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Semantic and Self-Referent Encoding Techniques and Recall of

Meanings of Unfamiliar Adjectives

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A Thesis

Submitted to the Graduate Faculty

of the University of Richmond

in Candidacy

for the degree of

MASTER OF ARTS

in

Psychology

May, 1992

Richmond, Virginia

I certify that I have read this thesis and find that, in scope and quality, it satisfies the requirements for the degree of Master of Arts.
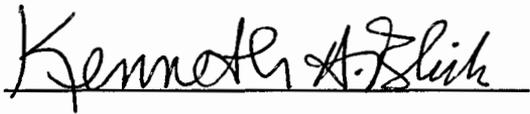
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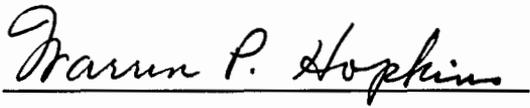
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Abstract

In order to test the efficacy of levels of processing on memory,

recall of unfamiliar adjectives among five encoding groups: a) semantic,

b) self-reference specific, c) self-reference general, d) semantic

(plural), and e) self-reference specific (plural) was examined.

Introductory psychology students at the University of Richmond viewed

twenty unfamiliar adjectives and definitions for forty-five seconds

each, followed by a five minute distractor task and a seven minute test

for recall of the definitions. A second seven minute recall test was

administered one week later. There were no significant differences in

recall between groups, but a significant effect of time upon recall over

retention intervals was indicated, $p < .01$, and simple effects revealed a

significant drop in retention for each group between the two retention

intervals. It was proposed that the lack of significant differences in

recall among encoding groups was the result of such factors as low

subject motivation, ambiguity of encoding instructions, informal

experimental setting, and inappropriateness of target words. These

factors were recommended as points for consideration in future studies.

Acknowledgements

I would like to express my appreciation to Dr. Ken Blick for his constant support and guidance over the course of this project. I would also like to to thank my committee members for their participation and valuable comments.

Semantic and Self-Referent Encoding Techniques and Recall of

Meanings of Unfamiliar Adjectives

Since the introduction of the levels of processing framework

(Craik & Lockhart, 1972), much research has focused upon the utility of

various encoding techniques and the respective degrees of recall which

they engender. The levels of processing framework postulates

progressively deeper and more cognitive analysis of information which

proceeds in a stage-like fashion. After a stimulus has been recognized,

it may be subjected to further processing by enrichment or elaboration,

ultimately producing the end product, the memory trace.

Craik and Lockhart (1972) assert that highly familiar, meaningful

stimuli are compatible by definition with existing cognitive structures.

They acknowledge two types of memory storage, short term and long

term and specify their encoding characteristics as predominantly

acoustic or articulatory for the former and largely semantic for the

latter.

Subsequent research by Craik and Tulving (1975) compared recall

following tasks intended to produce memory traces of varying depths.

Shallow encodings were produced by asking questions about stimulus word typescript; intermediate encoding questions asked whether or not words rhymed; deep processing was elicited by questions about semantic properties. Their findings revealed that, in general, deeper encodings took longer to accomplish and were associated with superior performance on a subsequent memory test. Additionally, they concluded that retention depends critically upon the qualitative nature of the encoding task performed, for example, a minimal semantic analysis is more beneficial than an extensive structural analysis. The authors suggest that at encoding a stimulus is interpreted in terms of the cognitive system's record of past learning, that is, knowledge of the world or "semantic memory".

Markus (1977) proposed that self schemata are cognitive generalizations about the self derived from past experience. Such schemata organize and guide processing of the self related information contained in an individual's social experience. Her findings suggested that if subjects possessed a particular trait (e.g., independent, outgoing) as part of their self schema, they required shorter amounts of

processing time to make judgements about whether or not a related trait adjective described them.

Cantor and Mischel (1977) conducted a study designed to demonstrate the existence and operation of personality traits as prototypes for organizing incoming data. Their hypothesis stated that such trait prototypes should facilitate recall of semantically related words. They found support for this hypothesis. The recognition bias observed in the study suggests once an implicit trait schema has been primed, further material is inferred as being identified with a character, and the material is associated with a pre-existing trait schema. However, subsequent research did not provide additional support.

Brucker, Barrow, and Blick (1986) explored the hypothesis that personality traits act as self schemata in memory. They predicted a positive correlation between scores for specific traits on the Personality Research Form (PRF) and recall of adjectives with content specific to that trait. Support was not found for this prediction. Barrow, Barefoot and Blick (1987) conducted a study similar to the

1986 study discussed above. The latter experiment differed with respect to trait examined and test used; the former experiment looked at the traits of endurance and affiliation while the latter examined anxiety as measured by the State Trait Anxiety Inventory (STAI). Again, no significant correlation was found between an individual's score on the STAI and recall of adjectives with anxiety related content. The authors suggested that more favorable results might be obtained if the study were replicated with a clinical population.

Baddeley (1978) suggested that it is intuitively attractive to think of a semantic continuum in which we expect to find varying degrees of memory performance depending upon the particular processing task. He pointed out that this aspect of levels of processing had been inadequately explored, and called for analysis of complex underlying processes rather than the existing research which he considered to be a search for broad generalizations.

Kuiper and Rogers (1979) examined whether or not different levels of recall would be produced by having subjects rate words as descriptive of themselves, that is, self-referent. Results indicated

that self judgements were consistently regarded as easier to make as well as being accompanied by greater degrees of confidence. Time required to make ratings was shorter in the self-referent condition. Resulting mean recall of words replicated findings by Rogers et al. (1977). Support was found for Markus' self-schema concept. In the self referent condition words associated with short reaction times namely those that "fit" the self schema were recalled. The opposite pattern was demonstrated for the other referent condition; words with long reaction times were the ones recalled. Such an outcome is predicted by the self schema model.

Bower & Gilligan (1979) noted that according to prior research, during recall of trait adjectives, subjects used the self as a retrieval cue, generating a list of personal traits and checking to see which ones or their opposites had been mentioned in the experimental list. The advantage of such a retrieval procedure is that it generates a number of different cues. The authors speculated that the enhancing mechanism of self-referent encoding could be simply relating input to any prior self information, even memories of specific episodes and incidents. Such a

line of thought allows for the possibility that two kinds of memory may
be tapped by self referent tasks, episodic memory involving specific
events in the individual's past, and semantic memory containing more
general information about the world. Tulving's definitions of these
distinct memory stores is included later in the review. Bower and
Gilligan found support for the proposal that events from one's personal
history afford a similar mnemonic advantage as does the personal trait
schema. However, they found no difference between words encoded with
reference to a well known other such as the subject's mother. The
authors stated that there is nothing unique about the self schema as a
mnemonic device; any well differentiated person will do.

Cacioppo & Petty (1981) had subjects perform tasks of rhyme,
volume discrimination, association, evaluation and self-reference for
verbal stimuli, simultaneously monitoring oral and non-oral
electromyographic (EMG) and cardiac activity. They found deeper
processing tasks to be associated with enhanced EMG activity of the
speech muscles. They concluded that the pattern of perioral EMG
activity can reflect the extent to which encoding operations are

directed toward meaning. Encoding operations aimed primarily at

determining meaning or self-relevance of a stimulus produced the most

durable memory traces and the largest elevations of oral EMG activity.

Encoding operations focused on sensory features produced the opposite

effects.

Derry & Kuiper (1981) examined schematic processing and

self-reference in a clinically depressed population. They found recall of

adjectives was greater overall for a self-referent rating task compared

to structural and semantic tasks. Normal and nondepressed controls

exhibited superior recall for self referenced nondepressed content

adjectives; clinical depressives displayed significantly enhanced recall

for depressed content adjectives in the self referent condition. The

authors viewed these findings as indicating that in clinical depressives

the self is organized primarily for the interpretation and encoding of

depressive or negative self-referent material.

Ferguson, Rule & Carlson (1983) conducted a study to test the

validity of the self construct as an organizational facilitator of

information encoding. They compared recall and recognition of positive

and negative words in conditions of self referent judgement, judgement

regarding familiar and neutral others, and conditions intended to

discriminate whether words were desirable, imageable, meaningful, or

familiar. Results indicated that self rated words were better recalled

than meaning rated or other rated words. They found no significant

effect when comparing recognition of self referent encodings vs.

meaning based encodings. This finding brought into question previous

research which used recall and recognition tasks interchangeably. The

authors concluded that no unique memorial status be attributed to the

self or familiar others using the then existing paradigm.

Belleza (1984) looked at the self as a set of organized internal cues

consisting of personal experiences representing the internal self.

Additionally, he used cues consisting of names of body parts,

representative of the external self. Trait words were better recalled

after being related to personal experiences; no difference between

groups was indicated for recall of concrete nouns. Bellezza suggested

that perhaps the large amount of information associated with the self

may not be organized enough to qualify as a schema per se. He stated

that it may be more appropriate to refer to a self concept rather than to

a self schema.

McCaul & Maki (1984) argued self reference effects are better

studied utilizing within subjects designs so that the context is similar

for different types of processing. Data from a within subjects design

revealed superior recall in the self referent condition than in a

condition rating traits for desirability. Findings failed to support a

prediction by Ferguson et al. (1983). McCaul & Maki observed, as had

others throughout the literature, that it is unclear precisely why self

reference is superior to other types of semantic encoding schemes.

Warren, Hughes & Tobias (1985) looked at effects of self referent vs.

autobiographical vs. pleasantness ratings of presented adjectives. In

the autobiographical condition subjects were instructed to remember a

specific episode for which the adjective described how they felt or

behaved. In the self reference condition subjects rated how often the

adjective was self descriptive. The pleasantness task required

subjects to rate the degree of pleasantness of the adjective. Subjects

in both autobiographical and self reference conditions recalled

significantly more words than subjects in the pleasantness condition.

No significant difference in recall was found between autobiographical

and self reference conditions. Warren et al. (1985) speculated that both

tasks may have elicited more retrieval cues per adjective than

pleasantness because they encouraged retrieval of autobiographical

memories.

Klein and Loftus (1988) discussed alternative explanations for the

effect of self referent encoding to enhance information recall. Their

proposed explanations are, A) an elaborative processing model which

involves the formation of multiple associations between an item of

information and material already stored in memory, and B) an

organizational model which would influence the encoding of

associations among list words by leading subjects to think about

stimulus words in relation to one another. In short, elaborative tasks

promote the encoding of item specific information; organizational

tasks promote the encoding of relational information. Klein and Loftus

concluded that self referent encoding is unique in its ability to promote

good retention regardless of whether stimulus conditions favor tasks

promoting elaborative or organizational processing, offering a dual process explanation.

Klein, Loftus & Burton (1989) suggested that self reference effects observed in the past were due to distinct encoding processes, one involving decisions about whether or not a trait adjective was self descriptive, the other requiring subjects to retrieve a personal memory involving the word. Their assertion was that conflicting results from past research attested to the existence of distinct processes. Descriptive and autobiographical tasks were designed to tap different memory stores, semantic and episodic respectively. Tulving defined semantic memory as organized knowledge about words and verbal symbols, their meanings and referents, and the relations among them . . . ; episodic memory involves individual acts of remembering that begin with the witnessing or experiencing of an event and end with its subjective remembering (Tulving, 1983). Klein et al. (1989) concluded that both trait descriptive and autobiographical information about the self are available in memory and can be addressed independently.

Flannagan and Blick (1989) tested the effect of three encoding

techniques; rote, semantic and self reference encoding (SRE). Subjects

in the SRE condition wrote how the presented word might or might not

describe them, semantic instructions had subjects use the word in a

sentence, and rote instructions had subjects write the word and its

given definition. In support of their predictions, self referent encoding

produced significantly higher retention than either semantic or rote

instructions at short term and long term retention intervals, (short

term = five min., long term = one week). The authors interpreted the

results to indicate that access to personal data during information

processing leads to greater retention.

Howe and Blick (1989) conducted a similar study using rote,

semantic and SRE instructions, modifying two of the tasks. Subjects in

the semantic group wrote sentences using the target word and the

pronouns "he", "she", "it", or "they". Subjects in the SRE group wrote the

target word in a sentence with the pronouns "I" or "me". The short and

long term retention intervals were five minutes and three weeks,

respectively. At the short term interval, SRE encoding produced

significantly higher recall than either of the other conditions. At three

weeks there was no difference in retention between the processing

groups. The failure to demonstrate a long term effect was suggested to

result from the extreme difficulty of target vocabulary words combined

with the fact that only sixty seconds was allowed to process meanings.

Vochatzer and Blick (1989) used a different task to compare rote,

semantic, and SRE encoding. The study utilized a paired-associate task,

similar to learning a foreign language vocabulary, in which a low

meaning nonsense word was paired with a high meaning English noun.

Retention was measured at intervals of five minutes and two weeks. At

both retention intervals, SRE and semantic processing produced

significantly higher retention than rote processing but there was no

difference in retention between SRE and semantic groups.

Flannagan and Blick (1989) found evidence of a long term SRE effect,

but subsequent studies (Howe & Blick, 1989; Vochatzer & Blick, 1989),

did not. A possible explanation could be that different encoding

instructions were used in the three studies. Compare Flannagan's

instruction, "Spend the time allotted for each word writing how it

might or might not pertain to you", with Howe's, "Using 'I' or 'me' write

each word in as many different sentences as you can in the time allotted". Vochatzer's encoding instruction was similar to Howe's but his method differed in target content.

It is possible that instructions stipulating the use of "I" or "me" constricted subjects' search more than Flannagan's general discrimination of self descriptiveness. The present study used both encoding tasks, designated as specific, using "I" or "me", and general, "pertains to you", with the prediction that the general task would provide access to a wider range of information thereby engendering greater recall. Another reason for predicting the superior efficacy of the SRE general instruction is that it is the instruction used by Flannagan and Blick (1989), who collected results more supportive of the SRE effect than did subsequent studies. It has been repeatedly demonstrated that semantic and SRE tasks produce superior recall to rote encoding. For this reason the rote condition used in past research was not included; however, a semantic encoding task was included.

Previous studies required subjects to write sentences using the pronouns "I", "me", "he", "she", and "it". No research has specifically

examined the facilitative effect of plural pronouns upon recall. A second experiment using SRE specific and semantic conditions was conducted with one modification; the plural pronouns "we" and "us" were substituted for "I" and "me in the SRE specific condition; "they" and "them" were substituted for "he", "she" and "it" in the semantic condition. The rationale for examining the effectiveness of plural pronouns as self-reference cues is that prior research has used singular pronouns exclusively. It was speculated that plural pronouns could tap different memorial information and significantly affect recall. If the second experiment indicated that the plural pronouns "we" and "us" produce comparable encoding to "I" and "me", serious questions could be raised regarding the mechanism behind the SRE effect.

Experiment 1

Method

Subjects. Subjects were drawn from a pool of introductory psychology students at the University of Richmond. Voluntary participation earned credit toward a class research requirement. Only scores of those subjects who participated in both experimental

sessions were included in the data analysis. The semantic group

originally consisted of 21 subjects,18 of whom participated in the

second session, 12 females and 6 males; the self-reference specific

group had 22 subjects originally, and16 in the final group, 9 females and

7 males; and the self-reference general group was composed of13

subjects originally, and 12 subjects finally, 8 females and 4 males.

Materials. Twenty unfamiliar adjectives were used as target

items, appearing in typed form on a transparency, viewed by means of an

overhead projector. The adjectives were: exiguous, mordacious,

querulous, habile, drupaceous, prolix, arrant, limitrophe, nuncupative,

nugatory, obdurate, trenchant, nocent, minatory, chimerical, protean,

neoteric, umbrageous, aleatoric, and laconic. Adjectives and their

definitions are included in Appendix A. Judgements of unfamiliarity

were based upon frequency ratings from Francis and Kucera's Frequency

Analysis Of English Usage: Lexicon and Grammar (1982). Words

included in the study had frequency ratings of one or zero occurences

per million words.

Design and Procedure. Subjects signed up for one of the three

experimental sessions; subjects in the respective sessions performed

different encoding tasks. Directions for each group began with the

instruction, "Each word and its definition will be shown on the screen

for forty-five seconds". Further instructions for the semantic group,

"Using 'he', 'she' or 'it', write the presented word in as many sentences

as you can in the allotted time"; SRE general, "Spend the allotted time

writing how the presented word might or might not describe you, or,

how it might or might not pertain to you"; SRE specific, "Use the

presented word in as many sentences as you can in the allotted time

using 'I' or 'me'". After being given the directions, participants in all

groups were exposed to each target word and its dictionary definition

for forty-five seconds. After completion of encoding , subjects engaged

in a nonverbal distractor task consisting of a slide show for five

minutes. Upon completion of the distractor task subjects were

presented with a list of randomly ordered target adjectives and

instructed to write each definition to the best of their knowledge.

Seven minutes were allotted for the recall task. After one week,

subjects returned for a final session at which time a second recall test

was administered, identical to the first except for a different random

ordering of target words.

It was predicted that both SRE instructions, general and specific,

would produce better retention than the semantic instructions at both

retention intervals, and that the SRE general instruction would engender

significantly greater retention than the SRE specific condition.

Data and Scoring. Subjects' responses were scored by a blind

scorer according to a master list of minimum correct definitions.

Correct responses were assigned one point and incorrect responses

were assigned zero. In order to establish inter-rater reliability

between scorer and experimenter, Cohen's kappa was calculated and a

coefficient of .86 was obtained indicating that the two observers would

agree 86% of the time. However, after initial scoring was complete, it

became apparent that such a high rate of agreement was not in fact

occurring and that the scorer had deviated substantially from the

correctness guidelines set forth by the experimenter. Consequently,

the experimenter rescored the data according to the original guidelines,

blind to subjects' group membership

Experiment 2

<u>Method</u>

    <u>Subjects.</u> Subjects were obtained by identical means as in experiment one. The semantic plural group was composed of 23 subjects originally, and 20 subjects in the final group, 11 females and 9 males, while the self-reference specific plural group had an original group of 13 subjects, all of whom participated in the second session, 10 females and 3 males.

    <u>Materials.</u> Twenty target adjectives were the same as those used in experiment one.

    <u>Design and Procedure.</u> Subjects were divided into two groups, SRE specific (plural) and semantic (plural). Instructions were identical to those in experiment one except that plural pronouns were substituted for singular pronouns; "we" and "us"instead of "I" and "me", "they" and "them" instead of "he", "she" or "it". Retention was tested at five minute and one week intervals; all other procedural aspects were identical to experiment one.

    <u>Data and Scoring.</u> Scoring was conducted according to the same

procedures as used in experiment one.

Results

A 5 X 2 mixed design analysis of variance was performed to examine the effects of the five encoding methods on retention scores over the five minute and one week retention intervals. The group means and standard deviations for all methods for the two retention intervals are shown in Table 1.

Insert Table 1 about here

As predicted, interaction of group x time was not significant, F (4,74) = 1.29, MSe = 2.03, p = .281. There was a significant main effect of time between the retention intervals, F (1,74) = 91.31, MSe = 2.03, p = .000. The main effect for group was not statistically significant, F(4,74) = .66, MSe = 2.03 , p > .05.

A simple effects analysis indicated significant differences between the mean scores of each group across retention intervals: semantic (sing.), F(1,34) =11.33, p= .004; SRE specific (sing.), F(1,30) =34.66,

p = .00; SRE general (sing.), $F(1,22)$ = 6.47, p = .027; semantic (plur.),

$F(1,38)$ = 35.05, p = .00; SRE specific (plur.), $F(1,24)$ = 24.09, p =

.0004.

Discussion

The overall results did not support the prediction that there would

be significantly different amounts of recall of word definitions among

the encoding groups, and failed to replicate the findings of Flannagan

and Blick (1989) and Howe & Blick (1989). Furthermore, no support was

found for any predictions other than the absence of a significant

interaction between group and time. The prediction that the SRE general

group would outperform the SRE specific (sing.) group which in turn

would outperform the semantic (sing.) group was not supported, nor was

the prediction that the SRE specific (plur.) group would outperform the

semantic (plur.) group. No difference was found between the effects of

singular vs. plural pronouns used in the SRE instructions.

Several factors may have contributed to the nonsignificant

results. The first could be in the wording and explanation of the

encoding instructions. It is possible that the instructions, "Spend the

time allotted for each word writing how it might or might not describe

you or how it might or might not pertain to you" and "Use each word in

as many sentences as you can in the time allotted using 'I' or 'me'", do

not make the self-reference component as salient as is optimal. The

use of examples in conjunction with the instructions could make the

task clearer and more precise. Another point which was brought up by a

subject in one of their sentences was that it is somewhat difficult to

take a word like "drupaceous"= (bearing overripe fruit) and decide how

that pertains to oneself. Additionally some of the target adjectives are

similar in their meanings. For example, <u>MINATORY:</u> menacing,

threatening; and <u>NOCENT:</u> harmful, causing injury; or <u>QUERULOUS:</u> given

to complaining or fretting, peevish, and <u>UMBRAGEOUS:</u> easily offended,

irritable. Semantic similarity in the definitions could account for some

amount of confusion and failure to accurately recall adjectives and

their respective meanings.

Another possibility to consider regarding the target adjectives is

that some had three word definitions while others had definitions that

were more like sentences. Perhaps the longer definitions were more

meaningful and better recalled by the subjects. It could be valuable to ensure that all definitions are of comparable lengths, plus or minus one to two words. In scoring the subjects' responses, it became apparent that some subjects were writing two or three three-word sentences rather than constructing one well developed sentence that would require more thought and probably more thorough processsing. It may prove beneficial to recommend writing "well-constructed, substantial" sentences.

Finally, there is the issue of subject motivation. Subjects involved in this study were introductory psychology students, primarily first year, at the University of Richmond. They participated in the study in order to fulfill a class requirement and were not necessarily motivated to excel at the experimental task. This was evidenced by the lack of attention exhibited by some subjects, i.e. staring into space rather than writing during the encoding segment of the study, forgetting to attend the second installment of the study, and some responses contained in the encoding sentences, for example, "This is really boring and I want to go have dinner". Another factor which could have influenced subjects'

motivation was that the study was conducted entirely by a graduate student who may not have been taken as seriously as would a faculty member. Previous studies (Flannagan & Blick, 1989; Howe & Blick, 1989) were conducted with a faculty member present; that may have exerted an impact upon the level of subjects' involvement and subsequent results.

Suggestions for future research include the following alterations: a revised word list containing only adjectives logically applicable to humans, revised instructions including clearcut examples of what the task requires, an emphasis upon the preferability of writing a single good sentence rather than several impoverished ones, the utilization of some means to promote subject interest and enthusiasm for the task, and a more formal structure in the data collection segment to enhance credibility.

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APPENDIX A

<u>Unfamiliar adjectives presented to subjects, in order of presentation:</u>

<u>EXIGUOUS:</u> scanty, meager, skimpy

<u>MORDACIOUS</u>: caustic, sarcastic, biting

<u>QUERULOUS</u>: given to complaining or fretting, peevish

<u>HABILE</u>: adroit, handy, able

<u>DRUPACEOUS</u>: bearing fleshy or overripe fruit

<u>PROLIX</u>: unduly long or drawn-out, long-winded

<u>ARRANT</u>: straying, erring

<u>LIMITROPHE</u>: adjacent, neighboring, borderline

<u>NUNCUPATIVE</u>: designating a will delivered orally to witnesses rather than written.

<u>NUGATORY</u>: of no value, worthless, trifling

<u>OBDURATE</u>: hardened in feelings, hardhearted

<u>TRENCHANT</u>: sharply perceptive, keen, incisive

<u>NOCENT</u>: causing injury, harmful.

<u>MINATORY</u>: menacing, threatening

<u>CHIMERICAL</u>: imaginary, unreal, fantastic.

PROTEAN: readily taking on different shapes or forms; variable

NEOTERIC: youthful, new, modern

UMBRAGEOUS: easily offended, irritable

ALEATORIC: dependent upon chance or luck

LACONIC: using a minimum of words; concise to the point of being rude.

APPENDIX B

Informed Consent Form

I, _____, agree to participate in this study. I understand that I will be performing a paper and pencil task concerning a series of vocabulary words and their meanings. Neither of these tests pose any physical or psychological risk for me. The whole experiment will take about 1 & 1/2 hours and for my participation I will receive 1 & 1/2 hours of credit toward my research requirement in introductory psychology. I understand that Maria Whittington, a graduate student in the psychology department at the University of Richmond, will be administering the tests. I know that I am volunteering for the study and that I may exit at any time. My participation or lack thereof will in no way affect my status in school. I further understand that the results of the study will be kept confidential. My name will not be used in any report of this study. Debriefing will follow the last phase of the experiment.

_____   _____

(Signature)   (Date)

TABLE I

<u>Mean number of words recalled as a function of encoding group and retention interval</u>

Semantic

5 min	1 week
<u>M</u> = 6.00	<u>M</u> = 4.00
<u>SD</u> = 4.39	<u>SD</u> = 3.07

Self-Reference Specific

5 min	1 week
<u>M</u> = 6.813	<u>M</u> = 3.75
SD = 3.56	<u>SD</u> = 2.91

Self-Reference General

5 min	1 week
<u>M</u> = 6.083	<u>M</u> = 4.667
<u>SD</u> = 2.503	<u>SD</u> = 2.498

Semantic (Plural)

5 min	1 week
<u>M</u> = 5.100	<u>M</u> = 3.00
<u>SD</u> = 3.110	<u>SD</u> = 2.62

Self-Reference Specific (Plural)

5 min	1 week
<u>M</u> = 6.769	<u>M</u> = 4.308
<u>SD</u> = 3.68	<u>SD</u> = 2.955

Biography

The author is a native of Irving, Texas who graduated with a B.A. in

psychology from Loyola University, New Orleans in 1989. The M.A. in

general psychology at the University of Richmond will hopefully

serve as a bridge between undergraduate and doctoral work. Ms.

Whittington's primary goal at this writing is to pursue a PhD in

clinical psychology.