Loyola University Chicago
Loyola eCommons

Master's Theses | Theses and Dissertations

1991

Affective Predication in Memory for Sentences: Anticipating Meaningfulness Before Meaning Is Fully Known by Alec Ulasevich.

Alec Ulasevich
Loyola University Chicago

Follow this and additional works at: https://ecommons.luc.edu/luc_theses

 Part of the Psychology Commons

Recommended Citation

Ulasevich, Alec, "Affective Predication in Memory for Sentences: Anticipating Meaningfulness Before Meaning Is Fully Known by Alec Ulasevich." (1991). *Master's Theses*. 3896.
https://ecommons.luc.edu/luc_theses/3896

This Thesis is brought to you for free and open access by the Theses and Dissertations at Loyola eCommons. It has been accepted for inclusion in Master's Theses by an authorized administrator of Loyola eCommons. For more information, please contact ecommons@luc.edu.

This work is licensed under a Creative Commons Attribution-Noncommercial-No Derivative Works 3.0 License.
Copyright © 1991 Alec Ulasevich

AFFECTIVE PREDICATION IN MEMORY FOR SENTENCES: ANTICIPATING MEANINGFULNESS BEFORE MEANING IS FULLY KNOWN

by

Alec Ulasevich

Loyola University

A Thesis Submitted to the Faculty of the Graduate School of Loyola University of Chicago a Partial Fulfillment of the Requirements for the Degree of Masters of Arts.

May 1991

Copyright by Alec Ulasevich, 1991.
All rights reserved.

ACKNOWLEDGEMENTS

I wish to thank all the people who helped me to prepare this thesis, and who inspired me to go on in the pursuit of academic excellence. First, I would like to thank Fr. Daniel O'Connell for the help and encouragement he has given me. I especially would like to thank Dr. Joseph Rychlak, the chairman of my committee, for his guidance and support as well as for his confidence in my ability. I would like to dedicate this work to my wife Laura Beth Ulasevich for her patience and understanding.

TABLE OF CONTENTS

LIST OF FIGURES AND TABLES

CONTENTS OF APPENDICES

CHAPTER I

INTRODUCTION

This thesis stems from a vast body of literature on affective assessment (Rychlak, 1988, chap. 9). As such, it has two goals. First, the writer intends to replicate the findings of the previous affective assessment studies by employing a sentence-completion methodology that has not been used previously. Second, the writer hopes that this thesis will advance the understanding of affective assessment as a top-down process involving organization of material into the context of an overriding conceptual category. This latter goal draws on the tenets of logical learning theory (LLT) (ibid., chaps. 7-9).

Before proceeding further, an explanation of the term "affect" as it is used in conjunction with "affective predication" is necessary. The writer wishes to distinguish his proposed meaning of "affect" from that which is espoused by the mood induction studies in Bower's (1981) tradition. In the latter case, affect is to be understood as a physiological state, synonymous with emotion or mood. In the context of research on affective assessment/predication, affect signifies a purely cognitive evaluative construct, operationally defined as an idiographic rating of an item on a

"like -dislike" dimension of meaning. In earlier research on LLT, the score along this dimension was termed reinforcement value (RV). Thus, RV is the operationalized measure of a subject's affective assessment of literally anything in his/her experience. In this sense, affect is similar to the Osgoodian (Osgood, 1952) evaluative dimension on the semantic differential scale. It is this Osgoodian interpretation of the term that Fiske and Taylor (1984) refer to as the "fourth code," noting that its role in cognition is yet to be deciphered.

Another issue that must be addressed at this time is the distinction between the terms "meaning" and "meaningfulness." According to Rychlak (1988, pp. 51-57), meaning is a construct signifying a pattern of relations between items, as well as "the relation between a user of such meaningful ties and the items he/she employs for understanding." (ibid., p. 57). Thus, the meaning of the word "dog" includes the superordinate relations such as categories to which it belongs like "animals" and "pets." It may also include features such as "big brown eyes," and "fur." In addition, the meaning of the word dog may encompass its symbolic significance -- "loyalty."

The meaningfulness refers to the latter part of the definition of meaning, one that highlights the relation between the person doing the understanding and the item he/she understands. Rychlak defines meaningfulness as "a

measure of the extent of meaning -- i.e., clarity, centrality, import, value-- the item holds for the individual" (ibid., p. 57). The RV measure mentioned above is thus one of the operationalizations of meaningfulness, henceforth referred to as affective meaningfulness.

The central theoretical claim made in this paper is that meaningfulness (as defined by affective assessment) effects cognition in the top-down fashion. Specifically, the present experiment investigates the effect of meaningfulness in learning. The postulate here is that once the affective judgment rendered by an individual in relation to an item is known, one can predict what items that individuals is more likely to learn.

This contrasts with the typical "association value" interpretation of meaningfulness in verbal learning studies that conceptualize the effects of meaningfulness in the "bottom-up" fashion. Here, meaningfulness is a measure of the subject's familiarity with a given item, a formulation that relies on the assumptions of a frequency and/or contiguity principle to account for the patterning of meaning. As such, any explanation of the obtained effects of meaningfulness must ultimately refer to the nomothetic mediating influences external to the person as idiographic evaluator, and thus inherently input driven.

The first chapter of this thesis is dedicated to the discussion of the theoretical assumptions held by the models

that base their explanation of cognition on the frequency/-contiguity principles. Based on the terminology suggested by Rychlak (1988, chap. 3), these models will be referred to as Lockean models -- a nomenclature that reflects their philosophical and historical origins. This discussion will center around the assumptions pertaining to the causation of mental phenomenon as they are conveyed by the Lockean formulation of association. A number of current cognitive models will be discussed in light of these assumptions as well as their explanations of affect and meaningfulness.

The purpose of Chapter 2 is to place the construct of affective assessment within a historical-theoretical framework. Again, using Rychlak's (ibid.) terminology, the construct of affective assessment reflects the Kantian theme in psychological explanation. Thus, the issue to be addressed here is what constitutes this line of philosophical theorizing, and how is it different from the philosophical development of the association models. The explication of the differences between these models will be focused upon by the relation of an individual to the presented stimuli. As I will argue, according to the Kantian model, an individual is regarded as an active conceptualizer of his/her experience, rather than a passive recipient of environmental stimuli. A predicational model proposed by Rychlak (ibid., chap. 7) to capture such active conceptualization of experience will be presented.

A review of literature beginning with the early research on affective meaningfulness which established the role of affective assessment in learning and stresses its orthogonality with association value will be presented next. Studies that lend support to the formulation of affective meaningfulness in terms of the predicational model will also be taken up.

The present project differs from previous research in two respects. First, sentences are used as experimental stimuli. Second, the affective valence is measured nomothetically by relying on inter-rater agreement. The present methodology employs a sentence completion task in which subjects must complete sentences lacking a predicate, administered following a learning trial. Given the evidence that suggests the commencement of affective predication at the initiation of cognition, subjects are expected to know the affective valence of the predicate before the "word" meaning per se. of that predicate is fully known. Thus, in a sentence such as "When solving problems, John is fast," subjects would be able to state that the predicate is positive in affective meaningfulness before they could think of a synonym to "fast" -- such as "swift."

CHAPTER II

THE LOCKEAN MODEL AND ITS IMPLICATIONS

As suggested in the introduction, Rychlak (1988, chap. 3) identifies what he calls the Lockean tradition in psychology, named after John Locke, although this style of though goes back to ancient philosophy (e.g., Democritus). It is fair to say that the term "Lockean tradition" is tantamount to "British empiricism." The influence of British empiricism in psychology is indisputable. The Lockean position was adopted early in the historical development of scientific psychology, and it became dominant with the advance of American psychology in the early part of the twentieth century (ibid., chaps. 3 and 4). Its influence did not wane. Referring to the recent domain of cognitive psychology, Bourne, Ekstrand, and Dominowski (1971) state that British empiricism "is the movement which gave the psychology of learning and thinking most of its important problems and defined its essential content" (p. 21).

More often than not, the references made to British empiricism are made in the context of association theory (see ibid., chap. 1; Tarter, 1988, chap. 1; Chaplin & Krawiec, 1974, chap. 1). But, the term "association" per se.

was first used by Aristotle to refer to the relationships between items in the memory (Rychlak, 1988, chap. 3, Anderson & Bower, 1979, chap. 2). According to these authors, the British empiricists imposed a theoretically limited interpretation of association.

As such, the construct of association serves as an excellent starting point for the analysis of the theoretical assumptions held by the Lockean tradition. As will be asserted shortly, the essence of the limitation upon the explication of association mentioned above entails the understanding of the relations between items exclusively in terms of "efficient cause" (Rychlak, 1988, chap. 3). Such a narrow interpretation of association in terms of efficient cause further infuses other assumptions into the theoretical framework which include conjectures regarding human nature and the relationship between past and present events. Besides the already alluded to task of expounding the philosophical assumptions of the Lockean tradition, this chapter intends to illustrate the influences of these assumptions in the current models of cognition and to show their effects in the contemporary understanding of affect and meaningfulness. The purpose here is to set the stage for the theoretical critique of the Lockean tradition.

Efficient Cause and Association

The foremost theoretical assumption of the Lockean tradition is that most observed relations can be explained

by the efficient cause. The efficient cause is the cause/effect relationship occurring when an antecedent elicits a consequent within a temporal order. In other words, it is motion over time (see Rychlak, 1981a, Introduction).

This emphasis on efficient cause explanation of the relationships is evident in a thrust toward identification of antecedents found in the work by the British empiricists. David Hume, for instance, suggested contiguity, resemblance and cause and effect as his principle of association (Boring, 1950, p. 191). David Hartley added repetition (ibid., p. 197) -- a frequency construct. James Mill contributed vividness (ibid., p. 224) in addition to contiguity and frequency, and John Stuart MIll extended the list of possible antecedents with similarity, intensity and inseparability (ibid., p. 229). As such, we find these antecedents at the origin of a causal event. They provide an impetus that sets the causal progression in motion. The Lockean tradition further assumes that these antecedents originate in the environment and thus effect the mental events through experience by way of sensory input. Association can be viewed as the consequence of these antecedents. For instance, it is not uncommon in psychology to say that two items become <u>associated</u> due to frequency of their co-occurrence. Yet, this statement stops short of disclosing the complete picture. The postulated association between two items is not an end in itself, rather it is a

causal explanation of some other obtained effect such as a probability of one item being generated given the other. The latter is the lawful consequent of the antecedent, while association is the representation of the "motion over time" between an antecedent and a consequent, and thus a relational construct. It is, in the words of Hume (cited by Anderson & Bower, 1979, p. 24). the "gentle force that commonly prevails" (italics added).

Related Philosophical Assumptions

Thus, according to the causal scheme laid out so far, the environmental antecedents set forth the lawful progression towards the specific consequents. The dogma of environmental determinism logically follows the assumption of efficient causation. Since the antecedent of a causal event originates in the environment, it is in the environment where one can trace the origins of all effects.

The route from a given environmental antecedent to an observed consequent is not necessarily direct. The British empiricists distinguish between simple and complex ideas (Chaplin & Krawiec, 1974, chap. 1). The simple ideas are direct inputs from the environment through sensory modalities, while the complex ideas represent aggregation of simple ideas previously experienced. The process of the aggregation of simple ideas into complex ones does not change the fundamental principles of causation postulated by

the British empiricists. As the term "aggregation" suggests, this process is an additive, constitutive process. In Hume's example (cited by Anderson & Bower, 1979, p.23) for instance, an idea of a "house" is composed of a sum consisting of items such as "doors," "windows," and so on, in the same way a real house in composed of bricks. Hence, the explanation of any complex phenomenon ultimately rests in the understanding of its constituent parts, which according to the Lockean formulation, ultimately originate in the direct experience of the environment. As a result, the notion of environmental determinism is reaffirmed even in the cases were direct progression of causation is not explicit. Furthermore, here we find the basis for reductionism, since the complex can be explained in terms its constituent parts. Note, that the temporal order of the relation between the simple and complex ideas parallels that of efficient causation. Like antecedents, simple ideas are always first in the temporal order. These principles serve as a foundation for the mediational modeling, that prevails in psychological theory (see below).

In this causal scheme, an individual is delegated a strictly passive role -- that of a <u>tabula rasa</u>. Namely, he/she does not actively intercede in the causal scheme of things, but rather registers its effects. In the case of more complex causal relations, the previous "inscriptions" upon the <u>tabula rasa</u> serve to direct the new causal rela-

tions.

Implications of the Lockean Tradition in Psychology

The adaptation of British empiricism by psychologists coincided with the advance of psychology as a scientific discipline. On the surface, the scientific method appears to rest upon the Lockean view of causation, because the procedure of validating a hypothesis follows the temporal order implied by the efficient cause. The antecedents lend themselves well to the interpretation as the independent variables (IV), and the observable consequences as the dependent variables (DV). But, in equating the Lockean tradition with scientific method, one is confounding theory with method (Rychlak, 1968, chap. 8).

The problem lies in the interpretation of the causal relation intervening between IV and DV, in fact, in the definition of association. For instance, assume that we want to test a hypothesis that associative strength between items facilitates learning. The null hypothesis tested here is that "strength of association will not facilitate learning," and the experimental hypothesis may be stated as follows: "If items are highly associated, then they will be easier to learn." This logical proposition in itself does not state anything about the nature of the causal relation between IV (i.e.,the degree of association) and DV (i.e, measure of learning rates). According to Meehl (1990), this consideration of the causal relation can be at-

tributed to the interpretative context of the theory tested. Thus, the possible interpretation of this relation in terms of efficient causation (i.e., facilitation occurs because strongly associated items elicit one another) is post hoc and reflects a philosophical bias rather than a conclusion based on results. Rychlak refers to this as an S-R bind: "limiting one's theoretical conceptions to an efficient-cause frame" (Rychlak, 1981b, p. 516). In fact, one can further delimit the historically acceptable interpretation of results chiefly to the consequences of the frequency and contiguity principles among the antecedents mentioned above. (Bugaj & Rychlak, 1989). Thus, the meaning of association in psychology is even narrower than that allowed by the British empiricists -- not only is it an efficient cause relation, but it is also a relation due to the specified antecedent.

A clear example of this efficient cause formulation of association as due to the frequency and contiguity principles is found in the verbal learning measures of associative strength that are used to account for the relatedness of verbal items. Derived by averaging responses on a free association task, the metric of associative strength was thought to reflect the actual frequency of the items' co-occurrence in a given environment (Deese, 1962). Considering the stated purpose to "remove computation inadequacies of S-R theories" (Anderson, 1983, p. 6)

such as verbal learning, it is therefore not surprising that cognitive models retain frequency and contiguity principles in their causal assumptions pertaining to the explanation of semantic relations. For instance, Wyer and Carlson (1979) proposed a network model in which the degree of relatedness between "nodes" that represent various concepts is determined by the frequency and the recency of activation of a pathway uniting the two. Wyer and Carlson further suggest that the "strength of association" between the nodes is a function of the "diameter" of a path between them, that becomes thicker when frequently activated. According to McClelland's (1988) model, the so-called "connections" between the items are assigned weights that are adjusted based on the frequency of their activation. As more weight is assigned to a given pathway, there is a greater probability that activation will take that route. Collins and Loftus (1975) also view semantic relations as the network of associative pathways connecting different nodes representing meanings. In their model, the spread of activation is determined by the length of a postulated associative link, as well as the diversity of associative links connecting one node to another in the network.

Considering the distinction between association as the relation between items and association as the "gentle force," the postulated "links" or "pathways" between nodes can be seen as representing the former. On the other

hand, the activation construct used by these models takes from the latter. Here, an assumed force is actually traveling or spreading within a postulated cognitive structure, and the direction as well as the strength of this force is determined by the frequency and contiguity principles.

Underlying the reliance on frequency and contiguity principles is the assumption that associations formed due to the effect of these antecedents are directly based on sensory experience, and thus can be used to explain more complex relations such as similarity and/or categorization. For instance, Underwood, Ekstrand, and Keppel (1965) use the strength of association construct to explain similarity in terms of conceptual relations as associations of various items to the same category name. The feature based model of similarity (Tversky, 1977) also inherently relies on frequency/contiguity principles -- at least in explaining how features become associated with given concepts before they enter into the process of comparison to derive "similarity" (see Medin, 1989, for review and criticism of the application of this model to concept formation). In either case, the relationship between associations based on frequency/contiguity principles and the more general concepts of similarity and category is reminiscent of the relationship between simple and complex ideas.

Thus, the type of explanation offered by the Lockean

models for the more complex phenomenon is that of mediation, defined as any type of cognitive modeling that relies on past experiences to account for a complex phenomenon (Bugaj & Rychlak, 1989). The simple associations, those formed due to sensory input of frequency/contiguity, must already be inscribed upon the "tabula rasa" in order for the process of aggregating them into the complex ideas can take place. This type of theorizing highlights the reductionism of the Lockean models and affirms the assumption of the environmental determinism. With diligence, one can trace the cause of all effects to the environmental input that determines the course of causal progression leading to a given output no matter how complex that final output is. Within this theoretical framework, the role of an individual remains as passive as it was in the days of early behaviorism. The zeitgeist has not changed; it is still Lockean. What did change with time was the metaphor describing an individual, in the direction of being more "attuned" with the technological advances. For instance, John Watson saw an individual as "a machine ready to run," while Skinner saw the person as a "black box." The contemporary metaphor is cybernetic, as theorists talk of "information processing" or "decision rules" depicting such in terms of computer-inspired flow-charts. Not surprisingly, in view of the diminished importance of an individual in the causal scheme, and the salience of environmental determinants, the Lockean

theorists generally take an extraspective point of view -- meaning that they " (frame) theoretical explanations of things and/or events in the third person, from the convenience of an observer" (Rychlak, 1988, p. 512).

The Lockean Explanations of Meaningfulness and Affect

The explanations of meaningfulness and affect made in the Lockean tradition reflect the tenets of that theoretical orientation. Within the Lockean theoretical framework, the meaningfulness of an item is defined as the item's familiarity (Houston, 1976, p. 223) This conceptualization of meaningfulness dates back to the work by Ebbinghaus who found that one tends to memorize a poem more easily than a list of nonsense syllables (Hintzman, 1978, p. 20).

Familiarity in itself is a frequency/contiguity based-relation; to put it simply, the more familiar the item is, the more likely it has been encountered in the past. Underwood, Ekstrand, and Keppel (1965) reflect this basic principle by referring to meaningfulness in terms of frequency of an item in the linguistic environment. Collins and Loftus's (1975) network model offers a similar interpretation. The more often an item appears in the person's experience, the more likely it is to appear contiguously with the other items, thus forming associative links with those items. In turn, these associative links provide more avenues for access to the original item.

Since these formulations define meaningfulness in

terms of the previous experiences with items, the operationalization of meaningfulness is no longer a metric of importance or the significance of an item to an individual, but is a measure of the frequency of his/her encounters with an item. To illustrate the latter point, the meaningfulness of the CVC trigrams are operationalized either as the number of word associations a subject can generate in the response to a trigram, or in terms of the subjects rating whether a trigram "looked like a word, sounded like a word, or could be used in a sentence (possibly as an acronym)" (Rychlak, 1988, p. 368). The latter operationalization was used by Archer (1960) in the development of the norms for the meaningfulness of the trigrams (termed the association value [AV] of a trigram).

One of the Lockean interpretation of the affect is found in behaviorism. Here, it is claimed that liked items are those that are associated with the positive contingencies, and disliked items are those associated with the negative contingencies (Rychlak, 1988 p. 367). Thus a person who consistently ate tasty apples would show a preference for "apples", while a person who consistently ate spoiled apples would not. Thus, this explanation employs both the contiguity principle (i.e., temporal proximity of a behavior and a contingency) as well as the frequency principle (i.e., the number of times a person has to experience the relation between a behavior and a contingency in order to learn it).

If the contingencies have a verbal label, then, these too would become associated with the item following the same causal principles.

Working in the verbal learning tradition, Zajonc (1968) argued that the mere exposure to learnable items translates into a preference for them. Thus he relied strictly on the frequency principle in his causal explanation of affect. Zajonc's explication of affect stipulates its relation to the meaningfulness, since both are assumed to be "due" to the frequency of previous exposures. Hence, the value of an item in the eyes of an individual is explained by citing the environmentally determined frequency of the item's exposure in the individual's experience.

In his comprehensive review of cognitive psychology, Mandler (1985) cites three possible explanations of affect (as defined here) to which he refers to as cognitive evaluation, and discusses in the context of emotions (p. 116). Interestingly, it is a rather short section and rather speculative, thus revealing the relative disinterest cognitive psychologists have shown toward this area.

It should be noted from the outset that Mandler calls these three explanations "sources" of cognitive evaluation (ibid.), thus already framing his explanation in terms of the efficient cause. The first such "source" is the "innate approach and withdrawal tendencies interpreted as value" (ibid., p. 117). Here, we actually see an interplay

of material and efficient causation. Mandler proceeds to list stimuli that elicit approach and avoidance reactions, such as sweetness and pain. Thus, at least initially, the reactions can be attributed to the physical nature of the stimuli. He then argues that a person's observations of his/her pattern of avoidance and approach reactions "produce the judgment of positive or negative value" (ibid., italics added). This second point is based exclusively on the frequency/contiguity principle since the end result (affective judgment) is due to association between the nature of the stimulus and the individual behavior. As was the case with the behavioristic position, it would be fair to say that if a set pattern of behavior is given a value label this value label would become associated with the stimulus object.

The second source of cognitive evaluation according to Mandler has to do with "cultural, social and idiosyncratic predications" (ibid.). In contrast to the predicational model that will be discussed below, Mandler gives this term a mediational interpretation. He stipulates that objects acquire these "predications" as a result of "personal learning experience," which may or may not involve direct experience with an object. The distinction between "cultural and social" and "idiosyncratic" is a matter of scope. For instance, we may learn that "war is hell" through public media, or that Volkswagens are excellent cars from a

personal conversation with a friend. While the first attitude may be shared by a large segment of our culture, the later sentiment may be shared by few. Yet, regardless of the scope of the affective relation, an individual is still a passive recipient of that information, rather than being actively involved in rendering an affective judgment. Thus, the source of the affective value remains external to a person; although one may not directly experience war, one nevertheless directly experiences a contiguous presentation of the term "war" with its affective label. The difference between a pacifist and a warmonger can be explained by the difference in the previous input pertaining to the value label associated with "war."

The third source of "cognitive evaluation" has to do with the "structural value" which (according to Mandler) "resides in the cognitive structure of objects, in the relationship among features" (ibid.). By underscoring the component part of an object, Mandler already reflects the Lockean tradition, specifically the reductionism discussed above. He further notes that judgment of value depends upon "frequency of encounter with objects and events" (ibid.), thus clearly asserting the frequency/contiguity principle.

Since, this thesis intends to explore the notion of "affective meaningfulness," this would be a good point at which to venture a formulation of the Lockean conceptualization of this construct. Given that meaningfulness is

defined in terms of familiarity and affect in terms of the association between an item and a value label, affective meaningfulness would involve a strongly associated and frequently encountered relationship between an item and a value label. This is a circular relationship in that frequent invocation of a given associative relationship will in turn strengthen that relationship. The content of the associative relationship according to the Lockean model would be determined by the individual's past (or vicarious) experiences. The frequency with which this relationship is "activated," and thus the strength of that relationship would depend upon the particularities of the individual's environment.

CHAPTER III

KANTIAN THEORY AND PREDICATION

Kantian Perspective

The major point of departure of the Kantian theories from the Lockean tradition concerns the role of an individual in relation to his/her environment. In his criticism of the British empiricists, Kant argued that even sensations must be initially framed in terms of temporal and spacial dimensions. Such organization is not in the input itself, but is rather imposed upon the sensory input to make it meaningful (Rychlak, 1988, chap. 3). Thus, the organization of the sensations logically precedes the experience rather than being determined by the experience. As such the organization is *a prior*, rather than *post hoc*. This is a top-down formulation of causality that employs the formal cause rather than the efficient cause. According to this perspective a person is no longer a passive recipient of environmental inputs. As a nativist, Kant argued that people impose such organization upon sensation from birth. In his view, the mind is not a *tabula rasa*, but rather is *pro forma* (ibid., p. 91).

The direct effect of the environmental factors is fur-

ther negated when it comes to higher mental operations such as thinking and comprehension (ibid., p. 89). According to Kant, here we find the operation of transcendental dialectic, or an ability to think to the opposite of a premise derived through the conceptualization of direct experience. Thus, even though we have an environmental input premising that two concepts are related, we can imagine these concepts to be unrelated, and proceed behaviorially according to such a negation. For instance, despite the previous conceptualization of blond people as untrustworthy, we can without further input negate this relation of meaning and place our trust with a blonde person. We may also contradict any given premise by imagining that the opposite premise is true. As such we may dream of our immortality, despite the fact that all evidence points to our eventual demise. Finally, dialectical transcendence may involve affirming the premise opposite in meaning to the premise given. For example, if the given premise is "Person A is kind," the opposite premise would be "Person A is cruel," thus the logical conclusion would depend upon the meaning of "cruelty."

On a "higher" plane of philosophical abstraction, the possibility of dialectical transcendence in experience opens the door for teleological formulations of human cognition. Since, the organization of environmental input can be transcended via dialectical reasoning, a person is faced

with alternatives to a "given" framework of meaning even when the environment does not provide such an alternative. In other words, a person is always faced with a choice. His/her actions thus must be understood in terms of the choices made, with the understanding that things could have gone otherwise. This is a final-cause formulation of human phenomenon. An action occurs for the sake of affirmed premises, chosen among at least two opposite alternatives.

The Kantian model is not inherently unscientific, as some psychologists assume it to be. The difference between the Lockean and Kantian traditions would be in terms of the critical variable postulated to account for a given experimental effect and not necessarily in terms of the application of scientific method per se. For example, from the Kantian perspective, the notorious failure to classically condition infants can be attributed to the infants inability to frame the contiguous relationships between the conditioned and unconditioned stimulus (Sameroff, 1971). The critical variables in the "awareness in conditioning" studies (see Rychlak, 1981, chap. 7) seem to be the subjects' perception of the relation between the targeted behavior and the reinforcer as well as their choice either to comply or not to comply with the experimenter's manipulation.

Given the importance of the person's choice and his/her framing of the relations in all experience, the in-

dividual him/herself can be regarded as the "critical variable" in the causal scheme. The Kantian model encourages us to take an introspective rather than an extraspective perspective --that is to "(frame) theories of things and/or events in the first person, from the outlook of an identity acting within them" (Rychlak, 1988, p. 513).

The Predicational Model

The theoretical position advanced in this thesis assigns to affect the function of organizing materials along an evaluative dimension of meaningfulness. Based upon the tenets of logical learning theory (LLT) (ibid., chaps. 7-9), the process by which an individual achieves this organization of meaning is termed predication, defined as: "the cognitive act of affirming, denying or qualifying the certain patterns of meaning in relation to other patterns of meaning" (ibid., p. 517).

This definition further stipulates that:"Predication always proceeds from a broader range of (precedent) meaning to a (sequaciously) narrower, targeted range of meaning" (ibid.).

The terms "precedent" and "sequacious" refer to the logical order which this process follows without consideration for the time factor assumed by efficient causation. As this definition implies, the precedent meaning goes first in the logical order, and hence establishes the logical course

along which the predication will proceed. The term "sequacious" literally means "slavishly complaint." As such, the result of a given predication is predetermined by the precedent meaning affirmed, qualified or negated at the "protopoint"-- the time when such affirmation, qualification or negations are made (ibid.). Thus, reflecting the Kantian position that stipulates the importance of the organization of input by an active intelligence, the predicational model postulates that this process occurs at the initiation of cognition. In view of the dialectical reasoning endorsed by the Kantian models, the predicational process involves denying as well as affirming the precedent meaning.

Rychlak employs Euler circles to illustrate the logical relation implied by the predicational process (see Figure 1 below). No claim is made here that the brain is drawing these circles, of course. But as a model within which to understand how people reason, the Euler circles -- used widely in logic, philosophy and mathematics -- prove helpful. Thus, for example, when we say that "All human beings are mortal" we, in effect, frame the meaning of "human beings" by the broader expanse of meaning that may be labeled "mortality," or "mortal organisms," and so forth. The meaning of the latter is extended to the former. The "target" (human being) is the end, point, or "telos" to which meaning is being extended.

The affirmation of "mortality" in relation to "human

beings" also implies that human beings are not "immortal," thus the affirmation of "mortality" involves the negation of "immortality" in relation to "human beings." The meaning of "human beings" thus also involves the understanding of what "human beings" are not, and knowing what "human beings" are not implies knowing what they are. In this sense, as illustrated by Figure 1, the outside of the circle delimits the meaning of what is inside the circle and vice versa. Thus, oppositionality is always an ingredient in any predication. It should be noted that the previous discussion referred to meaning rather than meaningfulness. Yet, according to the definition of meaning cited in the first chapter of this thesis, meaningfulness is the component of this definition signifying the relation between a concept's meaning and the individual using that concept (i.e., word, etc.). In view of the discussion of the importance of an individual in the causal schemes postulated by the Kantian model, the word "component" is misleading since it connotes some type of subservience of meaningfulness to meaning. Given the significance of an individual in such schemes, it is more theoretically appropriate to elevate meaningfulness to a commanding role "over" meaning. Thus, the affective assessment as the metric of affective meaningfulness (measured via a liked/disliked dimension) should be regarded as the most broad and fundamental precedent which a person extends to

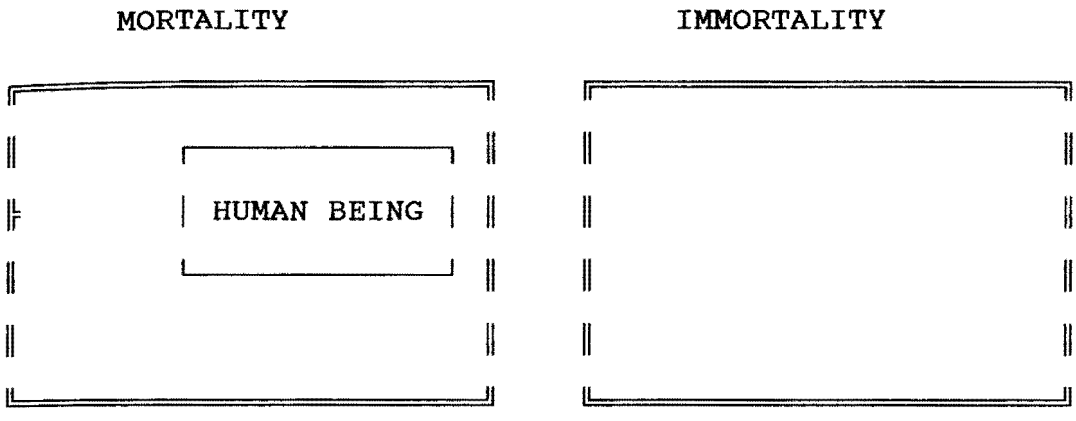
predicate the meaningfulness of anything in his/her experience.

This brings us to the definition of affective predication, as follows:

Affective predication is the cognitive act of affirming the meaningfulness of any item in experience by framing it within the broad dimension of likability. The person's affective preference of "liked" or "disliked" is extended to whatever is being focused upon in cognition, just as any predicate meaning frames and is then extended to some targeted item of interest. Inputs from experience do not determine affective predication. The latter always frame the former at the point of "input."

Figure 1

Euler Circle Illustration of Meaning Relations



CHAPTER IV

REVIEW OF LITERATURE IN SUPPORT OF AFFECTIVE PREDICATION

The previous chapter introduced the predicational model of cognition as an antithesis to Lockean models, and placed the explanation of affective assessment within the framework of this predicational model. The assessment of the stimuli in terms of a like/dislike dimension is thus seen as setting forth the major premises in any line of thought, recollection, and so on. In the framework of scientific method, this precedent context can be construed as the independent variable. Therefore, the hypothesis subjected to an empirical validation can be stated as follows: "If item A is assessed as liked, then B would follow." Given the oppositionality implied by the predication model the related hypothesis is "If item A is assessed as disliked then non-B would follow." According to the logical relations postulated by the predicational model, "B" and "non B" represent the "telos" or target to which the major premise is extended. In the empirical validation of these hypotheses, they represents the dependent variable.

The present chapter is dedicated to the empirical evidence gathered in support of the theoretical claims made by

the predicational model of affect.

Influence of Affective Assessment on Learning

The early studies on affective assessment have shown that persons learn consonant-vowel-consonant (CVC) trigrams which they have rated as positive more readily than those which they have rated as negative regardless of the associative value (Archer 1960) of these trigrams. This was termed the "RV positive effect" and it was demonstrated in a number of different tasks such as free recall (Rychlak, 1966), recognition (Labertaux, 1968), or when the rate of learning was measured in terms of trials to criterion (Abramson, 1967).

Subsequent studies have also found RV-positive effects when learning materials were other than CVC trigrams. For instance, Apao (1979) noted that positive affective assessment facilitates the primacy effect when learning words and Rychlak, Galster and McFarland (1972) and Rychlak and Saluri (1973) have shown the RV positive effect in learning names. Slife and Rychlak (1981) discovered that students tend to get better grades on academic subtopics in a course that they have prerated as liked. The RV effect was found regardless of induced states such as those of psychotropic drugs among psychiatric subjects (Rychlak, McKee, Schneider & Abramson, 1971) and alcohol intoxication (Mosbacher, 1984).

On the other hand, psychiatric subjects (Rychlak, McKee, Schneider & Abramson, 1971) as well as high school students and fifth graders with low self esteem (Rychlak, Carlsen & Dunning 1974; August,Rychlak & Felker, 1975) learned negatively rated materials more readily than positively rated ones. A similar effect was shown by Rychlak, Carlsen and Dunning (1974) who found that subjects learned liked words from a realm they assessed as liked (e.g. relations with authority) more readily than the words they disliked in this realm. Conversely, they learned disliked words more readily than liked words in a realm that they had predicated negatively (i.e., rated as disliked). Rychlak and Marceil (1986) demonstrated that subjects' positive or negative assessment of a paired associates task -- performed by models before the subjects participated in the identical task -- determined whether the subjects would learn along a positive or negative course of affective assessment.

The Relation Between Measures of Affective and Associated Meaningfulness

Above results, and especially the reversal of the RV positive effects lend themselves to interpretation of affective meaningfulness as a predicational process in so far as they follow the predicted course of meaningfulness extension postulated by the model. For instance, in the case of an RV negative effect, the learning of negative

items over positive (we may call this a negative learning style) is sequacious to a broader pattern of meaningfulness representing negative assessment of self or the learning situation. The actual items learned depend on the assessment of those items and the learning style. We can see the gradient of "broadness" in this interpretation of results: from the most encompassing affective predication of self or the learning task, to the affective predication of items, reflected in the measure of learning.

Although this is a plausible explanation, it does not in itself falsify the alternative mechanistic explanations of affective assessment cited in the previous chapter. Based upon the Lockean model, we can suggest that the rating itself is due to frequency of exposure to the stimuli, or in the behaviorist's interpretation, due to the type of contingencies involved in these previous exposures. Abramson, Tasto and Rychlak (1969) found no interaction between RV and associative value (AV) of CVC trigrams, but showed strong main effects for each of these variables. This pattern of results was obtained both when AV was measured nomothetically and idiographically. First of all, what this suggests is that RV and AV theoretically measure distinct constructs. Second, if we are to accept an argument that RV ratings reflect the quality of previous experiences, we would expect to find an interaction between the two measures at the higher levels of association value. This would be

the case, because, the more word-like trigrams would more likely elicit an association to a concept with which a subject has had some experience.

Kubat (1969) has shown that there is no consistent relationship between the RV of a given trigram and the number of word associations generated by that trigram in a production method. This study further suggests that the two measures are not related. It also contradicts the "affect as frequency of exposure" thesis advanced by Zajonc (1968, see above). If that were true, contrary to the obtained results, we would expect a richer associative structure around the positively rated items than around the negatively rated items.

Tenbrunsel, Nishball and Rychlak (1968) studied specifically the relationship between RV and AV measures. Given the hypothesis that associative meaningfulness accounts for affective meaningfulness, we would expect a confound between these measures in which the higher AV items would be rated more positively than lower AV items. The study did obtain a degree of confound between these measures, but it was most predominant among the <u>lower</u> AV items. In other words, the pattern of results suggested by the above hypothesis was limited to the variations in AV among the items from the lower ranges of Archer's (1960) norms, but was absent for items from higher ranges of Archer's norms. The support for the contention that AV and

RV are independent comes from the fact that if these measures were the variations of the same thing, we would find a pattern of results signifying a strong relationship between high AV items and "liked" rating and low AV and "disliked" rating, rather than variations within the lower range of associative norms.

Rychlak, Flynn and Burger (1979) advanced the notion of orthogonality between RV and AV measures based on the findings of cross-validating factor analysis. In this study, subjects were asked to rate CVC trigrams on a number of different dimensions. Besides looking at the ratings that correspond to RV measures (i.e., like/dislike) and those that correspond to AV measures (i.e., word-like/not word-like) the factor analysis also looked at the judgment of the items' perceived "learnability" (i.e., easy/hard to learn, easy/difficult to pronounce). This was done to address the criticism that the RV measure may reflect subjects' estimations of how easy it is to learn a given item. The results revealed a clear RV factor and a clear AV factor as well as a third factor termed "familiarity within the experiment." The "ease of learning" judgment tended to load closer to the AV factor than to the RV factor. As an interesting footnote, ratings in terms of Osgood's (1952) evaluative dimension (i.e., good/bad) loaded on the RV factor. As noted in the Introduction, the fourth code mentioned by Fiske and Taylor (1984) referred to this

evaluative dimension of the semantic differential. This finding allows us to draw a parallel between the evaluative dimension and the RV rating used in affective assessment studies.

In view of the demonstrated orthogonality of RV and AV it does not seem plausible to think of the latter determining the former. That is, we cannot really suggest that affection is "due to" frequent and contiguous contact with this or that item in experience. It is just as plausible to suggest that affective assessment is at the basis of frequent contact in life experience. We are drawn to and engage what we like. If we predicate something as harmful, we are sure to find unlikable aspects of this object or experience cropping up.

Effects of Affective Predication on Cognitive Organization

The studies discussed up to this point, demonstrated the effects of the postulated process in terms of the rate of learning. Namely, there was a consistent relationship between the postulated pattern of meaningfulness and the type of items recalled. In view of these studies, affective predication can also be understood as an organizing process and hence a process comparable to a schematic organization. Like a schema, affective predication imposes an organization which is reflected in the pattern of storage in memory as

well as in terms of its influences on subsequent cognitive acts. In view of this point, we can depict the process of affective predication as imposing a categorical structure consisting of a very broad designation of "liked meanings" and "disliked meanings" upon stimuli. Thus, we would expect to find similar effects to those obtained for categories elsewhere in the literature. For example, Bugaj (1984) found a clustering of liked traits used by subjects to characterize an individual. His results parallel those attained by Hoffman, Mischel and Mazze (1981) and Jefferey and Mischel (1979) who concluded that traits are organized by categories. Of course, in Bugaj's study the organizing category was one of affective assessment. Here, affective predication functions to organize traits that have a similar affective relationship according to the subjects' point of view.

Nguyen (1975) has actually established that affective predication determines the content of associatively based categories. In this experiment, she found that subjects cluster words according to their RV rating within categories such as "animals" or "professions." Furthermore, affective predication influenced the recall of words within each category as subjects were more likely to recall the liked than the disliked words in a given category.

Nguyen's findings are consistent with the general proposition that the structure of semantic memory is catego-

rical and that the invocation of a category within which an item is stored facilitates recall. Thus, Nguyen's study expands our understanding of memory structure by introducing a new level of conceptual organization. Her results encourage us to look for the "fourth code" not at a subservient or parallel level to the established categorical levels, but at a superceding or initiating level. As such, her results furnish further evidence that affective assessment is a broad conceptual category involved in the process of affectively predicating items in terms of their meaningfulness to an individual. The effects on learning obtained in her study as well as the studies that have been cited are the result of this process --a sequacious meaning-extension necessitated by the initial predication of the items' meaningfulness.

Affective Predication as a Dialectical Process

As discussed in the previous chapter, the predicational model takes into consideration the dialectical nature of human cognition. In regard to affective meaningfulness, the cognitive organization imposed upon items as the result of the predicational process is bi-polar, meaning that the postulated categories of "liked" and "disliked" items are related in such a way that one pole of the meaningfulness dimension delimits the other. This bipolarity of the cognitive organization was demonstrated by Rychlak, Williams

and Bugaj (1986) and Bugaj and Rychlak (1989).

In the Rychlak, Williams and Bugaj (1986) study, subjects exhibited the RV positive effect when learning the social descriptors that they had previously assessed as "liked" as well as when learning the antonyms of the social discriptors they previously had rated as "disliked". In the Bugaj and Rychlak (1989) experiment, subjects rated antonyms of liked primes negatively and antonyms of disliked primes positively. The ratings of synonyms were identical to the rating of the primes.

Primacy of Affective Predication

As stated previously, the theoretical approach taken by Rychlak and his associates is to suggest that predication is a process occurring "from birth." This means that a predication initiates (causes) learning rather than derives from it as an "effect." The postulated bipolar categories of "liked" and 'disliked" are believed to be innate and the process of imposing these categories upon experience occurs at the protopoint of cognition. There are three types of evidence that can be used to support these basic assumptions.

First, if the line of theorizing proposed here is correct, it should be possible to demonstrate that subjects will rely more on affective assessment (or RV) when their learnable materials lack the intellectualized or verbal dis-

criminants of association value (AV) than when such discriminants obtain.[1] That is, when a learner confronts materials to which he or she has "no" or "few" associations, when there is a lack of verbalized knowledge concerning the task at hand, affective assessment should be relied upon. Why? Because this capacity to predicate experience in terms of an oppositional "liked-disliked" is unlearned. Affective preferences are based on experience. But experience does not provide the choice as "liked" versus "disliked." This rendering of a preference is made by the evaluating intellect of the person as he or she confronts the "past experiences" initially -- literally from birth onward. Hence, it should be possible to design experiments proving that as specified cognitive associations are weakened, reliance on affective predication increases.

August and Rychlak (1978) have actually demonstrated something of this sort in the learning of abstract versus concrete words among 5th grade pupils. In this study, abstract words are analogous to the lower AV of CVC trigrams. That is, a highly abstract stimulus like "truth" lacks the concrete associative relations (such as visual referents) which subjects may employ as a learning heuristic (Paivio, 1965). As predicted, RV was found to have a greater effect when learning abstract (e.g., "truth") than

---

[1]Note: In earlier research on affective assessment, this dimension of "like-dislike" was operationally defined as "reinforcement value" or "RV."

concrete words (e.g., "tree").

Additional support for this hypothesis comes from several studies which argue that affective predication is a native human capacity, and thus a process which begins at birth. It was postulated that only later in life, due to subsequent learning, does an individual begin to rely on past associative relations. Therefore, these studies contended, there should be greater reliance on affective predication than on associative relations as a heuristic in learning among subjects who have less overall schooling. Consistent with this premise, it was discovered that affective predication plays an even greater role than usual in learning among younger children (Rychlak, 1975a), persons of a lower than middle socio-economic class (Rychlak, 1975b) and the educationally disabled (Woodward, 1978).

The above hypothesis also implies that predication occurs at the commencement of a cognitive process. This is a reflection of the basic tenets of the Kantian model which postulates the top-down approach to cognition beginning with the imposition of meaning upon stimuli.

Highly convincing evidence for the postulate that affective predication occurs at the beginning of a cognitive process is found in the studies that directly contrast affective predication with other types of cognitive organization. Interesting results were obtained by Rychlak's (1974) study that asked subjects to reverse the learning-

rate order of RV or AV effects. Subjects were able to reverse their AV effect (meaning they were able to learn the trigrams rated low in associative value first) but not the RV-positive effect. Normal subjects could not learn disliked materials quicker than liked materials, even though they tried to do so. Presumably, abnormal subjects would be unable to learn liked faster than disliked items, though this was not tested. This study lends further support to the suggestion that the stimulus materials were affectively predicated at the initiation of the learning process. The affective predication set the meaningful context which subjects could not negate without reassessing their initial position in regard to the stimulus materials. On the other hand, their ability to reverse the AV effect suggests that reliance on an associatively derived heuristic does not create a similarly broad context which dictates the subsequent course of cognitive processing. Rather, AV seems relates to an ongoing process in which each stimulus is treated differently.

The Present Experiment

The present study employs a nomothetic approach to affective predication in contrast to the idiographic one employed in the majority of the previously cited research on affective assessment. Tenbrunsel, Nishball and Rychlak (1968) have shown that a nomothetic measurement of affective

assessment has only a moderate (.54) test-retest reliability which was significant at a=.01, but this study was done using CVC trigrams. The writer believes that the stimulus materials used in the present study -- i.e., sentences -- lend themselves particularly well to the nomothetic approach.

Unlike CVC trigrams, sentences are intended to convey certain meanings between individuals who for the sake of understanding each other have entered a "social contract" (Rommetveit,1974, cited by O'Connell, 1988). After all, communication as well as language (O'Connell, 1988) is a social phenomenon and therefore a certain degree of intersubjectivity must obtain. In view of our discussion to this point, we can speculate that the meaning expressed by a sentence will have the positive/negative predication which we theorize is the most fundamental dimension of meaningfulness, and is one which must be shared by the individuals engaged in communication with each other. The assumption is that the overall positive or negative meaningfulness of the sentence constitutes the broad ground that will have an effect on the precedent-sequacious course of cognitive processing.

Given that we have found previous research suggesting that a person's affective preference (liked/disliked) enters into his or her learning and memory processes quite early (at the protopoint), it should be possible to demonstrate

some thing of the sort in a sentence-learning task. That is, previous studies relied on strings of CVC trigrams or words, either in paired associates or serial position. The experimenter could not discern in this process precisely "where" in the learning process that affective predication came into play. The writer believes that through the use of a sentence procedure it should be possible to demonstrate that affective assessment will come into play even more so than a comparison factor such as association value.

For example, let us assume that we were to ask subjects to learn to complete a series of sentences, such as:

When competing with others, John is _____.

In solving problems, John is _____.

When life gets strained, John is _____.

According to the present theoretical analysis, the initial phrase (i.e. In competing with others) in these sentences sets the context for the predication of John to follow (sequacious meaning extension). If, an ending of the sort "In competing with others, John is fearless" is considered "positive" and an ending of the sort "In solving problems, John is slow" proves "negative" in meaningfulness, then we have the basis for making a prediction. That is, based on previous research findings, we predict that the word "fearless" would be learned more readily in completing these sentences that the word "slow."

But even more importantly, we should find that when a

subject cannot recall the specific words "fearless" and/or "slow" he or she should be able to give us the affective quality of the sentence completion. Furthermore, a subject who cannot recall "fearless" should be able to guess that the word not yet learned has a positive meaning more readily than he or she will recall the negativity of the sentence completion requiring "slow." In other words, we should see the same "positive RV effect" in the presaged meaning-extension that we saw in the recall of CVC trigrams and words in earlier research. If people really do rely upon affective assessment as a very basic --literally pre-verbal--form of predication we should expect to find such differences in their anticipated learning efforts.

As a comparison to the affective predication procedure we might ask a different group of subjects to guess at the actual word meaning through use of a similar or synonymous word. For example, a subject who could not recall the word "fearless" might recall another word such as "courageous." Would this capacity to think of words similar to the one being learned compare favorably to the capacity to guess the affective quality of the sentence even before a word is attempted? It should be possible to assess the relative success rate of affective guesses (akin to RV) and similar word guesses (akin to AV). Based on previous research and the theory under development we would expect the affective guesses to be more prevalent and more accurate than the similar

word guesses.

CHAPTER V

METHOD

Hypotheses

(1) Subjects in a sentence completion task will anticipate the affective quality of words completing a positive sentence more readily than words completing a negative sentence.

Rationale. The vast preponderance of research on affective assessment establishes that subjects who are not specifically selected for a proclivity to predicate their experience negatively will predicate the learning task positively. Thus, random groups of college students invariably reflect a positive affective learning style. We therefore expect our subjects to behave in a comparable fashion. Hence, we predict that they will anticipate correctly more positive than negative sentence qualities even though they cannot recall the specific word completing this sentence.

(2) Subjects in a sentence completion task will be more likely to think of synonyms to words completing a positive sentence than words completing a negative sentence.

Rationale. The same theoretical reasoning applied to hypothesis 1 holds here. Previous research demonstrates

that subjects learn lists of words more readily if these words are liked than if they are disliked. Although we think affective assessment is the basic factor determining such learning dynamics, we expect to find affective preference reflected in actual word guesses. Subjects will guess more correctly along a positive than a negative dimension of meaning.

(3) Subjects will reflect a higher percentage of correct guesses when they are trying to name the affective quality of the missing word completions than when they are guessing similar words to these completions.

Rationale. Since it is our view that affective assessment is among the most fundamental or basic predications made in human learning, it follows that the scores issuing from affective guessing should be more plentiful and accurate than scores issuing from the word guesses. Obviously, the task confronting the subject who has to guess similar words involves both affective predication and additional factors in the learning process. We believe these additional factors do involve predication as well; but since there is an obvious complexity added to the task, a subject may be expected to do more poorly in guessing words than in guessing affective quality alone.

(4) Subjects in the sentence completion task will be able to recall words completing the positive sentences more readily than the words completing the negative sentences.

Rationale. This hypothesis pertains to a manipulation check on the positive affective assessment's facilitation of learning discussed in rationale for hypothesis 1 and hypothesis 2. We expect that subjects will reach the learning criterion of two errorless trials of an entire list of sentences by providing correct sentence completions for positive sentences in fewer trials than for negative sentences. Results in the predicted direction will lend additional support for our hypothesis that affective predication is employed by the subjects in this learning task.

Subjects.

Seventy undergraduates fulfilling requirements for the introductory psychology course at Loyola University of Chicago were assigned to the between group conditions using the randomized blocks procedure (Shaughnessy & Zechmeister, 1985). Twenty other subjects were used to pretest the experimental material. Out of these, 6 served to pre-rate sentences and another 3 pre-rated the stems of the sentences. Another group of 5 individuals was recruited to rate the subjects' responses. These individuals were blind to the experimental hypotheses and the identity of the subjects.

Experimental Tasks

Following the presentation of complete sentences during an initial learning trial (see below), the principle task employed in this study required subjects to provide an

omitted predicate (e.g., "graceful") of a sentence cued by the stem of that sentence (e.g., "In athletics, John is...." If a subject failed to do so within 5 seconds or had provided an incorrect predicate, he/she was prompted to perform one of the two following tasks depending upon the between-subjects condition he/she was assigned to: (a) guess the affective valence of the omitted predicate by stating whether it was "positive" or "negative," within 15 seconds of the prompt; (b) suggest a similar word to the omitted predicate within 15 seconds of the prompt. These test trials continued until a subject reached a learning criterion of two errorless trials.

Apparatus

All testing was done using an IBM PC personal computer with a gray monochrome monitor and the original (i.e., 10 function keys layout) IBM PC keyboard.

A program was written specifically for the purposes of this experiment. During a learning trial the program presented sentences in the following fashion: The stem (e.g., "In athletics, John is...") was presented first on the upper left hand side of the screen for 2 seconds, and the predicate (e.g., "graceful") was presented next on the upper right hand side of the screen for another 2 seconds. Thus, the stem was on the screen for a total of 4 seconds, with the last 2 seconds appearing together with the word

completing the sentence. The order of sentence presentation was randomized and there was no delay between items on the list.

Between the learning trial and the first test trial, a message "Now try to complete these sentences" appeared for 5 seconds. During the test trials, the stems of the sentences were presented as before. A timer appeared right above where the predicates were located during the learning trial. The timer was set to 5 seconds, and counted down to zero, reflecting the time given to subjects to start their response. A message "Please press enter to continue" was placed right below where the predicates appeared during the learning trial. The order of stem presentation was randomized for each test trial.

The timer stoped as soon as a subject began to enter his/her response. The program waited until a subject pressed the "enter" key to proceed further. Once, a subject pressed the "enter" key the program compared the response to the correct answer. No discrepancy between the response and the correct answer was tolerated by the program, thus subjects were instructed to check their spelling and allowance was made for misspelling when reviewing subjects' protocols (see below).

If the response matched the correct predicate, the program flashed a "Good Job!" message in the center of the screen for 2 seconds and moved to the next item on the list.

Thus, there was a 1-second delay between items on the test trials. If the list was exhausted, the program presented a message "This is an end of a trial...," toward the bottom center of the screen. The duration of this message was 2 seconds, thus signifying the between-test trial delay. The program self terminated after two consecutive errorless test trials (see below for the discussion of the trial to criterion scores).

If a subject's response did not match the correct predicate, or if the time expired before a subject made an entry, the course of the program depended on the experimental condition the subject was assigned to.

If a subject was assigned to the condition that required him/her to state the affective valence of the predicate, a prompt "Is this word Positive or Negative; enter P or N" appeared in the left-center of the screen. A prompt "Press enter to continue" then appeared below the previous prompt. The timer was set to 10 seconds. Once, a subject pressed "enter" or if the time ran out, the program moved to the next item.

If a subject was assigned to the condition that required him/her to provide a similar word, a prompt "Similar word:" appeared in the left-center of the screen, and a prompt "Press enter to continue" right below it. The timer was reset to 10 seconds. Once, a subject entered his/her response, or if the time expired, the program moved to the

next item.

Independent Variables

The between subjects independent variables in this study were the experimental conditions defined by the task performed by subjects when they failed to provide a correct predicate on a test trial. As stated above, one group of subjects was asked to state the affective valence of an omitted predicate. This group is referred to as the Affective Judgment condition. The second group was instructed to provide a similar word to the omitted predicate. This group is referred to as the Similarity Judgment condition. The instructions given to these groups are cited below in the procedure section. These group variables were used in all analyses of variance preformed to test the above hypotheses.

For the test of hypotheses 1, 2, and 3 the types of sentences were differentiated in terms of the stem-predicate combinations. Thus, we have two within subjects variables: affective valence of the stem (positive or negative) and the affective valence of the word completion (also positive or negative). The interception of these variables defined the type of sentences presented to the subjects. For instance, the stem "In athletics, John is..." was rated as positive (see below in the "Material" section for the rating procedure), while the stem "On a rainy day, John is..." was rated

as negative. Thus, a positive stem (e.g., "In athletics, John is...") combined with a positive predicate (such as "graceful") resulted in a positive stem-positive predicate (PP) sentence (i.e., "In athletics, John is graceful"), which had an overall positive rating. By combining a negative stem (e.g., "On a rainy day, John is...") with a negative predicate (e.g., "sad") the negative stem, negative predicate sentences (NN) were derived, which had an overall negative valence. Other possible stem-predicate combinations were also used. Thus, there were positive stem, negative predicate or "PN" sentences (e.g., "In athletics, John is clumsy.") that had an overall negative valence, and the negative stem, positive predicate or "NP" sentences (e.g., "On a rainy day, John is happy.") that had overall positive valence.

The reason for this more precise differentiation of the sentence types than was mentioned in hypotheses 1, 2, and 3 was because we wanted to test for a possibility that the stem-predicate combinations by themselves could have influenced the subjects' responses. This situation posed the most serious threat in the Affective Judgment condition, in which subjects were instructed to provide the affective valence of the omitted predicates. It was theoretically possible that subjects could have relied on the valence of the stem to guess the affective valence of the predicate. Thus the test of hypotheses 1, 2, and 3 involved comparisons

between types of stem (positive or negative), types of word completion for these stems (positive and negative) and also the between subjects variable (Affective Judgment and Similarity Judgment conditions). To test the hypothesis 4, only the overall affective valence of the sentences was used to operationalize the within-subjects variable. As such, the test of hypothesis 4 is a comparison between the sets of positive and negative sentences and the group variables.

Dependent variables

Trials to criterion scores: The first dependent variable under consideration was the trials to criterion score, defined as the number of test trials that it took a subject to reach two errorless trials for the list. The two errorless trials were included in the score. For example, if a subject did not make an error for any of the positive sentences after the third trial, his/her trials to criterion score for the positive sentences would have been "5." If the same subject made the last error on any of the negative sentences on the fourth trial, his/her trial to criterion score for the negative sentences would have been "6." The analysis of this variable constituted a test of hypothesis 4.

To clarify this scoring, let us consider an experimental protocol of an imaginary subject named Sampson.

Assume, Sampson had completed the task in seven trials. That is, he made errors on the first five trials, but by the sixth trial, he correctly anticipated all the words in all the sentences and this carried over to the seventh trial as well. Also, assume that on the fifth trial, Sampson made an error only for a negative sentence, while the last error for a positive sentence occurred on the fourth trial. Thus, his trials to criterion score for negative sentences was "seven," but for postive sentences "six."

As was noted above, the computer program did not tolerate any descrepancy between the responses and correct answers. Cases where the review of subject's protocol indicated that an initial incorrect response was due to misspelling, were not counted as an error. These were rare (seven in all for the total sample) and none of the trials to criterion scores in the sample had to be adjusted because of misspelled responses.

Match/error ratio scores: The second dependent variable was the "match/error ratio" score that was used to test hypotheses 1, 2 and 3. This represented the number of matches over the number of errors affording the opportunities to make a match for a particular type of sentence. For example, if our imaginary subject -- Sampson failed to provide a correct word completion to the PP sentences on the list (e.g., "In athletics, John is graceful.") five times while reaching the learning criterion, he/she was prompted

five times to either state the affective valence of these sentences, or to enter a similar word. The operationalization of the "match" varied according to the between-subject condition and is discussed below. Since the number of opportunities was expected to vary due to individual differences in learning the experimental material, and due to the variations in learning expected under hypothesis 4, the number of "matches" was divided by the number of opportunities to make a match, yielding a ratio score. This score was computed for each type of the sentence (PP, NP, NN, PN) and was used to test hypotheses 1,2 and 3.

Scoring for the Affective Judgment condition was as follows: Any time a subject could not recall a word completing a sentence, but, when prompted to do so, was able to correctly state the affective quality of that word completion, the response was considered to be a match. Suppose Sampson had attempted to answer the stems "In athletics, John is...," "When solving problems, John is...," "When competing with others, John is...," all of which are positive stems. (see Table 1 below) Furthermore, suppose that each of these stems was completed by a positive predicate (e.g "graceful," "fast," and "active" respectively), thus deriving positive stem-positive predicate (PP) sentences. If it took Sampson five trials to reach the learning criterion of two consecutive trials, these PP sentences were presented to him/her 15 times.

Assume that in these 15 times the sentences were presented, Sampson failed to provide a correct word completion on five occasions. For instance, he failed to answer all three stems on the first trial; the stem "In athletics, John is ..." on the second trial; and the stem "When competing with others, John is..." on the third trial. Each time, Sampson failed to provide a correct word completion, the computer program prompted him to state the affective valence of the word completion, whether it was positive or negative. Thus, in this example, Sampson was prompted to state the affective valence of the sentences five times. If he answered correctly three out of five times by entering P for "positive," his match/error ratio score for PP sentences would be 3/5 or .60.

If the subject did not make an error for a particular type of sentence (for instance, the same subject answered all negative stems that were completed by a positive word, i.e., NP sentences), a score of 1.00 was assigned.

As was noted above, misspelled responses were not counted as an error and thus, were droped from consideration in calculating the match-ratio scores. Considering the infrequency of their occurrence, their possible effect, if any, on the match-ratio scores was negligible.

Table 1

Positive and Negative Sentence Stems

	Positive stems	Negative stems
1	When competing with others	When life gets tense
2	When eating	When bad things are likely
3	When watching a movie	If fault is assigned
4	When it comes to money	When others are rude
5	When attending a party	In dangerous situations
6	If schedule must be kept	When others are in trouble
7	In solving problems	On a rainy day

In scoring for the Similarity Judgment condition, a match was defined in terms of the agreement between four out of five raters who judged the semantic relatedness of the subjects' responses; that is the particular stem they used with the predicate. For example, when asked to provide a similar word to the predicate "passive" completing the stem "When competing with others, John is..." the subjects responded with "slow," "vicious," "not motivated" and so on. The raters were given the complete sentence (e.g., "When competing with others, John is passive.") and the list of all responses to that particular stem given by the subject in question. The raters were instructed to state if a given response could be used in that sentence without altering the meaning of the sentence (see Appendix A for the actual instructions given to these raters). For example, can the words "not motivated" be substituted for "passive" without changing the meaning of the sentence "When competing with others, John is passive." conveys? If four out of five raters agreed that "not motivated" could be used in lieu of "passive" in that sentence, this response ("not motivated") was scored as a match for the subject or subjects who made it.

As in the Affective Judgment condition, the derived score for the Similarity Judgment condition was the number of matches over number of opportunities to make a match. If a subject did not make an error for a particular type of

sentence, a score of 1.00 was assigned. Instances where a subject failed to respond to the prompt to provide a similar word were scored as "no match." If a subject provided a correct sentence completion in place of a similar word despite explicit instructions to the contrary, this completion was considered an error. As before, subjects were not penalized for misspelling words.

Material

This study used two lists of 14 sentences (see Appendix B). The first list contained four sentences with positive stems and positive word completions (PP), three sentences with positive stems and negative word completions (PN), three sentences with negative stems and positive word completions (NP), and four sentences with negative stem and negative word completions (NN). The second list contained three PP sentences, four PN sentences, four NP sentences and three NN sentences. Thus both lists had seven positive sentences and seven negative sentences. There were two forms of lists arranged (A and B) and subjects were randomly assigned to work with either list A or B.

The two lists were assembled using the following procedure: Initially, two preliminary lists were made with each sentence consisting of a stem (e.g., "When competing with others John is ...") and a word completion (e.g., "active"). If a positive word completion was used in the

list A (i.e., "active") its antonym was used in the list B (e.g., "passive"). Thus, lists A and B mirrored each other in terms of the affective connotations of the word completions.

Each list was given to a different group of three raters for their judgment. The raters were instructed to judge the meaningfulness of the sentences as positive or negative. (see Appendix C for the instructions given to these raters). They made their responses by circling the letter "P" if they thought a sentence was positive, or the letter "N" if they thought that the sentence was negative. These letters were at the end of each sentence and their order was randomized to control for response bias.

In addition, the raters were asked to generate as many synonyms as they could for the adjectives of the sentences within one minute. The adjectives were underlined so that they would be easily recognized by the raters.

A sentence and its variant were included on the experimental lists only if both met the following criteria:

1) All three raters agreed on the positive or negative meaningfulness of a sentence.

2) All three raters generated at least three words that were similar in meaning to the predicate of the sentence.

The latter criterion is a precaution against using words that have few readily accessible associates, hence biasing

the results in favor of the Affective Judgment condition.

Originally, the design called for eight sentences to be used in this manner, but pre-testing showed that subjects were able to learn this list in two trials. This situation forced us to expand the lists and decrease the time of their presentation on the learning trial. As such, all 14 sentences that met the above criteria were used.

Once the sentences were selected using this procedure, its stems (14 in all) were given to another group of raters to judge for their affective meaningfulness. A procedure similar to that used with the rating of sentences was employed. An example of the instructions given to these raters is presented in Appendix D. This was done to determine the type of stem-predicate combination a given stem was involved in (see above for a discussion of the possible bias due to the variations in the stem-predicate combinations). Again, an agreement between three raters was required to retain a given stem on the lists. All 14 stems met this criterion.

Unfortunately, this selection process resulted in the uneven number of stem-word completion combinations. Pre-testing also revealed that dropping the number of sentences to 12 would make this task considerably easier. There were no more available sentences to increase the number to 16. This disparity was not a crucial blow to the design since the score most likely to be affected by this inequality --

the match/error score was a ratio score already due to other considerations (see above). Thus, since the only way this inequality could effect the results was by affording more opportunities to provide correct word completions to a group of stem-word combinations, the use of ratio scores preempted this criticism. This was the case because what was compared was the proportion of matches rather than the actual number of correct guesses of affective quality of word completions or the actual number of words similar to the word completions. In regard to the trial to criterion scores, this disparity could be considered a factor, since the analysis of this score did not make differentiations in terms of stem-word combinations. The number of positive and negative sentences was equal at seven.

The word completions for these sentences were also checked for appearance in the standing language structure using Thorndike and Lorge (1944) norms. These are presented in the Appendix B. Except for one pair of word completions (active [rating A] and passive [rating 7]) all other word completions for a given sentence were equal in terms of their word frequencies.

Procedure

Testing was conducted individually in a small laboratory room with the experimenter present to assist with the operations of the IBM personal computer and to answer ques-

tions pertaining to the instructions. Each subject was scheduled at least 10 minutes after the previous subject was expected to complete the task.

Subjects were told that this experiment was a learning task that involved memorizing a list of sentences and that it was not a test of their competence. They were further informed that they were free to discontinue the experiment at any point they wished without incurring any penalty.

Following their informed consent, subjects were asked if they ever had worked on a computer. The "enter" key was pointed out to all subjects, and they were asked to press the key several times to familiarize themselves with its location.

The procedure was first demonstrated by the experimenter using sentences "In athletics, John is graceful," and "When it comes to dancing, John is clumsy." Subjects were not informed regarding the affective valence of these sentences, or the word-completions. The order of presentation was randomized by the program, but for the sake of clarity, the above order will be used in this discussion.

Before the sentences appeared on the computer screen, subjects were told that this was an example of a learning trial and they were to try to memorize the sentence that would appear. At this time, the task of providing the omitted predicate was explained to the subjects. Subjects were also informed that the actual list would be much longer

and that only one learning trial would be used during the actual experiment, though correct responses would be given if they made a mistake.

Following the demonstration of the learning trial, the demonstration of the test trial began. Only the stem appeared on the screen, along with a timer counting down from five seconds. The experimenter entered the first letter of the predicate "graceful" to illustrate that the timer would stop once a subject began to enter a word. The screen locations of the stem, the timer, as well as the location where subjects' entry would appear were pointed out. The experimenter proceeded to misspell the predicate (e.g., "grcful"). Subjects were told that this task was not a test of their typing ability and were shown how to change the spelling of the word using the backspace key. They were also instructed not to change the word itself. Once the spelling of the word was corrected, the experimenter pressed the "enter" key. The program responded with a "good job!" message appearing on the screen.

When, the next sentence stem ("When it comes to dancing, John is...") appeared on the screen, the experimenter stopped the timer by entering a random set of digits in lieu of the word completion, thus committing an intentional error. At this point, the tasks required of the subjects after they had failed to provide a correct predicate were explained.

For the Affective Judgment condition, subjects were instructed to guess the affective quality of the word they could not recall by typing in "P" or "N" at the program prompt. The experimenter then asked the subjects what letter (P or N) he should enter.

For the Similarity Judgment condition subjects were instructed to type in the first word coming to mind that they thought was similar to the one they could not recall. Again, subjects were informed that the timer would stop as soon as they started typing. Subjects were also asked not to change the word once they started typing, and not to enter the correct word if they happened to remember it on the second try. All these admonitions were conveyed during this demonstration.

Following this demonstration by the experimenter, subjects were asked to practice the procedure using the same two warm up sentences for at least three test trials. After their questions were answered, the actual experiment began. The subjects were debriefed after they had completed the full experimental procedure.

CHAPTER VI

RESULTS

Trials to Criterion Scores

The first dependent variable in this experiment was the trials to criterion scores. The raw data of these scores are presented in Appendix E. As the reader may recall, this score signified the number of trials it took a subject to reach the criterion of two errorless trials (including the two errorless trials) for each type of sentence (positive and negative). A higher value of this score indicated more trials were needed to learn a sublist of a particular type of sentences. These scores were intended to test hypothesis 4, which predicted that postive sentences would be easier to learn than negative sentences; thus, it would take fewer trials to reach criterion for positive sentences than for negative sentences.

The trials to criterion scores were analyzed with 2 between-subjects (task: Affective Judgment versus Similarity Judgment) by 2 within-subjects (type of sentence: positive versus negative) repeated measures analysis of variance (ANOVA). The BMDP2V program was used to compute the ANOVA. The ANOVA source table is presented in Table 2 and the means

and standard deviations are cited in Table 3. The inequality of the number of subjects was due to the software failure described above. This inequality was random, and was taken into account as such by the computational program.

As shown by Table 2, the ANOVA yielded no significant main effect, nor interactions. Consequently, we are unable to reject a null hypothesis framed in terms of hypothesis 4. No advantage was found for positive over negative affective assessment.

Match-Ratio Scores

The second dependent variable in this experiment was the match-ratio scores (see Appendix E for raw data). As noted above, the match-ratio scores were computed by dividing the number of matches by the total number of opportunities to make a match (i.e., the sum of matches and non-matches). Thus, the match-ratio scores represented the subjects' accuracy in either stating the correct affective quality of a sentence completion in the Affective Judgment condition, or providing a word similar to the sentence completion in the Similarity Judgment condition. The higher values of the match-matio scores signified greater accuracy in the latter judgments.

Table 2

Source Table For the Analysis of Variance of Trials to Criterion Scores

Source of Variance	Sum of Squares	df	Mean Square	F	p
Judgment Condition	5.49	1	5.49	1.4	ns
Error(1)	167.47	44	3.81		
Sentence Type	0.21	1	0.2	0.19	ns
Sentence Type X Judgment Condition	0.47	1	0.47	0.43	ns
Error(2)	48.75	44	1.11		

Table 3

Means and Standard Deviations for

Trial to Criterion Scores

Experimental conditions	mean	std. dv.
Affective Judgment		
Sentence type		
Positive	4.68	1.75
Negative	4.92	1.66
Similarity Judgment		
Sentence type		
Positive	4.33	1.32
Negative	4.29	1.45

The match-ratio scores were used to test hypotheses 1, 2, and 3. The independent variables involved in the test of these hypothesis were the affective valence of the sentence stems (positive or negative), the affective valence of the word completions (positive or negative) and the judgment tasks (Affective Judgment and Similarity Judgment).

The match-ratio scores were submitted to a 2 between (judgment task: Affective Judgment versus Similarity Judgment) by 2 within (affective valence of the stems: positive versus negative) by 2 within (affective valence of the word completions: positive versus negative) repeated measures ANOVA. The ANOVA was computed using the BMDP2V program. The source table for this ANOVA is presented in Table 4, and means and standard deviations for the independent variables are presented in Table 5. As noted above, the inequality in the number of subjects for Affective Judgment and Similarity Judgment conditions was due to software failures, and thus was a random effect, accounted for by the computational program.

Since the match-ratio scores were proportions, they were transformed using an arcsine transformation to equate the distance between the data points (see Winer, 1971). These transformed match-ratio scores were submitted to the same ANOVA as the raw match-ratio scores. The source table for the ANOVA of transformed match-ratio scores is presented in Table 6. The transformed means and standard deviations

for the independent variables are cited in Table 7.

As can be seen in Table 4, the ANOVA revealed a significant main effect only for the judgment task variables ($F[1,44]=8.87$, $p > .005$) The same pattern of results was obtained for the transformed scores. ($F[1,44]=8.40$, $p > .001$) (see Table 6). Since, the raw match-ratio scores are more discriptive of the subjects' performance than the transformed match-ratio scores, and the significant pattern of results was identical for nontransformed and transformed scores, the results will be discussed in terms of raw match-ratio scores.

Thus, the obtained results indicate that on the average, subjects in the Affective Judgment condition were more likely to accurately state the affective valence of the word completions than subjects in the Similarity Judgment condition were able to provide a similar word (X (Affective Judgment) $=.741 > X$ (Similarity Judgment) $=485$). Thus, the results lend support only to hypothesis 3 by showing the predicted difference between the Affective Judgment and the Similarity Judgment conditions.

Table 4

Source Table for the Analysis of Variance of Raw Match-Ratio Scores

Source of Variance	Sum of Squares	D.F.	Mean Squares	F	p
Judgment Task	2.97	1	2.97	8.87	.0047
Error Term	14.75	44	.34		
Sentence Stem	.03	1	.03	.30	ns
Sentence Stem by Judgment Task	.05	1	.05	.48	ns
Error Term	4.21	44	.09		
Word Completion	.08	1	.08	.55	ns
Word Completion by Judgment Task	.17	1	.17	1.16	ns
Error Term	6.62	44	.15		
Sentence Completion by Word Completion	.02	1	.02	.22	ns
Sentence Completion by Word Completion by Judgment Task	.18	1	.18	2.14	ns
Error Term	3.66	44	.08		

Table 5

Means and Standard Deviations for

Raw Match Ratio Scores

Experimental Groups	Mean	Std. Dev.
1) Positive Stem, Positive Word Completion		
Affective Judgment	.788	.318
Similarity Judgment	.440	.449
2) Positive Stem, Negative Word Completion		
Affective Judgment	.686	.418
Similarity Judgment	.587	.467
3) Negative Stem, Positive Word Completion		
Affective Judgment	.712	.352
Similarity Judgment	.426	.476
4) Negative Stem, Negative Word Completion		
Affective Judgment	.776	.311
Similarity Judgment	.488	.469

Table 6

The Source Table of the Analysis of Variance of the Transformed Match-Ratio Scores

Source of Variance	Sum of Squares	D.F.	Mean Square	F	p
Judgment Task	27.16	1	27.16	8.4	.0001
Error	142.34	44	3.23		
Sentence Stem	.22	1	22	.25	ns
Sentence Stem by Judgment Task	.27	1	.27	.30	ns
Error	39.67	44	.90		
Word Completion	.84	1	.84	.60	ns
Word Completion by Judgment Task	1.92	1	1.92	1.35	ns
Error	62.44	44	1.42		
Sentence Stem by Word Completion	.14	1	.14	.18	ns
Sentence Stem by Word Completion by Judgment Task	1.33	1	1.33	1.77	ns
Error	33.35	44	.75		

Table 7

Means and Standard Deviation for

the Transformed Match-Ratio Scores

Experimental Groups	Mean	Std.Dev.
1) Positive Stem, Positive Word Completion		
Affective Judgment	2.46	.95
Similarity Judgment	1.39	1.40
2) Positive Stem, Negative Word Completion		
Affective Judgment	2.17	1.31
Similarity Judgment	1.85	1.46
3) Negative Stem, Negative Word Completion		
Affective Judgment	2.24	1.06
Similarity Judgment	1.36	1.49
4) Negative Stem, Negative Word Completion		
Affective Judgment	2.41	.92
Similarity Judgment	1.59	1.43

As one may recall, hypothesis 1 predicted that subjects in the Affective Judgment condition would be more accurate in guessing the affective valence of a word completing a positive sentence than a word completing a negative sentence. Hypothesis 2 predicted that subjects in the Similarity Judgment condition would be more likely to provide a word similar to a word completing a positive sentence than to a word completing a negative sentence. Since, the word completion of a sentence determined the affective quality of a sentence, these hypotheses predicted a main effect for the word completion variables where the accuracy for positive word completion would be greater than the accuracy for negative sentences for both Affective Judgment and Similarity Judgment conditions.

Since no main effect for the word completion variable was obtained, the results did not support hypotheses 1 and 2. According to these results, contrary to prediction of hypothesis 1, subjects in the Affective Judgment condition were no more likely to accurately state the affective valence of the words completing the positive sentences than those completing the negative sentences. Contrary to the prediction of hypothesis 2, in the Similarity Judgment condition, subjects were no more likely to provide a word similar to one completing a positive sentence than to one completing a negative sentence.

Chi Square Analyses

Chi Square of Match Frequencies in Affective Judgment Condition. An argument can be made that the pattern of scores obtained in support of hypothesis 3, were due to the limitation of the response alternatives for the Affective Judgment condition, while no such limitation existed for the Similarity Judgment condition. Namely, the subjects in the Affective Judgment condition were presented with two alternatives for a response -- "P" for "positive," or "N" for negative. On the other hand, subjects in the Similarity Judgment condition who had to generate their own responses were faced with a potentially unlimited number of alternatives. Thus, it could be argued that the difference in match-ratio scores between the Affective Judgment condition and the Similarity Judgment condition was due to the higher probability of subjects in the Affective Judgment condition arriving at a "correct" response.

This argument was already taken into consideration in the procedure of selecting sentences for this experiment. That is, we required that the raters provide at least three synonyms to word completions of all the sentences selected, thus increasing the probability of a similar response being available. An additional counter-argument can be made by presenting evidence that the pattern of responses obtained for the Affective Judgment condition was not due to chance alone. Since, the subjects in this condition were faced

with dichotomous alternatives, the chance probability is thus .5 or 50%.

To test that the match scores for Affective Judgment condition were not obtained by chance alone, a chi square was performed comparing the observed frequency of matches (because there was no effect for the word completion and the sentence stem variables: both positive and negative matches were summed together) with the value expected under the probability of .5 (or 50%) to make a match. The frequencies used are presented below in Table 8. The analysis yielded χ^2 (1, N= 131)= 11.62, which was significant at $p<.01$.

Thus, we can conclude that the pattern of match-ratio scores obtained for the Affective Judgment condition was not due to chance alone. Since, we can now begin to rule out the possibility that the subjects simply guessed the affective quality of the word completion, we have evidence to suggest that the obtained pattern of results for match-ratio scores in the Affective Judgment condition reflects the postulated ability to anticipate the affective quality of the word completions, and hence, lends support to the predicational model presented above. Here, we find evidence that the affective predication of the sentence completion had an effect, beyond that expected due to chance alone.

Table 8

Observed and Expected Frequencies for Matches for the Affective Judgment Condition

Observed Frequency of Matches	85
Expected Frequency of Matches	65.5
Observed Frequency of Nonmatches	46
Expected Frequency of Nonmatches	65.5
Total Number of Observations	131

The Chi Square Analysis of Frequencies of "Affective" Matches in Similarity Judgment Condition. Additional support for the hypothesis that affective predication had an effect on the subjects' ability to anticipate the affective quality of the word completions can be derived by looking at the correspondence of affective quality of the "similar" responses provided by subjects in the Similarity Judgment condition with affective quality of the word completions. In view of the above discussions of affective predication, we would expect that the affective predication of the sentence would determine the generation of the "similar" responses along the same affective dimension. For instance, we would predict that the "similar" responses to a sentence stem "In solving problems, John is..." which is completed by a positive "fast," would also be positive, even when a "similar" response is not related to the actual word completion in other ways (e.g., "friendly" and/or "brilliant"). Thus, we would expect the frequency of correspondence between the affective quality of the "similar" responses with the affective quality of the sentence completion (i.e., the frequency of "affective" matches) to be above that expected by chance alone. As was the case in the above chi square analysis, the frequency expected by chance alone would be 50% of all responses.

To test this hypothesis, the same group of raters who evaluated the subjects' "similar" responses in terms of

"similarity" with the sentence completions also scored the subjects' "similar" responses in terms of the affective dimensions of "positive" and "negative." The instructions given to these raters were as follow:

> "Please indicate if you think that the following items are positive or negative in meaning by checking off "P" for positive and "N" for negative. Please rate items one at a time, and go by your first impression."

As was the case for "similarity" judgment, the correspondence between the affective valence assigned to a subject's response by four or more raters, and the affective valence of the word completion of a sentence to which the response was made, defined an "affective" match.

For instance, assume that a subject responded with "wonderful" when cued with the stem "When solving problems, John is...," but the actual word completion here was suppose to be "fast." The word "fast" was positive. If four or more judges rated "wonderful" as positive, then we would consider "wonderful" to <u>affectively</u> match "fast," despite the fact that there is no other apparent semantic relationship between them.

These "affective" match scores were analyzed with a chi square to see if their frequency was significantly different from the value expected by a chance probability of 50 %. The frequencies analyzed are presented in Table 9.

An analysis yielded a $\chi 2$ (2, N=92)=21.04, p.<.01.

Based on this analysis, we can conclude that the frequency of "affective" matches was not due to chance alone. These results further support the counter-argument made in the previous section. Not only can we conclude that subjects were able to state the affective quality of the sentence completions when directly asked to do so in the Affective Judgment condition, but now we also have an indirect measure of the same effect. Thus, we have additional evidence in support of the predicational model proposed under test.

Table 9

Observed and Expected Frequencies for Affective Matches For the Similarity Judgment Condition

Observed Frequency of Matches	68
Expected Frequency of Matches	46
Observed Frequency of Nonmatches	24
Expected Frequency of Nonmatches	46
Total Number of Observations	92

CHAPTER VII

DISCUSSION

The main finding of this study is the difference between group match scores; as predicted in hypothesis 3. Subjects were more likely to anticipate the affective quality of the predicate than to provide a similar word. In view of the theoretical framework laid out in Chapters III and IV, these results indicate that a subject knew the affective sense of the predicate before the exact word was learned. This, conclusion is further supported by the trend in the subjects' responses to provide an affectively similar word to the actual predicate in the Similarity Judgment condition as indicated by the chi square analysis of frequency of "affective" matches. The affective quality thus represents a broad organizing structure that allows one to draw the relationship between items, even when no other relationship exists.

For example, in some cases, the similar responses were word completions of other sentences having the same affective quality. This pattern of errors further supports the notion that the items were predicated in terms of their affective quality, and hence, are more likely to be inter-

changed within the same affective context regardless of the specifics of their meaning. On the other hand, the specific relations between words may become apparent only after the word is put into the context which it shares with a limited number of other similar items. Affect may be too broad of a conceptual category to bring these relationships out. Thus, if the learning is a top-to-bottom process as it is claimed here, one would be cognizant of the affective quality of the words before they would be aware of the specific relations which facilitate the ability to state a similar word.

As was noted above, one may argue that the limitation of response alternatives for the Affective Judgment condition to positive and negative versus the potentially unlimited number of possible responses for the Similarity Judgment condition had an effect. Thus, the results obtained are the reflection of a fact that in the subjects in the Affective Judgment condition had at least a 50% chance of responding correctly (matching the actual affective valence of the sentence completion) while for the subjects in the Similarity Judgment condition, the chance of providing a similar word would be smaller. This is a formidable challenge, but it was countered in three ways, and here the fourth will be suggested. First, the selection criterion for the sentences that required the raters to provide at least three similar words to the predicate of a sentence partly meets this criticism by insuring that each word used

had readily available alternatives. Second, given that the frequency of matches in Affective Judgment condition was well above that expected by chance alone (as was indicated by the chi square analysis), we can conclude that the performance of subjects in the Affective Judgment condition reflects more than mere guessing. Third, subjects in the Similarity Judgment condition tended to provide "similar" responses that were affectively similar to the sentence completions even when these "similar" responses did not meet the other criterion of similarity. As was noted above, this evidence is another indication that subjects had a "hunch" about the affective quality of the word completions.

Fourth, the lack of the simple main effect for the type of sentence variable in the Affective Judgment condition is actually encouraging. Any pattern of scores other than those predicted by hypotheses 1 and 2 (i.e., PP=NP> NN=PN) or its opposite (i.e., PP=NP<NN=PN that would suggest RV reversal effect), would have indicated that stem-word combinations had an effect beyond the positive or negative evaluation of the sentences. Especially damaging would have been an interaction in which the scores for PP and NN sentences were higher than PN and NP scores. This would imply that the obtained main effect for the group variable might have been due to the fact that subjects simply guessed the affective valence of the predicate based upon the affective valence of the stem.

A related issue is that the tasks between conditions differed in terms of difficulty. In the case of the Affective Judgment condition, the task simply required the subjects to indentify the correct response between the presented alternatives (i.e., positive or negative). In the case of the Similarity Judgment condition, subjects had to generate their own responses. This point is well taken and future research should take into account this distinction by equating these tasks. For instance, the subjects in the Similarity Judgment condition could be given a choice of a word similar to the actual word and an unrelated word.

Another methodological criticism of these results can be made in view of the disparity of stem-word combinations, an unfortunate situation that arose due the selection processes of the material used in this experiment. This criticism can be countered in two ways. First, the disparity differed between lists, and these were randomly assigned. Given that list A had more NP and PN than NN and PP sentences and list B had more NN and PP than PN and NP sentences, the average number of stem-predicate combinations was identical when calculated across lists. Second, the match-ratio score was a percentage of correct responses over the opportunities to make these responses. The stated reason why a ratio score was used thus counters this possible criticism. The difference in the number of errors made by subjects was anticipated by hypothesis 4 which pre-

dicted that the negative sentences would be harder to learn than the positive sentences. Thus the percentage score was used to obtain a metric of subjects' performance not influenced by this predicted disparity in the number of responses for different types of material. Therefore, the use of a ratio score should also equate subjects' scores in this situation where the number of opportunities to make an error was not equal.

Another objection that can be raised to question these results concerns the relations between subjects' initial responses and those after the prompt (either to state the affective quality or to provide a similar word). One may postulate that the obtained matches (either in the Affective Judgment condition or affective matches in Similarity Judgment condition) were the result of subjects altering their responses following an error and thus were indicative of the feedback provided by the experimental procedure and not their knowledge of the affective quality per se. For instance, a subject could have scored a match by stating that a word completion was positive after incorrectly responding with a negative word (e.g., dumb) to a sentence stem "When solving problems, John is____," where the actual word completion was a positive "fast."

The pattern of scores suggests that such reversals of affective quality were infrequent. For instance, out of 85 matches scored in the Affective Judgment

condition, 52 were made following a failure to respond within five second (thus following a "blank"), 24 coincided with the affective quality of the initial erroneous response (e.g, stating that word completion [e.g., fast] was positive after initially responding with "smart") and only nine were the reversals described above. For affective matches scored by subjects in the Similarity Judgment condition, 10 were reversals, 17 coincided with the initial response and 41 were blanks. Caution should be exercised in interpreting these findings, since no formal procedure was used to rate the affective valence of the initial responses. Even so, the tendency of subjects not to reverse the affective valence of their initial responses suggests that the feedback given by the experimental procedure was not an important factor.

Futhermore, this pattern of results lends additional support to the predicational model. The contrast between the frequencies of "reversal" of affective quality following the initial response and "nonreversal" of affective quality (9 vs. 24 for the Affective Judgment condition and 10 vs. 17 for the Similarity Judgment condition) suggests that the initial predication of the affective quality guided both responses -- the initial response and the response following the prompt to either state the affective quality of the sentence completion or to state a similar word. In fact, for the Affective Judgment condition, this pattern remained

even when the subjects' initial impressions were wrong. For instance when subjects in the Affective Judgment condition did not score a match (i.e., responded "negatively" to a positive sentence), they reversed the affective valence of their initial responses four times and failed to do so 28 times, thus lending further support to this hypothesis. The pattern of responses for Similarity Judgment condition was not clear, since most failures to score an affective match came after "blanks," but when these came after erroneous responses, five were reversals and four were nonreversals.

It is also interesting to note that for all six cases in the Affective Judgment condition and for the two cases in the Similarity Judgment condition when the initial response was an antonym to the actual word completion (e.g., cautious to careless), subjects did not score a match. This trend in subjects' responses is significant in view of the oppositional nature of the predicational process proposed in Chapters III and IV. Some antonyms can be viewed as representing the opposite poles of affective valence as well being opposite in terms of some dimensions of meaning (Hampton & Taylor, 1985; Glass, Holyoak & Kriger, 1979; Herrmann, Chaffin, Conti, Peters & Robbins, 1979). For instance "innocent" and "guilty" are opposite in terms of their affective connotation, but are also opposite in terms of the representation of the judgment rendered. Thus, the relation between antonyms is closer than the relation

between words opposite solely on the affective dimension (e.g., cautious and guilty). In terms of this study, this suggests that the subjects had an inkling of the meaning of the actual word, but failed to respond correctly because of the erroneous affective predication. The failure to reverse the initial affective predication in case of antonymy implies that as postulated by hypothesis 3, affect rather than meaning played a key role in determining the nature of the subsequent responses.

The alternative explanation to these results made in terms of the Lockean tradition would stress the associative relation between the item and its value label. In order to account for the above results, a Lockean model would have to either a) postulate the salience of the item-affective label association or b) specify the conditions under which this relation is salient. In regard to the first point, there is no evidence that such is the case. The value labels per se (i.e., good, bad, etc.) do not generally appear as high associates on the norms of free association frequencies (see Palermo & Jenkins, 1964). In fact, if the process involved in this task was guided strictly by the associative strength, we would expect a reversal of the results.

On the other hand, a Lockean model may postulate that the instructions given to the subjects in the Affective Judgment condition primed the affective labels, thus specifying the condition when the relation with these labels

ought to be accessible. Yet, the reverse may be true for the Similarity Judgment condition. Thus, the Lockean model is faced with the challenge of explaining why one type of priming is superior to another.

Again, given the theoretical tenets of the Lockean tradition, one would have to rely on the mediational mode of explanation. For instance, one can speculate that the associative links between items and affective nodes are at a higher level in the associative network. This type of post hoc explanation relying on the level in the associative network was used by Glass, Holyak and Kriger (1979) in interpreting antonymy effects.

Citing the hierarchical levels in the network could also account for the trend that in the Similarity Judgment condition, subjects tended to provide words with the same affective valence as those actually completing the sentences. The predicational model would, of course, predict these results noting that the choices of erroneous items were guided by the subjects' predications of the meaningfulness of the actual words. Thus, I must concede that the more advanced Lockean models can account for this finding given proper modifications, but as was noted by Chang (1986), such models, have so much flexibility in their theoretical constructs that they can account for almost any phenomenon. The predicational model has an advantage of accounting for this result parsimoniously, expecting the ob-

tained pattern of scores based upon its theoretical tenets.

The results did not show the predicted main effect of the type of sentence for trial to criterion scores. The most probable statistical culprit is the lack of variance. It took subjects on the average 4.57 trials to reach the learning criterion for the whole list. This indicates that the lists were too simple and thus too readily learned to capture the possible difference between the positive and the negative sentences (Labertaux, 1968).

Another plausible explanation of this failure to find the predicted main effect refers back to the influence of the subjects' predication of the task on their performance. This study also differs from the previous research on affective assessment in that experimental material was presented on a computer. The experimenter observed that subjects were more or less evenly split in terms of their familiarity with the computer. Although there are no data to assess the relationship between one's familiarity with an apparatus and his/her attitude toward the task, it is a possibility that those less familiar with the apparatus might have had a negative predication of the task itself and thus learned along the negative dimension (see Rychlak & Marceil, in press). Therefore, the predicted RV-positive effect was "washed out." Given the field's increasing reliance on computer generated presentations of experimental material, this topic should be investigated in some detail.

Still another issue is that unlike previous research on affective assessment, subjects were not required to rate the material themselves. The assumption of the correspondence between the nomothetic rating of items in terms of "positive" or "negative," and the subject's idiographic affective assessment of the items' meaningfulness should be explored further. This issue may be strictly procedural, pertaining to how the instructions for raters and subjects are worded. The sentences used here were written to convey evaluative information about "John" and without an appreciation of this meaning, the sentences are meaningless. The raters were asked to state if the sentences conveyed a positive or negative impression of "John," and the subjects were asked to simply state if the word completion was positive or negative. Hence, the task used in this experiment might have required raters and subjects to predicate the sentences in terms of an evaluative dimension that was semantic, rather than affective in the sense of meaningfulness. As meaning, the evaluative dimension may be a reflection of societal norms or linguistic convention for conveying the sense of "positive" or "negative," rather than a sense of personal significance or importance. The distinction between "evaluative meaning" and meaningfulness could be viewed in terms of the dimension of objectivity as well as a matter of purpose. In the case of "evaluative meaning" sequacious extension of meaning is for the sake of

understanding the sentence, rather than for the sake of its personal value or significance. Thus, if the purpose is to understand, both positive and negative meanings are equally important and we would not find the expected RV positive effect. The variations in the presented instruction would help to investigate this question.

Based on the findings of this study that affective quality of the items were known before the actual items were learned, there is evidence to suggest that the predicational process was involved regardless of whether this was a case of affective meaningfulness or evaluative meaning. In either case, the affective quality of the word can be construed as the broad conceptual structure lending meaning to the items learned, and/or determining the pattern of responses. As was discussed above, a number of methodological and theoretical issues challenge this interpretation of the results. Some of the methodological issues were countered with anecdotal evidence and thus warrant further investigation. The theoretical issues are harder to resolve since they are based on assumptions that go beyond the logic of the empirical validation of the hypotheses. In regard to these, one must invoke the principles of parsimony. The predicational model provides a clear explanation of the results presented here, since they are predicted by the model itself based upon its assumption pertaining to the nature of the cognitive process.

APPENDIX A

Instruction Given to Raters Making Judgement of Semantic Relatedness Between the Subjects' Responses and Actual Predicates

Following is a list consisting of sentences used in a psychology experiment. As you can see, the last word, the sentence's predicate, is underlined. Underneath each sentence you will find a list of words. Please, read these words one at a time, and decide if a given word can be substituted for the sentence's predicate without altering the meaning of that sentence. If you think that a word can in fact be substituted in the sentence, please put a check mark next to it. Please repeat this procedure for each sentence in the list.

APPENDIX B

Lists of Sentences Used in the Experiment

Their Stem-Predicate Designations and Frequency Norms

In dangerous situations, John is careful. (A)	NP
careless (A)	NN
If fault is assigned, John is innocent. (41)	NP
guilty (38)	NN
When others are in trouble, John is concerned.(11)	NP
uncaring (10)	NN
On a rainy day, John is happy.(AA)	NP
sad (A)	NN
In solving problems, John is fast. (AA)	PP
slow (A)	PN
When competing with others, John is active (A)	PP
passive (7)	PN
When eating, John is neat. (29)	PP
messy (17)	PN
When bad things are likely, John is unlucky.(24)	NN
lucky (24)	NP
When others are rude, John is impolite (20)	NN
polite (10)	NP
When watching a movie, John is loud.(A)	PN
quiet (A)	PP
If schedule must be kept, John is tardy. (7)	PN
prompt (19)	PP
When it comes to money, John is stingy. (1)	PN
generous (40)	PP
When attending a party, John is timid.(15)	PN
outgoing(1)	PP
When life gets strained, John is tense (A)	NN
relaxed (A)	NP

Thorndike and Lorge norms are in parenthesis

APPENDIX C

Instructions Given to the Raters

Judging the Affective Valence of the Sentences

Following is a list of sentences that state something about a fictitious person named John. As you read each sentence, please indicate if you feel that a sentence makes a positive or a negative statement about John. We have provided a scale at the end of each sentence, so all you will have to do is to circle P if you feel that a sentence makes a positive statement, or N if you feel that a sentence makes a negative statement. We ask you to rate each sentence one at a time as you go down the list and not to correct your initial rating.

As you rate each sentence, you will notice that the last word of each sentence is underlined. Once you have finished rating every sentence on the list, please, go back to the beginning and try to write down as many synonyms to the underlined word in each sentence as you can within approximately one minute. To do so use the blank space below each sentence. As before, work on one sentence at a time. Once, you have finished writing synonyms for the underlined word in a given sentence, do not return to that word once you have begun working on the word in the next sentence.

DO YOU HAVE ANY QUESTIONS BEFORE YOU START?

APPENDIX D

Instructions Given to Raters Making a Judgment Regarding the Affective Valence of the Sentence Stems

Following is a list of phrases we took from a list we are planning to use in an experiment. As you read each phrase, please indicate if you feel that this phrase makes a positive or a negative statement. We have provided a scale at the end of each sentence, so all you will have to do is to circle P if you feel that a sentence makes a positive statement, or N if you feel that a sentence makes a negative statement. We ask you to rate one sentence at a time as you go down the list and not to correct your initial rating.

APPENDIX E

Raw Scores

Affective Judgment Condition

S#	TTC*		Match-Ratio Scores			
	P(a)	N(b)	PP(c)	PN(d)	NP(e)	NN(f)
1	6	4	1.00	0	1.00	0.40
2	6	5	0.17	0.50	1.00	1.00
3	5	4	1.00	0.50	1.00	1.00
4	8	7	0.50	0	0.43	0.50
5	3	4	1.00	1.00	1.00	1.00
6	4	4	1.00	1.00	0	1.00
7	7	7	0.	0.33	0.83	0.80
8	3	5	1.00	1.00	1.00	1.00
9	3	4	0.50	1.00	0.4	1.00
10	3	3	1.00	0.33	0.25	1.00
11	6	4	1.00	1.00	1.00	1.00
12	4	5	0.67	1.00	1.00	1.00
13	4	2	1.00	1.00	1.00	0.50
14	4	4	0.43	0.50	0.25	0.40
16	6	5	0.75	0	0.75	0.86
17	9	8	1.00	1.00	0.50	0.83
18	3	7	1.00	1.00	1.00	1.00
19	3	6	0.14	1.00	1.00	0.25
20	3	2	0.83	0	0.57	0
21	5	5	1.00	1.00	0.50	0.85
22	6	6	0.67	1.00	0.33	0.80
23	5	8	1.00	0	1.00	0.20
24	4	6	1.00	1.00	1.00	1.00
25	5	5	1.00	1.00	1.00	1.00
mean	4.68	4.92	mean .79	.69	.71	.78

Note:

*) TTC stands for Trials to criterion scores
a) P signifies Positive sentences
b) N signifies Negative sentences
c) PP signifies Positive stem, Positive word completion
d) PN signifies Positive stem, Negative word completion
e) NP signifies Negative stem, Positive word completion
f) NN signifies Negative stem, Negative word completion

Similarity Judgment Condition

S#	TTC*		Match-ratio scores			
	P(a)	N(b)	PP(c)	PN(d)	NP(e)	NN(f)
26	7	7	0.33	1.00	0	0.20
27	3	5	1.00	1.00	0.25	0
28	3	3	0	1.00	1.00	1.00
29	4	2	1.00	0.50	1.00	1.00
30	4	3	0.12	0	0.20	0.12
31	3	5	0	0	1.00	0.15
32	6	6	0	0	0	0
33	4	5	1.00	1.00	1.00	1.00
34	5	4	1.00	0	0	0
35	5	3	0.66	0.33	0.25	0.25
36	5	5	0	0	1.00	0
37	6	6	0	1.00	0.50	0
38	5	5	1.00	1.00	1.00	1.00
39	5	5	0	0.50	0.50	1.00
40	6	6	0	0	0	0
41	2	3	0	0	0	0.33
42	3	5	0	0	1.00	1.00
43	5	2	1.00	1.00	1.00	0
44	4	4	1.00	1.00	1.00	1.00
45	3	4	1.00	1.00	1.00	1.00
46	3	2	0	0.50	0.50	1.00
mean	4.33	4.29	mean 0.44	0.59	0.43	0.49

Note:

*) TTC stands for Trials to criterion scores
a) P signifies Positive sentences
b) N signifies Negative sentences
c) PP signifies Positive stem, Positive word completion
d) PN signifies Positive stem, Negative word completion
e) NP signifies Negative stem, Positive word completion
f) NN signifies Negative stem, Negative word completion

REFERENCES

Abramson, Y. (1967). Reinforcement value: An idiographic approach to meaningfulness. Unpublished doctoral dissertation. St. Louis: St. Louis University.

Abramson, Y., Tasto, D.L., & Rychlak, J.F. (1969). Nomothetic vs. idiographic influences of association value and reinforcement value on learning. Journal of Experimental Research in Psychology, 4, 65-71.

Anderson, J.R. (1983). The architecture of cognition. Cambridge, MA: Harvard University Press.

Anderson, J.R., & Bower, G.H. (1979) Human associative memory. Hillsdale, NJ: Lawrence Erlbaum.

Apao, W.K. (1979). Affects and memory: Tests of the serial position effects. Unpublished doctoral dissertation. West Lafayette, IN: Purdue University.

Archer, E.J. (1960). Re-evaluation of the meaningfulness of all possible CVC trigrams. Psychological Monographs, 74, No.10.

August, G.J., & Rychlak, J.F. (1978). Role of intelligence and task difficulty in the affective learning styles of children. Journal of Educational Psychology, 70, 406-413.

August, G.J., Rychlak, J.F., & Felker, D.W. (1975). Affective assessment, self-concept, and the verbal learning styles of fifth grade children. Journal of Educational Psychology, 67, 801-806.

Boring E.G. (1950). A history of experimental psychology. New York: Appleton Century-Crofts.

Bourne, L.E., Ekstrand,B.R., & Dominowski, R.L. (1971). The psychology of thinking. Englewood Cliffs, NJ: Prentice-Hall.

Bower, G.H. (1981). Mood and memory. American Psychologist, 36, 129-148.

Bugaj, A.M. (1984). Affect and the cognitive organization of social information. Unpublished doctoral dissertation. West Lafayette, IN.: Purdue University.

Bugaj, A.M., & Rychlak, J.F. (1989). Predicational versus mediational modeling and the directedness of cognition in impression formation. Journal of Mind and Behavior, 10, 135-152.

Chang, T.M. (1986). Semantic memory: Facts and models. Psychological Bulletin, 99, 199-220.

Chaplin, J.C., & Krawiec, T.S. (1974). Systems and theories of psychology. Chicago: Holt, Rinehart and Winston.

Collins, A.M., & Loftus, E.F. (1975). A spreading ac tivation theory of semantic processing. Psychological Review, 82, 407-428.

Deese, J. (1962). On the structure of associative meaning. Psychological Review, 69, 161-175.

Fiske, S.T. & Taylor, S.E. (1984). Social cognition. New York: Random House.

Glass, A.L., Holyoak, K.J., & Kiger, J.I. (1979). Role of antonymy relations in semantic judgments. Journal of Experimental Psychology: Human Learning and Memory, 5, 598-606.

Hampton, J.A., & Taylor P.J. (1985). Effects of semantic relatedness on same different decisions in good-bad categorization task. Journal of Experimental Psychology: Learning Memory and Cognition, 11, 85-93.

Herrmann, D.J., Chaffin, R.J., Conti, G., Peters, D., & Robbins, P.H. (1979). Comprehension of antonymy and generality of categorization models. Journal of Experimental Psychology: Human Learning and Memory, 5, 585-597.

Hintzman, D. L., (1978). The psychology of learning and memory. San Fransisco: W.H.Freeman and Company.

Hoffman, C., Mischel, W., & Mazze, K. (1981). The role of purpose in the organization of information about behavior: Trait-based versus goal based categories in person cognition. Journal of Personality and Social Psychology, 31, 311-327.

Houston, J.P. (1976). Fundamentals of learning. New York: Academic Press.

Jefferey, K.M., & Mischel, W. (1979). Effects of pur pose on organization and recall of information in person perception. Journal of Personality, 47, 397-419.

Kubat, W.J. (1969). The reinforcement value of associations made to CVC trigrams. Unpublished master's thesis. St Louis: St Louis University.

Laberteaux, T.E. (1968). The influence of positive versus negative reinforcement value on mediated paired-associate learning. Unpublished master's thesis. St.Louis: St Louis University.

McClelland, J.L. (1988). Connectionist models and psychological evidence. Journal of memory and language. 27, 107-123.

Mandler, G. (1985). Cognitive psychology: An essay in cognitive science. Hillsdale, NJ: Lawrence Erlbaum Associates.

Medin D.L. (1989). Concepts and conceptual structure. American Psychologist, 44, 1469-1481.

Meehl, P.E. (1990). Appraising and amending theories: The stategy of Lakatosian defense and two principles that warrant it. Psychological Inquiry. 1, 108-141.

Mosbacher, B.J. (1984). Depression and alcohol ingestion: A teleological perspective. Unpublished doctoral dissertation. West Lafayette, IN: PurdueUniversity.

Nguyen, M.L. (1975). Clustering in terms of categorization and reinforcement value in randomly arranged associates. Unpublished master's thesis. West Lafayette, IN: Purdue University.

O'Connell, D.C. (1988) Critical essays on language use and psychology. New York: Springer-Verlag.

Osgood, C.E. (1952). The nature and measurement of meaning. Psychological Bulletin, 49, 197-237.

Paivio, A. (1965). Abstractness, imagery, and meaningfulness in pair-associated learning. Journal of Verbal Learning and Verbal Behavior, 4, 32-38.

Palermo D.S., & Jenkins, J.J. (1964). Word association norms: grade school through college. Minneapolis, MN: University of Minnesota Press.

Rychlak, J.F. (1966). Reinforcement value: A suggested idiographic, intensity dimension of meaningfulness for personality theorist. Journal of Personality, 34, 311-335.

Rychlak, J.F. (1974). Intentionally manipulating association value and reinforcement value in pair-associated learning. Unpublished manuscript. West Lafayette, IN: Purdue University.

Rychlak, J.F. (1975a). Affective assessment, intelligence,social class, and racial learning style. Journal of Personality and Social Psychology, 32, 989-995.

Rychlak, J.F. (1975b). Affective assessment in the recognition of designs and paintings by elementary school children. Child Development, 46, 62-70.

Rychlak, J.F. (1981a). Introduction to personality and psychotherapy (2nd ed.). Boston: Houghton Mifflin.

Rychlak, J.F. (1981b). A philosopy of science for personality theory (2nd ed.). Malabar, FL.: Krieger.

Rychlak, J.F. (1988). The psychology of rigorous humanism. New York: New York University Press.

Rychlak, J.F., Carlsen, N.L., & Dunning, L.P. (1974). Personal adjustment and the free recall of material with affectively positive and negative meaningfullness. Journal of Abnormal Psychology, 83, 480-487.

Rychlak, J.F., Flynn, E.J., & Burger, G. (1979). Affection and evaluation as logical processes of meaningfulness independent of associative value. Journal of General Psychology, 100, 143-157.

Rychlak, J.F., Galster, J., & McFarland, K.K. (1972). The role of affective assessment in associative learning: From design and CVC trigrams to faces and names. Journal of Experimental Research in Personality, 6, 186-194.

Rychlak, J.F., McKee, D.B., Schneider, W.E., & Abramson, Y. (1971). Affective evaluation in the verbal learning styles of normals and abnormals. Journal of Abnormal Psychology, 77, 11-16

Rychlak, J.F., & Marceil, J.C. (1986). Task predication and affective learning style. Journal of Social Behavior and Personality, 1, 557-564.

Rychlak, J.F., & Marceil, J.C. (in press). Affective task and self predication in the learning of affectively connotative materials. Journal of Social Behavior and Personality.

Rychlak, J.F., & Saluri, R.E. (1973). Affective assessment in learning of names by fifth- and sixth-grade children. Journal of Genetic Psychology, 113, 251-261.

Rychlak, J.F., Williams, R.N., & Bugaj, A.M., (1986). The heuristic properties of dialectical oppositionality in predication. Journal of General Psychology, 113, 359-368

Sameroff, A. (1971). Can conditioned response be es tablished in the newborn infant? Child Development. 5, 1-12.

Shaughnessy, J.J., & Zechmeister, E.B. (1985). Research methods in psychology. New York: Alfred A. Knopf.

Slife, B.D., & Rychlak, J.F. (1981). Affection as a separate dimension of meaningfulness. Contemporary Educational Psychology, 43, 861-868.

Tarter, V.C. (1988). Language processes. Chicago: Holt, Rinehart and Winston.

Tenbrunsel, T.W., Nishball, E.R., & Rychlak, J.F. (1968). The idiographic relationship between association value and reinforcement value, and the nature of meaning. Journal of Personality, 36, 126-137.

Thorndike, E.L., & Lorge, I. (1944). The teacher's word book of 30,000 words. New York: Teachers College of Columbia University.

Tversky, A., (1977). Features of similarity. Psychological Review, 84, 327-352.

Underwood, B.J., Ekstrand, B.R., & Keppel, G., (1965). An analysis of intralist similarity in verbal learning with experiments on conceptual similarity. Journal of Verbal Learning and Verbal Behavior, 4, 447-462.

Winer, B.J. (1971). Statistical principles in experimental design. New York: McGraw-Hill.

Woodward, K.E. (1978). Affective factors in learning across levels of intelligence. Unpublished doctoral dissertation. West Lafayette, IN: Purdue University.

Wyer, R.S., and Carlson, D.E. (1979). Social cognition and attribution. Hillsdle, N.J.: Lawrence Eribaum.

Zajonc, R.B. (1968). Attitudinal effects of mere exposure. Journal of Personality and Social Psychology Monogram Supplement, 9, (2, part 2).

VITA

Alec Victorovich Ulasevich was born in Riga, Latvia to Victor and Lusya Ulasevich on May 6, 1964. The family emigrated to the United States in June of 1976. On August 13th, 1988, he married Laura Beth Gantert of Prairie Village, Kansas. Their first child, Sampson Max Ulasevich, was born on April 2, 1989.

In September of 1982, Mr. Ulasevich entered Loyola University of Chicago. He received a Bachelor degree in Psychology in the Spring of 1986, where he was a member of Psi Chi honor society and was named to the dean's list. While attending Loyola, Mr. Ulasevich did volunteer work at the Loyola Day School. During his senior year, he supervised an after school program at Mayer Kaplan JCC.

Following graduation from Loyola, Mr. Ulasevich worked as a behavior technician at a group home operated by Rimland School. He returned to Loyola University of Chicago in September of 1988 to begin his graduate studies. Mr. Ulasevich was granted an assistantship for the 1989-90 and 1990-1990 school years. A paper that he co-authored with Brooke Leaton, David Kramer, Adolf E. Heike and Daniel C. O'Connell entitled Pause reports for American and Japanese

subjects was accepted for presentation at third annual conference of International Society of Applied Psycholinguistics. He is currently preparing his recent study -- Interstimulus interference for opposites and similars -- for publication.

The masters thesis submitted by Alec Ulasevich has been read and approved by the following committee:

Dr. Joseph F. Rychlak
Professor, Psychology
Loyola University of Chicago

Fr. Daniel C. O'Connell
Professor, Psychology
Georgetown University.

The final copies have been examined by the director of the thesis committee and the signature which appears below verifies the fact that any necessary changes have been incorporated and that the thesis is now given final approval by the Committe with reference to content and form.

The thesis is, therefore, accepted in partial fulfillment of the requirements for the degree of Master of Arts.

April 18, 1991
Date

Joseph F. Rychlak
Director's Signature