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ABSTRACT

There is a multitude of research on vocabulary methods or strategies, how many relate to second language learners and the importance of vocabulary knowledge to reading comprehension. Researchers have explored the possibility that grouping words in a manner other than the traditional list of nouns, all fitting under a common theme, might be more beneficial for students. This suggests that it might be helpful to give a list of words that are not semantically related. However, there is a deficit in the research on teaching vocabulary by using different word clusters for elementary students and for students learning a second language. The study presented here attempted to answer the question "Will grouping vocabulary words thematically result in more words learned by second language students than semantic grouping?" In addition, this research produced data on the retention of new vocabulary data over 3 weeks and the students' opinions about the two types of word clusters. Participants were third, fourth, and fifth grade students receiving the same level of English-as-a-Second-Language (ESL) instruction. Results showed both word groupings were beneficial, suggesting teachers might consider using both semantic and thematic groupings to help second language elementary students learn new vocabulary words. Twenty-three appendices (containing sample worksheets, questionnaires, letters, lists, and other items associated with the research) and 22 references are included. (Author/KFT)

Semantic Clustering versus Thematic Clustering of English Vocabulary Words for Second Language Instruction

Which Method is More Effective?

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May 12, 2000

Abstract

There is a multitude of research on vocabulary methods or strategies, how they relate to second language learners and the importance of vocabulary knowledge to reading comprehension. Tinkham (1993, 1997) and Waring (1997) both explored the possibility that grouping words in a manner other than the traditional list of nouns, all fitting under a common theme, might be more beneficial for students. This suggests that it might be helpful to give a list of words that is not semantically related. However, there is a deficit in the research on teaching vocabulary by using different word clusters for elementary students and for students learning a second language. The study presented here attempted to answer the question, "Will grouping vocabulary words thematically result in more words learned by second language students than semantic grouping?" In addition, this research produced data on the retention of the new vocabulary over three weeks and the students' opinions about the two types of word clusters. Participants were Third, Fourth and Fifth grade students receiving the same level of ESL instruction. Results showed both word groupings were beneficial, suggesting teachers might consider using both semantic and thematic groupings to help second language elementary students learn new vocabulary words.

Table of Contents

Introduction

Vocabulary development is an essential component of successfully acquiring a second language. It is a critical part of becoming a fluent, functional reader and writer in the second language. Often there are only one or two second language (L2) learners in a classroom and teachers do not have enough time in a school day to meet their specific vocabulary development needs. It is even possible that some teachers simply do not do any direct vocabulary instruction in their classroom regardless of whether or not there are any L2 students.

It takes L2 learners over four years to acquire a passive vocabulary large enough to permit fluent reading. Crow and Quigley (1985) suggest that over 150,000 words should be known for accurate and smooth reading to occur. They also point out that this is a much larger number than the 2,000 words required for an average conversation and advocate that some vocabulary instruction is necessary for L2 students to begin to make sense of what they are asked to read in school.

Research on methods for teaching vocabulary, whether to first or second language learners, is very popular. Issues such as which method has better results (Crow & Quigley, 1985; Harley, Howard, & Roberge, 1996; Tinkham, 1993, 1997), what combinations of strategies work together (Ianacone, 1993; Zimmerman, 1997), semantic theory (Channell, 1981) and incidental vocabulary knowledge (Newton, 1995) have all been explored.

Teaching vocabulary becomes more important when considering the future of L2 students because without the knowledge of a large number of word meanings these students can not make sense of what they are reading or accurately communicate through writing. Teachers frequently try to find new and proven methods of instruction for increasing their students' achievement and, therefore, helping them to become better readers and writers. This study will investigate one way students might be facilitated in learning vocabulary in a second language.

Purpose Statement

The purpose of this quasi-experimental study is to compare semantic and thematic clustering methods for developing vocabulary in elementary L2 learners by measuring word retention after the different methods were used and over time. The data will examine two areas: 1) whether students increase and retain new words better when they are presented in a semantic or thematic cluster; and 2) which method students think helped them learn words better.

Theoretical Perspective

This study brings together the learning of two elements: 1) a second language and 2) vocabulary words. It attempts to identify an aspect of vocabulary instruction that addresses both. In this section, the interference and distinctiveness theories will be discussed in addition to popular thought about learning a second language and new vocabulary.

Learning a second language.

Numerous theories exist as to how a second language is acquired. Piper (1998) narrowed them to nine and listed them under the following headings: acculturation, accommodation, behaviorism, cognitive, discourse, interlanguage, monitor model, neurofunctional and universal. She then used five variables, identified by Spolsky (1985), to describe the theories.

The variables are 1) the learner, 2) the process, 3) proficiency, 4) language, and 5) environmental conditions. Learner variables account for attributes of the person that affect his success at second language acquisition. The process refers to "the strategies used in learning, understanding or producing the new language" (p.104). Proficiency covers those factors that affect how much is learned and the level of mastery. Language includes features of the target language. The final variable, environmental conditions, addresses situational factors. The process variable is of interest to the present study as a strategy to assist in learning.

Piper's categories for theories of second language acquisition have different combinations of these variables (see Appendix A). It is impossible to choose one theory

as correct since each one includes a different pattern of the five variables listed above. These patterns make it easier to see what must be considered in creating successful second language learning.

Learning vocabulary.

In addition to struggling with using a second language, ESL children face the challenge of learning new vocabulary words. Having a strong, large vocabulary knowledge can help increase the success of a second language student in school by facilitating reading comprehension. "Researchers have demonstrated a strong link between vocabulary knowledge and reading comprehension; that is, most students who do well on vocabulary tests also do well on reading comprehension tests" (Herman & Dole, 1993, pg. 44). A combination of instructional methods and active involvement by the students "may provide the necessary depth of knowledge about each to-be-learned word" (Herman & Dole, 1993, pg. 44).

When a reader understands the meanings of the words being read, he is able to comprehend the text. Rupley, Logan, & Nichols (1998) described how "as children's vocabulary grows their ability to comprehend what they read grows as well; furthermore, as their comprehension skills grow so do their abilities to learn new words from context" (pg. 336). Learning word meanings leads to improved comprehension which, in turn, leads to increased word learning from understanding what has been read.

Learning vocabulary can be broken down into two theoretical processes: the examination of linguistic processes or cognitive processes (Tinkham, 1997). Linguistic theory supposes that "the vocabulary of a language consists not of a long random list of words, but rather of many interrelating networks of relations between words" (Channell, 1981, p. 117). For example, spoon, fork, and knife are all words from one network that could be titled silverware. The suggestion is that the way language organizes words into groups helps the mind remember them.

This application has been put into practical use by authors of curriculum for second language learners who have typically followed two approaches: language centered and learner-centered. Both approaches incorporate the linguistic idea of relationships between words and semantic clustering. The language-centered approach uses groups of words to

complete fill-in-the-blank worksheets. Students can change the meaning of a sentence simply by choosing a different word from the cluster. The learner-centered approach selects groups of words that are more meaningful to the students such as items found in the grocery store or words to describe being sick (Tinkham, 1993).

The cognitive processes of a variety of learners have been addressed by lexical semanticists who have recognized that clustering words may assist in learning them. The semanticists are just beginning to research the idea that there are different ways of clustering words within one schema that might better facilitate learning (Tinkham, 1997). Thematic clusters, such as dog, hairy, run which are all related to the theme dog, draw on the cognitive processes more than the linguistic ones. For second language learners, tapping into the cognitive processes, as well as the linguistic processes, by teaching words that are grouped and are more varied might result in more words learned and improved reading skills.

Interference and distinctiveness theories.

Is it harder for one to remember a group of new words if they are too similar? There are two theories about the similarity of words that will be discussed here. The interference theory "hypothesizes that as similarity increases between targeted information and other information learned either before or after the targeted information the difficulty of learning and remembering the targeted information also increases" (Tinkham, 1993, 372). This could explain difficulty learning a list of words that are all nouns and all from the same theme. That problem was explored by Higa (1963), McGeoch & McDonald (1931), and Tinkham (1993; 1997). All three researchers found support for the interference theory through their studies. They concluded that words too similar in theme interfere with each other and get in the way of solid learning.

The interference theory is contrasted with the distinctiveness hypothesis which "relates ease of learning to the distinctiveness (non-similarity) of the information to be learned" (Tinkham, 1993, pg. 373). Tinkham hypothesized that new word learning would be greater if the words learned were unrelated. Second language learners have much to overcome in the school setting and may have greater success if the interference factor is eliminated.

Literature Review

A large number of techniques have been developed for teaching vocabulary. Research to determine how well each of these methods works has been extremely popular in the 1990's. Many studies have examined vocabulary learning for second language learners at the high school and college level, but only two studies discussed here involved elementary aged students. First, an overview of what has been found thus far will be presented. Second, research on word components and student opinion on word learning strategies will be summarized to give background information. Finally, a summary will link this research to the present study.

Vocabulary Methods

This researcher's experience talking with other teachers and substituting in several classrooms indicates teachers believe that students learn words better in context and if they are meaningful to them, but, in practice teachers present children with lists of words unrelated to any current issue in the child's life. While teachers have a sense, intuition, or feeling that context is important, research is divided in proving this claim.

Contextualized versus decontextualized instruction.

Qian (1996) attempted to determine whether L2 words were learned better, by L2 students, in contextualized or decontextualized instruction. Sixty-three Chinese university students, taking a first-year English course, were given a pretest to determine words, in English, unknown to the students. One group received decontextualized instruction of the fifteen words chosen and a second group received contextualized instruction. Retention of the words was tested twenty minutes after the instruction, one week later, and a third time three weeks later. The results showed that the group which received decontextualized instruction learned and retained more words than the group that received contextualized instruction. It is interesting to note that this study was performed in China because Qian (1996) realized that all the studies he reviewed for his paper had been conducted in Western civilizations. Qian noted that Chinese students are traditionally instructed in rote learning and he assumed they were familiar with word lists such as was presented in the decontextualized instruction. This could account for the increased performance by the group that received decontextualized instruction.

Direct instruction.

Other researchers argued that words are learned better when there has been explicit instruction about their meaning and forms. The common term for this is direct instruction. Harley, Howard, & Roberge (1996) performed an exploratory study on direct instruction techniques. The subjects in this study were English-speaking secondary school students, learning French as a second language. The role of direct instruction was examined by requiring the students to read three stories in French and then complete several activities related to the vocabulary in those stories. The activities included semantic mapping, scrambled words, labels, word families and discussion questions each with a worksheet to accompany it. Posttesting, completed four days to one week after the instruction, indicated significant gains in word knowledge. This posttesting in addition to student interviews led the researchers to conlude that the vocabulary activities had been, overall, beneficial and enjoyable. The word families task was the most difficult for all the groups. The semantic mapping technique was perceived by the students to be the most helpful. The final conclusion was drawn from a teacher's comment. She suggested that the use of dictionaries, especially for students with a lower second language proficiency, might result in building a greater word knowledge. This was a combination quanitative and qualitative study and no control group was included. The conclusions, therefore, may not be strong without that comparison.

Incidental word learning and meaning negotiation.

The reverse of direct instruction is the incidental learning of words. Children learn a large number of words between third and seventh grades, approximately 1,000-3,000 a year (Zimmerman, 1997). Zimmerman explained that "such extensive gains suggest that a considerable amount of word learning takes place incidentally through exposure to new words in meaningful contexts" (p.123). Instruction alone cannot account for this large number of words learned each year. Other researchers concluded that a combination of free reading and vocabulary instruction is what aided children to learning 800-1,200 new words per year (Herman & Dole, 1993).

Newton (1995) performed a case study on a 21-year-old male Taiwanese undergraduate student, who had moved to New Zealand, to determine the effects of

incidental vocabulary learning. The student participated in four communication tasks with his class, two of which required him to come to a consensus with group members and two of which required him to share information he had and understand information the other group members shared in order to complete a worksheet. Pretests and posttests of the target vocabulary in the four tasks were administered and the use of the unknown words in communication was analyzed in comparison with the acquisition of those words.

Newton (1995) found that twenty-one of the fifty-six unknown words were learned simply through meaningful communication "in which there was minimal teacher input and direction apart from providing the task..." (p.163). Word negotiation was another aspect considered in the analysis of this data. Some words that were negotiated, talked about to clarify understanding of them, were learned, some were not. The same was true of words that were used in interactions, but not negotiated. Some were learned, some were not. Incidental vocabulary learning is plagued by a hit-and-miss record. Harley, Howard, & Roberge (1996) stated "that inferring the meaning of new vocabulary in context is a lengthy and error-prone undertaking which, by itself, is an inefficient way of mastering second language vocabulary" (p. 281).

Later, Ellis & Heimback (1997) explored the issue of children's use of meaning negotiations to improve vocabulary learning. Meaning negotiation is the active or inactive way that a person determines the meaning of a word. An example of active meaning negotiation would be when a student asks a question to clarify a word (Where did you go?). An example of inactive meaning negotiation would be when a student listens to material that has been modified to promote comprehension as well as vocabulary acquisition. Ellis & Heimback questioned the value of negotiation for young children in particular. This study looked at vocabulary development in ten ESL kindergarten students after they participated in group and individual listening activities. The new vocabulary presented in Ellis & Heimback's study was in English, the students' second language. While the words were semantically clustered, which may have facilitated the learning, it was concluded that each child had a uniquely individual level of ability to negotiate word meaning. Some students failed when one-on-one, as well as when in a group, while others were successful in at least one of the settings. Overall, vocabulary gain due to meaning

negotiation was minimal. This could suggest that meaning negotiation is a valid technique to be used together with other teaching strategies for learning new vocabulary words, but might not be reliable as the only means for teaching new words.

Keyword technique.

Another method of vocabulary development involved using the student's first language to facilitate learning the words of the second language. Avila & Sadoski (1996) tested fifth grade Hispanic students, with limited proficiency in English, for retention of English vocabulary using the keyword method. The keyword method is a mnemonic technique using pictures and has two parts. First, the second language word is associated with a familiar first language word that sounds similar. Next, an image is produced to link the two words together. For example, to learn the word carta, Spanish for postal letter, a student might imagine a cart , like a shopping cart, with a giant postal letter in it. They found that "students using the keyword method were able to recall approximately 25% more definitions immediately, and nearly three times as many definitions after one week" (pg. 391). This study also concluded that the keyword method was a workable instructional tool for use in public school classrooms. Interviews with some of the students indicated the method was enjoyable for them.

Combination strategies.

This literature review has focused on individual vocabulary learning strategies. Zimmerman (1997) explored the effect of a combination of strategies. She recognized that "word knowledge involves a range of skills, and word learning is facilitated by approaches that provide varied experiences" (pg.122) such as with reading, writing, speaking, and listening. Zimmerman combined reading exercises with communication tasks to build word knowledge. Thirty-five ESL students who were enrolled in a program that used skill-based instruction to prepare students for entrance into California universities were selected to participate in the study. The students were divided into two groups, both of which participated in 24-25 hours of English instruction. Group 1, however, received an additional 3 hours of interactive vocabulary instruction. This instruction included multiple exposures to words in meaningful contexts, active participation by the students, lots of supportive information about the words, and links between student experiences, previous knowledge

and the new words. Although this study was of a small size and the results were to be interpreted with caution, it was found that reading and communicative activities together do have a positive effect on word learning.

Word clusters.

Whether new vocabulary is presented in context, with a keyword in the native language of the student, or in a combination of strategies it is common to find words grouped together semantically. An example of a semantically clustered set of words would be man, chap, fellow, guy, and gentleman. Crow & Quigley (1985) investigated if students exposed to semantic groups of words could learn twice as many words, as students exposed to words in a more traditional style, and retain them over a long period of time. The traditional style is defined by word-for-word learning, possibly in alphabetical order and with definitions given for each word. Forty-two college students enrolled at the North Texas State University Intensive English Language Institute were divided into two groups. The immediate posttest results showed more vocabulary learning occurred with the traditional method than with the experimental semantic method. However, it must be remembered that the students who received the experimental method learned double the words but were tested on the same number as the other group. Group 1 might have performed better if they had been given the opportunity to respond to all the words they had been exposed to instead of only some of them. On the other hand, long term retention results indicated the learning through semantic instruction was better over time.

Tinkham (1993) also studied the results of learning words in semantic clusters. He explored whether new word learning would be greater if the words learned were unrelated or related. All twenty subjects who volunteered to be a part of Tinkham's study, were students at a university and acquaintances of the researcher. Four of the students were non-native English speakers, but were judged to have advanced level English. The words to be learned were in pairs, one English word and one made-up word that followed a set of criteria. Although the researcher admitted to having changed his oral presentation of the activity with Group B, after having given it to Group A, he found that unrelated words were learned faster than related words in semantic clusters.

These negative findings for the semantic clustering of words are contrary to the way

many publishers create ESL curriculum. A replication of Tinkham's 1993 study was completed by Robert Waring in 1997. Japanese students participated in trials-to-criterion activities in which they were presented pairs of words: the original words Tinkham used, translated into Japanese, and an artificial word created under the same guidelines as in Tinkham's study. The results of Waring's work supported Tinkham's conclusions. Both experiments showed new words presented together under the same theme, and therefore being similar, interfered with learning.

Tinkham (1997) took the topic of semantic clustering one step farther and attempted to find a different way of clustering words that would enhance vocabulary learning. While semantic clusters such as eye, hand and ear are linguistically derived, thematic clusters such as frog, green, and hop are cognitively derived and may facilitate, or make easier, the learning of new words. The questions of the study were to find out whether semantic or thematic clustering made learning words easier than unrelated groups of words. Forty-eight students at a mid-western American university, all native English speakers, participated in Tinkham's 1997 study as a requirement for a class they were taking. Data analysis showed unrelated words were learned quicker than semantically clustered words and thematically clustered words were learned quicker than unrelated words. The researchers concluded students may benefit from being presented with a more varied group of words.

Components of Word Knowledge

Three components of word knowledge develop in children. The first is the basic receptive, or passive, knowledge defined as understanding the most frequent and core meaning of a word while receiving information, but not producing it. The second and third are controlled productive knowledge and free productive knowledge. Controlled knowledge involves producing words when prompted by a task and free knowledge has to do with using words when one wants, as one pleases (Laufer, 1998).

A study was performed to investigate the development of these three components of word knowledge. Laufer (1998) examined what developments occurred in each of the three types over one year, how the three types were related and how those relationships changed over the year of the study. Two groups of Israeli high school students with six or seven years experience learning English participated in the study. The results showed that

the passive vocabulary of the students grew by about 1,600 words, controlled vocabulary by about 850, and that there was a lack of progress in the free vocabulary section over one year. It was concluded there is a relationship between a person's passive and controlled vocabulary; "an increase in one's passive vocabulary will... lead to an increase in one's controlled active vocabulary..." (pg.267). Passive and controlled vocabulary had very little effect on the free vocabulary.

Student Opinion

Another avenue for determining which method of vocabulary development is most effective is to ask the students how they feel they learn words best and by what means they prefer to learn words. Gu and Johnson (1996) researched this issue when they sought to learn what vocabulary strategies Chinese university students used. They concluded that the students did not rely on memorization techniques, but preferred to use more meaning oriented strategies.

Summary

There is a wide variety of research on aspects of learning new vocabulary words. Methods for teaching words, the categories they fall under and students' opinions on how they learn them are three areas of research. The main points of this literature review include the realization that there are many beneficial methods for helping L2 students learn new words, those methods work for some students and not for others, people can learn new words incidentally, there are different components to word knowledge and there is value in asking students what they find most useful when learning new words.

Each of the three sections discussed in this literature review led to the design of the present study which compares semantic and thematic clustering. Direct instruction will be given, regarding the words, but the groups of words will be in different forms. Students will also be given the opportunity to share their opinions on vocabulary learning. The participants in the present study were all learning a second language, English, as were the participants in all the research cited above with the exception of three. The two studies by Tinkham (1993, 1997) and the research conducted by Waring (1997) used artificial words as L2 words in some clusters. The other clusters were made up of words from the first language of the participants.

The research reviewed here reported mostly on college and high school students. Therefore, it would be helpful to have more research on instructional tools for teaching vocabulary to L2 learners in the elementary level. The results could provide new conclusions since an elementary student's level of proficiency in the first language might be lower than a college student's level of proficiency in the first language.

Definition of Terms

This study will focus on second language learners. As a result, several terms pertaining to second language acquisition will be encountered.

ESL refers to English as a Second Language

L2 signifies a second language

Lexical group is a group of vocabulary words (Tinkham, 1997, p. 138)

Receptive vocabulary refers to the words a person understands in reading or conversation, but might not know well enough to generate independently; the term passive vocabulary is also used to indicate this stage (Laufer, 1998, p. 257)

Retention, as in "retention of words", means something that has been learned and can be remembered after a period of time

Second language proficiency indicates the ability to which a person can communicate in a second language

Semantic clustering is a group of words, all nouns in this case, that fit into one theme or schema such as arm, leg and hand are all body parts; often the term lexical sets is also used (Tinkham, 1997, p. 138)

Semantic mapping is "a graphic procedure in which links are drawn between a central concept and a surrounding network of related elements" (Harley, Howard, & Roberge, 1996, p. 282)

Thematic clustering is a group of words that fit into one theme but nouns, verbs, and adjectives are all represented such as dog, run, hairy (Tinkham, 1997, p. 138)

Hypothesis and Questions

The hypothesis tested in this study is that thematic clustering, as a part of a larger instructional strategy for developing vocabulary, will result in more words learned and longer retention of the new words than semantic clustering. Questions this study addressed include:

1. Will grouping vocabulary words thematically result in more words learned by L2 students than grouping words semantically?

2. Will L2 students retain more knowledge of new vocabulary words, over time, if the words are learned in a thematic group?

3. What is the L2 student's opinion about whether or not thematic grouping helped them learn words?

Subquestions.

1. What was the students' previous experience with semantic and thematic clustering of words in their regular classroom or their ESL group?

2. How do students see themselves learning vocabulary? What do they think works for them?

3. What differences do students at the elementary level notice between thematically and semantically grouped words?

Delimitations and Limitations

This study will only include results from intermediate level elementary L2 students and therefore may not pertain to younger or older students. Also, the results will only reflect learning achievements for ESL learners participating in a pull-out program. In addition, passive vocabulary was chosen to be the single form of vocabulary knowledge tested in this research in an attempt to narrow the study. Socioeconomic factors and the reading level of each student were not taken into consideration because it was considered unnecessary information.

The students in this study only received the treatment from the researcher and afterward they returned to their classrooms and regular routines. The influence of the classroom environment could have had an effect on the achievement level of the students.

Significance of the Study

Educators look to research to provide ideas on what instructional methods might provide the best learner outcome. Examining the learning of vocabulary through two different types of clusters may provide teachers, who are looking for a strategy to teach vocabulary, a new method by which to present those words. This would be of particular interest to ESL teachers as there is a correlation of great importance between reading comprehension, learning new vocabulary and learning a second language. If this technique

for grouping words results in ESL students showing an interest in learning new words or leading them to more success in school, then it would be to the teacher's advantage to incorporate thematic clusters of vocabulary words.

Students in Washington State are required to meet Essential Academic Learning Requirements (1997). These requirements have included points on vocabulary learning under the Reading section:

1. The student understands and uses different skills and strategies to read.
    1.1 use word recognition and words meaning skills to read and comprehend text
    1.2 build vocabulary through reading
2. The student understands the meaning of what is read.
    2.1 comprehend important ideas and details

If thematic clustering of words results in better word learning, then it might also help students meet these important requirements.

A review of research revealed minimal examination of thematic word clusters. The studies found used artificial words as the second language vocabulary and, therefore, do not represent a true situation where students are trying to read and learn in a new language. Exploration of this subject was also found to have been done with college aged students. This left the question of the effectiveness of thematic clusters for elementary aged children relatively unanswered. The present study will hopefully add to the knowledge base of vocabulary learning for second language students in the elementary grades.

An added component, in this study and popular in most vocabulary studies, is that of the second language. The new vocabulary will be learned in a new language, not the more familiar first language of the students. Also, the present study will focus on development of the passive vocabulary or the most commonly understood meaning of the words presented. Thematic word clusters might additionally be considered as a tool for building controlled vocabulary.

Often, there is not enough time for teachers to cover all the required curriculum. As a result, it is easy to pass over vocabulary instruction and hope the students will just naturally pick it up. Teachers who do spend time instructing in new vocabulary words should try to

use the best methods and find those that the students find beneficial. Both semantic and thematic clustering are relatively simple to create and would easily fit into existing instruction with minimal adaptations.

Methods

This study combined quantitative and qualitative components to explore what worked for the students. The rationale for this combination stemmed from the thought that if the students were successful with thematic clusters they would also find it more enjoyable. It also incorporated the interference and distinctiveness theories. The subjects were learning English as a second language, building their word vocabulary, and experienced word clusters that gave them the opportunity to use linguistic and cognitive processes and clusters that may have caused interference.

Rationale for Qualitative / Quantitative Design

Pre and post tests gave numeric data suggesting one form of word cluster was more beneficial than the other. However, to find out what the students thought and felt when experiencing the two different clusters, and to get their feedback on what was helpful, an interview was given to the students. Confirmation of some results, contradictions of others, new understandings and expansion of the study were benefits of using this combined design.

The interview responses were compared with the numeric postest results for each group to see if the cluster that was beneficial for the group was also preferred by the students. The analysis found contradictions as well as agreement between the two data sources and added a level of depth that would not have otherwise been achieved. Therefore, new understanding about the data as well as the interview process for L2 students were gained. The combination of both qualitative and quantitative design into this study made it more useful and added to the scope of the findings.

Research Design

A quasi-experimental design was used in this study. A written survey was given to the students prior to the treatment to identify how they have been learning words in the past. A pretest was given to identify known and unknown words. Then, ten semantically grouped words were shown to Group A and a written task, allowing the students to interact with the words, was completed. Group B was presented with three sets of thematically grouped words and also completed a written activity. Immediately following the instruction,

learning of the new words was tested. After three weeks, retention of the words was tested again for both groups.

The next step involved switching the treatments. A second pretest was administered to both groups. Group A received instruction in a thematically grouped set of ten new vocabulary words and Group B received instruction in a semantically grouped set of ten new vocabulary words. The instruction was the same as described above during the first treatment with only the ten words being different. Postests followed immediately after the instruction and three weeks later. Finally, students were interviewed to determine how they felt about the instructional method they participated in and if they would recommend using it again in the future. Therefore, this study involved a pretest, a treatment, and two posttests for each group.

Variables in the Study

The independent variable will be the way in which the vocabulary words are clustered, semantically or thematically. The dependent variables will be the new knowledge of the word, the retention of it over time, and the attitude and preferences of the student toward the two strategies for learning new vocabulary.

School Setting

Both schools were a part of the same school district in a small Northwestern Washington town. ESL students' parents work mainly in agriculture, a fish processing plant and a beef processing plant. The student population at Group A's school was 450 students. The number of ESL students at the school was 35. The student population at Group B's school was 309 students with 52 ESL students. These numbers included students in grades Kindergarten through Sixth. The elementary ESL pull-out program was started during the 1991-1992 school year and has been run by one certified teacher.

The setting in which Group A met was very small and cramped. Although warm and filled with the sounds of happy and busy kids, there was barely room for the eight Third and Fourth graders to sit around the two tables pushed together. This ESL area was set up in the corner of a full size classroom occupied by a class of fifteen students. When the students arrived they had to walk through the back of the classroom to get to the area sectioned off by tall bookcases. These bookcases acted as a divider and storage for the

ESL teacher. A newer, large computer sat against one wall on a table and a stereo system on a smaller bookshelf against another wall. Both items were necessary for the ESL teacher's planned activities and assignments, but took away more workspace. On the first day of this study, when the pretest was given, I was moving from one side of the group of children to the other and tripped over a chair while turning myself sideways to slide between a student and a bookshelf. The ESL teacher's comment was, "Pretty awful, isn't it?"

The space Group B worked in was much more accommodating to student needs and comfortable. There were two large tables for the group of six children to work at. Bookshelves, filled with supplies, lined the walls, but there was room above for student work to be displayed. From the ceiling hung more student work. There was a sink when the need for water arose. There was also a large, newer computer used for student activities and projects with enough space for a whole group to gather around and be able to see what was happening. There was a white board and overhead projector for displaying information and examples for the students in a manner that each one could easily see. This ESL room was a room by itself. It was not as large as a regular classroom, but had its own private entry and windows.

Participants

Two groups of ESL students were chosen for this study. They were already grouped according to their score on the Language Assessment Scales (LAS) which indicates second language proficiency. In addition, a Woodcock Muñoz score from the previous spring aided in an appropriate placement for ESL groups. The decision about the make-up of the groups was made by the ESL teacher.

The groups for this study were chosen because they were at the same ESL curriculum level four, out of eight levels, and represented two schools. Students were from grades 3, 4, and 5. One group contained two students whose first language was Spanish and four students who spoke Russian as a first language. The second group was made up of eight native Russian speaking students. One group met in the morning, the other in the afternoon, four days a week for forty-five minutes. Some students received additional migrant services depending on how much their families moved from one location to another

in a twelve month period. Additional information about the students can be found in Table 1 below.

Table 1

Student Information

	Group A Students	Group B Students
Total # of students	8	6
Male	6	1
Female	2	5
Hispanic	0	2
Russian	8	4

Permission for students to participate in the study was granted through a letter signed by a parent or guardian of each child (see Appendices B, C, & D). The principal of each school also gave permission for this study to be conducted in his school in a written letter (see Appendix E). Students in both groups were at ease with one another, talked loudly and in their first language, mostly Russian. In Group A the only two girls had to be seated next to each other as one was more timid. It increased her comfort level to sit next to another girl. In Group B only two students spoke Spanish, one female the other male. They were both quieter than the four female Russian students. The ESL teacher shared with me some cultural observations he made about his students when he said he never had discipline problems with the Hispanic children, only with the Russian students. Being of Ukranian heritage himself he said he understood why the Russian students were always moving, why they worked very fast, and why they were loud. He described them as "go-getters" who had to fight for themselves.

The Role of the Researcher

My role, as researcher, in conducting this study was to complete the data collection and administer the treatments to the students as well as coordinate schedules and curriculum with the classroom teacher. During the completion of this study I used another teacher's

classroom because I did not have one of my own. Students from one group were already familiar with me as a teacher, as I was employed at one of the schools for the two years previous to this study. My position, when employed, was as a Reading Recovery Teacher specializing in the ESL students in Grade One. In addition, I worked with a Title I group of four Grade One students for a period of two months.

My entire teaching career has been filled with opportunities to work with ESL and bilingual students. My experience has ranged from teaching Hispanic students in a bilingual Kindergarten class to Reading Recovery in Spanish and English. Those teaching positions increased my knowledge and interest in the issues children learning a second language face when they are beginning to read. I knew from the beginning this study would have to explore a second language issue so I could continue to work with these students and learn more about what helps them succeed.

My job with the students, for the purpose of this study, included administering, presenting, and gathering the data. I worked with the students during their regularly scheduled ESL time. In this way I had time before and after data collection to prepare and to reflect upon what I observed. I began to ask questions to guide my interactions with the students such as, "What is the shortest way I can say this so the students will best understand?" and wonder, "Do students really notice a difference between the two clusters of words?" I intend to share my findings with teachers who work with ESL students.

Data Collection and Materials

Data was collected for this study over a two month period. The researcher collected data, chose vocabulary words and created the materials. The ESL teacher provided some oral translation in Russian of instructions and explanations for the activites. Translation was also provided for the Spanish speaking students by both the researcher and the ESL teacher.

Survey

The written survey was developed by the researcher for the purpose of determining how familiar the students were with either semantic or thematic groups of words. It sought to identify the students' previous experience with the presentation of vocabulary words and what the students felt aided them to learn new words (see Appendix F). The

answers addressed subquestions 1) What was the students' previous experience with semantic and thematic clustering of words in their regular classroom or their ESL group, 2) How do students see themselves learning vocabulary? What do they think works for them? and 3) What differences do students at the elementary level notice between thematically and semantically grouped words? This survey was given one week before the treatments were administered.

Pre / Post Test

Words for the pretests were chosen from the IDEA (1992) curriculum used by the ESL teacher. He suggested units that would be taught later in the school year so there would not be additional instruction, at the time of the treatments, beyond the instruction given by the researcher. The majority of the vocabulary words in the curriculum were nouns, with only a few verbs and adjectives for each unit. Therefore, some verbs and adjectives, not listed in the curriculum were added to the pretest by the researcher. Effort was made to be sure the adjectives and verbs coincided with, or went meaningfully with, the nouns. This was done so that when a thematic, or more varied, cluster of unknown words was being formed they could still be combined under one thematic heading.

The pretests and posttests were a paper and pencil task students completed individually. The vocabulary words were listed on the left and pictures, in random order so as not to be alongside the coinciding words, were along the right. Students drew a line from the word to the appropriate picture (see Appendix G). This was a task familiar to the students, as regular ESL instruction they received included this activity from time to time. The purpose of the pretest was to determine which, if any, of the words were already known to the students. The words were chosen from future ESL curriculum to assure they had not already been taught and would not be taught during the time of the experimental treatments. The pretest was administered one week before the instruction was given and followed the written survey.

The posttest was in the same format as the pretest and assessed learning of the same ten words each group was exposed to in the study. It was administered immediately following the instruction and again three weeks after the instruction.

Treatment 1

Ten unknown words, fitting into appropriate clusters, were chosen from the pretest for instruction (see Appendix H). The words for Group A were different from those for Group B as they were clustered according to different guidlines. Group A received instruction in a semantically grouped set of new vocabulary words one week after the pretest was administered. Cards with the written words and an accompanying picture were shown, one at a time, to the students and a discussion of each word followed. Then a pencil and paper task was completed (see Appendices I & J). It required the students to read the new words grouped at the top of the paper, read a sentence with blanks in it and find the appropriate missing word from the list above. This activity was led by the researcher and completed by all students together. The emphasis was on allowing the students to use the words and to have one more opportunity to read them. A five minute break was taken and the first postest was given (see Appendices K & L).

Group B received instruction in a thematically grouped set of new vocabulary words, also one week after the pretest was given. The introduction to the words and the instruction activity were the same, only modified to accommodate the appropriate words, as described above. After a five minute break, the first postest was administered. Three weeks later both groups received the same postest a second time to measure retention of the new knowledge over time.

Treatment 2

The next step was for each group to receive instruction in a group of words clustered in the opposite manner than what they received in Treatment 1. A second pretest (see Appendix M) was given and ten words were chosen to be grouped thematically for Group A. A different set of ten words were chosen in a semantic grouping for Group B (see Appendix H). Cards with the written words and a picture and the same form of paper/pencil task were presented to the students as described in Treatment 1(see Appendices N & O). A postest was given after a five minute break and the same test was given again three weeks later to measure retention over time (see Appendices P & Q).

Interviews

The interview questions were created by the researcher to determine students'

feelings about the two methods and what characteristics of the treatments helped them learn more words. The questions were stated in a manner that took into consideration the nature of these students' language skills and encouraged them to honestly state their opinions (see Appendix R). Consultation with the ESL teacher helped to word the questions in a clear manner.

The interview questions are listed below.

Question 1) Did you notice a difference in the way I grouped the two sets of words I taught you? If yes, what was the difference you noticed?

Question 2) If no to question 1, what do you notice about the way these words are grouped?

Question 3) Which way helped you learn more words?

Question 4) What about the group made you learn the words?

Question 5) Which group should Mr. Page use to help you learn the words better?

Student responses to the questions were written by the researcher as they were given. Additional notes were added as soon as possible either while students were thinking or immediately following the interview. Codes were assigned to the responses after analyzing the data. Responses to questions 1, 3, and 5 could only be short, one word answers; either yes, no, thematic, semantic, or do not know. Responses to questions 2 and 4 were more narrative and were more varied. After comparing the responses by writing them all down and then breaking them into what seemed to be appropriate groups, they were categorized into two levels of answers. Those became the codes. They were general comments and deeper comments. General comments were simple, given quickly and had to do with a visible aspect of the new vocabulary words. Deeper comments were more reflective, explained an aspect of the cluster of words that was important to the student or an understanding of the difference between the two groupings.

Verification of Results

It was important to include a student interview in this study to possibly support the quantitative findings about which method of clustering words was more important and to strengthen the internal validity of the research. This feedback from the participants would either confirm, or contradict, that the word cluster beneficial to them in the treatments was also the method they preferred. The analyses of responses to the interview also explored whether or not students recommended their ESL teacher use the same cluster they stated to be most beneficial to their learning. The intent was for this to show continuity among a student's responses and support for the quantitative findings.

Replication of this study might be possible to support the reliability of the findings. Generalization of the findings is limited due to the uniqueness of the participants, the setting and the position of the researcher. However, replication with consideration of a few key details could be supportive to the findings. With the exception of two students in Group B, the researcher was an outsider who came in to gather data through the pretests, postests, surveys and interviews. During the interviews, the researcher was able to interpret for Spanish speaking students, but had to rely on students to interpret comments made in Russian. These were the only two languages spoken by the participants. The two groups in this study were chosen because they received the same ESL instruction. Assumptions of the researcher included thoughts that the participants would be able to complete a written survey and would be able to express their ideas about the word clusters verbally in response to the interview questions. These factors affect the reliability of the findings.

Results

Descriptive analysis of the data collected included between and within group comparisons. Pretests and two posttests were given to students before and after each of the two treatments. In addition, each student completed a survey before the study began and an interview at the end of the study. The researcher reviewed student responses to the survey and interview questions in an effort to find patterns that explained the students' perception of the two treatments. Group A and Group B were comprised of ESL students at the same curriculum level and approximately same grade level, but represent two different schools.

Quantitative Analysis

Knowledge and retention of the new words, measured on the posttest, was analyzed through a comparison of scores within and between groups. Graphs and descriptive statistics explain the information gathered by these scores. The scores for Treatment 1 semantic instruction, Group A are shown in Table 2 below.

Table 2

Semantic Instruction Data Number Correct

Group A Students	Pretest 1	Postest 1	Postest 1b
A1	1	2	3
A2	6	6	7
A3	2	7	7
A4	10	7	10
A5	2	8	5
A6	6	8	10
A7	6	10	10
A8	8	8	10
Averages	5.1	7.2	7.8
Standard Deviation	3.2	2.5	2.7

These scores indicate growth for five of the eight students from the pretest to

postest 1. The scores of two students stayed the same and the scores of one student decreased by three points. Scores on postest 1b, showing retention of the new vocabulary from postest 1 to postest 1b, indicate improvement for five students, scores that stayed the same for two of the students, and a score that decreased by three points for one of the students. Only two students increased their scores from the pretest to postest 1 and from postest 1 to postest 1b. Overall, postest 1b resulted in scores that were higher than on the pretest for all students minus one student whose score remained the same as on the pretest.

The scores for Treatment 1 thematic instruction, Group B are shown in Table 3 below.

Table 3

Thematic Instruction Data Number Correct

Group B Students	Pretest 1	Postest 1	Postest 1b
B1	1	6	8
B2	3	9	10
B3	4	8	10
B4	5	10	10
B5	4	8	10
B6	4	8	10
Average	3.5	8.2	9.7
Standard Deviation	1.4	1.3	0.8

This data indicates all students improved their scores from the pretest to postest 1. Five students made further gains from postest 1 to postest 1b and one student's score remained the same. All students showed growth in knowledge of the new vocabulary when comparing the pretest scores to those of the postest 1b.

The scores for Treatment 2 thematic insruction, Group A are shown in Table 4 on the next page.

Table 4

Thematic Instruction Data Number Correct

Group A Students	Pretest 2	Postest 2	Postest 2b
A1	0	3	6
A2	1	5	5
A3	0	2	2
A5	0	10	6
A6	1	8	8
A7	0	6	2
A8	5	10	7
Average	1	6.3	5.1
Standard Deviation	1.8	3.2	2.3

The results for this second instruction with Group A indicate that all seven students improved their scores from the pretest to the posttest 2. Increases ranged from two to ten points depending on the student. Student A4 was absent during this treatment and therefore was not included. Only one student improved scores from the posttest 2 to the posttest 2b while three kept the same score and three lost points. All seven students improved their scores from the pretest to posttest 2b.

The scores for Treatment 2 semantic instruction, Group B are shown in Table 5 on the next page.

Table 5

Semantic Instruction Data Number Correct

Group B Students	Pretest 2	Postest 2	Postest 2b
B1	4	7	4
B2	1	10	10
B5	4	10	10
B6	3	10	10
Average	3	9	8
Standard Deviation	1.4	1.5	3

Student B3 was absent for the instruction and posttest and was therefore not included. Student B4 moved to another city, leaving only four students in Group B. As a result of the second treatment, all students in this group made improvements in their scores from the pretest to posttest 2. Students' scores increased from two to nine points. Scores for posttest 2b show three students' scores stayed the same from posttest 2 and one went down three points. Three students made improvements from the pretest to posttest 2b and one student's score stayed the same.

The average number of increase in points between the pretests and first posttests was calculated for each treatment and group. They are shown in Table 6.

Table 6

Average Increase in Words From Pretest to First Posttest

Group A	Semantic (Treatment 1)	Thematic (Treatment 2)
	2:9	5.3
Group B	Semantic (Treatment 2)	Thematic (Treatment 1)
	6.3	4.7

These numbers indicate the students in Group A were able to improve their scores more after the thematic instruction whereas the students in Group B improved their scores

more after semantic instruction. In addition, the difference between the two averages for Group A is larger, 2.4 points difference, than the difference between the two averages for Group B, only 1.6 difference. It is impossible to conclude that one method of clustering words was more effective than the other due to the small difference between the average number of words learned after each treatment.

The second posttest, given three weeks after instruction to show retention of the new knowledge over time, indicated some continued improvement. Table 7 shows the semantic instruction resulted in higher retention of new word knowledge over time for Group A. For Group B, the thematic instruction was much more beneficial in helping the students remember the new vocabulary over a three week time period.

Table 7

Data for Retention Over Three Weeks Second Postest

	Thematic	Semantic
Group A	-1.2	0.6
Group B	1.5	-1

The scores for words presented in a semantic cluster went up .6 point for Group A from the first posttest to the second and down one point for Group B. After thematic instruction, the scores went down 1.2 points for Group A from the first to second posttest and up 1.5 points for Group B.

Qualitative Analysis

Interview questions.

The interview questions (see Appendix R) were generated by the researcher to stimulate responses that would give insight and answer the questions of the study. All students in Group A were paired for the interview. One could act as a translator if necessary. The Russian students in Group B were paired for the same reason and the one Spanish speaking student was interviewed alone as the researcher spoke Spanish and could interpret if necessary. The researcher recorded all comments by hand during the interview and used the original vocabulary cards to aid in answering the questions. Student responses to the interview questions were coded to find similarities in student opinions of

the treatments they received. Student recommendations for future use of the strategy were also coded and conclusions were drawn from the comments made.

The interviews were hampered by unforeseen, last minute activites at both schools. The date of the interview had been prearranged by the researcher with the ESL teacher, but the schedule was changed that morning. Group A was participating in an art activity, in a large group, with a special guest and Group B's students arrived one at a time over a long period of time due to class activities. As a result, the students in Group A were upset about missing a classroom activity and Group B appeared distracted by the arrival of each new student. The number of students in Group B was down to five because one student had moved to another area. One student in Group A was upset to the point of tears and basically refused to answer the questions.

Responses to questions.

The responses to question 1, "Did you notice a difference in the way I grouped the two sets of words I taught you?" are shown below in Table 8.

Table 8

Responses to Question 1

QUESTION 1	GROUP A	GROUP B
yes	4	1
no	1	1
don't know	3	3

The responses to this question indicated some students said they were aware of differences between thematic and semantically grouped words, but were not able to explain what the distinctive characteristics were. Others either did not notice a difference or were unable to express this idea, therefore accounting for the large number of "do not know" answers.

Next, the cards were spread out and a brief reminder was given about the words before question two was asked: "What do you notice about the way the words are grouped?" The responses are shown in Table 9.

Table 9

Responses to Question 2

QUESTION 2	GROUP A	GROUP B
surface / general comment	4	3
reflective comment	1	0
Do not know	3	2

Two students from each group still responded by saying they did not know or there was no difference. However, more students gave information in the form of a surface, or general, comment about the words in front of them instead of giving no response. An example of a general, surface comment was made by student B2 when she simply read each of the words written on the cards. Another example was given by student A8: "These are people, these animals. Just the name of animals and words." Only one student, from Group A, named characteristics of the words and distinguished between the two groups giving a more reflective, deep answer. Student A6 commented, "Thematic all good, about people, where they go, how they are. Semantic grouped those on four legs... those with animals."

The responses to question three, "Which way helped you learn more words?" can be found in Table 10.

Table 10

Responses to Question 3

QUESTION 3	GROUP A	GROUP B
Semantic	4	3
Thematic	2	2
Do not know	2	0

These answers indicated half the students preferred the semantic method of clustering words. Two students from each group felt the thematic cluster was more beneficial and two students from Group A did not know which cluster was more helpful. Students only gave one word answers to this particular question. The quantitative results

showed the thematic grouping was more beneficial for students in Group A. That information is in disagreement with the cluster they chose to be most helpful when interviewed. Group B, however, did better, quantitatively, after the semantic group of words was taught and that was also the group they chose as being most helpful.

Question four on the interview was, "What about that group (the one chosen as most beneficial in question three) made you learn the words?" The responses are shown in Table 11.

Table 11

Responses to Question 4

QUESTION 4	GROUP A	GROUP B
Surface / general comments	2	0
Enjoyable	1	0
Familiar words	0	1
Aided learning	2	1
Do not know	3	3

Three students from each group indicated they did not know what helped them. Two students from Group A and one from Group B said the cluster actually helped them learn. An example of this was student A7's comment, "I was able to learn them better" and student A1's comment, "The difference in the words helped." One student in Group B explained the words in the helpful cluster were familiar and one student in Group A found the chosen cluster to be more enjoyable. Two students in Group A made surface, or general, comments about visual aspects of the words in front of them. A comparison of the answers to questions three and four resulted in the discovery that two students from each group were consistent in choosing the same cluster as being beneficial and the one they discussed when describing why it was helpful. All other students changed the cluster, either thematic or semantic, they were talking about.

The final question on the interview asked the students' recommendation of either thematic or semantic clusters for their ESL teacher to use. Their choices can be found in Table 12.

Table 12

Responses to Question 5

QUESTION 5	GROUP A	GROUP B
Semantic	4	4
Thematic	2	1
Do not know	2	0

Two students in Group A did not know which the teacher should use. Four from each group recommended semantic clusters, and two from Group A and one from Group B suggested thematic clusters. Overall, the majority thought semantic clusters should be used. A comparison of questions three and five showed most students recommended the teacher use the same cluster they chose as most beneficial for themselves.

Survey conditions.

The survey (see Appendix F) was given to determine what experience the students had learning new words before this study. Question one was "What do you do to help you learn new words?" In Group A, students either studied the words, wrote the words, looked them up in the dictionary or listened to the words and thought about what they meant in an attempt to remember them. In Group B, students wrote the words, studied them and thought about the words to help learn them.

All students reported having a time when they learned vocabulary words either in their regular classroom or ESL room in response to question two, "Do you have a time when you learn new vocabulary words in your classroom?"

Question three, "How many words does the teacher give you to learn?" resulted in a varied response from Group A students. They suggested they were given between five and twenty-eight words to learn at once. Group B students felt they learned between ten and twenty words at one time.

Question four on the survey asked, "How do you think the teacher chooses the new words?" One student from each group responded that he/she did not know how the teacher chose new words, one from Group B said, "From his brain!" and one student from Group A answered that the teacher thought about the words to teach. Six students from

Group A and four from Group B suggested the teacher used a book or word list to select the new vocabulary words.

In response to question five, "Have you noticed that the words all go together somehow?" all students said the words did go together somehow, meaning there was a cohesive factor to the list of words. Students did not elaborate about why they perceived the words to be related. It seemed as though they could sense there was a common link between the words, but could not articulate what it was.

Conclusion

The purpose fo this study was to explore the benefits of two different ways of grouping vocabulary words for ESL students. Two groups of ESL students, both at the same ESL curriculum level, were given the opportunity to learn new words grouped in a thematic manner and new words grouped in a semantic manner. This section will explain the findings of the research by elaborating upon the results section and giving additional anecdotal information.

Discussion of Results

Treatments 1& 2

The question was posed at the beginning of this study "Will grouping vocabulary words thematically result in more words learned by L2 students than grouping words semantically?" According to the results from the scores of the pretests and first postests, the thematic grouping was only beneficial for Group A. Group B's scores improved more when they learned the words grouped semantically.

This generated a new question: "Why did the thematic clustering help Group A learn more words, but not help Group B?" There are several possible reasons for these results. The first is what Waring (1997, pg.269) calls "task-learning effects." Comparison of the data and graphs in Appendices S, T, U, V & W showed that it was the second treatment each group received that resulted in the higher scores. Groups A's scores improved more when given the thematic instruction, Treatment 2, while Group B's scores improved more when given the semantic instruction, Treatment 2. Since the procedure was the same and only the words changed it was possible that the sudents were more familiar and at ease with the routine the second time around. In addition to being more at ease with the task, the students could also have been more comfortable with the researcher's mannerisms, requests and vocabulary. Although two students in Group B already knew the researcher from the previous school year it is still possible that the students became more accustomed to the researcher after experiencing the first treatment. This, in turn, could have resulted in higher scores after the second treatment.

A second explanation for the positive results from both types of clusters might be that all words in a group were related under the same theme and not a random,

meaningless mixture. Waring (1997) explained "that presenting new words that share a common superordinate in a set of words to learn does interfere with learning" (267). The superordinates, or head words, for the clusters used in this study were Animals, Occupations (used twice), and Food. Waring suggested that in order to completely counteract the interference theory, words should be presented in totally unrelated sets. For example, frog, car and rain fall under three different themes or superordinates: animal, type of transportation, and weather. Again, none of the word groups in this study were comprised of completely random words. This may have allowed the interference theory to continue affecting the students' learning of new words.

A third aspect explaining the results of this part of the study is that if a student already knows some of the words in a semantic set, or theme, he was adding to a previous set instead of making a new set. "For example, if learners already knew 10 words from the 'clothes' semantic group and were being asked to learn some more words they would be adding to, rather than setting up, a new semantic set..." (Waring, 1997, pg.269). Adding to a pre-designated semantic set would seem easier than creating a new one, but still allows the interference theory to affect learning.

The data in the present study showed that all students knew at least one of the instructional words on the pretest. The only exception was Group A, students A1, A3, A5, and A7 who all scored zero on the pretest before Treatment 2, the thematic instruction. The other students already had a language network established for the words in the other treatments since they correctly identified at least one. Group A made its greatest improvement in Treatment 2 where four of the students did not seem to have previously set up semantic groups for the words. It appeared that sometimes previous knowledge could have interfered with new learning.

A fourth concept which may have influenced the results of this study was that of prototypicality. Were the words, or concepts, chosen for this study ones that students of Spanish and Russian speaking descent would be familiar with? Were they "typical" examples of the concept they were learning? If not, these words would be harder to learn resulting in a disadvantage to the student. Waring (1997) controlled the words in his study for prototypicality effects and gave the example of the word nectarine. This is an

uncommon fruit in Japan where his study took place. If most Japanese do not know what a nectarine is it would be unfair to expect them to learn the name of this foreign fruit, quickly, in English. He interviewed several Japanese native speakers, discovered apples, oranges and bananas were more common and changed nectarine to a more widely known fruit.

Possibly, the Russian students in this study were not familiar with some of the occupation words used in this study: president, carpenter, lifeguard. The Spanish speaking students could have found the food Jello to be somethings new and unknown. Since prototypicality effects were not considered in the design of this study, some words or concepts may have been harder to learn.

Question two in this study was "Will L2 students retain more knowledge of new vocabulary words, over time, if the words are learned in a thematic group?" The data showed slight improvements from the first postest to the second after Treatment 1 for both groups. After Treatment 2, the second postest scores went down from the first postest scores for both groups. This would indicate Group A retained more words over time after learning those words in a semantic manner and Group B retained more words over time after learning them in a thematic manner. It was interesting to note that this was not the most beneficial manner of grouping words for each group according to the data from the first posttest. Group A gained more points from the pretest after the semantic instruction; they did not retain this new knowledge over three weeks. Group B gained more points from the pretest after thematic instruction, but retained the new words better after semantic instruction.

One explanation for these results might be the individuality and differences in learning style of each student. The cluster that worked for some students did not work for others. The scores varied, even within each group, and it would seem that each student benefited from each of the word clusters to varying degrees.

The task-learning effect, discussed in relation to question one of this study, could have occurred and influenced the scores for retention of new words over time. The students had already seen the posttest once and participated in the activity of completing it, so the task was familiar. While this might have resulted in higher scores on postest 1b, it does not explain why the scores did not go up for posttest 2b as well, but instead went down.

Surveys

The eight students from Group A and the six in Group B wrote or dictated their answers on the survey in either their native language or English. The responses to the survey questions addressed subquestions one, two, and three.

Subquestion one was "What was the students' previous experience with semantic and thematic clustering of words in their regular classroom or their ESL group?" The findings showed that all students did feel new words they learned from other teachers went together somehow. This indicated students were aware there was a common factor among the words such as a theme or book that was being studied. Therefore, it can be concluded the students had some experience with clustering of words.

Subquestion two was "How do students see themselves learning vocabulary? What do they think works for them?" The students' responses led to the understanding that students thought they learned new vocabulary in the classroom through activities directed by the teacher and through studying at home. The students described their study activities as writing the words, thinking about the words, looking the words up in the dictionary, and listening to the words. These activities are what students said they did to help learn new vocabulary words. It is my opinion that these are fairly typical responses for ESL students. The students did not mention the numerous additional activities or procedures a teacher giving direct vocabulary instruction might have his students complete. Possibly students do not consider those activities studying or do not connect the activity with the fact it is helping them learn vocabulary words.

Subquestion three was "What differences do students at the elementary level notice between thematically and semantically grouped words?" Students said they noticed words went together in response to question five on the survey, "Have you noticed that the words all go together somehow?" and some made comments to indicate an awareness of the differences between the semantic and thematic clusters in answers to the interview. Most students, however, did not explain how the clusters differed. Students might have been unable to express themselves thoroughly due to lack of vocabulary in the L2, but it seemed more likely that they just did not recognize the deeper differences between the groups of vocabulary words.

Interviews

The interviews, although influenced by unfavorable circumstances, did provide information for additional conclusions about the benefits, or disadvantages, of using semantic and thematic clusters. Asking upper elementary ESL students to think about how they learned and what helped them may be beyond their abilities. Even if the questions had been worded in a more simplistic, but still detailed manner, the issue of the students' English language proficiency would still have been a factor in the level of response received. This was indicated by several students who made comments on the visible aspects of the words and did not go deeper into what it meant to them. These seemed like surface comments rather than an explanation of the thoughts or thinking process the child had in relation to the words. For example, "those (pointing to the thematic set) pictures better match the word," " purple pen, green pen," and "paper pictures and colored pictures."

First, it is important to note that there was a great variety in the responses, especially when students were asked which of the two methods was most helpful. The conclusion here was that what works for one student may not work for another. It is important to consider using a variety of techniques in the classroom in an effort to help all students.

The third question this study posed was, "What is the students' opinion about whether or not thematic grouping helped them learn the words?" Responses to the interviews showed, overall, students did not find the thematic cluster most helpful. The semantic cluster was recommended as beneficial more than the thematic cluster. Again, it was hard to determine why students answered this way due to the general comments that did not offer deep insights into the children's thoughts.

This study's second subquestion asked, "How do students see themselves learning vocabulary? What do they think works for them?" In addition to the activities students already did at home to study new vocabulary words, it was suggested through the interview responses that half of the sudents in each group saw themselves learning new words better if they were grouped semantically. While there were some students who felt the thematic grouping would help them most and some who did not know which would be the best, the students seemed to prefer the semantic cluster.

Implications for Education

This study gathered data that led to several conclusions of importance to education. It would seem educators certainly want to use the best practices for their students. The results discussed here showed both clusters were beneficial, suggesting that it might be useful to consider a combination of both strategies. A semantic cluster could be used for one unit of vocabulary words and a thematic cluster for the next. In this way a variety of clusters, in addition to a mixture of other strategies for teaching vocabulary, might allow each student to find a method that really helps him learn words well.

Some points to consider when forming clusters include the topic of the unit, students' previous knowledge and culture, and the meaningfulness of the words. If the topic, or superordinate as discussed earlier, is one the students are already familiar with they may have a semantic set already established. It was suggested this may interfere with the learning of new words and teachers might need to allow more time for learning of those words to occur. Information about the cultural background of the student could provide helpful insights as to what topics or words the student will have a concept of and what might be totally unknown. Also, it might be advantagous to remember that learning new words in, and with the help of, meaningful text could cancel out the effect of the interference theory. This could be important for teachers to consider when deciding what would be most beneficial for their students.

The review of literature for this study found numerous research studies on learning vocabulary. The interest in studying this topic might indicate that it is of importance for students, those learning a second language and those working on their first, to receive instruction in new vocabulary words. It was suggested there is a correlation between increased vocabulary knowledge and improved reading comprehension. Teachers wanting to do the best for their students could consider these points for vocabulary instruction.

Suggestions for Further Research

It would be interesting to investigate the benefits of learning a thematic cluster of words taken from a meaningful text for L2 students. Therefore, two strategies other studies have concluded were beneficial for ESL learners would be combined. Future research on thematic and semantic clusters could include a test for retention of new vocabulary words

over a longer period of time than the three weeks used in this study. In addition, a larger sample of L2 participants would be of benefit to arriving at more solid conclusions in the future. Checking the prototypicality of the words, expanding the interview process, using a professional translator and taking the results back to the students for verification are suggestions for further research.

Closing Comments

In closing, a few additional thoughts might help explain the results of this study and the main conclusions.

First, it is important to note that this study does not isolate just the groupings, thematic or semantic. Instructional methods, activities used in the treatments, and time in the regular classroom could have had a role in the outcomes. Students had opportunity to talk between days they met with the researcher and the activities selected could have helped the students learn the words more than the actual form of grouping the words. The idea that one of these clusters might be more beneficial than the other cannot be proved definitively in this study since it is difficult to tell whether or not other factors influenced the results.

Second, it is interesting that Tinkham (1993, 1997) and Waring (1997) used artificial L2 words in their studies, combinations of vowels and consonants that followed the rules for forming a word but were not recognizable. These were paired with genuine L1 words to form the word lists. The present study used genuine L2 words that would have been taught to the students later in the same school year. There are two sides to this point; it could have made the words harder to learn because they were not paired or easier since the words had a concept behind each one that was concrete and genuine. At the very least it was a more natural progression for the students.

Third, the interference theory was the basis for exploring thematic versus semantic clusters. The theory was that a more varied group of words in a thematic cluster might result in more learning because the words did not interfere with one another and the learning. Waring (1997) explained that if new words are learned in a meaningful passage, then the effect of the interference theory is cancelled out. Learning words in text that are meaningful to the student allows the words to become solidified in such a way that there is no interference or confusion from other words.

Fourth, there was considerable variation between students in their opinions and results on the tests. This would indicate that variety in teaching methods and not only the words, as investigated in this study, would be valuable for a classroom of diverse students. Data from this study does not support one form of clustering words as the best way that should always be used. That would be misleading. However, given the results and analysis of this study, the suggestion can be made to try a combination of both semantic and thematic clusters or varying the use of the two; use one for one set of words and the other for the next set of words. Both tools are valuable and, at the very least, worth giving a try.

In summary, this study explored the benefits of semantic and thematic word clusters to students learning new L2 vocabulary. This research sought to determine whether or not thematic clusters resulted in better learning of the new words, if those words would be remembered over a three week time period and what the students' opinions of learning words in the two clusters were. Additional information included how the students studied new words, whether or not they recognized differences in the way words were grouped and their previous experience with either of the two ways of grouping words.

It was found that the thematic cluster resulted in more words learned for one group, but not for the other. It was beneficial to some, but not all. The group that benefited from the thematic cluster was better able to retain words over a three week time period. On the other hand, the group that benefited most from the semantic word cluster retained more words over time after instruction in the thematic cluster of words. The cluster that was most helpful to the students as shown in the first postest data, was not helpful over time as shown by the second postest data gathered three weeks later. The students' opinions of the clusters showed that just over half the students preferred the semantic cluster. A few students did prefer the thematic cluster showing, again, that both clusters were helpful to some students.

Additional information showed that students did have previous experience with groups of words, but could not elaborate upon the details of the groupings. Students felt they had to study to learn words. Study activities included reading the words, listening to them, writing them, and looking them up in the dictionary. Two levels of awareness of the

differences between thematic and semantic clusters were discovered. Most students were aware of only the visible differences between the words such as color, type of drawing that accompanied the word, or size. However, a few of the students were able to make deeper comments showing they recognized the thematic cluster as having more varied words than the semantic cluster.

As stated previously, the responses, opinions and data in this study represent much individuality and variety. Nevertheless, this is typical of a public school ESL classroom where no two students are alike. For that reason, it might be beneficial to consider using both types of clusters when teaching new vocabulary words to second language students.

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Appendices

Appendix A

Piper's Categories of Second Language Acquisition Theories

Table 4.2 Nine Theories of Second Language Acquisition

Theory/scope	*Origin*	*Evaluation/discussion*
Acculturation		
Learner Proficiency Conditions	Schumann (1978a, 1978b, 1981a, 1981b, 1982)	McLaughlin (1987) Ellis (1985) Larsen-Freeman (1983) Larsen-Freeman & Long (1991)
Accommodation		
Learner Conditions Proficiency	Giles et al. (1977) Giles & Byrne (1982)	Ellis (1985)
Behaviorism		
Conditions Language	Skinner (1957)	McLaughlin (1978, 1984, 1987)
Cognitive		
Learner Process	McLaughlin et al. (1983); McLeod & McLaughlin (1986); Segalowitz (1986)	McLaughlin (1987)
Discourse		
Learner Conditions Process	Hatch (1978c, 1978d)	Ellis (1985) Larsen-Freeman (1983)
Interlanguage		
Process Language Proficiency	Selinker (1972)	McLaughlin (1987) Ellis (1985)
Monitor Model		
Leaner Process Conditions Language	Krashen (1977a, 1977b, 1978, 1981, 1982, 1985)	McLaughlin (1987) Spolsky (1985) Ellis (1985) Larsen-Freeman (1983); Gregg (1984)
Neurofunctional		
Process Language	Lamendella (1977, 1979)	Larsen-Freeman (1983); Ellis (1985)
Universal		
Process Grammar Language	Chomsky (1980) Greenberg (1966, 1974); Wode (1981)	McLaughlin (1987) Gass (1984) Ellis (1985)

English Parent Permission Letter

September 7, 1999

Dear Parents,

This school year I will be conducting a research project as a requirement for my Master's degree program. The research compares two ways of grouping vocabulary words. I will be giving a written survey, pre-test, teaching one 45 minute lesson, giving two post-tests and interviewing each child in the ESL group.

There will be no discomforts or risks for the students. I hope this study will provide answers for teachers about how to group words in a way that helps kids learn them better.

If you have any questions, please don't hesitate to call me at 650-0931 and I will be happy to discuss this research with you. Also, if at any time after the study has started you are concerned about your child's participation, you may freely withdraw your child from this particular instruction.

The information gathered will be published and reviewed by my colleagues and by professors at Western Washington University. You and the principal are also welcome to review the report. Student names will not be used, but samples of student work may be included in the final paper.

If you agree to your child participating in this study, please sign and date this letter and return it with your child to Mr. Page by September 24, 1999. Thank you for your cooperation!!

Sincerely,

Tina Hippner-Page

I give permission for my child, _____,
to participate in this research study as outlined in this letter.

Signed _____ Date: _____

Spanish Parent Permission Letter

7 de septiembre, 1999

Estimados Padres,

Este año de colegio estudiará un projecto de investigación que es una condición de realización un programa de Masters Degree. Este projecto será una comparación de dos caminos para agrupar palabras de vocabulario. Voy a dar un sondeo de opinion, pre-examen, enseñanza de 45 minutos, dos examenes después y una entrevista con cada alumno/a en el programa de ESL.

No habrá nada de riesgo ni molestia por los alumnos. El objectivo de este estudio es de ayudar a los maestros de clasificar (juntar) grupos de palabras en una manera que el alumno pueda aprender más fácil y mejor.

Si tiene cualquier pregunta de este estudio por favor llameme por teléfono al numero 650-0931. También, si después de empezar este estudio usted está preocupado por la participación de su hijo/a, se puede sacarlo del estudio inmediatamente.

Los resultados de este estudio serán editado y criticado por mis colegas y profesores en la Universidad de Western Washington. Usted y el principal también pueden examinar este reporte. Los nombres de los alumnos no serán usados en este reporte, sólo el trabajo de los alumnos puede ser usado en el reporte final.

Si está en acuerdo que su hijo/a puede participar en este estudio, por favor ponga su firma y la fecha abajo y mande esta carta con su hijo/a al Señor Page antes del 24 de septiembre de 1999. Grácias por su ayuda.

Atentamente,

Tina Hippner-Page

Yo doy permiso para mi hijo/a _____ participar en el projecto de estudio como he explicado en esta carta.

Firma_____ Fecha_____

Russian Parent Permission Letter

29 Сентября, 1999

Дорогие родители,

В этом школьном году я буду производить разные темы которые должны быть сделаны для моего "Диплома". Эта тема состоит с двух частей словарных слов. Я буду давать письменный осмотр, пред-контрольные, учить один урок на протяжении 45 минут, также две по пунктам контрольные работы и интервью каждого ребёнка с програмы (АБЯ-ESL)

Там небудет никаких неудобств или рисков для учеников. Я надеюсь что эти учиние ответят на все вопроссы учителей как групповать слова в правельный путь, который поможет детям.

Если у Вас есть либо-какие вопроссы, пожайлуста нестисняйтесь звонить мне по тел: 650-0931, я буду очень рада Вам помочь. Также, в любую минуту после занятий которые начались, Вы начали беспокоится за своего ребёнка в этой участии, Вы

Appendix E

Principal Permission Letter

September 7, 1999

Dear _____,

This letter is to request your permission to conduct a research study at _____ Elementary. In fulfillment of my Master's degree program, I am required to conduct a study. The purpose of my proposed study is to compare two ways of grouping vocabulary words: semantically (eyes, ears, nose) and thematically (dog, hairy, run). Jamie Page has agreed to allow me to work with his intermediate ESL group. I will be giving a written survey, pre-test, teaching one 45 minute lesson, giving two post-tests (one immediately following the instruction and one three weeks later) and interviewing each child in the ESL group. My plan is to be done collecting data by winter break.

No discomforts or risks will occur for the students. I hope this study will provide answers for teachers about how to group words in a way that helps kids learn them better.

The information gathered will be published and reviewed by my colleagues and by professors at Western Washington University. You and the parents are welcome to read the report as well. Student names will not be published, but samples of student work may be included in the final paper. If you have any questions, please feel free to call me at 650-0931 (home) and I will be happy to discuss this research with you.

Sincerely,

Tina Hippner-Page

I give my permission for Tina Hippner-Page to conduct this research project at _____ Elementary School during the school year 1999-2000.

Signed _____ Date: _____

Written Survey

Name:_____ Written Survey

Please read and answer these questions carefully. This information will help me to know how you have been learning new words.

1. What do you do to help you learn new words?

2. Do you have a time when you learn new vocabulary words in your classroom?

3. How many words does the teacher give you to learn?

4. How do you think the teacher chooses the new words?

5. Have you noticed that the words all go together somehow? How?

Pretest 1

Name_____ pretest 1

boots

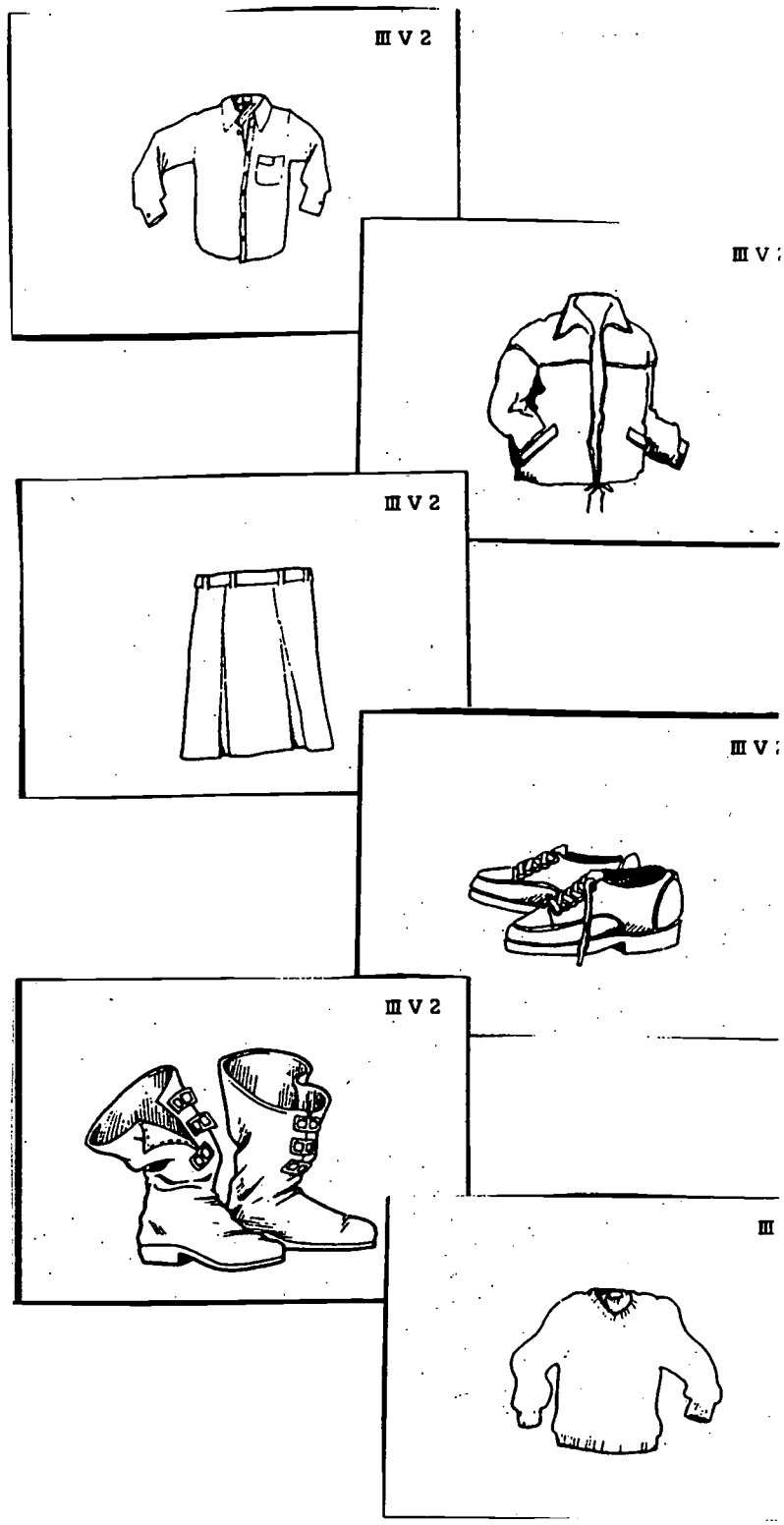
shirt

sweater

shoes

skirt

jacket



IIIV2 Nouns

shorts

ring

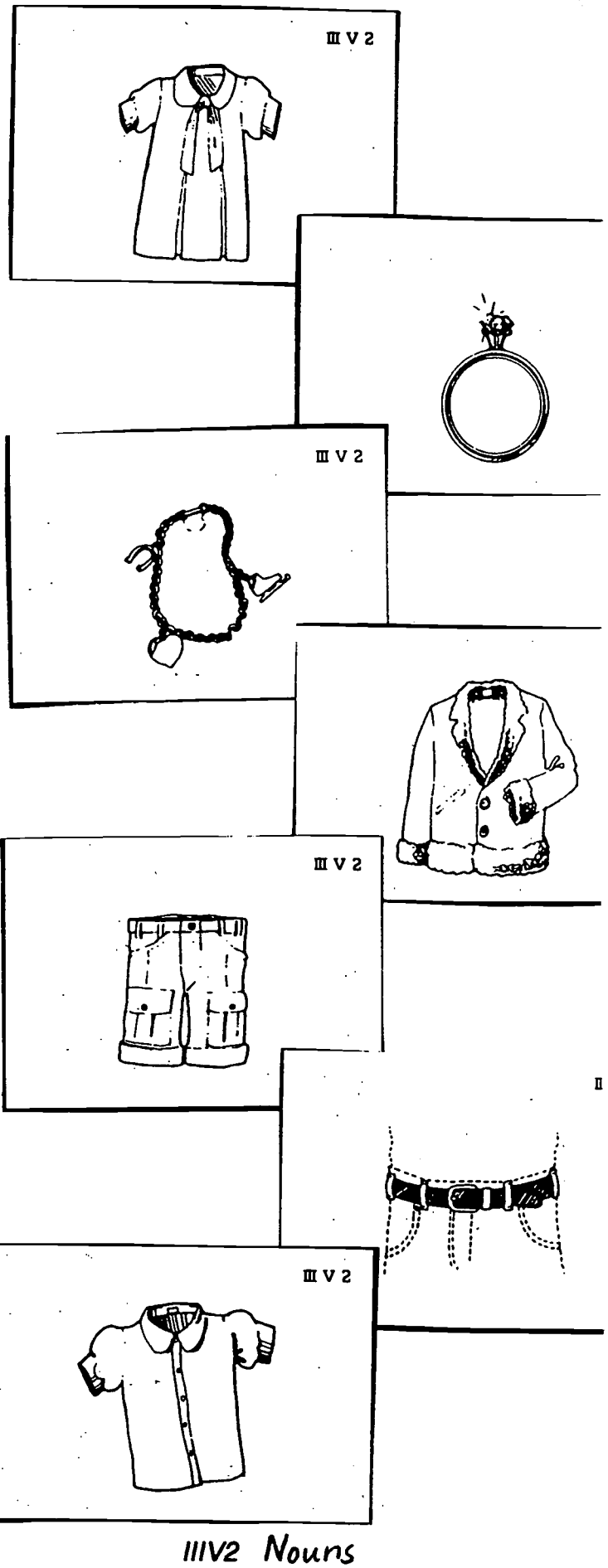
dress

blouse

coat

belt

bracelet



IIIV2 Nouns

60

goose

sheep

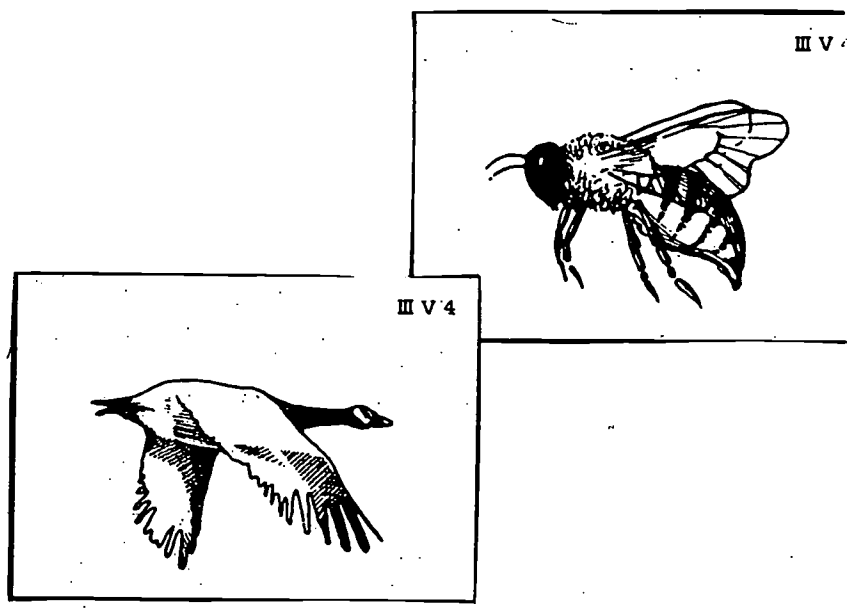
colt

horse

goat

bee

turkey



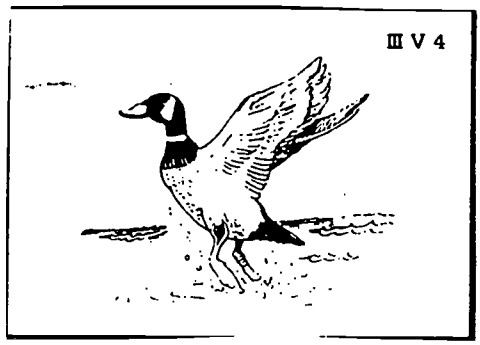
IIIV4 Nouns

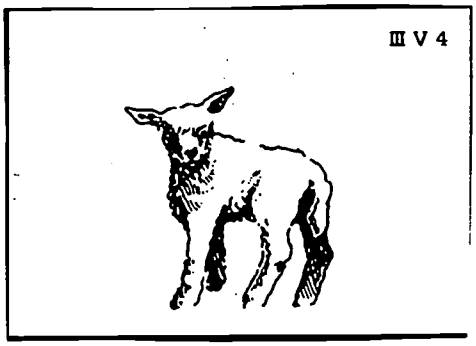
pig

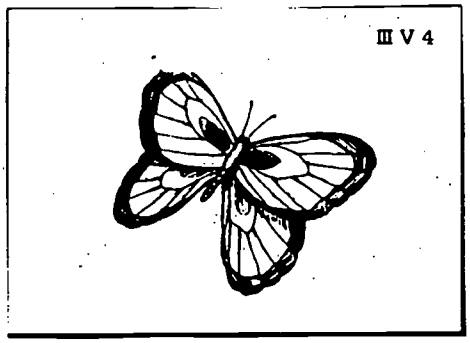
duck

butterfly

lamb







IIIV4 Nouns

hot dog

ice cream

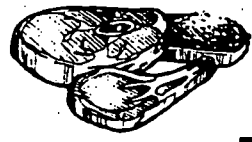
juice

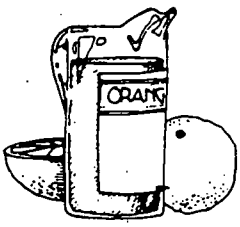
pumpkin

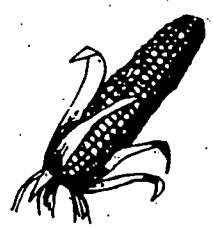
corn

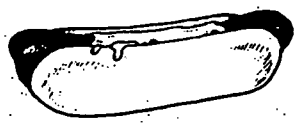
popcorn

meat







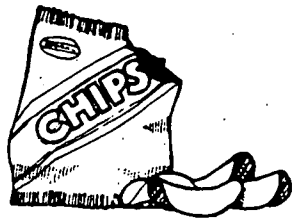


IIIV5 Nouns

strawberries

potato chips

III V 5

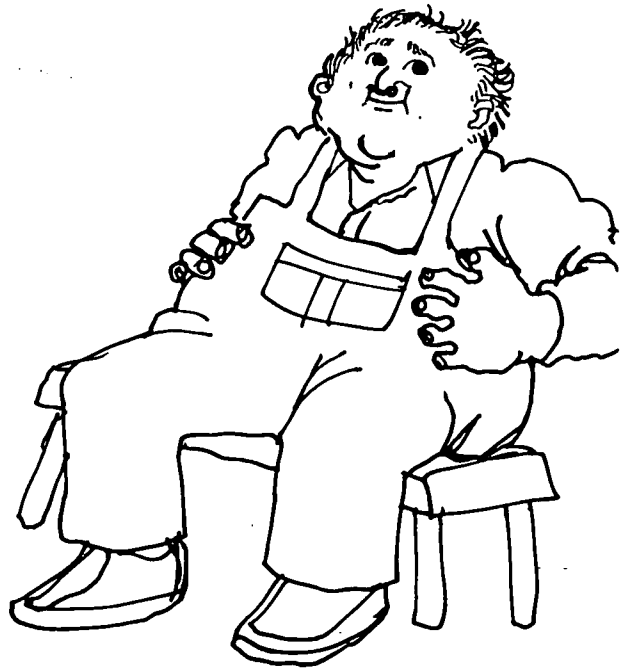


III V 5

IIIV5 Nouns

hairy

fat

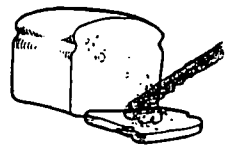


fly

dig

IIIV4 Verbs

mix



spread

IIIV5 Verbs

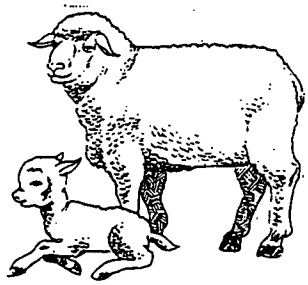
fuzzy

warm

pretty

ugly

old



new

smooth

IIIV2 Adjectives

hard

hungry

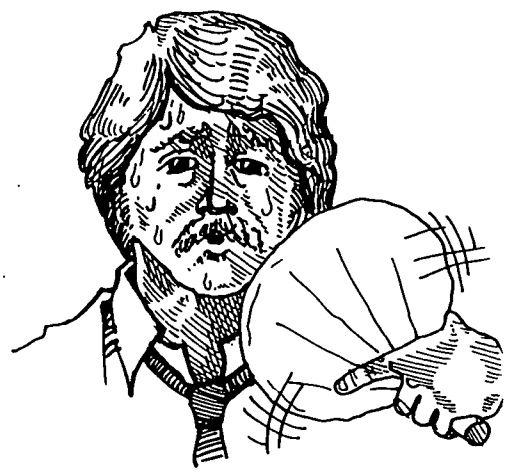
thirsty

hot

cold

good

bad



IIIV5 Adjectives

Words Presented to Group A

Treatment 1- Semantic		Treatment 2- Thematic
calf		salesman/lady
colt		wash
rooster		friendly
chicks		president
sheep		dance
horse		neat
chickens		smart
hen		carpenter
goat		collect
turkey		kind

Words Presented to Group B

Treatment 1- Thematic		Treatment 2- Semantic
taco		banker
warm		king
cook		baker
beans		boxer
hungry		checker
stir		carpenter
Jello		soldier
smooth		lifeguard
cut		queen
eat		salesman/lady

Instructional Activity Treatment 1, Group A

Name _____

colt	calf
rooster	chicks
sheep	horse
chickens	hen
goat	turkey

1. A chicken's babies are called _ _ _ _ _ _ .
2. We use wool from a _ _ _ _ _ to make a sweater.
3. _ _ _ _ _ _ _ is eaten at Thanksgiving.
4. A cow's baby is called a _ _ _ _ .
5. A horse's baby is called a _ _ _ _ .
6. _ _ _ _ lay eggs.
7. People like to watch _ _ _ _ _ races.
8. The _ _ _ _ _ _ _ _ is famous for waking people up in the morning with his "cock-a-doodle-doo".
9. The _ _ _ _ gives us cheese and milk.
10. A favorite food of _ _ _ _ _ _ _ _ _is corn.

semantic instruction
Treatment 1, Group A

Instructional Activity Treatment 1, Group B

Name _____

taco	beans	Jello
warm	hungry	smooth
cook	stir	cut
		eat

1. I get _ _ _ _ _ _ when I _ _ _ _ _ _ _ _ _on the stove.

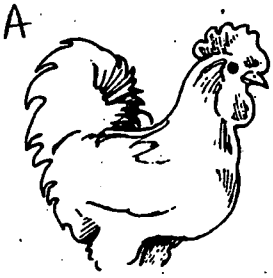
2. A _ _ _ _ is _ _ _ _ because you _ _ _ _ the meat.

3. I like _ _ _ _ _ _ , red _ _ _ _ _ _ _ . I _ _ _ it into squares and _ _ _ it.

Posttest 1 and 1b, Group A

Name_____

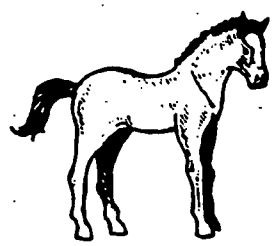
Postest Semantic
1&1b Treatment 1
Group A



colt

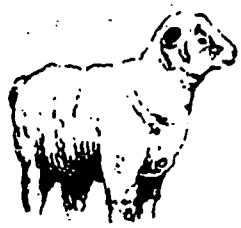
calf

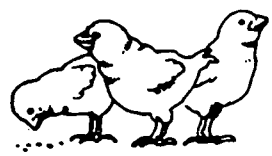
rooster



chicks

sheep





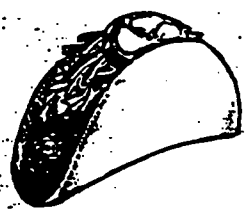
Posttest 1 and 1b, Group B

Postest 1 & 1b
Thematic
Treatment 1 Group B

taco

warm

Jello



smooth

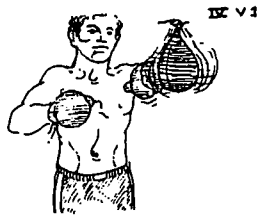
hungry

Pretest 2

Name _____

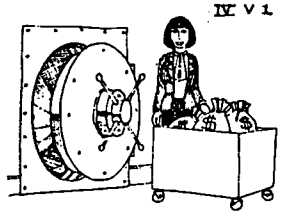
Pretest 2

truck driver



painter

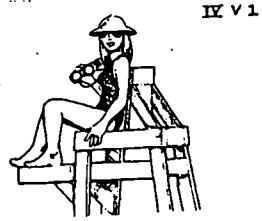
lifeguard



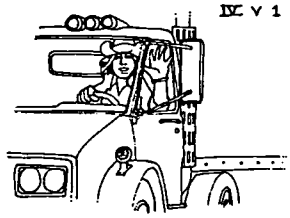
banker

gardener

baker

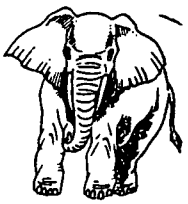


checker



boxer

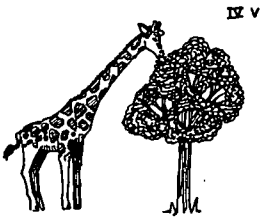
snake



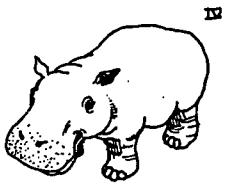
hippopotamus

fox

zebra

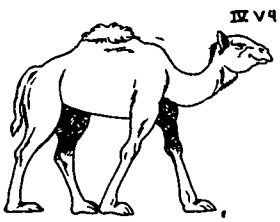


camel

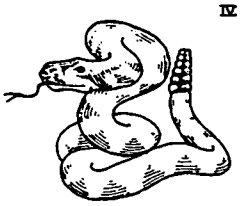


parrot

giraffe

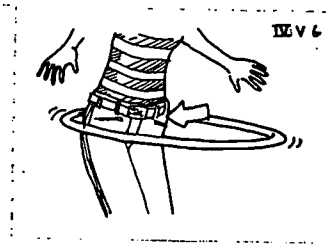


elephant



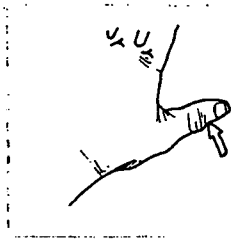
kangaroo

toenails

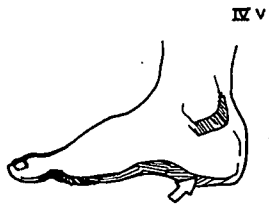


forehead

hips



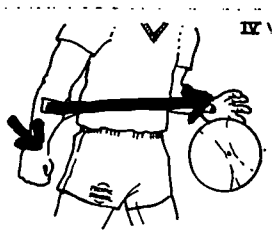
thumb



heel

jaw

skin



cheeks

wrist

kind

nice

playful

friendly

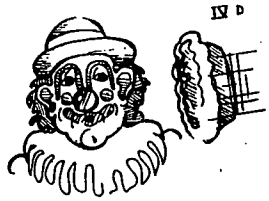
smart

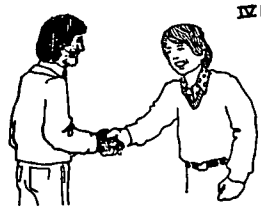
careful

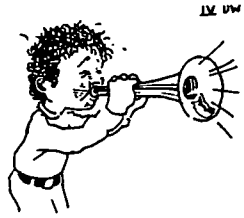
neat

funny

noisy







talk

collect

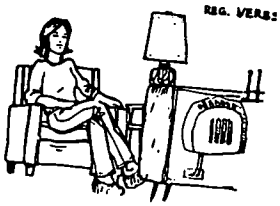
jump

watch

clap

climb

brush



dance

push

Instructional Activity Treatment 2, Group A

Name _____

salesman/lady	president	carpenter
wash	dance	collect
friendly	neat	kind
	smart	

1. The _____ is the leader of our country. When he talks to people his clothes are always _____ and he sounds _____. Sometimes he goes to big dinners and can _____ afterward.

2. A _____ builds things with wood and nails. He likes to _____ tools for building. He is _____ because he helps people have a new house.

3. I get help from a _____ when I buy new shoes. In the morning he or she makes sure to _____ the windows of the store so they are clean. They are very _____ when they help me.

Instructional Activity Treatment 2, Group B

Name _____

banker	king
baker	queen
boxer	checker
carpenter	soldier
salesman/lady	lifeguard

1. A _____ uses wood and nails to build a house.

2. Cakes and pies are some of a _____ specialties.

3. The _____ helped me find the perfect pair of new shoes.

4. A _____ wears special gloves.

5. Who helps people with their money? A _____.

6. A _____ and _____ wear big robes and sit on thrones.

7. After I pick out my groceries, I go to the _____ to pay.

8. Who watches us while we're swimming and saves us if we get in trouble in the water? A _____.

9. A _____ tries to protect his country when he fights in a war.

Semantic Instruction 2

Group B

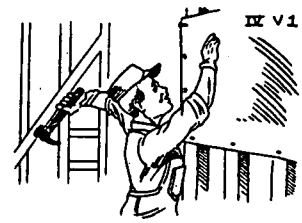
Posttests 2 and 2b, Group A

Name _____

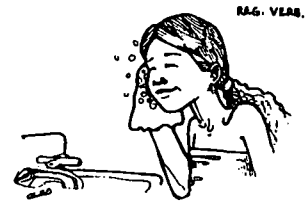
carpenter

salesman/lady

president



dance



wash

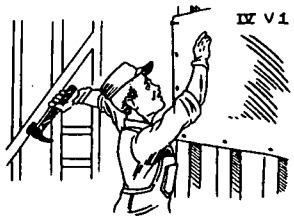
Postest 2 & 79
Themat
Group A

Posttests 2 and 2b, Group B

Name _____

salesman/lady

baker



queen

carpenter

lifeguard

Postest 2 & 2b
semant 80
Group B

Interview Questions

1. Did you notice a difference in the way I grouped the two sets of words I taught you? If no, go to question 2. If yes, what was the difference you noticed?

2. If no to question 1, lay out the vocabulary cards used for instruction. What do you notice about the way the words are grouped? If no answer, explain briefly about the differences.

3. Which way helped you learn more words?

4. What about that group made you learn the words?

5. Which group should Mr. Page use to help you learn the words better?

Appendix S

Comparison of Words Known

GROUP A-Semantic	PRETEST 1	POSTEST 1	POSTEST 1b
A1	1	2	3
A2	6	6	7
A3	2	7	7
A4	10	7	10
A5	2	8	5
A6	6	8	10
A7	6	10	10
A8	8	10	10
Average:	5.1	7.2	7.8
Mode	6	7, 8, 10	10
Median	6	7	7
Standard Dev	3.2	2.5	2.7

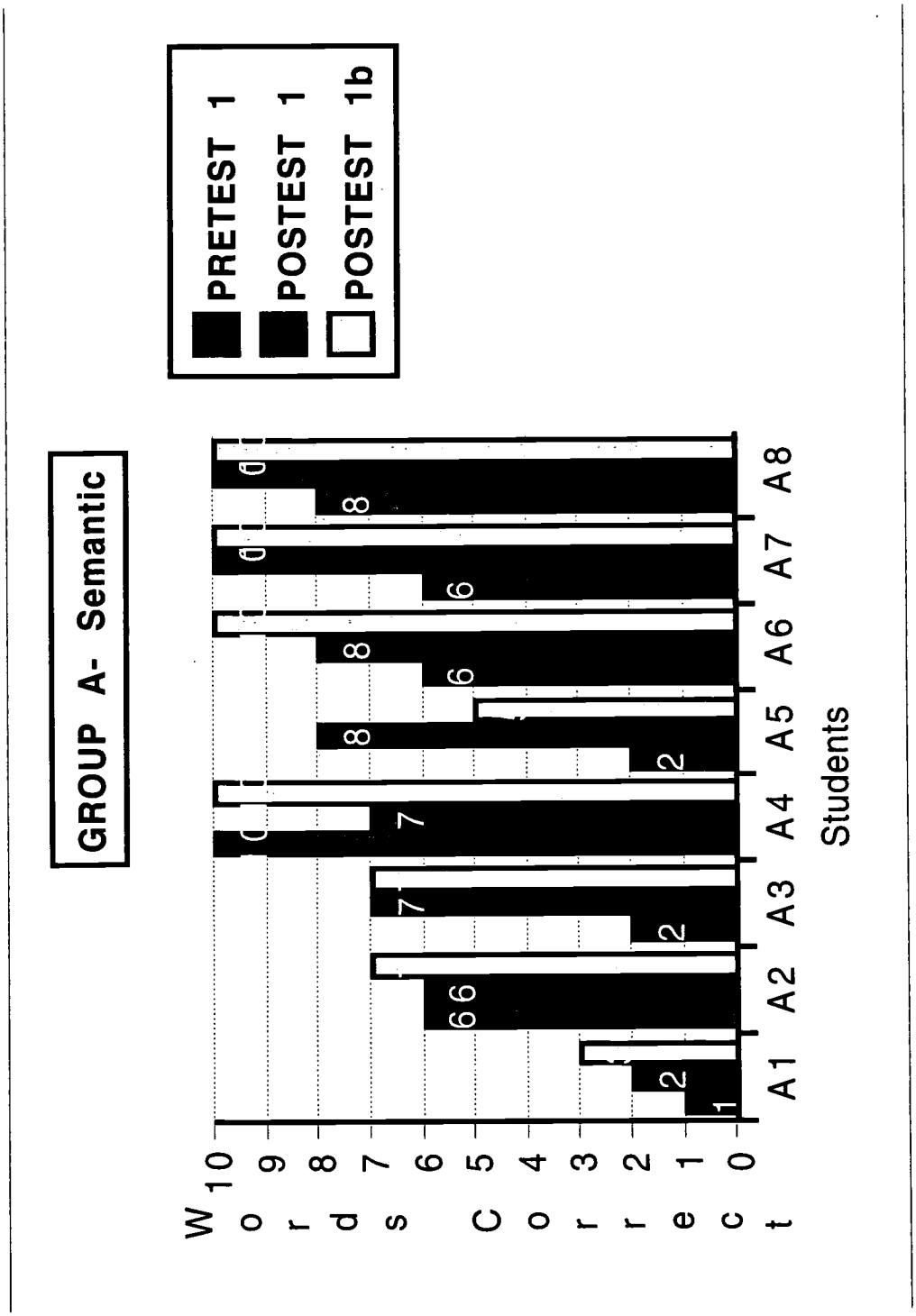
GROUP B-Thematic	PRETEST 1	POSTEST 1	POSTEST 1b
B1	1	6	8
B2	3	9	10
B3	4	8	10
B4	5	10	10
B5	4	8	10
B6	4	8	10
Average:	3.5	8.2	9.7
Mode	4	8	10
Median	4	8	10
Standard Dev	1.4	1.3	0.8

Comparison of Words Known, cont.

GROUP A-Thematic	PRETEST 2	POSTEST 2	POSTEST 2b
A1	0	3	6
A2	1	5	5
A3	0	2	2
A5	0	10	6
A6	1	8	8
A7	0	6	2
A8	5	10	7
Average:	1	6.3	5.1
Mode	0	10	6, 2
Median	0	5	5
Standard Dev	1.8	3.2	2.3

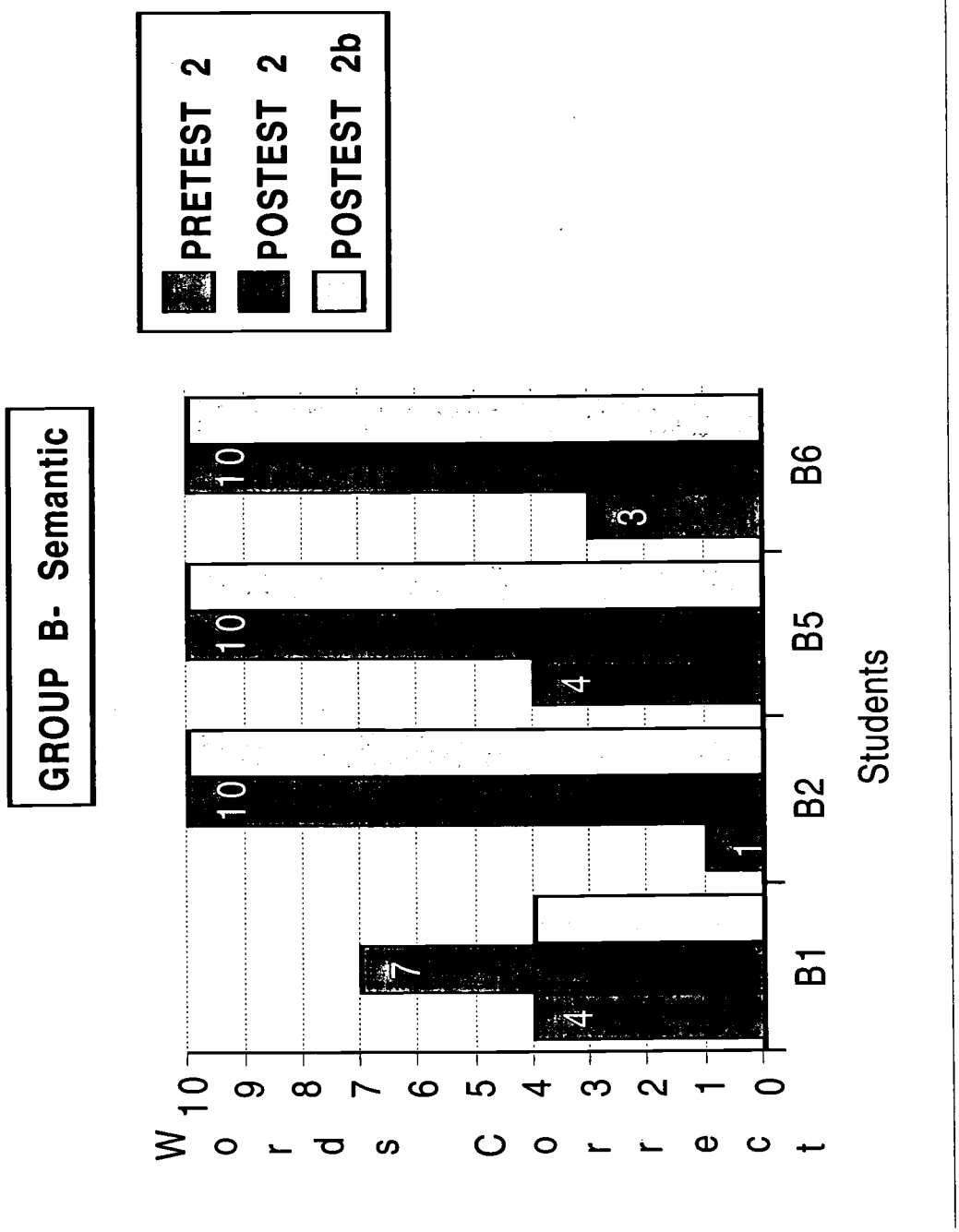
GROUP B-Semantic	PRETEST 2	POSTEST 2	POSTEST 2b
B1	4	7	4
B2	1	10	10
B5	4	10	10
B6	3	9	8
Average	3	9	8
Mode	4	10	10
Median	4	10	10
Standard Dev	1.4	1.5	3

Group A- Semantic Scores



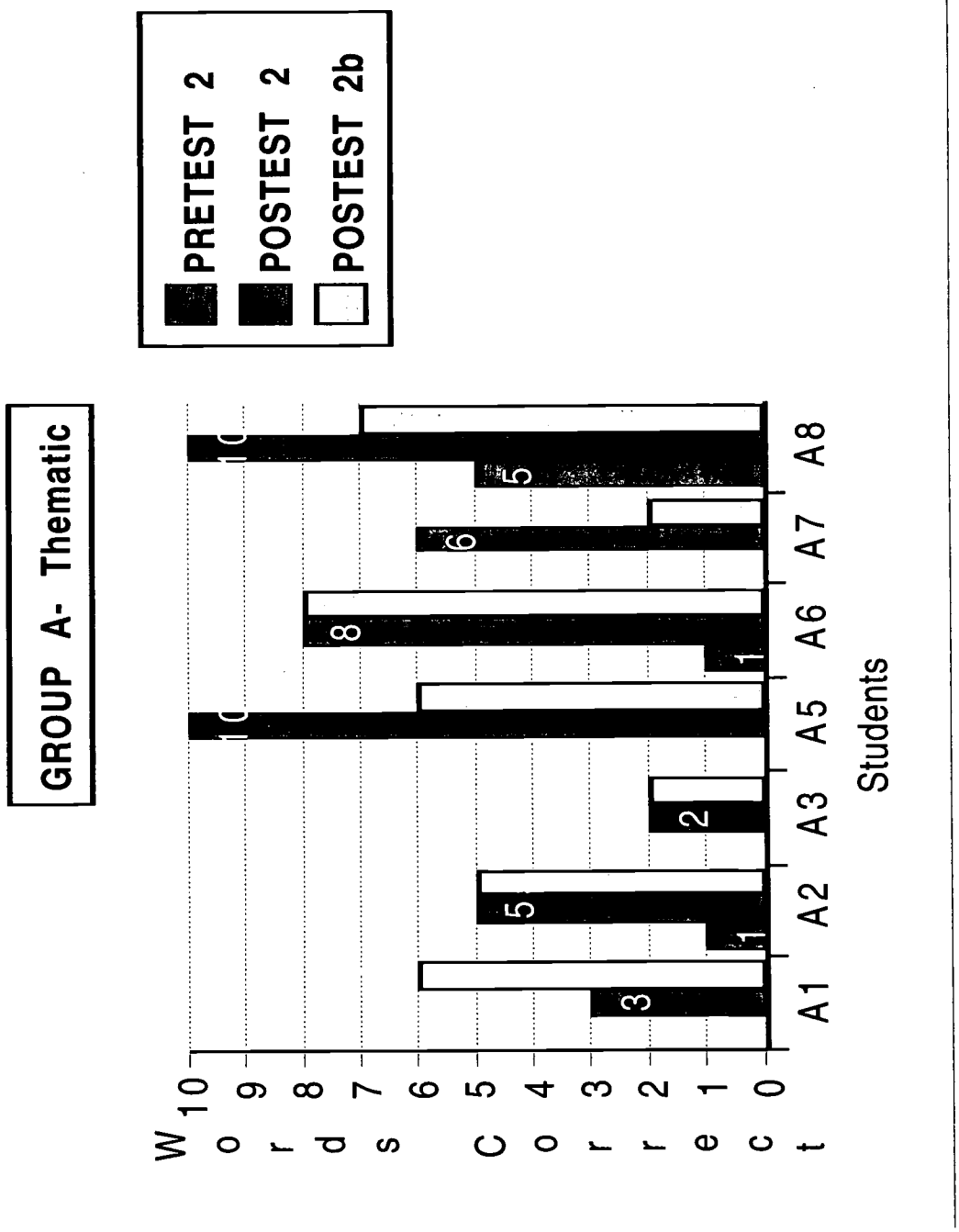
Appendix U

Group B- Semantic Scores



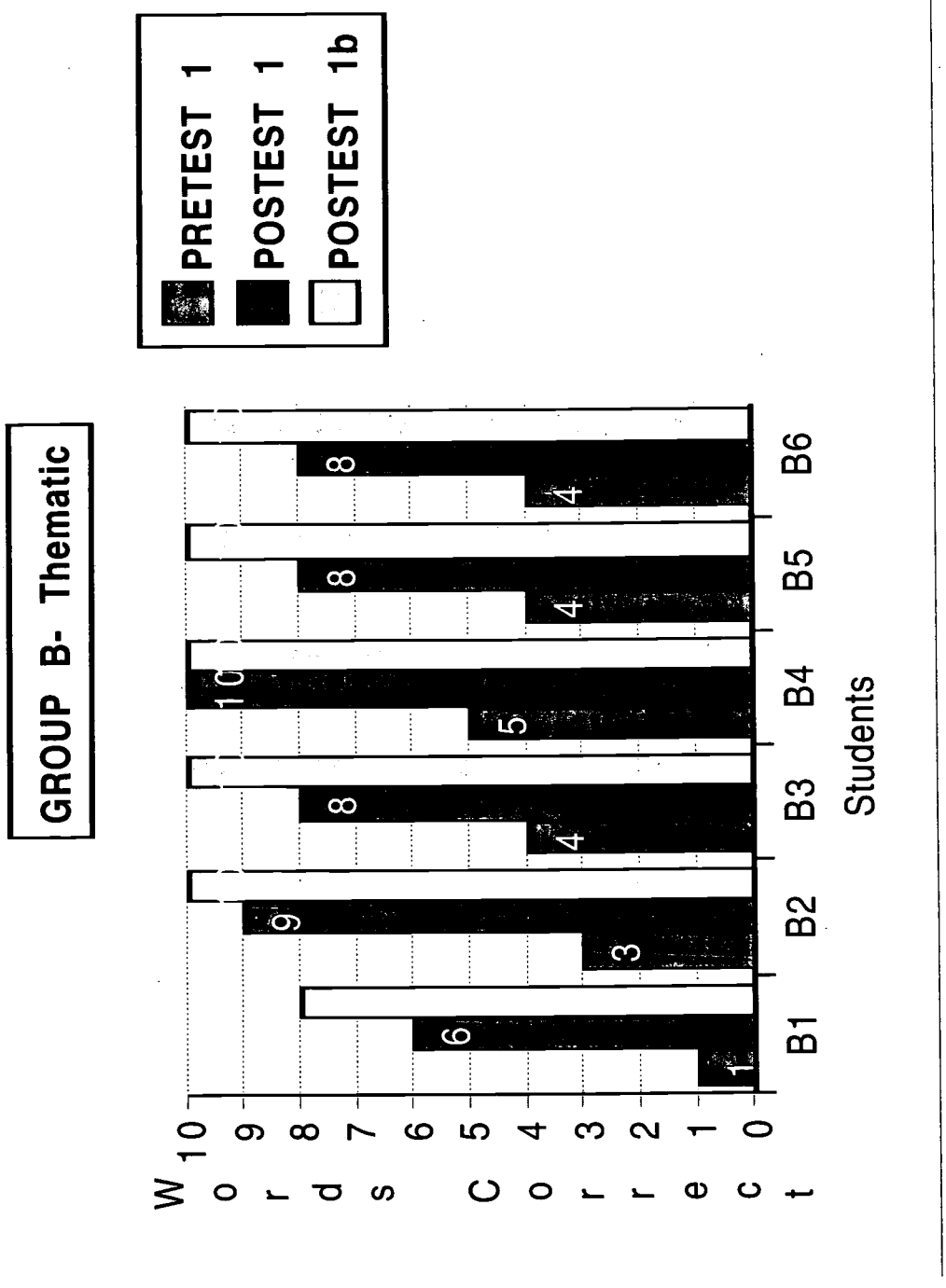
Appendix V

Group A- Thematic Scores



Appendix W

Group B- Thematic Scores



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