_____ Pat sort of feels butterflies in his stomach.

_____ Pat kind of accepts Chris the way she is.

_____ Pat sort of likes Chris.

_____ Pat sort of has a lot in common with Chris.

_____ Pat somewhat does things for Chris.

_____ Their relationship is kind of exciting.

Given that you know Chris and Pat love each other, some of these sentences about their relationship will sound very peculiar with hedges in them, while others will sound very natural. Rate how peculiar or natural each sentence sounds using the following scale:

1	2	3	4	5	6	7
extremely						extremely
natural sounding						peculiar sounding

_____ Pat is sort of attached to Chris.

_____ Pat is somewhat happy in his relationship with Chris.

_____ Pat is kind of open with Chris.

_____ Pat feels sort of content in his relationship with Chris.

_____ Pat is sort of patient with Chris.

_____ Pat sees his relationship with Chris as kind of scary.

_____ Their relationship is somewhat characterized by friendship.

_____ Their relationship is sort of characterized by compassion.

_____ Their relationship is somewhat characterized by sexual passion.

_____ Pat feels sort of close to Chris.

_____ Their relationship is somewhat uncertain.

_____ Pat kind of misses Chris when they're apart.

_____ Pat is kind of concerned about Chris' well-being.

_____ Pat sees their relationship as sort of unconditional.

Given that you know Chris and Pat love each other, some of these sentences about their relationship will sound very peculiar with hedges in them, while others will sound very natural. Rate how peculiar or natural each sentence sounds using the following scale:

1	2	3	4	5	6	7
extremely natural sounding						extremely peculiar sounding

- _____ Pat sort of makes sacrifices for Chris.
- _____ Pat is sort of supportive of Chris.
- _____ Pat says that Chris is somewhat important to her.
- _____ Pat somewhat sees only Chris' good qualities.
- _____ Pat is sort of loyal to Chris.
- _____ Their relationship is somewhat characterized by sexual appeal.
- _____ Pat feels sort of euphoric.
- _____ Pat is somewhat affectionate with Chris.
- _____ Pat sort of forgives Chris.
- _____ Pat sort of puts Chris first.
- _____ Pat kind of cares for Chris.
- _____ Pat kind of thinks about Chris all the time.
- _____ Pat is kind of devoted to Chris.

Given that you know Chris and Pat love each other, some of these sentences about their relationship will sound very peculiar with hedges in them, while others will sound very natural. Rate how peculiar or natural each sentence sounds using the following scale:

1	2	3	4	5	6	7
extremely						extremely
natural sounding						peculiar sounding

_____ Pat is somewhat interested in Chris.

_____ Their relationship is sort of characterized by a positive outlook.

_____ Pat feels sort of relaxed with Chris.

_____ Pat feels kind of protective of Chris.

_____ Pat feels somewhat secure in his relationship with Chris.

_____ Pat feels sort of free to talk about anything.

_____ Their relationship is somewhat characterized by laughing.

_____ Pat kind of feels his heart rate increase when he's with Chris.

_____ Their relationship is characterized by somewhat warm feelings.

_____ Pat kind of wants the best for Chris.

_____ Pat is sort of dependent on Chris.

_____ Pat sees their relationship as kind of longlasting.

_____ Their relationship is kind of characterized by empathy.

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 containing hedges sound. Hedges are words like "sort of", "kind of", "somewhat" and so on. They serve as qualifiers in sentences. If it's not appropriate to use a qualifier, inserting a hedge in a sentence will yield a peculiar sounding sentence. For example, if told that Jane is an extravert, the sentence "Jane is sort of outgoing" probably sounds rather peculiar to most people, because extraverts typically are outgoing--not just "sort of" outgoing. On the other hand, a sentence like "Jane is sort of impulsive", probably sounds rather natural, because extraverts can be impulsive, but aren't necessarily impulsive. Thus, the use of the hedge "sort of" is appropriate in this sentence.

In this study, we're not interested in sentences about extraverts. Rather, we are interested in how peculiar or natural sentences about interpersonal relationships sound. Below is a series of sentences about the relationship between two people who are committed to each other, Chris and Pat. For some of these sentences, the use of a hedge is appropriate, and therefore the sentence sounds natural. For other sentences, the use of a hedge is inappropriate, resulting in a rather peculiar sounding sentence. Your task is to read each sentence to yourself and rate how peculiar or natural 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 response on your first impression from reading the sentence.

Thank you very much for your participation.

Given that you know Pat and Chris are committed to each other, some of these sentences about their relationship will sound very peculiar with hedges in them, while others will sound very natural. Rate how peculiar or natural each sentence sounds using the following scale:

1	2	3	4	5	6	7
extremely						extremely
natural sounding						peculiar sounding

- _____ Pat somewhat cares for Chris.
- _____ Their relationship is kind of characterized by maturity.
- _____ Pat sort of sees their relationship as a mutual agreement.
- _____ Pat feels kind of obligated to Chris.
- _____ Pat somewhat lives up to her word.
- _____ Pat feels somewhat content.
- _____ Pat is sort of supportive of Chris.
- _____ Their relationship is somewhat characterized by working out problems.
- _____ Pat and Chris sort of work toward common goals.
- _____ Pat is sort of concerned about Chris' well-being.
- _____ Pat is sort of reliable.
- _____ Pat kind of sees the relationship as hard work.
- _____ Pat kind of loves Chris.

Given that you know Pat and Chris are committed to each other, some of these sentences about their relationship will sound very peculiar with hedges in them, while others will sound very natural. Rate how peculiar or natural each sentence sounds using the following scale:

1	2	3	4	5	6	7
extremely natural sounding						extremely peculiar sounding

_____ Pat sees his relationship with Chris as somewhat longlasting.

_____ Pat is sort of giving.

_____ Pat kind of trusts Chris.

_____ Pat is sort of affectionate with Chris.

_____ Pat is kind of loyal to Chris.

_____ Pat's attention is sort of focussed on Chris.

_____ Pat kind of thinks about Chris all the time.

_____ Pat sort of gives his best effort.

_____ Pat is somewhat attached to Chris.

_____ Pat somewhat helps Chris.

_____ Pat somewhat respects Chris.

_____ Pat is somewhat faithful to Chris.

_____ Pat kind of shares with Chris.

Given that you know Pat and Chris are committed to each other, some of these sentences about their relationship will sound very peculiar with hedges in them, while others will sound very natural. Rate how peculiar or natural each sentence sounds using the following scale:

1	2	3	4	5	6	7
extremely natural sounding						extremely peculiar sounding

- _____ Pat is kind of devoted to Chris.
- _____ Their relationship is sort of characterized by giving and taking.
- _____ Pat somewhat likes Chris.
- _____ Pat sees the relationship as kind of a promise.
- _____ Their relationship is characterized by being sort of responsible.
- _____ Pat feels sort of trapped in the relationship.
- _____ Pat is kind of honest with Chris.
- _____ Pat sees the relationship as kind of a conscious decision.
- _____ Pat sees the relationship as sort of a high priority.
- _____ Pat somewhat tries to be there for Chris in good and bad times.
- _____ Pat sort of puts Chris first.
- _____ Pat somewhat perseveres in her relationship with Chris.
- _____ Pat somewhat makes sacrifices for Chris.
- _____ Pat feels kind of secure in her relationship with Chris.

Appendix H

Summary Table of the Analysis of Variance on Peculiarity Ratings for Features of Love

WITHIN SUBJECT FACTORS ARE:

A - ATTRIB : 1 CENTRAL , 2 PERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
S-WITHIN	6.612	19.	0.348		
A	7.051	1.	7.051	71.386	0.001
AS-WITHIN	1.877	19.	0.099		

Summary Table of the Analysis of Variance on Peculiarity Ratings for Features of Commitment

WITHIN SUBJECT FACTORS ARE:

A - ATTRIB : 1 CENTRAL , 2 PERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
S-WITHIN	6.284	19.	0.331		
A	3.969	1.	3.969	26.830	0.001
AS-WITHIN	2.811	19.	0.148		

Appendix I

This appendix contains the instructions for rating the types of relationships according to degree of love, followed by the instructions for rating the relationships according to degree of commitment. The last two pages contain the 53 types of relationships that were rated.

RELATIONSHIP TYPES QUESTIONNAIRE

This study is part of a larger study on interpersonal relationships. On the next page, you will find a list of various kinds of interpersonal relationships that may or may not involve commitment. For each one, ask yourself, "To what extent is this a committed relationship?" If you think the relationship is definitely not a committed relationship, give it a 1 which means "not at all committed". If you think a particular relationship is definitely a committed relationship, give it a 9 which means "extremely committed". A 5 would mean the relationship is moderately committed. Don't worry about why you think each relationship is or is not characterized by commitment--just give us your opinion.

Please remember that your participation is voluntary. You are free to withdraw at any time.

Thank you very much for your help.

RELATIONSHIP TYPES QUESTIONNAIRE

This study is part of a larger study on interpersonal relationships. On the next page, you will find a list of various kinds of interpersonal relationships that may or may not involve love. For each one, ask yourself, "To what extent is this a loving relationship?" If you think the relationship is definitely not a loving relationship, give it a 1 which means "not at all loving". If you think a particular relationship is definitely a loving relationship, give it a 9 which means "extremely loving". A 5 would mean the relationship is moderately loving. Don't worry about why you think each relationship is or is not characterized by love--just give us your opinion.

Please remember that your participation is voluntary. You are free to withdraw at any time.

Thank you very much for your help.

1	2	3	4	5	6	7	8	9
not at all				moderately			extremely	
_____ close friends				_____ salesperson and regular customer				
_____ husband and wife				_____ personal enemies				
_____ parent and young child				_____ interviewer and job applicant				
_____ business partners				_____ professor and graduate student				
_____ opposing negotiators				_____ children in a family (siblings)				
_____ nurse and invalid				_____ mother-in-law and son-in-law				
_____ political opponents				_____ parent and teenager				
_____ business rivals				_____ teacher and young pupil				
_____ supervisor and employee				_____ second cousins				
_____ guard and prisoner				_____ psychotherapist and patient				
_____ co-workers				_____ teammates (during a game)				
_____ casual acquaintances				_____ a one-night sexual encounter				
_____ a marriage of 25 years				_____ divorced husband and wife				
_____ an engaged couple				_____ an affair with a married person				
_____ a short, mutual first love				_____ an unhappy but stable marriage				
_____ verbal and physical flirting at a party, without follow-up								
_____ a boy/girlfriend living together after several months of dating								
_____ a young marriage after an unwanted pregnancy								
_____ a permanent but nonsexual relationship between two young religious people								
_____ a "going steady" relationship maintained mainly to impress peers								
_____ a steady relationship where each person goes out with member of the opposite sex								
_____ widowers remarried in middle age, after several years of living alone								

1	2	3	4	5	6	7	8	9
not at all			moderately			extremely		

_____ a mainly sexual relationship with an older and more experienced person

_____ a school affair between teacher and pupil

_____ brief, fluctuating relationships among members of a permanent social group.

_____ a young marriage after a long, involved courtship

_____ a relationship in which only one of the partners is deeply involved.

_____ a longlasting, close platonic relationship

_____ a short, mainly sexual affair between two students

_____ an irregular, occasional dating relationship for mutual entertainment between two young people

_____ a high school dating relationship that breaks up once the couple has gone away to college

_____ the continuation of a once personal relationship by letters and phone calls from overseas

_____ a long, involved "going steady" relationship at school

_____ "love at first sight", followed by engagement, after a brief but intense relationship

_____ the recommencement of an old flame, that didn't work out before

_____ a short, emotional holiday affair

_____ a middle-aged child caring for his/her elderly parent because s/he feels obligated to

_____ a middle-aged child caring for his/her elderly parent because s/he wants to

Appendix J

Summary Table of the Analysis of Variance on Love Ratings for 53 Relationships

SRC. NO.	SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARE	F VALUE	F PROB	TESTED AGAINST
1	A	29	644.782390	22.233871	12.1389	0.0000	3
2	B	52	6762.557233	130.049164	71.0022	0.0000	3
3	ERROR	1508	2762.084277	1.831620			
4	TOTAL	1589	10169.423899				

Summary Table of the Analysis of Variance on Commitment Ratings for 53 Relationships

SRC. NO.	SOURCE	D.F.	SUM OF SQUARES	MEAN SQUARE	F VALUE	F PROB	TESTED AGAINST
1	A	29	769.188050	26.523712	11.8403	0.0000	3
2	B	52	5378.906918	103.440506	46.1762	0.0000	3
3	ERROR	1508	3378.111950	2.240127			
4	TOTAL	1589	9526.206918				

Summary Table of the Analysis of Variance for Applicability of Central and Peripheral Features of Love to Relationships

WITHIN SUBJECT FACTORS ARE:

A - RELSHIP : 1 HI , 2 MEDHI , 3 MEDLO , 4 LO
 B - ATTRIB : 1 CENTRAL , 2 PERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
S-WITHIN	62.737	14.	4.481		
A	149.613	3.	49.871	19.057	0.001
AS-WITHIN	109.912	42.	2.617		
B	4.074	1.	4.074	2.549	0.133
BS-WITHIN	22.377	14.	1.598		
AB	18.491	3.	6.164	4.474	0.008
ABS-WITHIN	57.856	42.	1.378		

Summary Table of the Analysis of Variance for Applicability of Central and Peripheral Features of Commitment to Relationships

WITHIN SUBJECT FACTORS ARE:

A - RELSHIP : 1 HI , 2 MEDHI , 3 MEDLO , 4 LO
 B - ATTRIB : 1 CENTRAL , 2 PERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
S-WITHIN	27.391	14.	1.957		
A	339.216	3.	113.072	64.837	0.001
AS-WITHIN	73.246	42.	1.744		
B	1.511	1.	1.511	1.235	0.285
BS-WITHIN	17.125	14.	1.223		
AB	12.875	3.	4.292	3.165	0.034
ABS-WITHIN	56.955	42.	1.356		

Appendix K

The first page consists of the instructions given to subjects in Study Six. The next six pages consist of the three versions of the questionnaire containing unique attributes of love and commitment (each version is two pages long). For half the subjects, the question on top of the first page read, "To what extent will this event decrease LOVE?". Finally, the shared attributes questionnaire is included. For half the subjects, the question on top of the first page read, "To what extent will this event decrease COMMITMENT?"

RELATIONSHIP EVENTS QUESTIONNAIRE

This is a simple study to find out the effects of various events on interpersonal relationships. Below you will read a short story about two people who are involved in a close relationship. You will be asked to give your opinion of how certain events will impact upon the relationship. Keep in mind that we're interested in what you think will happen, not what you think should happen.

"Pat and Chris love each other and are committed to one another. They began dating toward the end of their first year at U.B.C. and will both be graduating in the spring. Pat and Chris enjoy doing things together and frequently go to movies, sports events, out for dinner, and so on. They also spend many evenings together just watching TV or visiting with friends. Certain things could happen that would have little or no impact on their relationship. Other things could have a major impact."

On the next page, you will find a list of hypothetical events. While most of these events probably would have an impact on their relationship, some probably would have a greater impact than others. For each one, think about the extent to which that event would cause a decrease in COMMITMENT in Pat and Chris' relationship. If you think the event would have no impact on commitment, give it a 1 which means "not at all likely". If you think it's extremely likely that an event would cause a decrease in commitment in the relationship, give it a 9 which means "extremely likely". A 5 would mean that that the event would probably have a moderate impact on commitment. Please try to use the entire scale when making your judgments. Keep in mind that each event has nothing to do with the event before or after it--in other words, treat each event separately.

Please remember that your participation is voluntary. If you complete this questionnaire I will assume that you have given your consent to participating in this study.

Thank-you very much for your help.

For each event, rate: "To what extent will this event decrease COMMITMENT?"

1	2	3	4	5	6	7	8	9
not at all				moderately				extremely
likely				likely				likely

- _____ Pat's relationship with Chris is no longer characterized by obligation.
- _____ Pat's relationship with Chris is no longer characterized by happiness.
- _____ Pat's relationship with Chris is no longer characterized by faithfulness.
- _____ Pat's relationship with Chris is no longer characterized by touching.
- _____ Pat's relationship with Chris is no longer characterized by "being there" for her in good and bad times.
- _____ When asked about his relationship with Chris, Pat says he no longer feels free to talk about anything.
- _____ When asked about his relationship with Chris, Pat says he no longer gives his best effort.
- _____ Pat's relationship with Chris is no longer characterized by laughing.
- _____ When asked about his relationship with Chris, Pat says he no longer lives up to his word.
- _____ Pat's relationship with Chris is no longer characterized by sexual appeal.
- _____ Pat no longer see his relationship with Chris as a promise.
- _____ Pat no longer see his relationship with Chris as unconditional.
- _____ Pat no longer see his relationship with Chris as a high priority.
- _____ Pat's relationship with Chris is no longer characterized by a positive outlook.
- _____ Pat no longer sees his relationship with Chris as a conscious decision.
- _____ When asked about his relationship with Chris, Pat says he no longer experiences an increase in heartrate.
- _____ Pat's relationship with Chris is no longer characterized by perserverance
- _____ Pat's relationship with Chris is no longer characterized by euphoria.

1	2	3	4	5	6	7	8	9
not at all				moderately				extremely
likely				likely				likely

- _____ Pat's relationship with Chris is no longer characterized by working out problems.
- _____ Pat's relationship with Chris is no longer characterized by physical attraction.
- _____ When asked about his relationship with Chris, Pat says he no longer feels trapped.
- _____ Pat's relationship with Chris is no longer characterized by forgiveness.
- _____ When asked about his relationship with Chris, Pat says he no longer is reliable.
- _____ When asked about his relationship with Chris, Pat says he no longer misses her when not together.
- _____ Pat's relationship with Chris is no longer characterized by giving and taking.
- _____ Pat no longer sees his relationship with Chris as scary.
- _____ Pat's relationship with Chris is no longer characterized by maturity.
- _____ Pat's relationship with Chris is no longer characterized by wonderful feelings.
- _____ Pat no longer sees his relationship with Chris as hard work.
- _____ Pat's relationship with Chris is no longer characterized by empathy.
- _____ Pat's relationship with Chris is no longer characterized by working toward common goals.
- _____ When asked about his relationship with Chris, Pat says he no longer does things to make her happy.
- _____ Pat no longer sees his relationship with Chris as a mutual agreement.
- _____ When asked about his relationship with Chris, Pat says he no longer focusses his attention on her.

For each event, rate: "To what extent will this event decrease COMMITMENT?"

1	2	3	4	5	6	7	8	9
not at all			moderately			extremely		
likely			likely			likely		

- _____ Pat's relationship with Chris is no longer characterized by obligation.
- _____ Pat's relationship with Chris is no longer characterized by excitement.
- _____ Pat's relationship with Chris is no longer characterized by faithfulness.
- _____ Pat's relationship with Chris is no longer characterized by patience.
- _____ Pat's relationship with Chris is no longer characterized by "being there" for him in good and bad times.
- _____ When asked about her relationship with Chris, Pat says she no longer experiences "butterflies in the stomach".
- _____ When asked about her relationship with Chris, Pat says she no longer gives her best effort.
- _____ Pat's relationship with Chris is no longer characterized by kindness.
- _____ When asked about her relationship with Chris, Pat says she no longer lives up to her word.
- _____ Pat no longer see her relationship with Chris as mutual.
- _____ Pat no longer see her relationship with Chris as a promise.
- _____ Pat's relationship with Chris is no longer characterized by sexual passion.
- _____ Pat no longer see her relationship with Chris as a high priority.
- _____ Pat's relationship with Chris is no longer characterized by uncertainty.
- _____ Pat no longer see her relationship with Chris as a conscious decision.
- _____ Pat's relationship with Chris is no longer characterized by warm feelings.
- _____ Pat's relationship with Chris is no longer characterized by perserverance

1	2	3	4	5	6	7	8	9
not at all			moderately			extremely		
likely			likely			likely		

- _____ Pat's relationship with Chris is no longer characterized by protectiveness.
- _____ Pat's relationship with Chris is no longer characterized by working out problems.
- _____ When asked about her relationship with Chris, Pat says she no longer feels relaxed with him.
- _____ When asked about her relationship with Chris, Pat says she no longer feels trapped.
- _____ Pat's relationship with Chris is no longer characterized by dependency.
- _____ When asked about her relationship with Chris, Pat says she no longer is reliable.
- _____ Pat's relationship with Chris is no longer characterized by openness.
- _____ Pat's relationship with Chris is no longer characterized by giving and taking.
- _____ When asked about her relationship with Chris, Pat says she no longer accepts him the way he is.
- _____ Pat's relationship with Chris is no longer characterized by maturity.
- _____ Pat's relationship with Chris is no longer characterized by intimacy.
- _____ Pat no longer sees her relationship with Chris as hard work.
- _____ When asked about her relationship with Chris, Pat says she no longer comforts him.
- _____ Pat's relationship with Chris is no longer characterized by working towards common goals.
- _____ Pat no longer sees her relationship with Chris as a mutual agreement.
- _____ When asked about her relationship with Chris, Pat says she no longer focusses attention on him.

For each event, rate: "To what extent will this event decrease COMMITMENT?"

1	2	3	4	5	6	7	8	9
not at all			moderately			extremely		
likely			likely			likely		

_____ Pat's relationship with Chris is no longer characterized by obligation.

_____ Pat's relationship with Chris is no longer characterized by closeness.

_____ Pat's relationship with Chris is no longer characterized by faithfulness.

_____ When asked about his relationship with Chris, Pat says he no longer gazes at her.

_____ Pat's relationship with Chris is no longer characterized by "being there" for her in good and bad times.

_____ When asked about his relationship with Chris, Pat says he no longer feels good about himself.

_____ When asked about his relationship with Chris, Pat says he no longer gives his best effort.

_____ Pat's relationship with Chris is no longer characterized by admiration.

_____ When asked about his relationship with Chris, Pat says he no longer lives up to his word.

_____ When asked about his relationship with Chris, Pat says he no longer wants the best for her.

_____ Pat no longer see his relationship with Chris as a promise.

_____ When asked about his relationship with Chris, Pat says he no longer considers her to be very important.

_____ Pat no longer sees his relationship with Chris as a high priority.

_____ Pat's relationship with Chris is no longer characterized by friendship.

_____ Pat no longer see his relationship with Chris as a conscious decision.

_____ When asked about his relationship with Chris, Pat says he no longer wants to be with her.

_____ Pat's relationship with Chris is no longer characterized by perserverance

-1	2	3	4	5	6	7	8	9
not at all				moderately				extremely
likely				likely				likely

_____ Pat's relationship with Chris is no longer characterized by energy.

_____ Pat's relationship with Chris is no longer characterized by working out problems.

_____ When asked about his relationship with Chris, Pat says he no longer sees only her good qualities.

_____ When asked about his relationship with Chris, Pat says he no longer feels trapped.

_____ Pat's relationship with Chris is no longer characterized by compassion.

_____ When asked about his relationship with Chris, Pat says he no longer is reliable.

_____ Pat's relationship with Chris is no longer characterized by understanding

_____ Pat's relationship with Chris is no longer characterized by giving and taking.

_____ When asked about his relationship with Chris, Pat says he no longer has alot in common with her.

_____ Pat's relationship with Chris is no longer characterized by maturity.

_____ Pat's relationship with Chris is no longer characterized by needing each other.

_____ Pat no longer sees his relationship with Chris as hard work.

_____ Pat's relationship with Chris is no longer characterized by interest.

_____ Pat's relationship with Chris is no longer characterized by working towards common goals.

_____ Pat no longer sees his relationship with Chris as a mutual agreement.

_____ When asked about his relationship with Chris, Pat says he no longer focusses attention on her.

For each of the events below, ask yourself, "To what extent will this event decrease LOVE?"

1	2	3	4	5	6	7	8	9
not at all			moderately			extremely		
likely			likely			likely		

_____ Pat's relationship with Chris is no longer characterized by honesty.

_____ Pat's relationship with Chris is no longer characterized by trust.

_____ Pat's relationship with Chris is no longer characterized by devotion.

_____ When asked about his relationship with Chris, Pat says he no longer is concerned about her well-being.

_____ Pat's relationship with Chris is no longer characterized by contentment.

_____ Pat's relationship with Chris is no longer characterized by sharing.

_____ Pat's relationship with Chris is no longer characterized by sacrifice.

_____ Pat no longer see his relationship with Chris as a responsibility.

_____ Pat's relationship with Chris is no longer characterized by respect.

_____ Pat's relationship with Chris is no longer characterized by attachment.

_____ Pat's relationship with Chris is no longer characterized by supportiveness.

1	2	3	4	5	6	7	8	9
not at all				moderately			extremely	
likely				likely			likely	

_____ Pat's relationship with Chris is no longer characterized by caring.

_____ When asked about his relationship with Chris, Pat says he no longer puts her first.

_____ Pat's relationship with Chris is no longer characterized by liking.

_____ Pat's relationship with Chris is no longer characterized by loyalty.

_____ Pat's relationship with Chris is no longer characterized by security.

_____ When asked about his relationship with Chris, Pat says he no longer thinks about her all the time.

_____ Pat's relationship with Chris is no longer characterized by affection.

_____ Pat's relationship with Chris is no longer characterized by helpfulness.

_____ Pat's relationship with Chris is no longer characterized by giving.

_____ Pat no longer sees his relationship with Chris as longlasting.

_____ your age

_____ female

_____ male

Appendix L

Summary Table of the Analysis of Variance on Impact of Violations of Unique Features of Love and Commitment

BETWEEN SUBJECT FACTORS ARE:

A - RATING : 1 impactL , 2 impactC

WITHIN SUBJECT FACTORS ARE:

B - CONCEPT : 1 LOVE , 2 COMMIT

C - ATTRIB : 1 CENTRAL , 2 PERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	0.0	1.	0.0	0.0	0.999
S-WITHIN	665.621	178.	3.739		
B	5.801	1.	5.801	15.752	0.001
AB	0.308	1.	0.308	0.835	0.362
BS-WITHIN	65.551	178.	0.368		
C	321.372	1.	321.372	461.353	0.001
AC	0.154	1.	0.154	0.221	0.639
CS-WITHIN	123.992	178.	0.697		
BC	19.666	1.	19.666	43.863	0.001
ABC	0.132	1.	0.132	0.294	0.588
BCS-WITHIN	79.805	178.	0.448		

Summary Table of the Analysis of Variance on Impact of Violations of Unique and Shared Features of Love and Commitment

BETWEEN SUBJECT FACTORS ARE:

A - RATING : 1 impactL , 2 impactC

WITHIN SUBJECT FACTORS ARE:

B - CONCEPT : 1 LOVE , 2 COMMIT

C - ATTRIB : 1 CENTRAL , 2 PERIPH

SOURCE	SUM OF SQUARES	DEGREES OF FREEDOM	MEAN SQUARES	F RATIO	PROBABILITY
A	0.057	1.	0.057	0.016	0.898
S-WITHIN	807.141	232.	3.479		
B	1.400	1.	1.400	4.333	0.038
AB	0.371	1.	0.371	1.150	0.285
BS-WITHIN	74.934	232.	0.323		
C	396.332	1.	396.332	591.996	0.001
AC	0.800	1.	0.800	1.195	0.276
CS-WITHIN	155.320	232.	0.669		
BC	22.537	1.	22.537	62.549	0.001
ABC	0.057	1.	0.057	0.159	0.691
BCS-WITHIN	83.594	232.	0.360		