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FAST MAPPING VERB MEANING FROM ARGUMENT STRUCTURE

A Dissertation Presented

by

VALERIE E. JOHNSON

Submitted to the Graduate School of the
University of Massachusetts Amherst in partial fulfillment
of the requirements for the degree of

DOCTOR OF PHILOSOPHY

May 2001

Communication Disorders

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DEDICATION

This dissertation is dedicated in loving memory of my grandmother, Mary Elizabeth George Johnson, who taught me about the love of Jesus Christ.

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ABSTRACT

FAST MAPPING VERB MEANING FROM ARGUMENT STRUCTURE

MAY 2001

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Current methods for assessing African American English (AAE) speaking children's semantic knowledge are seriously flawed. Many AAE-speaking children who do not have language disorders perform poorly on standardized vocabulary tests. However, there is no reason to believe that all of these AAE-speaking children are deficient in their ability to learn a rich and functional vocabulary. Existing vocabulary tests often are culturally biased because lexical items are selected and normed on middle-class Euro-American children. This results in an inherent bias against linguistically and culturally diverse populations. Some African American children have less exposure to the lexical items selected for use on standardized tests than Euro-American middle-class children. These cultural and language differences become exacerbated when these children enter school. Frequently, AAE-speaking children are referred to the school speech-language pathologist (SLP) for language testing. However, the SLP is often ill-equipped to provide an unbiased evaluation due to reasons previously mentioned. The problem for the SLP is to determine what areas of semantics to test and what methods should be utilized in this assessment.

This study investigated the processing-dependent measure of fast mapping as an alternative method of assessing semantic knowledge in children. AAE and Standard American English (SAE) speaking children between the ages of four and six were presented with two comprehension tasks involving real verbs and the fast mapping of

novel verbs in four different argument structures (intransitive, transitive, transfer, and complement). These tasks were developed to evaluate how children use syntactic bootstrapping to help fix the meaning of new verbs. The participants' performance on the alternative assessment measure was compared to their performance on a commonly used psychometric vocabulary test. Although significant differences were found between AAE- and SAE-speakers in the transitive argument structure for real verbs and transfer argument structure for both real and novel verbs, overall results indicated that both groups were able to fast map novel verbs. A performance gap between AAE and SAE participants on the psychometric vocabulary test was noted in this study. These results suggest the feasibility of fast mapping as a method to reduce test bias in semantic assessment.

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CHAPTER I

INTRODUCTION

There is limited information regarding research and clinical practice concerning language acquisition and its disorders for culturally and linguistically diverse populations. This lack of information has left the profession of speech-language pathology in a precarious position concerning the assessment of speech and language of minority populations. One of the critical problems facing speech-language pathologists today is the absence of assessment tools that provide valid and reliable evaluations of non-mainstream speakers (Taylor, 1986). The magnitude of the problem is great given the fact that the American Speech-Language-Hearing Association (ASHA, 1991) estimates that 10% of the United States population has a disorder in speech, language, or hearing. Of that estimated 10%, it is conceivable that many minority children are over identified as needing speech and language services.

Specific to the assessment issue is the dilemma of inappropriate methods for evaluating the vocabulary of children who speak African American English (AAE). There are convincing studies that demonstrate standardized tests to be biased against AAE responses. Evidence of test bias is provided when African American children repeatedly miss specific test items that are not missed by Euro-American children (Kresheck & Nicolosi, 1973; Washington & Craig, 1992).

In addition, when 86% of typically developing African American children score below the national norms and 51% score more than one standard deviation below the mean on the Peabody Picture Vocabulary Test Revised (PPVT-R; Dunn and Dunn, 1981; Washington & Craig, 1992), there is evidence of test bias. This test bias continues to manifest in spite of the fact that some tests, such as the Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn & Dunn, 1981), have incorporated ethnic and racial balances in

the standardization population. Language assessment tools that are biased against certain populations are not appropriate or valid for use with those populations.

Inappropriate vocabulary assessment tools exist, in part, due to inadequate data on the AAE lexicon. There are certain terms that are used by both AAE and Standard American English (SAE) speakers, but have special meanings in AAE (Smitherman, 1977). AAE speakers will have words from this African American lexicon. This suggests that AAE speaking children will know some terms that preempt some SAE terms and AAE speakers will attach different meanings to SAE words. These differences will in turn affect AAE speaking children's performance on vocabulary tests. The use of the African American lexicon does not imply a vocabulary deficit, but a vocabulary difference (Mount-Weitz, 1996).

Cultural and language differences become exacerbated when AAE-speaking children enter school. Some vocabulary terms often encountered in school are directed to a greater degree toward middle-class children (Farran, 1982; Mount-Weitz, 1996). The ramifications of the differences in exposure to certain vocabulary terms lead to a discontinuity between the language used at home and the language valued at school for many African American children. A problem is created, not because there is something wrong with the language of these children, but because they have to adapt to school system expectations (Mount-Weitz, 1996). These language differences are often misinterpreted as a deficit not a difference. Hence, AAE speaking children are often referred to school speech-language pathologists (SLP) for language testing based on misinterpretation and lack of knowledge of the AAE lexicon by SAE speaking educators.

The lack of knowledge of AAE lexicon may be attributed to the limited number of studies that have focused on the semantic knowledge of AAE speaking children. Many of the language differences in AAE speakers have been described and documented by sociolinguists (Labov, 1969; Wolfram, 1969; Wolfram & Fasold, 1974). This literature focuses primarily on phonology and syntax. Just as it is important to document the

syntactic and phonological constraints of AAE, it is equally important to document semantic development of African American children for theoretical and practical purposes. Theoretically, this line of research could add to our understanding of language acquisition in normally developing AAE speaking children. From a practical standpoint it could provide normative data on African American children, which would establish a broader foundation for clinical and educational services to this population.

Current standardized methods for assessing the semantic knowledge of AAE speaking children are seriously flawed since the issue of test bias has not been adequately addressed. The long-standing concern of over- and under-identification of non-standard speakers in educational and clinical settings may be attributed to this lack of attention. The issue of how to document semantic competence accurately and efficiently is difficult because meaning is difficult to observe. Hence, the problem of reliably and validly assessing semantic competence cross-culturally becomes intensified. An index of vocabulary knowledge is the most popular means to assess semantic knowledge (Stockman, 1999). However, a vocabulary index is likely to be the most vulnerable to bias when assessing culturally and linguistically diverse populations. Given the expected variability in word knowledge cross-culturally, test developers are confronted with several types of problems in trying to develop unbiased standardized tests that require all children to know the same words.

One alternative solution to traditional assessment methods is the implementation of processing-dependent measures. Processing-dependent measures are more reliant on psycholinguistic processing and less contingent on language knowledge than most standardized language tests (Campbell, Dollaghan, Needleman, & Janosky, 1997). Campbell et al. (1997) showed that minority children did not differ from Euro-American children on language processing tests involving non-word repetition tasks, working memory for competing stimuli, and auditory processing of linguistic commands using a closed set of words. This contrasts with the significant differences noted between Euro-

American and minority participants on a test based on language experience, the Oral Language Scale subtest from the Woodcock Proficiency Battery-Revised (Woodcock, 1991) which relies on vocabulary knowledge. Hence, processing-dependent measures may prove to be superior to knowledge-based tasks in accurately identifying speakers whose poor language performance reflects psycholinguistic deficits, rather than different experiential and cultural backgrounds (Campbell et al., 1997).

One operation that does not depend on prior knowledge or experience, regardless of linguistic background, is *fast mapping* (Carey & Bartlett, 1978). Fast mapping consists of an initial understanding of a novel word's meaning that may be incomplete. This process involves a restructuring of the lexicon and of the underlying conceptual domain that can be achieved by a single exposure to the novel word (Carey & Bartlett, 1978). The notion of fast mapping could explain how young children accomplish rapid lexical growth by mapping "roughed-out" preliminary representations of new words into memory based on few exposures to new lexical items. Children could then maintain a large number of these incomplete representations in memory and update them as new information becomes available.

In the mapping of nouns, ostensive reference, or making a connection between the word and the entity, plays a major role in early lexical acquisition. When the acquisition of verbs is considered, ostensive referencing is rare and inadequate (de Villiers & de Villiers, 1999). For the acquisition of verbs another process seems necessary. Gleitman (1990) noted the role that syntactic frames played in verb learning. This observation gave rise to the term, *syntactic bootstrapping*. According to this notion, children can learn verb meaning by noting the range of syntactic frames in which the word appears. In other words, children use the grammar of their language to obtain meaning by using each syntactic frame or argument (any of the various elements of a sentence that are set in relation to one another by the verb) to narrow the choice of possible interpretations for the verb. For instance, some verbs have a single argument (i.e., intransitives):

1. The girl runs.

Other verbs have two arguments (i.e., transitives):

2. The boy eats the soup.

Some verbs have three arguments (i.e., transfers):

3. The boy gave the present to the girl.

Other verbs, such as mental verbs (i.e., complements) require a whole embedded proposition:

4. Amy thinks that Alex went home.

The work of Gleitman and her colleagues (i.e., Fisher, Hall, Rakowitz, Gleitman, 1994; Gleitman & Gleitman, 1992; Naigles, Gleitman, & Gleitman, 1993) has added support to the theory that there is a strong correlation between verb syntax and verb meaning across different languages. The type of argument structure a child hears with a particular verb permits specific restrictions on the possible meanings it can have. If a child were equipped with two skills: (1) the ability to recognize the argument structure, and (2) knowledge of the linking rules associated with each argument structure, then deducing a verb's meaning could be achieved through syntactic bootstrapping (de Villiers & de Villiers, 1999).

The purpose of this investigation was to examine the relationship of fast mapping and syntactic bootstrapping in assessing the acquisition of verb meaning in children. The lack of research and clinical practice with AAE speaking children has left speech-language pathologists ill-equipped to provide valid and reliable evaluations of these children's vocabulary skills. Traditional methods to assess vocabulary skills have not taken inherent test bias into account. Most vocabulary tests incorporate a vocabulary index, which is highly susceptible to bias, when assessing non-mainstream speakers. Because vocabulary continues to grow across the life span, it may be more clinically important to know how well one can acquire new words than to determine the size of the lexicon that has already been acquired (Stockman, 1999). In order to avoid misdiagnosis

of AAE speaking children, it may be more appropriate to test psycholinguistic processing operations that do not rely heavily on experience. Incorporating processing-dependent tasks in semantic assessment may provide a more accurate picture of African American children's semantic language abilities.

CHAPTER II

REVIEW OF THE LITERATURE

This research study will investigate the efficacy of using a processing-dependent measure, specifically fast mapping, to assess semantic knowledge in children. In addition, this study will examine the acquisition of novel verbs and their meaning through argument structure. The aim of this chapter is to review the available literature pertaining to the present investigation.

This chapter opens by reviewing traditional vocabulary assessment methods and why they are inappropriate and biased against AAE speaking children. Second, it discusses what is known about lexical acquisition in AAE speaking children and how this impacts assessment issues for this population. Third, research and studies will be provided that support alternative assessment methods that are more appropriate for AAE speaking children. Finally, an overview of the major theories of lexical acquisition will be supplied.

Assessment of Semantic Knowledge

The term, oral vocabulary, refers to the total number of words a person has in his or her lexical repertory. Oral vocabulary is viewed as the stock of words that an individual has at his or her disposal for use in spoken conversation. Included under the umbrella of oral vocabulary is the receptive ability to comprehend words spoken by others and the expressive ability to use words in one's own speech (Wallace & Hammill, 1994).

A great deal of importance has been placed on oral vocabulary. For instance, Harris and Sipay (1990) suggested that oral vocabulary knowledge is possibly the most important indicator of general learning ability. Another indicator of the important role oral vocabulary plays in our society is the influence it has had on determining academic

success. It has been documented that oral vocabulary is the best single index of school success (Dale & Reichert, 1957; Wallace & Hammill, 1994).

According to Gardner (1990) the quantity and quality of a child's vocabulary are determined by the individual's ability to express words that have been learned from his/her environment and formal education. An individual who is considered to have a rich vocabulary is thought of as intelligent and well-educated. However, concern arises when an individual has a deficiency in oral vocabulary since the individual might be language-impaired, have a hearing impairment, be mentally retarded, or be at-risk for school failure (Wallace & Hammill, 1994).

If a teacher is concerned about a child's oral vocabulary that individual most likely will be referred to a speech-language pathologist (SLP) for diagnostic testing. There are a variety of assessment tools that address oral vocabulary skills in children. Oral vocabulary subtests are included in test batteries that assess oral vocabulary skills, for instance, the Clinical Evaluation of Language Fundamentals-Third Edition (CELF-III; Semel & Wiig, 1996) and the Test of Language Development –Third Edition (TOLD-3; Newcomer & Hammill, 1996). These subtests interpret oral vocabulary within a "linguistic" frame of reference and are used as indicators of an individual's semantic competence (Wallace & Hammill, 1994). There are also a number of oral vocabulary tests available to the SLP that exist independently and are not part of any test battery. Some of these tools assess receptive vocabulary (i.e., Peabody Picture Vocabulary Test-Third Edition; PPVT-III, Dunn & Dunn, 1997) and some assess expressive vocabulary (Expressive One Word Picture Vocabulary Test-Revised; EOWPVT-R, Gardner, 1990).

Most of the aforementioned oral vocabulary tests can be considered inappropriate for use with culturally and linguistically diverse populations. For instance, one could observe that on the list of possible diagnostic labels for decreased vocabulary skills (i.e., language impaired or mentally retarded) described by test developers, that language difference is not mentioned. Often children who speak AAE receive decreased test scores

due to a language difference and not due to language and/or cognitive impairment(s). Test developers of vocabulary tests frequently select lexical items from word lists (e.g., Thorndike's list of 10,000 words) that are easy to illustrate. Such is the case for the PPVT-III and EOWPVT-R.

The dilemma that arises as a result of such methodology can be a mismatch in experience with the lexical terms between mainstream test developers and AAE speakers. A word can have multiple meanings and can be understood in multiple contexts by members of different linguistic communities. Persons from different communities may code the same concept with different synonyms, for instance boat, ship, sailboat and canoe. Some vocabulary tests allow for some lexical variation, but most do not allow for the full range of variants across different language groups by AAE speakers. Innovative variants that fall outside of the mainstream usage are either unknown or not permissible (Stockman, 1999).

Lexical Acquisition in AAE Speaking Children

The assessment dilemma can, in part, be directly related to the scarcity of information available regarding lexical acquisition in African American children. Unfortunately, we know considerably less about lexical acquisition in African American children than we do about their morphology and syntax. There are numerous gaps in our knowledge base, primarily because African American children have not always been included in research studies. When African American children have been included, the emphasis has been narrow. For example, a sizable amount of research has examined African American children's performance on standardized measures in comparison with that of mainstream children. Practically no attention has been directed toward African American children's lexical acquisition strategies or the extent of their vocabulary knowledge (Stockman, 1999).

Hart and Risley (1995) conducted a longitudinal study designed to document vocabulary growth in children. The 42 children who participated in the study were stratified by social class and ethnicity. The participants consisted of 25 Euro-Americans and 17 African Americans. Vocabulary was compared among children from professional families with those from working class and welfare families living in Kansas. Within the working class group, Hart and Risley made ethnic group comparisons. Ethnic comparisons were not possible for the professional group, which included only one African American child. In addition, ethnic comparisons were not possible for the welfare group, which was exclusively African American. The number of new words used in the speech samples collected at home during habitual activities was traced once every month for 2 1/2 years.

The Hart and Risley (1995) results indicated that all the children acquired a number of new words as age increased; however, there were prominent social class differences evident in the rate and size of vocabulary growth. Children from the professional class exhibited the most rapid and largest vocabulary growth. Those from the working class had larger vocabularies when compared to welfare families. Hence, the higher the social class, the larger and more early the word gain was across time. Social class accounted for 42% of the variance in vocabulary growth. In the working class group the vocabulary gains for African- and Euro-American children were comparable.

The variance in vocabulary growth was significantly correlated with several variables related to language input as indexed by the following caregiver interaction characteristics: (1) talking or listening to children beyond what was required to manage their care, (2) being nice as they corrected errors, (3) asking before demanding compliance for more mature behavior, and (4) providing basic education or elaborating answers more than necessary to answer a question. In essence, the quality of parenting amounted to responsiveness, prompting, gentle guidance, and feedback provided to the

child (Stockman, 1999). It was noted that parents of welfare families talked the least to their children and their talk was more frequently geared to parent-initiated topics, imperatives, and prohibitions (Hart & Risley, 1995).

Hart and Risley (1995) concluded that intervention with at-risk children prior to the age of three is imperative to the vocabulary growth trajectory. They recommended that social policy be aimed toward parental intervention for welfare families. The purpose of such a policy would be to educate parents to interact with their children in ways that stimulate language use.

There is no reason to believe that AAE speaking children are uniquely deficient in their ability to learn language. Regardless of culture, the rate of language acquisition is the same (Owens, 1992). Heath (1983) conducted an ethnographic research study for ten years in three different communities in a small geographical area of the Carolina Piedmont region. The children of these three communities attended school together. What emerged from this ten-year research in these three communities were the differences in the language-learning settings or contexts of the three groups of children. In two of the communities, the mother-child interaction was the major language-learning context of the children's first few years. However, the findings in the third community (Trackton) suggested that other interaction situations might have special significance for some children. In Traction, infants had a continuous presence during the conversations of others, but were seldom treated as participants. Infant vocalizations might be used referentially or they might produce words, but no one gave them special attention. Even in situations where the infants' utterances could be linked to objects or events, adults did not acknowledge these as labels. The adults did not repeat the utterances, announce them as labels for objects or actions, or even place the words in expanded phrases or sentences. To the Trackton adults, the responses carried no meaning which could be linked to objects or actions (Heath, 1983). The accepted belief in that community was that babies were not taught language but came to know language.

Davis, Williams, Vaughn-Cooke, and Wright-Harp (1993) described the types of words used across time. This was in contrast to Hart and Risley (1995) who focused on the number of words used in spontaneous speech over time. In the Davis et al. study the authors tracked the lexical development of two African American boys across a 6-month period between 18 to 23 months of age. One child was a typically developing language learner, while the other was not. The data were taken from the Center for Applied Linguistics (CAL) archives (Stockman & Vaughn-Cooke, 1982a, 1989). The database included audiovisual records of spontaneous speech samples collected in unstructured natural situations in children's homes. The participants were African American English (AAE) speakers living in Washington, D.C.

Davis et al. (1993) sampled words used in monthly 1-hour samples of spontaneous speech. Benedict's (1979) taxonomy was adopted to categorize the words as nominals, actions, modifiers and personal-social words. All four categories of words were noted in both participants' repertoires. Nominals and actions made up the largest categories of use across time and the number of words used increased with age for both children; however, the increase was slower for the language-impaired child. The normal child used twice as many words as the language-impaired child and the gap between the two children increased with age. The normal child also showed differences in the distribution of word types over time. Nominal words were used more frequently than action words at 18 months. At older ages, action words were used as often as nominals. In contrast, nominals dominated the repertoire of the child with the language impairment at every age sampled and this gap was significant at 23 months of age. The results of this study suggested that reduced vocabulary is associated with language delay in low-income African American children.

Reduced vocabulary appears to be symptomatic of language delay in general. Leonard (1989) found that children with language disorders were slow to acquire their first words. In addition, he also found subsequent lexical acquisition to be slow in this

population and that older language-impaired children occasionally made lexical errors that were similar to the types observed in younger children.

Semantic Relations

Stockman and Vaughn-Cooke (1982b) used a taxonomy adapted from Bloom and Lahey (1978) to illustrate the semantic relations produced in the spontaneous speech of 12 African American children in their cross-sectional study of children at 18, 36, and 42 months of age. The data were taken from the CAL archives. The analyses were based on single 2-hour language samples obtained from each child during low structured activities in their Washington, D.C. homes.

Results of this study showed that the children were combining words at 18 months and learning to code an assortment of semantic relationships. The earliest categories at 18 months consisted of existence, action, and locative action. The number of categories increased with age. Stockman and Vaughn-Cooke (1982b) concluded that the children's speech expressed the same types of semantic relations expressed by their Euro-American counterparts as described by Bloom and Lahey (1978).

A follow-up study by Blake (1984) validated the Stockman and Vaughn-Cooke findings (1982b). In a longitudinal study of three African American children in New York City, Blake depicted how the children's acquisition of semantic and pragmatic categories shifted in relation to mean length of utterance. The children were from working class families where AAE was used in the homes. Blake employed the taxonomy from Bloom, Lightbown, and Hood (1975) to track the children's semantic development at 4-week intervals between 18 to 27 months of age. Spontaneous speech samples were videotaped during interactive play with their mothers in a playroom at Columbia University. Blake reported that only 1% of the spontaneous utterances could not be categorized according to the taxonomy developed by Bloom et al. (1975).

According to Blake, the number of semantic/syntactic categories used in spontaneous speech increased with age. Blake also reported tradeoffs in language form, content, and pragmatics during the acquisition process. During the period of the greatest shift in the amount of semantic and pragmatic categories used, there was not a corresponding increase in sentence length. Blake concluded that the African American participants were acquiring the same categories as those that had been documented in the language of White middle class SAE speakers of comparable age.

Stockman and Vaughn-Cooke (1986) systematically compared the findings from the Stockman and Vaughn-Cooke (1982b) and Blake (1984) studies on African American children with those obtained for working class White children (Miller, 1982) and for middle class White children (Bloom et al., 1975). The analyses encompassed four studies that used comparable semantic relational taxonomy. Criteria were constructed for comparing the number and types of semantic/syntactic categories corresponding to Brown's (1973) MLU-related stages of development.

Results of the analysis indicated that every category coded by middle class and working class Euro-American children were also coded by one or more African American children at some age and the number of categories increased across age for all groups. Stockman and Vaughn-Cooke suggested that all children coded the same types of semantic notions regardless of social class or ethnic group membership.

The Stockman and Vaughn-Cooke analysis allowed a direct comparison of African American and White children in the first four of the five MLU-derived developmental stages shown before 30 months of age. At each stage, no semantic category was coded exclusively by the middle and/or working class White children and by none of the African American children and visa versa. Stockman and Vaughn-Cooke submitted that all the children were acquiring a shared core of semantic relational knowledge within the same developmental time frame, regardless of social class or

ethnicity. Hence, the data provides further support for the universal nature of the semantic categories studied (Stockman & Vaughn-Cooke, 1986).

The work of Stockman and Vaughn-Cooke are in contrast to the work of Hart and Risley (1995). Hart and Risley suggested that intervention was important to the vocabulary growth trajectory for welfare families. In addition, they suggest that the intervention should train parents to interact with children to stimulate language use. However, it has been documented (i.e., Heath, 1983) that the language spoken to some African American infants and toddlers is likely to be different from that of working- and middle-class Euro-American children. In essence, the work of Stockman and Vaughn-Cooke indicate more similarities than differences in the acquisition sequence of early semantic development in AAE and SAE speaking children.

Assessment and the AAE Speaking Child

The limited amount of available information concerning the language of typically developing AAE speaking children has influenced test development for this population. This lack of information may have contributed to test developers designing tests that penalize AAE speaking children for their culturally and/or linguistically diverse responses. There is a critical need for the identification and development of assessment procedures for culturally and linguistically diverse populations. The lack of non-biased assessment tools has had a profound impact on the ability of the speech-language pathologist to validly diagnose language impairment in non-mainstream populations. Since there is even less information regarding semantics in culturally and linguistically diverse populations, specifically African American English speaking children, the assessment issue in the area of semantics becomes more complex.

The Peabody Picture Vocabulary Test (PPVT; Dunn, 1959; Dunn & Dunn, 1981; Dunn & Dunn, 1997) has been used to study the vocabulary of African American children. This assessment tool is widely used to evaluate receptive vocabulary skills at the single word level. The format of the PPVT-III is that the child hears a stimulus word (i.e., dog), looks at a series of four pictures (i.e., pictures of a spoon, a ball, a dog, and a banana) and then points to the picture that depicts the stimulus word. In the example provided, the child is expected to point to the picture of the dog.

Although the format of the PPVT-III is like that of earlier editions, significant changes have occurred with the stimulus items. In an effort to decrease test bias the authors decided to evaluate the 350 stimulus words in the PPVT-R. A bias panel was assembled with representatives from underrepresented groups (African Americans, Asians, Hispanics, Native Americans, and women). This panel identified PPVT-R word items that may be offensive or biased on the basis of race, ethnicity or gender (Dunn & Dunn, 1998) and subsequently revised their test.

Kresheck and Nicolosi (1973) administered the PPVT (Dunn, 1959) to 50 typically developing African American and 50 typically developing White children from working class families between 5:6 and 6:6 years of age. The scores ranged from 33 to 68 with a mean of 48 for the African American children and from 42 to 76 with a mean of 59 for the White children. There was a statistical difference between the mean scores of the two groups. The response pattern did not reveal a reason for the missed items. In some cases, similarity between picture for the correct and erred responses suggested lack of familiarity with decontextualized picture representation. Kresheck and Nicolosi's (1973) results are not surprising given that the PPVT (Dunn, 1959) was not standardized on African American children.

However, when African American children were included in the standardization sample of the Peabody Picture Vocabulary Test-Revised (PPVT-R; Dunn, 1981), African

American children also obtained lower than average scores. Washington and Craig (1992) administered the PPVT-R to 105 working class African American children. Their participants' responses were scored using both the established scoring criteria and an adjusted score. The adjusted score was designed to take dialect differences into account. The preschoolers and kindergartners were between 4:5 and 6:3 years of age. The mean score for the African American children was greater than one standard deviation below the mean for the standardization sample. In addition, the adjusted mean scores were higher than the unadjusted ones, but the gains did not make a clinical difference for the sample as a whole. The missed items did not show a particular response pattern. Washington and Craig concluded that the PPVT-R was not appropriate for either renorming or scoring adjustments and should not be used with the African American population despite their inclusion in the standardization sample. They determined that the distribution of scores for their participants was significantly skewed toward the low tail of the standard normal distribution. Washington and Craig suggested that the PPVT-R test developers did not assess the scores of different minority groups separately, and as a consequence, performance differences that existed by race or socioeconomic status were not evident.

In a later study, Washington and Craig (1999) administered the Peabody Picture Vocabulary Test-Third Edition (PPVT-III; Dunn & Dunn, 1997) to 59 typically developing African American children between 47 and 57 months of age. The purpose of this study was to investigate the appropriateness of the PPVT-III for use with a population of at-risk African American preschoolers. Results of their study revealed a mean standard score for the participants of 91, with a standard deviation (SD) of 11. This score corresponds to the 27th percentile when compared to the normative sample. The mean was below the established standard score mean of 100 for the PPVT-III; however, the scores *fell* within normal limits for this assessment instrument. The authors noted that despite the difference in the mean and SD achieved for their participants, there was a

wide performance spread that approximated a normal curve. Unlike Washington & Craig's (1992) previous study, they did not observe any evidence of difficulty with specific items. Washington and Craig (1999) suggest that the PPVT-III should be informative as part of a language evaluation for describing receptive semantic skills of African American children. Hence, Washington and Craig (1999) provide a more favorable recommendation for PPVT-III than earlier versions of this test based on a normal distribution of performance scores obtained on African American participants, despite an overall mean difference from their White peers.

Processing-Dependent Measures

The issue of assessing the language skills of African American English (AAE) speaking child is complex. An AAE speaking child can be penalized for providing a culturally and/or linguistically varied response on a current standardization test. Since there is limited information regarding the distinction between a language difference and a language deficit, AAE speaking children are often misdiagnosed. Recent efforts have been made to increase the accuracy and validity of assessment procedures of culturally and linguistically diverse populations. Alternative procedures have been established to reduce test bias in assessing the language of minority populations.

In an effort to reduce test bias in language assessment, Campbell, Dollaghan, Needleman, and Janosky (1997) explored children's abilities to conduct psycholinguistic processing operations that are minimally dependent on prior knowledge or experience. They defined processing-dependent measures as measures that are relatively more dependent on psycholinguistic processing, and less dependent on language knowledge than those used in most norm-referenced vocabulary tests. The term, knowledge-based, was used to describe standardized language tests that traditionally have depended on a participant's prior vocabulary knowledge and experience.

One hundred fifty-six boys between the ages of 11:0 and 14:0 participated in their study. The investigation included 49 (31%) White and 107 (69%) participants who were from minority groups (67% African American, 1% Asian American, and 1% Native American). The Oral Language Scale (OLS) from the Woodcock Language Proficiency Battery-Revised (Woodcock, 1991) was used as the knowledge-dependent measures of language. All five of the OLS subtests (memory for sentences, picture vocabulary, oral vocabulary, listening comprehension, and verbal analogies) rely heavily on vocabulary knowledge. In addition, a non-word repetition task, a competing language processing task, and the shortened version (Arvedson, McNeil, & West, 1985) of the Revised Token Test (RTT; McNeil, & Prescott, 1978) were given to each participant.

The two groups did not differ in performance on any of the processing-dependent measures. However, the minority groups' performance was significantly lower than that of the majority group on the knowledge-dependent language measure (OLS). Hence, processing-dependent measures may prove to be better than knowledge-based measures in identifying speakers whose poor language performance reflects psycholinguistic deficits as opposed to differences in experiential and cultural backgrounds.

Fast mapping, a psycholinguistic process, occurs when a child first encounters a new lexical item and rapidly stores some sort of information about it in memory after one or more experiences with it. The first study of quick lexical learning was conducted by Carey and Bartlett (1978; Carey, 1978), who wanted to demonstrate that children could learn words more quickly than existing studies had indicated. They were interested in the mapping between the conceptual and lexical space. They chose color terms because they consist of a well-structured and closed lexical domain. They exposed 3- and 4-year old children to a novel color word, chromium, which was introduced in a naturalistic classroom setting. The classroom teacher had three cups and three trays, one each of red, blue, and olive-green. The experimenters designated the olive-green color as chromium. A student was instructed to bring the teacher the chromium tray. The children's

production and comprehension of the novel word, chromium, was subsequently tested over several weeks. The researchers found that the children began restructuring their lexical and conceptual domains after one or very few exposures to the new word.

The fact that many of the children learned something about the new word from their minimal contacts with it lead Carey and Bartlett to hypothesize that lexical acquisition is comprised of two phases, the first of which they labeled *fast mapping*. According to Carey (1978), fast mapping takes place when the child first notes a new lexical item and quickly stores some sort of information about it in memory after one or more experiences with it. During the second, "extended" phase of lexical acquisition, which may take place over a longer period of time, the initial fast-mapped representation is gradually refined as the child obtains additional information from subsequent encounters with the word.

The thought of a fast-mapping phase was intuitively alluring in light of the extraordinary rate of vocabulary acquisition between the ages of 1 1/2 and 6 years. Carey (1978) proposed that children in this period add an average of five new word roots to their receptive vocabularies each day. Carey suggested that fast mapping might contribute to the explanation of rapid vocabulary acquisition by suggesting that it enables children to map out a crude, preliminary representation of a novel item into memory based on few exposures to the novel word. Children can preserve a large number of these incomplete representations in memory simultaneously and update them as new information about each word is acquired. In contrast, if children required a number of exposures to each new word to create a new lexical representation, vocabulary growth would likely be a much more delayed process.

Dollaghan's fast mapping study (1985) modified and extended Carey and Bartlett's (1978) paradigm to allow a more detailed examination of the fast mapping skills of a group of typically developing preschoolers. Participants from 2:1 to 5:11 were exposed one time to an unfamiliar word and referent in a situation intended to facilitate

their use of an inference to link the two. Subsequent tasks probed the number and kinds of information they had stored in memory following the initial encounter with the novel word. Results showed that the participants entered information about a novel word into memory after one brief exposure with it.

Heibeck and Markman (1987) conducted a series of studies that investigated the generality of fast mapping and attempted to obtain more sensitive measures of children's word learning. Results of their studies showed that fast mapping could be used successfully by children to form quick and rough hypotheses about the meaning of a new word.

Although the Carey and Bartlett (1978) study lacked careful experimental controls and did not report sufficient methodological detail, others have since replicated their findings. Dollaghan (1985) and Heibeck and Markman (1987) reported evidence of preschoolers' ability to fast map new word meaning. These follow-up studies differed procedurally from Carey and Bartlett (1978). However, they shared several methodological characteristics: contact with a new word was limited to a few instances, the targeted words were object or attribute labels, and the learning occurred as an adult interacted with a child and manipulated joint attention to a targeted object while at the same time naming it, usually in a manner that contrasted the new word with a known word (Rice, 1990).

Theories of Lexical Acquisition

There are several topics important to the present study of fast mapping novel verbs in children. These include theories of lexical acquisition of objects and verbs. Children acquire vocabulary at a remarkable rate of speed. By age six, children have learned approximately 9,000 to14,000 words which roughly works out to nine new words a day from about eighteen months on (Carey, 1978). The mystery still remains, in part, as

to how children acquire a vocabulary at such an astonishing rate. The following is a review of theories of lexical acquisition.

Constraints Approaches

A traditional way to explain how children acquire form categories and acquire category terms is to assume a general, all-purpose, inductive mechanism. This position describing how categories are acquired contains many implicit assumptions about the nature of categories, the manner in which they are learned, and how children's abilities to categorize change with development[1]. These theories make the assumption that the learner, encountering a positive exemplar of the category, initiates concept learning. From that exemplar the learner formulates a tentative hypothesis about what the criteria might be that define the category. This hypothesis must then be assessed against subsequent information. Reformulation of the hypotheses would be necessary if inconsistent evidence was observed.

Markman (1989, 1992) claims that constraints on the hypotheses are required to help children solve the inductive problem that word learning poses. At the most extreme formulation of this theory, language learners would be unable to learn a single word by any other means. But there is cause, according to Markman, to believe that word-learning constraints could be required for language acquisition, but that they appear after some language has been acquired. The reason for this claim is that around 18 months of age children acquire words at a rapid rate. Such fast learning must involve a constrained form of learning.

Markman (1990) attempted to answer the problem posed by Quine (1960) that for word learning there are an infinite number of possible hypotheses. Markman claims that language learners are constrained to consider only some kinds of hypotheses, or at

[1] For a discussion of these issues, see Markman (1989).

minimum, to give them priority over others. This constraining may be especially true for children first attempting to acquire the concepts their language encodes. Markman goes on to state that children are able to acquire words at a rapid rate because they are limited in the kinds of hypotheses they can consider. Children do not have to reject hypotheses on the grounds of negative evidence; they can reject them because they are biased against them in the first place.

When an adult points to a novel object and labels it, the novel term could refer to the object, part of the object, its color, its weight, and so on. One way children initially constrain the meaning of terms is to honor the whole object assumption (Markman & Hutchinson, 1984). The whole object assumption may be thought of as an initial constraint wherein language learners assume the novel label is likely to refer to the whole object and not to its parts, substance or other properties (Carey, 1978).

Once a language learner decides a novel term refers to the whole object, they still need to decide how to extend it to other objects. Markman and Hutchinson (1984) proposed that children use the taxonomic assumption in extending novel objects' labels to other objects. The taxonomic assumption determines that labels refer to objects of the same kind rather than to objects that are thematically associated. By considering what children encounter when someone teaches them a new word and when someone points to an object and labels it (ostensive definition) can help one see why this constraint is needed. For example, suppose someone points to a dog and calls it a dog. *Dog* could refer to its proper name, or it could mean furry, or brown, or any number of other properties. Furthermore, dog could also refer to "the dog and his bone," or "the dog under the tree." In other words, objects are frequently found in spatial, causal, temporal or other relations with other objects. The question is: What prevents the child from reasoning that the label refers to objects that are related? Thematic relations, theoretically, pose a problem for children's learning of labels because they are interested in such relations and often find them more salient than categorical or taxonomic relations.

Markman (1990) found that children preferred to organize objects according to thematic relations on a number of tasks designed to investigate children's ability to categorize objects. For example, on sorting tasks, 6-and 7-year-olds frequently sorted objects on the basis of their taxonomic category (i.e., vehicles, buildings, animals, and people). Conversely, younger children generally sorted objects in groups that represented causal, temporal, spatial or other relations among the objects. These relations underscore events rather than taxonomic similarity, such that, young children might put a boy and a dog together because the boy is taking the dog for a walk. Markman (1990) concluded that younger children are more interested in the thematic relations among objects than among taxonomic relations, or that thematic relations are easier for children to notice than taxonomic ones. So the taxonomic constraint must be added to the constraints on word learning that children observe.

Unlike the taxonomic assumption, the whole object assumption guides the language learner to treat novel terms as labels for whole objects. However, children must learn terms that refer to parts, substances, and other properties (Markman, 1990). Markman (1990) states that mutual exclusivity helps language learners override the whole object assumption; therefore, enabling them to acquire terms other than whole object labels.

In addition to the whole object and taxonomic assumptions, children constrain word meanings by assuming at first that words are mutually exclusive. In order for categories to provide information about objects, they are usually mutually exclusive at the basic level of categorization. For example, a single object cannot be both a *chair* and *dresser* or a *chair* and a *table*. There are many exceptions given that categories overlap. For example, *dog* and *pet* overlap, as do *poodle* and *dog*. Hence, mutual exclusivity is not a reliable assumption to make. Markman (1989) suggests that despite assumptions that terms are mutually exclusive, language learners continue to acquire new words even if mistakes are made along the way.

One piece of evidence to support the hypothesis that children assume words will be mutually exclusive is that the mutual exclusivity assumption helps explain some of the errors children make. For instance, this assumption helps explain why children find class inclusion more difficult (class inclusion violates mutual exclusivity) and why the part-whole relationships are easier (part-whole relationships maintains mutual exclusivity; Markman, 1989).

Clark's (1993, 1995) principle of contrast is closely related to mutual exclusivity. Clark argues that every word in a dictionary contrasts with every other word and that to acquire words language learners have to assume that word meanings are contrastive.

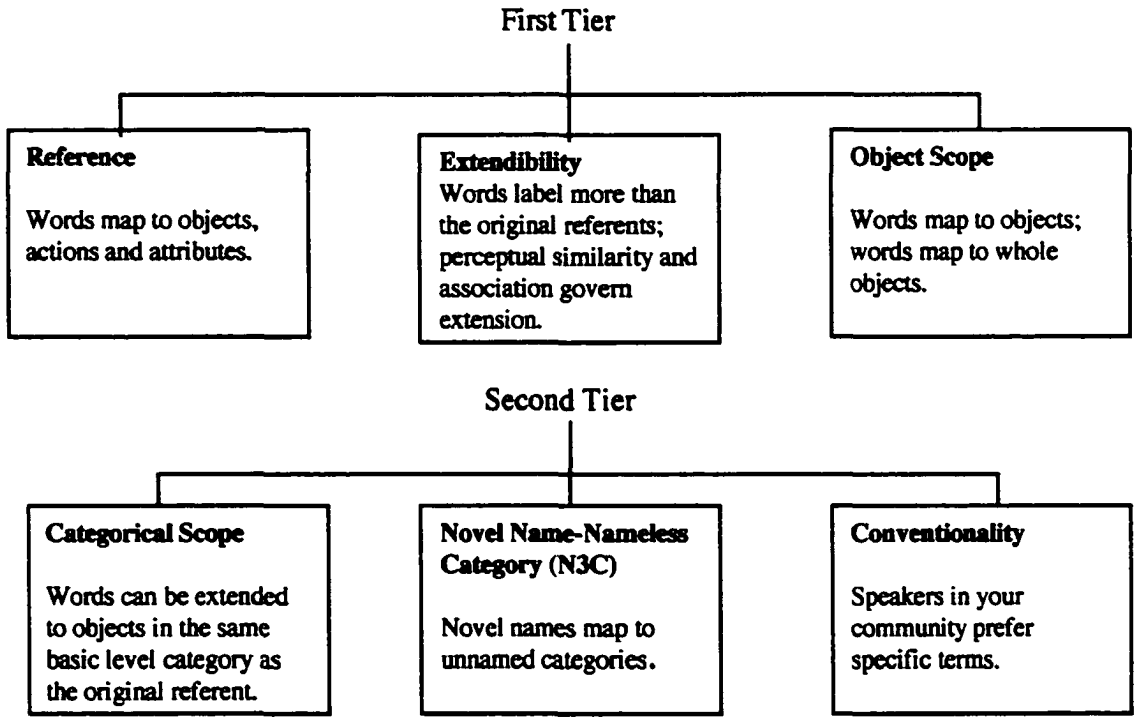
For instance, speakers in a community depend on a large number of implicit agreements on a daily basis about which words conventionally convey meaning (Clark, 1995). That is, speakers within a particular speech community are in accord that, for example, *oak* designates a kind of tree and that *cat* designates a kind of mammal. However, the social or pragmatic meaning of language implies that the speaker wants the listener to do something in response to the word/referent relations spoken (e.g., carry out an action). Therefore, in communicating with one another they observe the principle of conventionality. This principle states that well-established words have conventional meanings (Clark, 1993). When speakers want to express a particular meaning they choose a different word. Hence, they are relying on the assumption that words have different meanings (i.e., the principle of contrast). Clark proposes that together these two principles guide speakers in their use of the lexicon.

Conventionality and contrast work together in that the speaker and listener mutually assume that the speaker is attempting to communicate an intended meaning to the listener. Hence, the listener encountering a familiar term from the speaker can interpret the appropriate meaning. However, if the listener is not familiar with the term used by the speaker, the listener may have to follow-up on the speaker's intended meaning (Clark, 1993).

Developmental Lexical Principles

Golinkoff, Mervis, and Hirsh-Pasek (1994) have proposed a developmental lexical principle framework to explain the acquisition of object labels during the first two years of life. This framework is a two-tiered sequence with the principles of the second tier building upon the principles of the first tier. Refer to Figure 2.1 for an adaptation of this model. These lexical principles work to guide the word learner and keep the child on course by assessing a small set of probable alternatives. Although these principles may be violated and sometimes result in errors, Golinkoff et al. contend that rapid word learning still takes place.

Figure 2.1. Six lexical principles adapted from Golinkoff, Mervis, and Hirsh-Pasek (1994) for the acquisition of object labels.



Golinkoff et al. (1994) contend that their developmental lexical principles framework has three advantages over other word learning principles that do not incorporate a developmental perspective. First, taking a broad look at lexical

development, as opposed to one or two aspects, allows principles that were previously presupposed to emerge early. For example, Markman and Hutchinson's (1984) taxonomic assumption presumes that children can realize a term can be extended. Golinkoff et al. called this realization the principle of extendibility. This principle captures the knowledge that first, a term can be applied to more than one exemplar, and second, that extension should occur on the basis of perceptual similarity. A second principle of the second tier, categorical scope, then constricts the application of the principle of extendibility by specifying that extension should occur to referents in the same basic-level category as the original referent.

The second advantage is when principles are organized in a developmental framework, descriptions emerge for such standard observations as non-categorical over-extensions. One explanation for unique object label extensions is that the language learner has only the principle of extendibility and not the principle of categorical scope. Hence, unusual extensions may result from the language learner's failure to realize extension happens only on the basis of membership in the same basic-level taxonomic category (Golinkoff et al., 1994).

The third advantage of the developmental lexical principles approach is that the principles are intended to work with linguistic and non-linguistic input and not despite the input. In other words, this perspective calls for cooperation, as opposed to competition, between grammar and meaning (Golinkoff et al. 1994).

For children who have the principles of the first tier (reference, extendibility, and object scope) lexical acquisition appears to be deliberate and laborious. The principle of reference is the first and most essential insight language learners must accomplish. In addition, it is upon this principle that all other principles rest. The principle of reference states that words can be mapped onto a child's representations of objects, actions, events, or attributes in the environment.

The principle of reference leaves language learners with a number of unanswered questions about how people use words to refer to objects. Unless coupled with extendibility, Golinkoff et al. (1994) contend that the evidence for reference is almost non-existent. The second principle in the first tier, the principle of extendibility, states that a word can be used to label referents other than exemplars, which someone else has previously labeled. Under this principle, the criteria for extension are either similar to the original referent or they share a common thematic relationship.

Knowing that a word can be used to refer to something in the environment and that a word refers to more than the exemplars that someone has previously labeled for the language learner is not enough. Language learners need to have more specific hypotheses about *what* in the environment words label and *how* they are extended. The third principle in the first tier reduces much of the ambiguity about what words label. The principle of object scope has two parts. First, it states that words label objects. Second, it states that words refer to the whole object as opposed to its parts or attributes.

The second tier of Golinkoff et al.'s (1994) lexical principles is more dependent on and sensitive to syntax than the first tier. It serves to (1) further constrain the basis for extension (categorical scope), (2) help children map new words to objects in the environment (novel name-nameless category), and (3) encourage children to adopt conventional names for objects (conventionality). The principles of the second tier enable the child to acquire many new words rapidly.

Under categorical scope, the extension of novel labels occurs on the basis of basic level category membership. The basic level is fundamental in four respects: (1) perception, (2) function, (3) communication, and (4) knowledge organization. Once categorical scope has developed, extension should occur based on membership in the same basic level category.

The novel name-nameless category principle (N3C) is needed to allow children to "hook-up" novel names with previously unnamed objects with only one or two exposures

to the novel name. This principle is in competition with the principles of contrast (Clark, 1983) and mutual exclusivity (Markman, 1989). The N3C principle states that novel terms map to previously unnamed objects. Hence, N3C predicts that the child will map the new term to a whole object without a name. Prior to the development of N3C, children may ignore many of the new terms they hear or require repeated exposures to the same word-referent pair.

The last principle in Golinkoff et al's model is the principle of conventionality. Conventionality, according to Clark (1983), is the supposition that speakers expect certain meanings to be expressed in conventional forms within the language community. Conventionality may be part of what motivates children to imitate adult forms. The principle of conventionality also allows children to correct their overextensions even when the only input is the adult provision of the correct label. In other words, conventionality enables children to depend on minimal input for their correction.

Verb Acquisition

The constraints approach is a popular theory of lexical acquisition. It attempts to solve the problem of word learning in terms formulated by Quine's (1960) dilemma of the indeterminacy of meaning. The question is how the child can know which of the possible meanings of a novel word is the one the speaker intends. As there is not enough information available to the child to limit the tentative assumptions of potential meanings, there has to be some form of prior knowledge. This knowledge is often characterized as constraints that rule out certain classes of hypotheses (Markman, 1989, 1992).

The constraints approach to lexical acquisition does not address verb learning; it is biased toward the acquisition of object labels. In Markman's model (1989, 1992), the object label bias that is personified in the whole object constraint specifies for the language learner that a novel word is the name of the whole object. The main piece of

evidence for this view is that most young language learners have a predominance of nouns in their early vocabularies (Gentner, 1982). According to this view children learn to talk about other aspects of their experience only because a second constraint is also at work. The principle of mutual exclusivity (Markman, 1989, 1992) stipulates that any given object has only one appropriate label, so that if a child already knows a label for the object the adult is looking at then some other aspect of the object is likely to be the adult's intended referent. For example, a single object cannot be both a cow and a bird or a cow and a dog.

Based on a number of empirical observations, the constraints approach of lexical acquisition has been questioned. First, evidence has cast doubt on the conceptual priority of object labels in early language. This suggests that children's early preference for nouns is probably due to the nature of the language they are learning and the kinds of situations in which they hear that language used. Second, Tomasello (1995) cites a number of studies (i.e., Merriman, 1991; Mervis & Bertrand, 1993) that showed negative evidence of children's use of the principle of mutual exclusivity before their second birthdays.

Markman's (1989, 1992) theory has two additional problems related to verb learning. First, the theory assumes that children have an understanding of the social-pragmatic dimensions of language. Hence, the theory does not address the question of how young children determine the object to which an adult is referring if there are multiple objects in the immediate context without known names. In such situations children are relying on their implicit understanding of specific social-pragmatic cues (i.e., adult gaze direction and pointing gestures; Tomasello, 1995).

The second problem with Markman's theory, according to Tomasello (1995), is that the theory does not account for what the child is to do when mutual exclusivity overrides the whole object constraint. Hence, if the adult points to an object for which the child already has a name and uses a new piece of language, the child has no rule to use to decide among the many non-object aspects of the situation. With reference to the problem

of verb learning, Golinkoff, Hirsh-Pasek, Mervis, Frawley, and Parillo (1995) posit that children may have a hierarchy of word types that they assume adults will use and that verbs may be second in the hierarchy, behind object labels. This is a plausible theory, although it is somewhat ad hoc and will become even more so if the hierarchy is expanded to cover all the word types young children learn.

Social-Pragmatic Account

An alternative to the constraints or principles theory of lexical development of verbs is the social-pragmatic account (Tomasello, 1992). In this account, the problem of word learning is posed in an entirely different way: The child's problem is to determine precisely what the adult is doing in a given situation and why he/she is doing it. Language use is a social-communicative act, and the acquisition of words or other pieces of language is thus dependent most importantly on children's understanding of the actions of other persons because it is persons, not words, that engage in acts of linguistic reference. Children are able to begin acquiring language at a young age because adults structure contexts for children in culturally specific ways and because children have the capacity to understand these contexts and adult action in them, in some form, before language acquisition begins. The prior knowledge that makes language possible in this theory is not physical or linguistic knowledge, but social knowledge.

Although there is nothing definitive in the social-pragmatic approach to word learning that singles out object labels as particularly important in early language acquisition researchers with this focus have almost exclusively been concerned with object labels. Studies with this emphasis focused on how language learners determine which one of the possible objects in the immediate context an adult intends. The researchers presumed that children know what type of item the adult is intending (Tomasello, 1995).

Developmental Lexical Principles Framework

Golinkoff, et al. (1995) attempted to see if the lexical acquisition framework designed for the acquisition of nouns would transfer to acquisition of verbs. Golinkoff, et al. (1994) argued, if a different set of principles or constraints is required for the acquisition of lexical items in each word class, the number of such principles and their possible interactions would be immense. If the principles transfer to verbs, the principles would increase in power and effectiveness as they extend their predictions to other open classes.

In their empirical study, Golinkoff et al. (1995) applied the lexical principles described by Golinkoff et al. (1994) to see if they could be extended to the acquisition of verbs. The principles of reference, extendibility and object scope comprise the first tier of the developmental principle framework (see Fig. 2.1). These principles allow children's word learning to be initiated. However, new words are not acquired with ease. For both nouns and verbs, Golinkoff and colleagues (1995) contend these principles are in place by the end of the first year of life. The principles of the second tier further refine the lexical acquisition process and permit the language learner to quickly acquire lexical items.

In the second tier, the principle of categorical scope allows language learners to extend verbs on the basis of common semantic components. The novel name-nameless category (N3C) principle permits children to fast map (Carey & Bartlett, 1978) new items to unnamed actions. Finally, conventionality encourages children to attempt to get their names for nouns and verbs in congruence with the names others use in their community.

Syntactic Bootstrapping

The solution for the mapping problem for vocabulary acquisition (i.e., how word-level concepts are matched with their phonological realizations in the target language)

has traditionally been assigned to a word-to-world pairing wherein the language learner lines up the utterance of a word with the co-occurring extralinguistic contexts. The word-to-world pairing does not work as well for verbs as it does for nouns (Fisher, Hall, Rakowitz, & Gleitman 1994; Gleitman & Gleitman, 1992). Gleitman and Gleitman (1992) have noted problems with the word-world contingencies. Frequently this contingency is imperfect. For instance, caretaker speech is not always commenting on events in view. In one-third of the verbs spoken to children under the age of two, the act being referred to is not directly observable. For example, *open* is often said when nothing present in the context is in the act of opening (i.e., a physical action). In other cases, the word-world contingency is subtle and invisible (e.g., open your mind). Many verbs that are understood by 3- and 4-year-olds interpret abstract mental acts and states that are not observable, such as *want*, *hope*, and *know*.

A related problem to word-world contingencies is that the scene that accompanies utterances of a verb often encompasses many events but only one is typically encoded by that verb. For example, when a child hears the mother say, "Do you want this ice cream cone?", the mother is speaking, holding the cone, and possibly smiling and pointing to the cone; the cone is observably something to eat, dripping, melting, etc. (Gleitman & Gleitman, 1992). Although, none of these aspects of the scene is irrelevant to the conversational intent, only one of them is correct to map onto the exemplar *want*.

Gentner (1978, 1982) has proposed one reason why an observed scene is so decisive for nouns and so uninformative for verbs. One factor is related to the concepts that lexical classes regularly encode the difference between object-reference concepts and relational concepts. The reference of many nouns can usually be extracted by principles of object perception and pragmatic inference, but a verb's meaning expresses relations among such concepts. The relation the speaker wishes to convey is rarely accessible from observation alone.

Gleitman and Gleitman (1992) claim that the problems of word-world contingencies can be resolved if language learners perform a sentence-world pairing. Sentence-world pairing takes advantage of the clues to interpretation that is presented in the structure of the sentence heard. The nature of the relationship expressed by the verb is expressed across the clause structure within which the verb occurs. This relationship is accounted for in the theory of verb learning referred to as syntactic bootstrapping (Gleitman, 1990; Gleitman & Gleitman, 1992).

Syntactic bootstrapping suggests that children use the syntactic frames in which verbs are placed to help determine the meaning of novel verbs. The syntactic frames are informative because they contain semantic implications. For example, transitive frames indicate causative meanings, while intransitive frames implicate noncausative meanings (Gleitman, & Gleitman, 1992). Hence, proponents of the syntactic bootstrapping theory predict the correlation between syntax and verb meaning will be exploited early in the process of verb learning (Naigles, 1995).

Morphological information is an essential part of syntactic bootstrapping. Children as young as two years old have been reported to use morphological cues to determine the form class of a new word. For example, children who heard a sentence such as *See meeping* as opposed to *See the mep* when they saw a novel action were more likely to provide an action interpretation of *mep* (Golinkoff, Diznoff, Yasik, & Hirsh-Pasek, 1992).

There are several studies (i.e., Gentner, 1978; Fisher, et al., 1994; Naigles, 1990; Naigles, Gleitman & Gleitman, 1993) that support the syntactic bootstrapping hypothesis. Naigles (1990) showed videotapes of two characters (a duck and a rabbit) performing two simultaneous actions to young children. One action was causal, (e.g., the duck was forcing the rabbit to bend over) the other action was non-causal (e.g., the duck and the rabbit were each moving their left arms in unison). A novel verb was presented simultaneously with the scene in either a transitive or intransitive frame. After several

presentations, the actions were separated and the children were encouraged to "find" the novel verb and their looking patterns were recorded. The results of this study showed that 2-year-olds adjusted their looking preferences based on the syntactic frame presented to them. When a transitive frame was presented, the children looked longer at the causative action, but when an intransitive frame was presented they watched the non-causal action. This study demonstrates that children as young as 2-years-old can utilize information from the syntactic frame around a novel verb to narrow or constrain the referents of novel verbs. Hence, syntax appears to be an important and useful source of information during early verb learning (Naigles, 1995).

In essence, according to the theory of syntactic bootstrapping, the aspectual marking on the novel verb directs the child's attention to the actions of the scene. The meaning of the novel verb can be supplied by the presence of additional sentence cues, such as verb argument structure. Argument structure refers to the number of sentence constituents required by a verb for well-formedness in a sentence (Oetting, 1999). For example, the verb *eating* may involve one argument (i.e., *She* is eating) where as *feeding* requires two arguments (i.e., *She* is feeding *her*).

Syntactic bootstrapping was originally designed to account for how children interpret novel verbs on a first encounter. However, further research has suggested that syntax also influences how children extend the meaning of familiar verbs in novel frames. Naigles et al. (1993) investigated this concept. They presented children with ungrammatical sentences such as (a) the zebra goes the lion, and (b) the zebra brings to Noah. They hypothesized that if syntactic bootstrapping alone were considered, children would interpret (a) as causative and (b) as noncausitive and directional. By using such sentences Naigles and her colleagues were able to determine whether children's interpretations were consistent with the syntactic frame (Frame Compliance) or whether they adhered to the existing semantics of the verb, thus forcing a modification of the syntactic frame (Verb Compliance). In their study, the majority of the 2- to 4-year-old

participants were Frame Compliant in their interpretations. In contrast, the adult participants had a tendency to modify the verb to fit the frame. They attempted to fix the syntactic frame in order to comply with the typical meaning of the verb (Verb Compliance). This suggests that children will accept novel argument structures for familiar verbs despite the fact that the structures had not been previously validated in the input. Conversely, the novel argument structures for adults were viewed as unacceptable and were either avoided in production or repaired in comprehension.

Morphological cues can also influence preschoolers' interpretation of a verb's meaning. Behrend, Harris, and Cartwright (1995) taught young children novel verbs that were inflected with *–ed* or *–ing*. When children heard a novel verb inflected with *–ing* they tended to focus on the action and did not accept that verb as a label for a slightly differing action. When children heard the novel verb inflected with *–ed*, they attended to the result and were less likely to accept extensions of that novel verb to slightly differing results. These children tended to be conservative in their extension of novel verbs (Forbes & Farrar, 1993). The difference in the patterns of extension, which apparently depended on the morphological markings of the novel verbs, suggests that young children are sensitive to the morphological markings of new verbs.

Gleitman (1990) posits that learners of any language should be able to employ bootstrapping strategies because the same kinds of semantic-syntactic linkages apply across languages. However, across languages the balance between attention to syntactic and morphological information may shift depending on the nature of the syntactic and morphological cues available to the learner. Language users tend to be most attentive to those cues that are used frequently and provide reliable information (Bates & MacWhinney, 1987).

CHAPTER III

RATIONALE OF THE STUDY

In light of the fact that most measures that assess semantic knowledge are culturally and linguistically biased, the question arises as to how one can provide a non-biased assessment of semantic skills in children, particularly African American children. The available literature has shown that processing-dependent measures show promise as a means to reduce test bias in assessing minority populations. Fast mapping is an on-line processing task (Stockman, 1999). The question then becomes refined to how can this processing-dependent measure be developed into a clinically feasible procedure to measure semantic knowledge in children. The purpose of this chapter is to provide a preliminary answer to this question and provide a rationale for the study being proposed.

The preferential-looking (PL) method was developed to examine language comprehension in very young children (Golinkoff, Hirsh-Pasek, Cauley, & Gordon, 1987; Golinkoff, Mervis, & Hirsh-Pasek, 1994). PL was thought to be ideal for investigating questions about verb learning because it was more sensitive to the language comprehension paradigm than the "acting out" method. PL required the child to look at two simultaneously presented video events while a test stimulus (utterance) was presented. If the utterance the child heard was comprehended as correct, then the child would focus on the scene that best depicted that utterance. Otherwise, the child would focus on the alternate scene or would look randomly at either scene.

By incorporating the PL method Naigles (1990) demonstrated that children as young as two years have the capability to use a verb's position in a transitive or intransitive argument structure to determine whether the verb referred to causative (transitive argument structure) or non-causative (intransitive argument structure) action. The PL method was used as a means to measure a child's ability to match spoken nonsense verbs to filmed events. Naigles "taught" young children (mean age was 2:1) the

meaning of novel verbs by matching videotaped multiple novel actions with a single novel verb in one of the two syntactic frames (transitive and intransitive). For example, the children would view a duck making a rabbit bend over (causative action) while both the duck and rabbit were making arm circles (non-causative action). This event was matched with the novel word *krad* in either a transitive argument structure ("The duck is kradding the bunny.") or an intransitive argument structure ("The duck and the bunny are kradding."). Then the novel actions were separated so that the scene of the duck making the rabbit bend over appeared on one video screen, while simultaneously the scene of the duck and the rabbit making circles appeared on a second video screen.

The children were then encouraged to "Find kradding." The participants' choices were measured by fixation time to each screen in an effort to demonstrate the effect of syntax on verb learning. The young participants who heard the transitive audiotape looked longer at the causative action (duck making the rabbit bend over), whereas the participants who heard the intransitive audiotape looked longer at the non-causative action (duck and rabbit making arm circles). Hence, the participants were using the syntactic frames in which the verb appeared to choose the action to which it referred (Naigles, 1990).

Naigles, Gleitman, and Gleitman (1993) conducted another syntactic bootstrapping study that involved syntactic frames. In this study they used two- to four-year-olds to show that children could use syntax to extend the meaning of familiar verbs. Unlike the Naigles' (1990) study that utilized preferential-looking, this study incorporated the method of "acting out" sentences. They asked the children to act out sentences with toys that contained familiar verbs (i.e., come and go) presented in ungrammatical intransitive and transitive constructions. An example is "The zebra goes the lion" (an intransitive verb in a transitive frame).

The results showed that the participants preferred to act out intransitive verb/transitive frame constructions ("The zebra goes the lion.") causatively by making

the zebra go to the lion. The children alternated the meanings of *come* or *go* in accordance with the semantic implications of the transitive frames. They did not adhere to the verbs' seemingly familiar non-causative meanings.

Gleitman and several of her colleagues (Gleitman, 1990; Gleitman & Gleitman, 1992; Fisher, Hall, Rakowitz, & Gleitman, 1994) have conducted several studies regarding how children bootstrap the meaning of mental (i.e., want, hope, knowing) and speaker-perspective (i.e., chase/file, lead/follow) word meanings from complement argument structure. Mental verbs refer to in-observable events. Whereas speaker-perspective verbs are similar to mental verbs in that their meanings cannot be extracted from observing events when the verb is uttered. Speaker-perspective verbs describe events from the perspective of the speaker.

Despite the fact that mental and speaker-perspective verbs do not refer to observable events, Landau and Gleitman (1985) showed that normally sighted and blind children acquire the correct meaning distinctions and categorizations of perception verbs. In their study, one of the first verbs that was noted in the blind child's vocabulary was *see*. Although the exposure conditions for learning this verb differed between blind and sighted children, both populations acquired the word as a lexical item of achieved perception, and did so at the same stage of development.

Some researchers (Fisher et al., 1994; Gleitman & Gleitman, 1992) note that in most verb pairs vary primarily in the speaker-perspective on a single action or event. For instance, for every instance of *chasing* is an instance of *fleeing*; for every instance of *giving*, there is also one of *getting*. In the case of *give* and *get*, both verbs describe the transfer of possession between two parties. Separating these two verbs based on the pragmatics of the conversation would require the listener to have access to the mental perspective of the speaker. For example, the listener would have to figure out whether the speaker is referring to X's volitional act of giving the Z to Y or Y's consequent act of

getting the Y from X, where X and Y represent two individuals exchanging the item Z (Fisher et al., 1994; Gleitman & Gleitman, 1992; Gleitman & Gillette, 1999).

To assist the learner in determining the semantic implications of the sentence structure, additional information from inspecting the position of nouns in the sentence heard and comparing those nouns against the scene provided help. So, if a scene shows the ball moving from Mary to John, then adult utterances like:

1. Look! Ziking!

provides no differential information, but if the speaker says

2. John ziks the ball to Mary.

Then *zike* could mean *give*. However, if the sentence is

3. John zikes the ball from Mary.

Then *zike* could mean *gets*.

Fisher and colleagues (1994) investigated the acquisition of such perspective verbs. They showed scenes/sentences similar to those described above and found that if the sentence was uninformative as to the *give/get* distinction, as in example (1), the participants showed bias in interpreting the sentence as referring to someone giving rather than getting. If the sentence was like the one shown in example (2), the participants tended to respond with a verb that meant something like give. Finally, if the sentence was like example (3), the participants responded with a verb like get.

The Naigles' (1990) and Gleitman and colleagues' (1990, 1992, 1994) studies have demonstrated that children can bootstrap verb meaning from intransitive, transitive, and complement argument structures. However, there currently are no known studies that have overtly demonstrated that the meaning of verbs can be acquired through fast mapping. If such a study were to be designed, it could follow a format similar to that employed by Naigles (1990) by contrasting the argument structures: intransitive with transitive; complement with transfer (with dative verbs).

The transfer argument structure with dative verbs has three arguments that can be used to compare with the complement argument structure. Dative verbs share a common semantic property: they must be able to denote prospective possession of the referent of the second object by the referent of the first object (Pinker, 1989). In cases where dative verbs appear in the prepositional form with *to* (i.e., *give* and *send*); the first object must be the goal to which the transferred thing goes as a result of its movement and its possessor. This is illustrated in the sentence, "John sent the package to the girl." Hence, dative verbs are also restricted in the argument structures they may take.

Studies have demonstrated that children are sensitive to constraints on dative verbs (Gropen, 1989; Pinker, 1989). In the Gropen (1989) study, children were taught novel mono- and polysyllabic words. They found that the children produced more double-object datives with the monosyllabic verbs than with polysyllabic verbs. However, they did not show a preference with prepositional-object datives. Hence, the effect was not a product of phonology where polysyllabic verbs were more difficult to pronounce or learn, but a product of linguistic constraints.

The question that develops from these various studies is could these various verb types (intransitive, transitive, transfer [dative] and complements be used with older children (i.e., ages four, five, and six)? There are three reasons for using verbs in this study. First, verbs may be less susceptible to cultural variation than nouns. Some AAE speaking children have less exposure than SAE speaking children to material objects that leads to greater proficiency with those objects (Heath 1983; Mount-Weitz, 1996) and presumably skill in talking about such objects. Hence, it is likely that some AAE speaking children's lower vocabulary scores reflect deficiencies in vocabulary resulting from their impoverished environments (Washington & Craig, 1992). Second, verbs are a special domain of difficulty for children with specific language impairment (SLI). Rice, Buhr, and Nemeth (1990) employed a fast mapping task where unfamiliar names from the categories of objects, actions, attributes, and affective states were presented to five-

year-old children with SLI. Results of this study showed that the children with SLI showed decreased overall mapping ability on the comprehension task when compared with age and mean length of utterance controls. The names of actions were especially difficult for children with SLI. Lastly, bootstrapping via syntax is a process proven to occur with verbs (Fisher, et al., 1994; Gleitman, 1990, Naigles, 1990; Naigles, Gleitman & Gleitman, 1993); hence, verbs would be a good choice for fast mapping. In addition, by extending the fast mapping to more complex argument structures a child's ability to fast map novel verbs above the age of two can be investigated.

Previous studies (Naigles, 1990; Fisher et al., 1994) used children as young as two-years of age. In contrast to the Naigles (1990) study, the preferential looking method would not be needed if older children were tested. What would be needed for this study is a procedure that measures language comprehension. A method that measures language comprehension is asking questions. The traditional method of asking the child to point to the picture that depicts the action of the novel verb could be difficult to interpret. Simply pointing to a picture may not capture what the participant interprets as the meaning of a novel verb. In addition, by asking a question, such as, "Who is meeping?" could be trivially easy. Therefore, enhancement of this procedure could be accomplished by incorporating additional questions with bound morphemes. This set of potential questions should reveal the child's initial representation of what the verb means in terms of who is doing the action and what is happening when the action is completed. In essence, asking probing questions that incorporate bound morphemes reveals the frame of the initial representation.

Determining which bound inflectional morphemes could be incorporated in the questions is influenced by AAE syntax. There are several morphological markers that are variable in AAE syntax (i.e., third person *–s* and past tense *–ed*). Morphemes that are variable in AAE production should be avoided in the questions for the purpose of this study, due to limited information regarding the comprehension of these morphemes by

AAE speakers. In one of the few studies on the comprehension of morphological markers in young AAE speakers, Johnson, de Villiers, and Seymour (1998) examined AAE and SAE speaking children's comprehension of third person /s/ as a number agreement feature. The results of this study demonstrated that typically developing AAE speakers between the ages of four and six did not use third person /s/ morphological marker as an indicator of plurality as did their SAE peers. Hence, the inflectional morphemes selected should be non-contrastive or shared by the AAE and SAE to reduce possible bias.

Two inflectional morphological markers meeting the above criteria will be used in the present investigation. The two inflectional morphemes are present progressing *–ing* and past tense *–ed*. Present progressive *–ing* is a verb tense that indicated that an activity is currently in progress and is of temporary duration (Owens, 1992). According to Brown (1973), children master present progressive *–ing* between the ages of 19 and 28 months.

Since past tense *–ed* is a syntactic feature of AAE, it could be coupled with passive *got* in an effort to decrease dialect bias. The regular past tense *–ed* marker is acquired after the child has demonstrated the use of the limited number of irregular past tense verbs (Owens, 1992). Mastery of the past tense *–ed* occurs between 26 and 48 months of age (Brown, 1973).

Unlike inflectional morphology, where the constraint is choosing morphology that is not variable in AAE, the constraint for derivational possibilities is which one(s) would be too difficult for younger children. Derivational suffixes create words semantically related to a base word. Full knowledge of derivational morphology involves three aspects, relational, syntactic, and distributional (Tyler & Nagy, 1989). Relational knowledge refers to a child recognizing that words have complex internal structures and at least two words may share a common morpheme (i.e., *create* is related to *creator*). Syntactic knowledge refers to knowing that derivational morphemes mark words for a syntactic category (i.e., *regularize* is a verb because of the suffix *–ize* and *regulation* is a noun because of the suffix *-ion*). Distributional knowledge is related to the constraints on

the concatenation of stems and suffixes. For instance, *-ness* attaches to adjective (i.e., quietness), but not to verbs (i.e., *playness).

The agentive suffix *–er* and the neutral suffix *–able* were chosen for the present study. A neutral suffix does not change the stress or vowel quality of the word to which it is added. Most of the previous research regarding children's mastery of these morphological markers has concentrated on children's relational knowledge but these studies did not provide a clear picture as to when this knowledge is acquired (Tyler & Nagy, 1989). However, Clark and Cohen (1984) found evidence of some knowledge of agentive suffix *–er* for 4- and 5-year-olds.

Acquisitional studies regarding *–able* are limited. Roeper, Lapointe, Bing, and Tavakolian (1981) compared the performance of preschool, second grade, and fourth grade children on comprehension tasks regarding*–able*. The participants were given a series of questions concerning *–able* (i.e., Is the fence jumpable? Or is the boy jumpable?). Overall results revealed that the participants performed with 40% accuracy. However, when the individual participants' performance was examined, 40% of the second graders, and 83% of the fourth graders met the criteria established by the investigators. This suggests that *–able* is acquired by most children between second and fourth grade. However, given the limited possibilities for derivational morphology in the preschool years, *-able* was chosen for inclusion.

It must be noted that *wh*-questions can target some arguments of the complement argument structure that are inaccessible via inflectional or derivational morphology. The child has to recreate the full argument structure to answer questions regarding the subject and object of the complement verb.

In addition to contrasting argument structures, ambiguity should be built into the picture stimuli that will be presented to the participants between intransitive/transitive and transfer/complement argument structure. The construction of such a design would entail the participants being randomly assigned to be administered either Form A or Form

B for novel verbs. Each participant would be presented with the same picture scene, but would hear a different argument structure. For instance, when Form A participants are presented with an intransitive argument structure, Form B participants would be presented with the same picture set, but hear a transitive sentence. Moreover, when Form A participants hear a transfer sentence, Form B participants would be presented with an identical picture set, but hear a complement sentence, and vice versa. The use of such a design would support that it is the argument structure heard by the participants that would guide them towards the meaning of the novel word and not the picture.

Statement of the Problem

Semantic differences are apparent among different dialects of the same language (Stockman, 1999). For instance, the same word could have a broader range of semantic distinctions in one regional dialect than another (Wolfram, 1991). These semantic distinctions and experiential exposure are at the crux of inherent bias in semantic assessment tools. For example, Washington and Craig (1992) found that despite the application of scoring adjustments for items on the PPVT-R (Dunn & Dunn, 1981), there was not enough of a performance spread to provide useful information regarding the vocabulary skills of their African American participants.

The absence of research and clinical practice with AAE speaking children has left speech-language pathologists ill-equipped to provide valid and reliable evaluations of these children. Thus, to avoid misdiagnosis it may be more appropriate to conduct psycholinguistic processing operations that do not rely heavily on the child's prior language exposure and experience. A process dependent operation that does not depend on a child's prior knowledge or experience is fast mapping. By incorporating processing-dependent tasks in semantic assessment, a clearer picture of African American children's semantic language abilities may emerge.

In lexical acquisition children with varied language abilities and linguistic backgrounds utilize the skill of fast mapping to formulate a hypothesis about a novel word's meaning. In considering verb learning other linguistic cues are needed to narrow down a verb's meaning or relationship to an agent, patient, instrument, etc. By investigating how children use the grammatical forms of their language to understand these relationships, we will gain further insight into the nature of verb learning in children.

The present investigation will focus on evaluating how children utilize fast mapping skills to determine the meaning of novel verbs. Although fast mapping verb meaning from argument structure has been the subject of recent investigations (i.e., Oetting, 1999), it has not been investigated for its potential as a culturally and linguistically fair way to assess semantic knowledge in children. For example, to determine if a child considered to be at-risk for language impairment, the clinician might present a sentence with a novel verb and an intransitive argument structure, "The boy is meeping." One could then assess the child's semantic interpretation of the novel verb "meeping" by asking probing questions to see if the child understands the relationship of "meeping" to its argument (boy). Such a method has clinical and/or diagnostic relevance for the AAE speaking child. Since fast mapping of novel terms is a processing-dependent skill and does not depend upon previous experience or exposure to specific lexical items, it may be a culturally and linguistically fair way to assess semantic knowledge in AAE speaking children. The implications of this research for diagnosing language impairment in AAE speaking children are important. Those children who fail to correctly identify a novel verb's argument(s) may be exhibiting a language impairment.

The overall research question to be answered in this dissertation is whether AAE and SAE speaking children can fast map the meaning of novel verbs using morpho-syntactic cues. In order to answer this question, two comprehension tasks were constructed to test whether AAE and SAE speaking children differ in their abilities to use

syntactic cues to fast map the meaning of novel verbs. The first comprehension task investigated whether participants understood the relationship of a real verb to its agent, patient, instrument, and/or object. The second comprehension task investigated whether participants could transfer the same skills displayed in Real Verb Comprehension Task (RVCT) while attempting to determine the relationship of novel verbs to their patient, instrument, and/or object.

In addition, participants' performances on the two comprehension tasks were compared to their performance on a knowledge-dependent standardized assessment tool. This comparison was made to see if assessment bias of semantic knowledge could be reduced by utilizing a processing-dependent measure (i.e., fast mapping). The answer to these questions will be obtained by pursuing four related and more specific questions:

1. Is there a difference between AAE and SAE participants in their comprehension as it relates to argument structure for (a) a real verb comprehension task and (b) a novel verb comprehension task?
2. Is there a difference between AAE and SAE participants in their comprehension as it relates to the six different question types for the (a) a real verb comprehension task and the (b) a novel verb comprehension task?
3. Is there a relationship between the PPVT-III and the comprehension tasks for all argument structures and question types in (a) a real verb comprehension task and (b) a novel verb comprehension task for both AAE and SAE participants?
4. Is there a difference between AAE and SAE participants' performance on the PPVT-III?

The answers to these questions will allow comparison of fast mapping skills for the two participating groups. Answers will also provide further support for the contention that fast mapping verb meaning from argument structure is a processing-dependent measure. In addition, comparision of participants' performance on the PPVT-III with

their performance on the two comprehension tasks will allow further examination of the of inherent test bias issue. Finally, the answers to the posed questions will determine whether or not the experimental comprehension tasks, which implement the process of fast mapping verb meaning, can be a valid and unbiased measure of a child's capacity to acquire a vocabulary.

CHAPTER IV

METHODS

Two experiments were designed to test whether AAE and SAE speaking children differ in their abilities to use syntactic cues to fast map the meaning of novel verbs. In addition, participant performance on the experiments was compared to performance on a knowledge-dependent standardized assessment tool. The first experiment tested whether participants understood the relationship of a real verb to its agent, patient, instrument, and/or object (Real Verb Comprehension Task [RVCT]); the second experiment tested whether participants could transfer the same skills displayed in the RVCT while attempting to determine the relationship of novel verbs to their agent, patient, instrument, and/or object (Novel Verb Comprehension Task [NVCT]).

Participants

Two groups of 30 children participated in this study. The first group came from AAE speaking families. The second group came from Euro-American SAE speaking families. The SAE group was used as a control. In each group, there were 10 participants in each of three age group (four, five, and six year old). The AAE speaking group was recruited from daycare centers, Head Start programs, and public school systems in Hartford, CT. The schools were located in low to low-middle income communities where the neighborhood consisted primarily of African American ethnic backgrounds.

The SAE speaking group was recruited from Head Start programs and public school systems in Turner Falls, MA where the community is largely made up of individuals from Euro-American ethnic backgrounds. Turners Falls could be described as low to a low-middle income Euro-American community.

All AAE and SAE speaking participants met the following criteria:

1. Passed a hearing screening at 20 dB HL at 1000, 2000, and 4000 Hz and 25 dB HL at 500 Hz.
2. Received a passing score on the Fluharty Preschool Speech and Language Screening Test (Fluharty, 1978) or other standardized speech and language screening tool.
3. Obtained a non-verbal cognitive score of at least 85 on the Columbia Mental Maturity Scale (CMMS; Burgemeister, Blum, & Lorge,1972).
4. Had no history of neurological deficits per teacher and parent reports and as verified in school records when available.
5. Free from uncorrected visual or physical impairment based on school educational and health records.
6. Performing at grade level in academic subjects per teacher report.
7. Had no history of behavioral/emotional difficulties per teacher and parent reports and as verified in school records when available.
8. Be either an AAE or SAE speaker as determined by a collection of items measuring AAE syntax and phonology. These items were constructed so that children who produced predictable AAE patterns were classified accordingly and were subsequently given a dialect index score.

Additional documentation available included (1) the occupation and education of the parent(s)/legal guardian(s) of the participants sampled, and (2) other social factors (i.e., geographical location, receiving federal assistance for breakfast and/or lunch). Hence, social, economic, and linguistic documentation of participants for each group was the bases for matching participants by age, dialect, and economic status.

This study did not test children younger than four years of age because younger children may not have fully developed comprehension of some of the morphological and argument structures required for the comprehension tasks. Hence, this study is not a

complete investigation of the acquisition of verb learning. Rather, it is an investigation of the universal nature of vocabulary acquisition in AAE and SAE speaking children, with moderately mature language systems, as it relates to lexical acquisition.

Experimental Tasks

Each participant was given a standardized vocabulary comprehension task, the Peabody Picture Vocabulary Test-Third Edition (PPVT-III; Dunn & Dunn, 1997), and two experimental comprehension tasks (Real Verb Comprehension Task and Novel Verb Comprehension Task). Washington and Craig (1999) provide a favorable recommendation for the PPVT-III based on a normal distribution of performance scores obtained from African American participants, despite an overall mean difference from their Euro-American peers. This mean difference, noted as recently as 1999, continues to illustrate decreased standardized test performance by African American participants.

However, Campbell and colleagues (Campbell, Dollaghan, Needleman, & Janosky, 1997) identified processing-dependent tasks (i.e., non-word repetition, working memory for competing stimuli, and auditory processing of linguistic commands) as tasks that minority children performed equally as well on as their Euro-American peers. Therefore, processing-dependent measures may prove to be superior to measures that are dependent on prior knowledge or experience when identifying speakers whose poor language performance reflects psycholinguistic deficits, rather than different experiential and cultural backgrounds (Campbell et al., 1997). Thus, this experimental design is similar to the Campbell et al. (1997) study in that it will compare performance on a knowledge/experience-based task (PPVT-III) test to psycholinguistic processing operations (fast mapping and syntactic bootstrapping) performance assessed using experimental procedures.

In an effort to reduce situational bias where the experimentation format may be threatening to the participants, the examiners and participants were matched by race. In

other words, the principal investigator, who is African American, administered the experimental tasks to African American participants and a trained, Euro-American graduate speech-language pathology student administered experimental tasks to Euro-American participants.

Four argument structures that are not sensitive to dialect were used in this study. The argument structures and the meanings connected with them are listed below:

1. Intransitive:
Involves either a voluntary or involuntary motion (i.e., "smiled," "sneezed");

2. Transitive:
Incorporates a notion of causation (i.e., "lifted," "fixed," "dropped");

3. Transfer:
A path over which the affected entity passes (i.e., "poured," "sent");

4. Complement:
These only occur when the verb refers to a mental state, communication, perception, or emotion (i.e., "thought," "said," "saw").

The determination that these four argument structures are not sensitive to dialect or shared between AAE and SAE was based on a search of the Hall database (Hall, Nagy, & Linn, 1984). This database is comprised of data obtained from 39 preschool children (4:6 to 5:0 years of age) that were divided approximately equally according to race and socioeconomic status (middle-class African American, middle-class Euro-American, working-class African American, working-class Euro-American). A search of intransitive, transitive, transfer, and complement verbs was conducted on working-class African American and White children. All four argument structures were found in the spontaneous speech samples.

Real Verb Comprehension Task (RVCT)

Real Verb Comprehension (RVCT) was designed to test whether participants could understand the relationship of real or familiar verbs to their argument(s). In the RVCT the participants were expected to respond to questions regarding each sentence

they heard and supporting pictures presented. On a slightly different level, the results from the RVCT were analyzed to determine what the participants know regarding the verbs' argument structures. In addition, information regarding what the participants know about the bound morphology incorporated in the questions was also obtained. The questions orally presented to the participants were used as a vehicle to determine if they understood the relationship of the verb to its argument(s). The question types used were classified as follows:

Question Type One:
Included derivational morpheme *–er*.
Example: Which one was the raker?

Question Type Two:
Included bound morpheme present progressive *–ing*.
Example: Which one was raking?

Question Type Three:
Included bound morpheme *–ed* in a passive construction (*-ed* $_{\text{passive}}$).
Example: Which one got raked?

Question Type Four:
Included derivational morpheme *–able*.
Example: Which one was rakeable?

The bound and derivational morphemes incorporated in these question types were determined to be non-dialect specific because the available literature does not list any of the aforementioned as syntactic "features" of AAE. It must be noted that question type three contained the bound morpheme (past tense *–ed*), which is a syntactic feature of AAE due to its variable use in production. However, to decrease the potential dialect bias in comprehension, and to maintain a past tense marking, past tense *–ed* was coupled with passive "got" in a passive sentence construction.

Question types five and six did not contain any bound or derivational morphological markers because they were designed to address the object of the complement and subject of the complement components in complement argument structures. Examples of those question forms are as follows:

Question Type Five:
Object of the Complement (OC)
Example: Which one did the lady ask the man to throw? (the key)

Question Type Six:
Subject of the Complement (SC)
Example: Which one did the lady ask to throw the key? (the man)

Previous studies (i.e., Fisher, Hall, Rakowitz, & Gleitman, 1994; Naigles, 1990; Oetting, 1999; Rice, 1988) that investigated syntactic bootstrapping and fast mapping of novel verbs typically presented videotaped scenes to children. This study utilized sequential picture sets to simulate a "movie" of the main event to be presented to the participants. Responses to the question types required each participant to comprehend the relationship of the verb with its argument(s). Refer to Appendix A for the complete list of sentences and questions for each argument structure.

The participants were given the following instructions by the examiner:

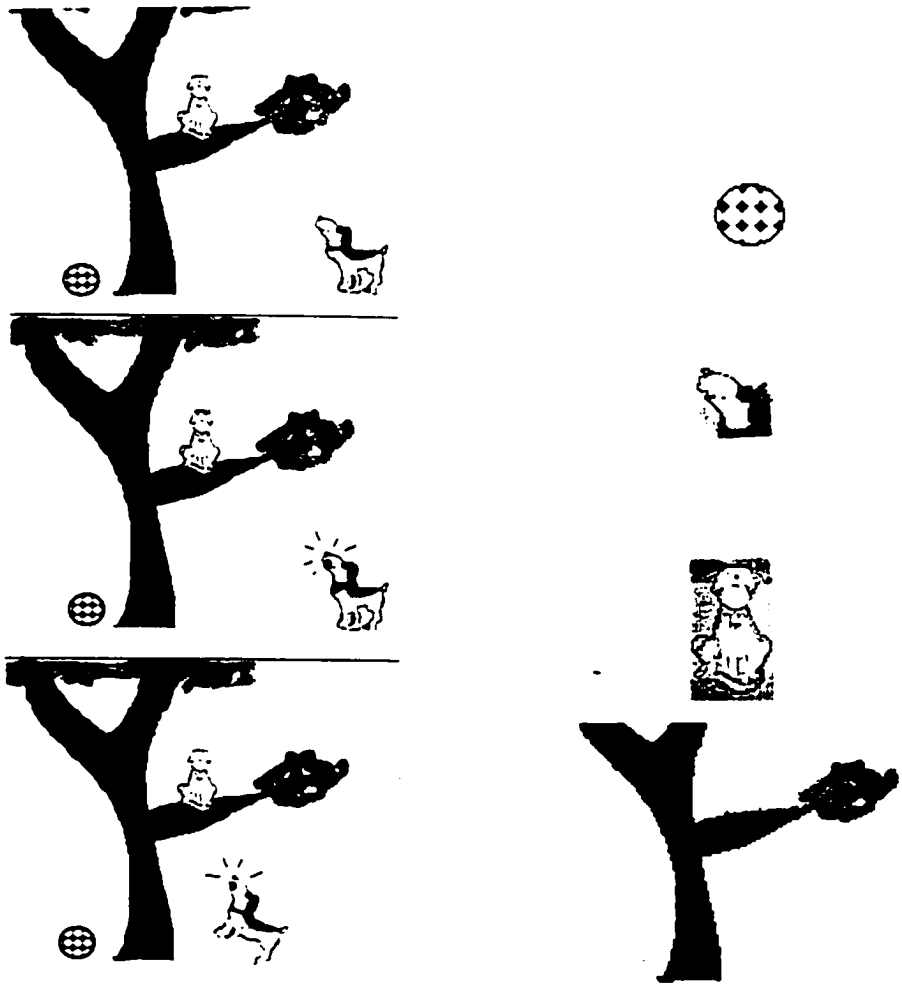
I am going to show you some pictures and tell you something about the pictures. Then I am going to ask you some questions about the pictures. It is okay to point to the same picture more than once.

Following the instructions a picture sequence (i.e., the left side of Figures 4.1, 4.2, 4.3, and 4.4) was presented to the participants with a statement about the main event. The items in the picture sequence (i.e., the right side of Figures 4.1, 4.2, 4.3, and 4.4) were revealed to the participants accompanied with the prompt,

Here are the things in the pictures. I want you to show me...

A series of questions were then asked to see if the participants comprehended the relationship of the verb to its argument(s). A foil question was utilized to break up the series of investigative questions. The foil question was designed not to test the participants' comprehension of the verb to its argument(s).

Figure 4.1[2]. Example of an intransitive argument structure picture sequence for the RVCT.



Statement: The dog is barking.
Questions:

a. Which one was the barker? (expected response: dog)
Foil: Which one was in the tree?
b. Which one was barking? (expected response: dog)

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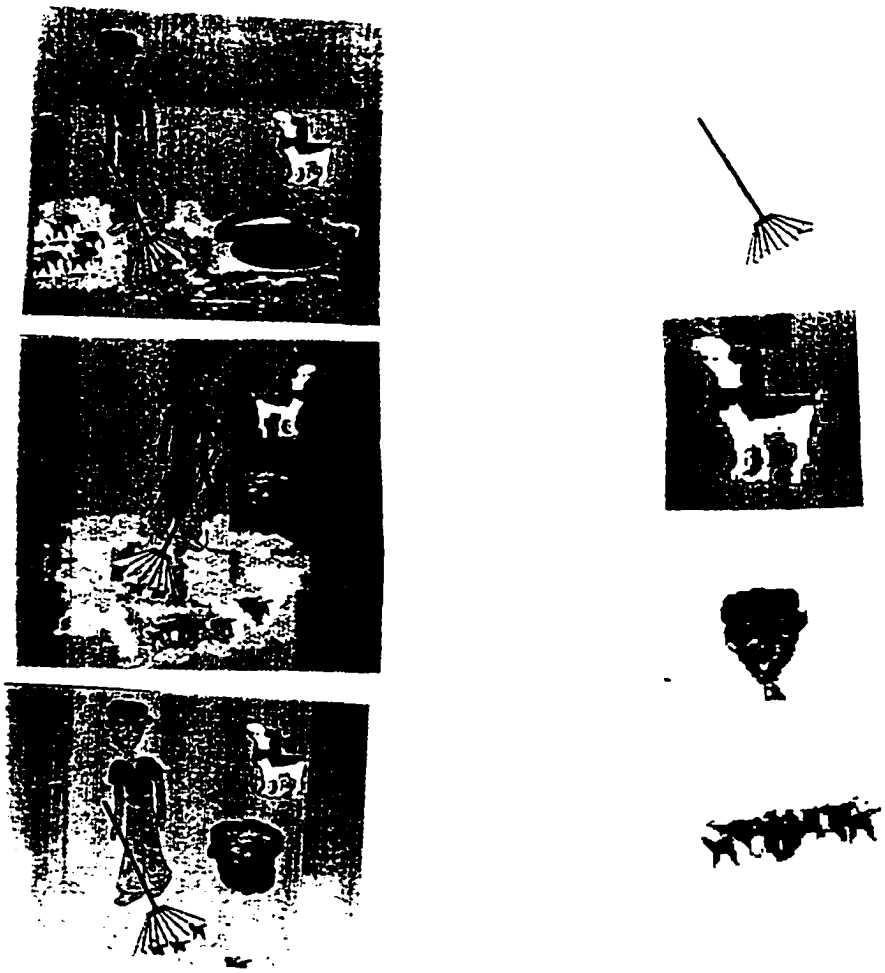
Figure 4.2. Example of a transitive argument structure picture sequence for the RVCT.



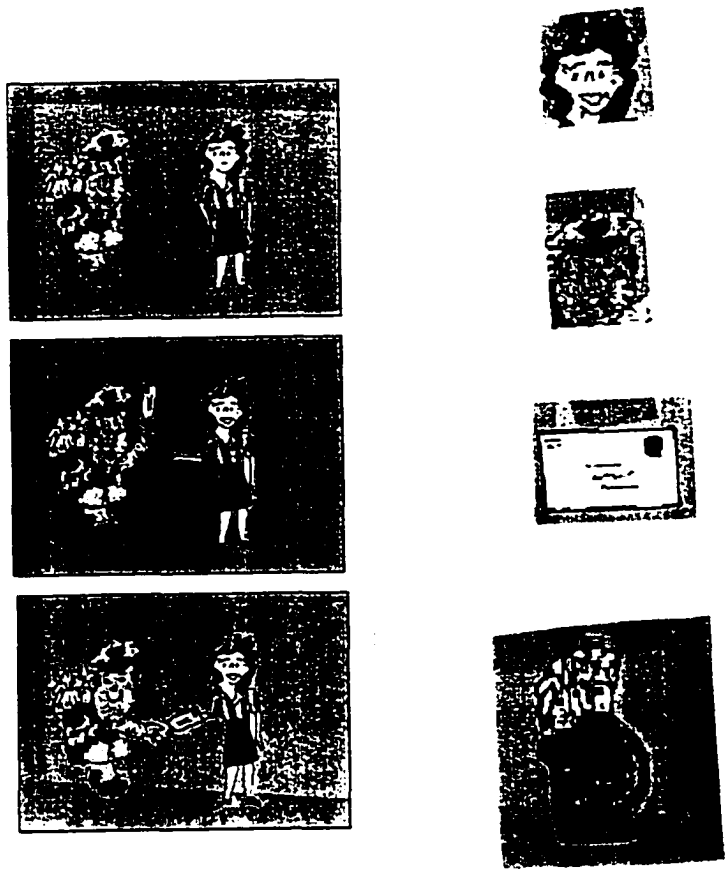
Statement: The boy is raking the leaves.
Questions:

a. Which one was the raker? (expected response: boy or rake)
b. Which one was rakeable? (expected response: leaves)

Foil: Which one barks?

c. Which one got raked? (expected response: leaves)
d. Which one was raking? (expected response: boy or rake)

Figure 4.3[3]. Example of a transfer argument structure picture sequence for the RVCT.



Statement: The mailman is handing the letter to the girl.
Questions:

a. Which one was the hander? (expected response: mailman)
b. Which one was handable? (expected response: letter)

Foil: Which one was wearing a dress?

c. Which one got handed? (expected response: letter)
d. Which one was handing? (expected response: mailman)

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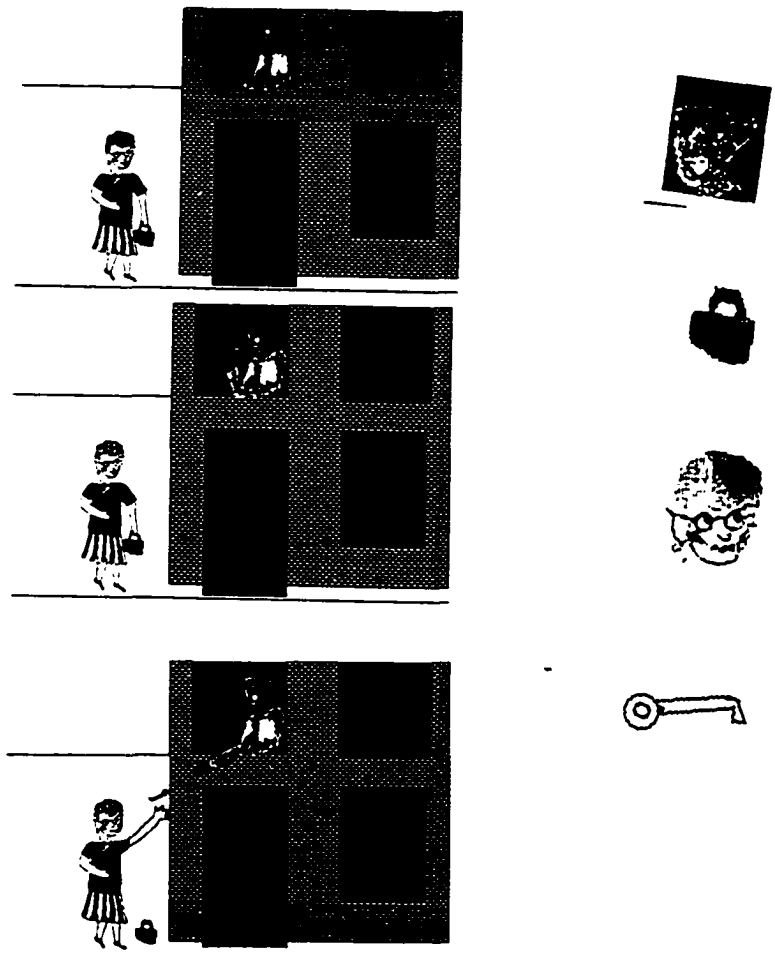
Figure 4.4. Example of a complement argument structure picture sequence for the RVCT.



Statement: The lady is asking the man to throw the key.
Questions:

a. Which one was the asker? (expected response: lady)
b. Which one did the lady ask the man to throw? (expected response: key)

Foil: Which one was the lady holding in her hand?

c. Which one did the lady ask to throw the key? (expected response: man)
d. Which one was asking? (expected response: lady)

It should be noted that question types three (*-ed* $_{passive}$) and four (*-able*) were not asked for intransitive sentences. Question type three (*-ed* $_{passive}$) cannot be answered because that argument is unspecified (i.e., The girl is sneezing. QT-3: *Which one got sneezed?). The same holds true for question type four (*-able*; i.e., The girl is sneezing. QT-4: *Which one was sneezable?)

In addition, question types three (*-ed* $_{passive}$) and four (*-able*) were not asked for complement sentences. This was the case because there were not direct and indirect object arguments, as in the transitive and transfer argument structures. Complement structures have a subject of the complement, and an object of the complement arguments. Hence, to fulfill the requirement that all arguments are tested for by asking questions, two different types of questions were asked. Refer to Table 4.1 for the matrix of the different argument structures and question types.

Table 4.1. Matrix of argument structures and question types presented to the participants to test the comprehension of real and novel verbs to their argument(s).

	Real and Novel Verbs			
Question Types	Intransitive	Transitive	Transfer	Complement
1 (*-er*)	X	X	X	X
2 (*-ing*)	X	X	X	X
3 (*-ed*$_{passive}$)		X	X	
4 (*-able*)		X	X	
5 (OC)				X
6 (SC)				X

Novel Verb Comprehension Task (NVCT)

Information gleaned from the Novel Verb Comprehension Task (NVCT) provided information as to whether the participants have an abstract idea of the novel verb's argument structure. Novel verbs were selected from a high-probability list of C-V-C items with phonetic patterns that occur frequently in English words (Jusczyk, Luce, & Charles-Luce, 1994). Experimental procedures for the NVCT were similar to those employed in the RVCT. However, participants were randomly assigned to be administered Form A or Form B. Once assigned to be administered Form A or its counterbalanced cognate, Form B, the participants were given the following instructions by the examiner:

> *I am going to show you some pictures and tell you something about the pictures. Then I am going to ask you some questions about the pictures, just like the last time. Except this time, I've made up some new words. I bet you can figure out what my new word means. Remember that it's okay to point to the same picture more than once.*

Following the instructions a picture sequence was presented to the participants. Each child assigned to either Form A or Form B saw the same set of pictures, but heard different argument structures with a particular picture. For example, when Form A participants heard an intransitive argument structure, Form B participants saw the identical picture sets, but heard a transitive argument structure. When Form A participants heard a transfer argument structure, Form B participants saw the identical picture set, but heard a complement structure, and vice versa. In other words, ambiguity between intransitive/transitive and transfer/complement argument structures was built in the picture set. The participants saw exactly the same picture sets, but the argument structure they heard led them to fix on a different aspect of the scene. The use of the ambiguous situations is meant to prove that it is the argument structure the participants heard that led the children to choose the meaning, not the pictures. Refer to Appendix B

for the complete list of sentences and questions for each argument structure. An example is provided to illustrate this design (Figures 4.5 and 4.6).

Statistical Treatment

Most of the data were analyzed by parametric statistical procedures. The procedures for the RVCT and the NVCT consisted of a mixed-model analyses between-participants (i.e., responses among the different variables) and within-participant (i.e., responses across the different variables, which is similar to an analysis of variance (ANOVA) with repeated measures. These procedures were used to determine if there were significant main effects. The independent variables that affected the types of responses given by participants were age and/or dialect. The dependent variables or experimental conditions were the actual type of responses (i.e., expected versus not expected responses) given by participants on the two experimental tasks. This 2 x 2 factorial design, depicted in Table 4.2, was used to determine if age and/or dialect caused participants to respond either with an expected or unexpected response to the questions provided.

In addition to the mixed-model ANOVAs, correlation analyses were conducted. Correlation analyses were conducted between the RVCT and PPVT-III, and NVCT and PPVT-III to determine if any significant relationship(s) existed.

Table 4.2. A 2 x 2 factorial design depicting the dependent and independent variables in this investigation.

Dependent Variables	Independent Variables				
Responses	Age			Language	
RVCT	4	5	6	AAE	SAE
NVCT	4	5	6	AAE	SAE

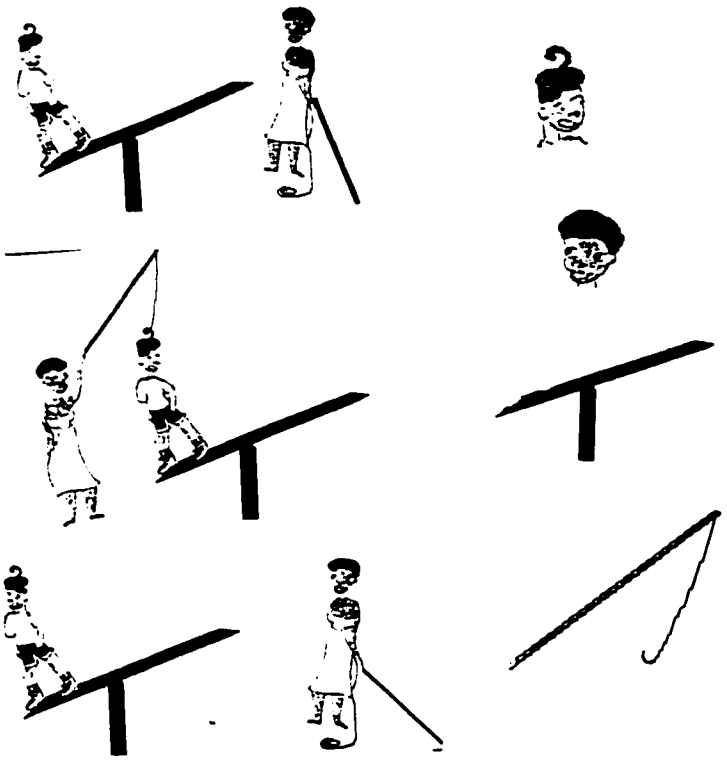
Reliability

Reliability was conducted on 20% of all coded score sheets for each participant which involved judges reviewing videotaped sample. All reliability judges underwent a training session. In the reliability procedure, a reliability judge scored the participants' responses. If a discrepancy occurred between the administrator and the reliability judge, then a second reliability judge resolved the discrepancy. Any discrepancies that could not be resolved by the second reliability judge were not included in the data analyses. However, discrepancies were few because the task was straightforward and simple, resulting in few questionable scoring entries. Fifteen out of 5,880 total participant responses were thrown out as a result of unresolved discrepancies. Results of the reliability judgments prior to discrepancy judgements were as follows:

RVCT:
AAE Participant Responses 98.9%
SAE Participant Responses 99.8%

NVCT:
AAE Participant Responses 91.4%
SAE Participant Responses 90.5%

Figure 4.5[4]. Example of an intransitive/transitive argument structure(s) picture sequence for the NVCT.



Intransitive (Form A):
Statement: The boy is temming.
Questions:

a. Which one was the temmer? (expected response: boy)
Foil: Which one was the boy standing on?
b. Which one was temming? (expected response: boy)

Transitive (Form B):
Statement: The woman is temming the boy
Questions:

a. Which one was the temmer? (expected response: woman)
b. Which one got temmed? (expected response: boy)
Foil: Which one was the boy standing on?
c. Which one was temmable? (expected response: boy)
d. Which one was temming? (expected response: woman)

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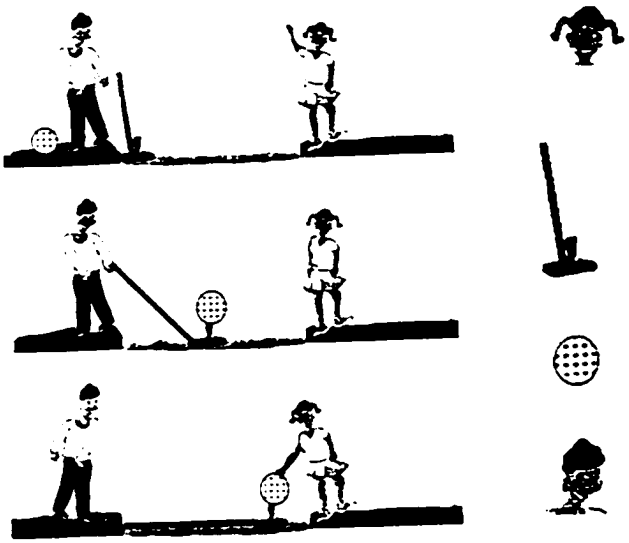
Figure 4.6[5]. Example of a transfer/complement argument structure(s) picture sequence for the NVCT.



Transfer:
Statement: The woman is sugging the ball to the girl.
Questions:

a. Which one was the sugger (expected response: woman)
b. Which one was suggable (expected response: ball)
Foil: Which one was wearing pants?
c. Which one got sugged? (expected response: ball)
d. Which one was sugging? (expected response: woman)

Complement:
Statement: The girl is sugging the woman to send the ball.
Questions:

a. Which one was the sugger? (expected response: girl)
b. Which one did the girl sug to send the ball (expected response: woman)
Foil: Which one was wearing pants?
c. Which one did the girl sug the woman to send? (expected response: ball)
d. Which one was sugging? (expected response: girl)

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CHAPTER V

RESULTS

This chapter presents the analyses and results of the two fast mapping experimental comprehension tasks (Real Verb Comprehension Task [RVCT] and Novel Verb Comprehension Tasks [NVCT]). Also provided are the analyses and results of these tasks with the Peabody Picture Vocabulary Test –III (PPVT-III; Dunn & Dunn, 1997). The specific research questions that will be addressed in this chapter are as follows:

1. Is there a difference between AAE and SAE participants in their comprehension as it relates to argument structure for (a) the RVCT and (b) the NVCT?
2. Is there a difference between AAE and SAE participants in their comprehension as it relates to the six different question types for the (a) the RVCT and (b) the NVCT?
3. Is there a relationship between the PPVT-III and the comprehension tasks for all argument structures and question types in (a) the RVCT and (b) NVCT for both AAE and SAE participants?
4. Is there a difference between AAE and SAE participants' performance on the PPVT-III?

Results were tabulated for each task from 60 participants determined to be either SAE or AAE speakers who ranged in age from 4:0 to 6:11 years. The mean age and age ranges of the participants across dialect, age, and gender are summarized in Table 5.1.

The presentation of the results for the experiment follows a format that first provides a brief description of the experimental task followed by the experimental questions posed and the results obtained.

Table 5.1. Dialect, gender, and means and ranges for ages of the participants.

Dialect/Age	Number of Participants	Mean Age*	Age Range*	Female	Male
AAE-4	10	4:3	4:0-4:10	7	3
AAE-5	10	5:3	5:0-5:9	3	7
AAE-6	10	6:3	6:0-6:11	7	3
Total	30		4:1-6:11	17	13
SAE-4	10	4:3	4:1-4:11	7	3
SAE-5	10	5:6	5:3-5:11	5	5
SAE-6	10	6:3	6:1-6:11	5	5
Total	30		4:1-6:11	17	13
Overall Total	60	5:4	4:0-6:11	34	26

*Note: Age is in years:months

Review of Experimental Tasks

The experimental tasks for the RVCT and NVCT are similar in format and design except contrasts between intransitive/transitive and transfer/complement argument structure in the NVCT. The following background review of experimental tasks pertains to the RVCT specifically, but the general format also applies to the NVCT. Hence, the four non-dialect specific argument structures included in this study with definitions and examples were as follows:

Intransitive
Has a single argument; involves either a voluntary or involuntary motion.
Example: The dog is barking.

Transitive
Has two arguments; incorporates a notion of causation.
Example: The boy is raking the leaves.

Transfer
Has three arguments: a path over which the affected entity passes.
Example: The mailman is handing the letter to the girl.

Complement
Requires an embedded proposition; occurs when a verb refers to a mental state, communication, perception, or emotion.
Example: The woman is asking the man to throw the key.

The four aforementioned arguments were determined to be non-dialect specific as a result of a review of the available literature and a search of Hall's database (Hall, Nagy,

& Linn, 1984). The Hall database consisted of spontaneous speech samples of preschool working-class African American and Caucasian children. All four arguments were found in the Hall database.

Questions were used as a vehicle to determine if the participants understood the relationship of the verb to its argument(s). The question types were classified as follows:

Question Type One:
Included derivational morpheme *–er*
Example: Which one was the raker?

Question Type Two:
Included inflectional morpheme present progressive *–ing*
Example: Which one was raking?

Question Type Three:
Included inflectional morpheme *–ed* in a passive construction ($-ed_{\text{passive}}$)
Example: Which one got raked?

Question Type Four:
Included derivational morpheme *–able*
Example: Which one was rakeable?

The inflectional and derivational morphemes incorporated in the question types were chosen because they were determined to be non-dialect specific. In an effort to reduce the potential dialect bias of past tense *–ed*, a syntactic feature of AAE, it was coupled with passive *got* in a passive sentence construction.

Question types five and six did not contain any inflectional or derivational morphology because they were designed to address the object and subject components in complement argument structures. These questions used *wh*-questions that required the participant to reconstruct the argument structure from which the *wh*-question arose. Examples of these question forms were as follows:

Question Type Five:
Object of the Complement (OC)
Example: Which one did the lady ask the man to throw?

Question Type Six:
Subject of the Complement (SC)
Example: Which one did the lady ask to throw the key?

Refer to Table 4.1 for the matrix of the different argument structures and question types. See Appendix A for the complete list of sentences and questions for each argument structure.

Analysis of the RVCT

The purpose of the RVCT was twofold. First, the RVCT was designed to determine if the participants understood the relationship of familiar verbs to their argument(s). Second, the RVCT was used as a control for the NVCT. Two research questions were posed to address these purposes. The relevant questions for RVCT were questions 1a and 2a. The results for each of these questions are reported below.

Question 1a

Is there a difference between AAE and SAE participants in their comprehension as it relates to argument structure for the RVCT?

A mixed-model analysis of variance (ANOVA) was used to determine if there was a difference between AAE and SAE participants in their comprehension as it related to argument structure. The mixed-model ANOVA measures within- and between-participants variables. The within variables measured were the four different argument structures (intransitive, transitive, transfer, and complement). The variables measured between the participants were dialect and age. The design for this analysis was not completely "balanced" in that all of the question types could not be asked for all of the argument structures. For instance, question types three ($-ed_{passive}$) and four (*-able*) could not be presented for intransitive and complement argument structures because there are no corresponding arguments. Table 5.2 represents the results of the mixed-model ANOVA.

can SD for real verb condition be recovered from here?

Table 5.2. Mixed-model ANOVA for argument structure for the RVCT.

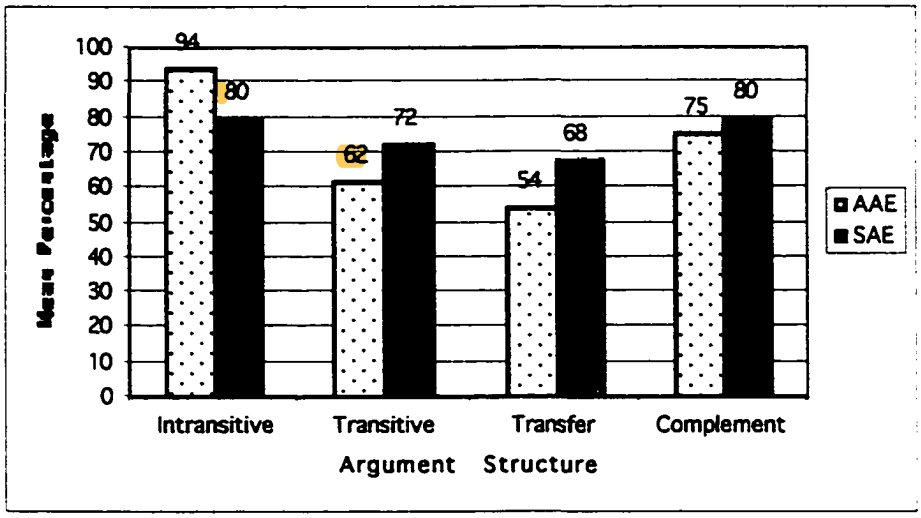
Source	df	F	Significance
Tests of Within-Participants Effects			
Argument Structure (AS)	3	131.863	.000*
AS x Dialect (D)	3	3.868	.010**
AS x D x Age (A)	6	5.810	.000*
Error	162	(102.991)	
Tests of Between-Participants Effects			
D	1	10.813	.002**
A	2	24.865	.000*
D x A	2	.557	.576
Error	54	(377.016)	

*p<.001
**p<.01
Note: Values enclosed in parentheses represents mean square errors.

There were two main effects as a result of the mixed-model ANOVA. There was a significant main effect for age [F (2,54)=24.865, p<.001]. This main effect for age indicates that there were significant differences in performance among the 4-, 5-, and 6-year-old participants. A linear trend analysis was conducted as a follow-up analysis to this age effect. In essence, the linear trend analysis was conducted to determine what kind of effect was taking place. The results of the linear trend analysis indicated a linear trend for age [F (1, 57)=10.443, p<.01]. In other words, as participants increased in age so did their performance on the task. The other main effect was dialect [F(1,54)=10.813, p<.01]. This main effect shows that there were differences between the speakers of the two dialects represented in this study in their comprehension of the argument structures. The ANOVA also revealed significant interactions between argument structure and dialect, and argument structure and age. Thus, AAE and SAE participants differed significantly from each other in their comprehension of the different argument structures by ages.

Due to the results of this analysis showing an argument structure by dialect interaction [F (3, 162)=3.868, p<.01], a post-hoc analysis was conducted to pinpoint which argument structures were driving the differences between the AAE and SAE participants. Figure 5.1 illustrates the mean scores for the AAE and SAE participants per argument structure.

Figure 5.1. Mean percentages of correct/expected responses of AAE and SAE participants per argument structure (RVCT).



A series of paired *t* tests determined that the transitive [*t* (58)=2.61, p<.05] and transfer [*t* (58)=2.74, p<.01] argument structures appeared to be contributing to the differences between the two groups. In other words, there was a significant difference between AAE and SAE participants in their comprehension of transitive and transfer argument structures for the RVCT. Refer to Table 5.3 for the *t* test results for all argument structures.

Table 5.3. *t* test results for all argument structures (RVCT).

	t	df	Significance (2-tailed)	Mean Difference
Intransitive	1.079	58	.285	3.00
Transitive	2.614	58	.001*	10.69
Transfer	2.738	58	.008**	14.24
Complement	1.174	58	.245	5.04

*p<.05
**p<.01

In summary, no differences were found between the AAE and SAE participants in their understanding of intransitive and complement argument structures. Significant differences between the two populations were found in the transitive and transfer argument structures. Differences between AAE and SAE participants as it relates to

transitive and transfer argument structures will be examined more closely in the analysis of the question types.

Question 2a

Is there a difference between AAE and SAE participants in their comprehension as it relates to the six different question types for the RVCT?

A mixed-model ANOVA was used to determine if there was a difference between AAE and SAE participants that was related to the six question types presented to the participants. Four of the question types contained inflectional or derivational morphology (inflectional morphology: present progressive *–ing* and $-ed_{passive}$; derivational morphology: *-er* and *–able*) and two of the question types were designed to address the object of the complement (OC) and subject of the complement (SC) in the complement argument structure only.

To measure within-and between participants variables a mixed-model ANOVA was used. The within-participant variables were the six question types and the between-participants variables were dialect and age (see Table 5.4 for results). There were two main effects, one for age [$F(1, 54)=25.990$, $p<.001$] and one for dialect [$F(1, 54)=9.643$, $p< .05$). Hence, there were significant differences among the 4-, 5-, and 6-year olds. In addition, the main effect for dialect revealed differences between AAE and SAE participants. These results indicated that AAE and SAE speaking participants differed in their responses to the questions asked.

Results from the mixed-model ANOVA indicated a question types by dialect interaction [$F(5, 270)=4.723$, $p<.001$] and a question type by age interaction [$F(10, 162)=2.224$, $p<.05$]. Hence AAE and SAE participants differed significantly in their responses to the different question types. The question types by dialect interaction lead to a post-hoc analysis to determine which question type(s) were possibly causing the differences between the AAE and SAE participants. Figures 5.2 shows the mean

percentages of correct/expected responses for AAE and SAE participants for each question type

The post-hoc *t* tests revealed that the two groups did not differ significantly in their responses to question types one, two, four, five, and six. However, AAE and SAE participants did significantly differ in their responses to question type three [F (58)=3.452, p<.001]. Table 5.5 shows the results of the independent sample *t* tests for all question types.

Table 5.4. Mixed-model ANOVA for question types (RVCT).

Within-Participants Effects			
Source	df	F	Significance
Question Types (QT)	5	80.702	.000*
QT x Dialect (D)	5	4.723	.000*
QT x Age (A)	10	2.224	.017*
QT x D x A	10	.867	.564
Error	270	(394.051)	
Between-Participants Effects			
D	1	9.643	.003**
A	2	25.990	.000*
D x A	2	1.327	.274
Error	54	(861.402)	

*p<.001
**p<.05
Note: Values enclosed in parenthesis represent mean square errors.

Figure 5.2. Mean percentages of correct/expected responses for AAE and SAE participants for each question type (RVCT).

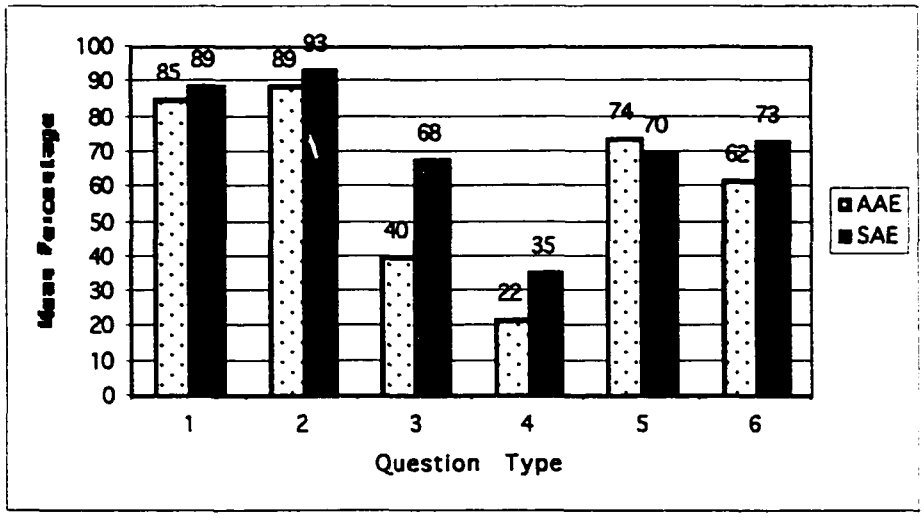


Table 5.5. *t* test results for all question types (RVCT).

Question Type	*t*	df	Significance	Mean Difference
1 (*-er*)	1.278	58	.206	3.830
2 (*ing*)	1.296	58	.200	4.880
3 ($-ed_{passive}$)	3.452	58	.001*	28.333
4(*-able*)	1.785	58	.080	13.254
5 (OC)	.666	58	.508	3.830
6 (SC)	1.348	58	.183	10.670

*p≤.001

Analysis of the NVCT

The NVCT was designed to test whether participants could transfer the skills displayed in the RVCT to the NVCT. In addition, the NVCT was intended to examine the psycholinguistic processing characteristics of fast mapping in assessing semantic knowledge in children.

The NVCT was similar in design to the RVCT. The same four argument structures that were used in the RVCT (intransitive, transitive, transfer, and complement) were also used in the NVCT. In addition, the same question types were used to assess comprehension of novel verbs to their argument(s). The novel verbs were selected from a

high-probability list of C-V-C items with phonetic patterns in English (Jusczyk, Luce, & Charles-Luce, 1994). See Appendix B for the complete list of sentences containing novel verbs and the questions presented.

Both AAE and SAE participants were randomly assigned to be administered either Form A or Form B of the NVCT. Each participant saw the same set of pictures, but were presented different argument structures for each particular picture set. For example, participants assigned to Form A heard an intransitive argument structure, whereas those participants assigned to Form B saw the identical picture set, but heard a transitive argument structure. In addition, when Form A participants heard a transfer argument structure, Form B participants saw the identical picture set, but heard a complement argument structure and visa versa. The use of the ambiguous pictures set, as described in Chapter 4, was designed to test the prediction that it is the argument structure the participants heard that led them to choose the meaning of the verb, not the picture. The relevant research questions for NVCT were questions 1b and 2b. The results for these questions follow.

Question 1b

Is there a difference between AAE and SAE participants in their comprehension as it relates to argument structure for the NVCT?

To examine whether differences existed between AAE and SAE participants among the four different argument structures, a mixed-model ANOVA was conducted. See Table 5.6 for results of the mixed-model ANOVA. As with the RVCT the within-participants variables were the four different argument structures and the between-participant variables were dialect and age. There was one main effect for this mixed-model ANOVA. There was a main effect for age [$F(2, 54)=6.529$, $p<.01$], indicating significant differences among the ages of the participants. A linear trend analysis was conducted to determine if there was a linear trend for age. The results of the linear trend analysis revealed a linear trend for age [$F(1, 57) = 1162.791$, $p<.001$]. The within-participant effects showed an argument structure by dialect interaction [$F(3, 152)=2.919$,

p<.05]. As in the RVCT this design was not "balanced" across argument structures, and likewise, all of the question types could not be asked across argument structures. Refer to Table 4.1 for the matrix of questions asked.

Table 5.6. Mixed-model ANOVA for argument structure for the NVCT.

Tests of Within-Participants Effects			
Source	df	F	Significance
Argument Structure (AS)	3	8.638	.000*
AS x Dialect (D)	3	2.919	.036**
AS x D x Age (A)	6	1.001	.427
Error	162	(380.457)	
Tests of Between-Participants Effects			
D	1	.529	..470
A	2	6.519	.003**
D x A	2	.090	.914
Error	54	(853.902)	

*p<001
**p<.01
Note: Values enclosed in parentheses represents mean square errors.

The argument structure by dialect interaction lead to post-hoc *t* tests to determine which argument structures were driving the differences between AAE and SAE participants. Figure 5.3 shows the mean percentages of correct/expected responses for the AAE and SAE participants for each argument structure.

Comparisons of the means were made using two-tailed independent sample *t* tests. The results of the *t* tests indicated that the transfer argument structure was the single argument structure that was driving the argument structure by dialect interaction. There was a significant difference between AAE and SAE participants in the transfer argument structure [F (58)=2..357, p<.05]. Refer to Table 5.7 for the *t* test results for all argument structures.

Figure 5.3. Mean percentages of correct/expected responses for AAE and SAE participants per argument structure (NVCT).

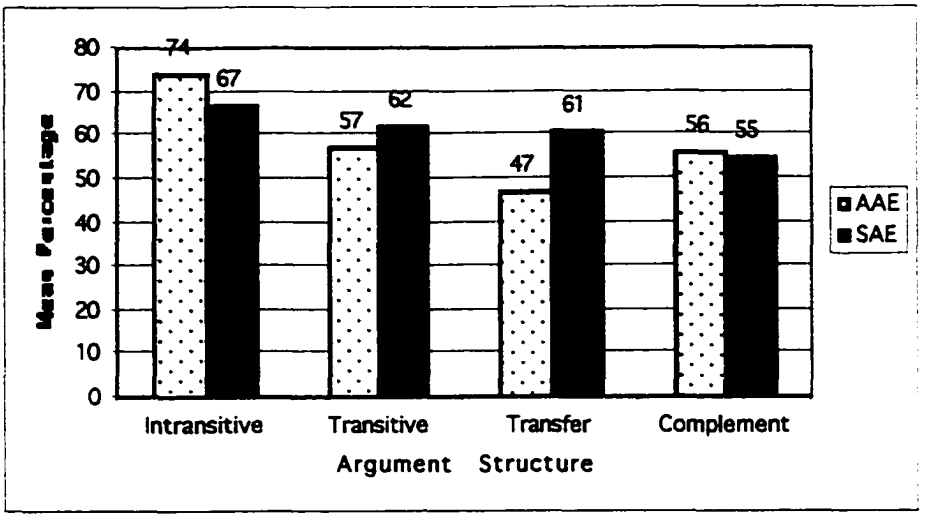


Table 5.7. *t* test results for all argument structures (NVCT).

	t	df	Significance (2-tailed)	Mean Difference
Intransitive	.959	58	.342	6.67
Transitive	.692	58	.492	4.31
Transfer	2.357	58	.022*	13.75
Complement	.089	58	.930	.42

*p<.05

In summary, results of the mixed-model ANOVA indicated an argument structure by dialect interaction. This interaction was caused by differences between the speakers of the two dialect groups in terms of their comprehension of the transfer argument structure. What might have been causing the difference in the transfer argument structure will be examined more closely in the analysis of the question types.

Question 2b

Is there a difference between AAE and SAE participants in their comprehension as it relates to the six different question types for the NVCT?

To answer this question, a mixed-model ANOVA was used to measure the between- and within-participant variables. The within-participant variables were the six different question types presented. The between-participant variables were dialect and

age. See Table 5.8 for the results of the mixed-model ANOVA. The results revealed a main effect for age [F (2, 54)=8.097, p<.001]. Hence, there were significant differences among the 4-, 5-, and 6-year olds.

Due to the fact that dialect group by question type variances were significantly different, follow-up *t* tests were conducted to identify which question type(s) accounted for the differences. Figure 5.4 represents the mean scores of the AAE and SAE participants for their responses to the six different question types.

Table 5.8. Mixed-model ANOVA for question types (NVCT).

Within-Participants Effects			
Source	df	F	Significance
Question Types (QT)	5	22.536	.000*
QT x Dialect (D)	5	2.378	.039**
QT x Age (A)	10	.715	.711
QT x D x A	10	1.531	.128
Error	270	(659.558)	
Between-Participants Effects			
D	1	1.012	.319
A	2	8.097	.001*
D x A	2	.401	.672
Error	54	(1329.621)	

*p<.001
**p<.05
Note: Values enclosed in parenthesis represent mean square errors.

The *t* tests revealed that there were significant differences between the speakers of the two dialect groups for question type three [$-ed_{passive}$; *t* (58)=2.172, p<.05] and question type four [*-able*; *t* (58)=2.174, p<.05]. Table 5.9 shows the results of the independent sample *t* tests for all types.

Figure 5.4. Mean percentages of correct/expected responses for AAE and SAE participants for each question type (NVCT).

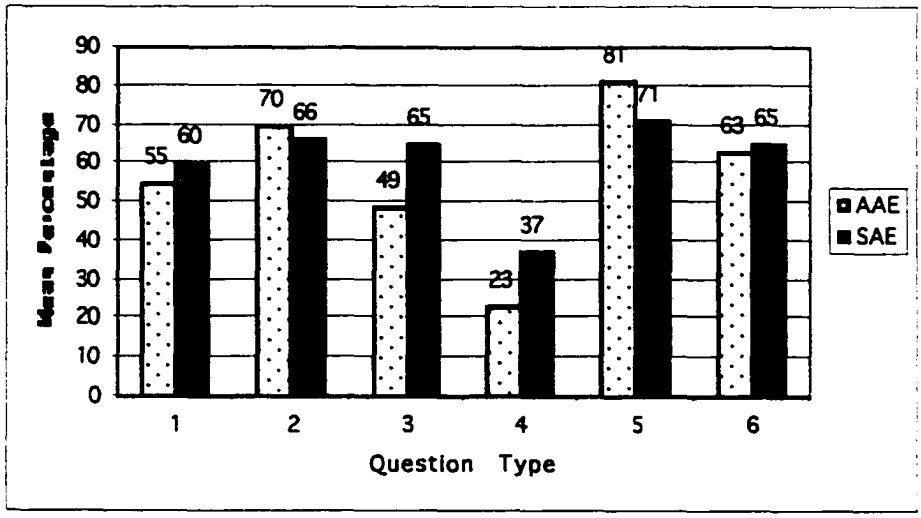


Table 5.9. *t* test results for all question types (NVCT).

Question Type	*t*	df	Significance	Mean Difference
1 (*-er*)	.865	58	.391	4.166
2 (*ing*)	.914	58	.364	5.416
3 ($-ed_{passive}$)	2.172	58	.034*	16.666
4(*-able*)	2.174	58	.034*	13.611
5 (OC)	1.196	58	.237	10.000
6 (SC)	.163	58	.871	1.670

*p<.05

Analysis of the PPVT-III

Three questions were posed to examine the performance status of the two dialect groups on the PPVT-III as it relates to the participants' performance on the two experimental tasks. These questions are important to the current study because they address (1) the extent to which the experimental tasks and the PPVT-III are measuring comparable semantic knowledge, and (2) the extent to which commonly reported performance differences between AAE and SAE children on the PPVT-III may be attributed to inherent bias in properties of the test. The three questions and the results obtained are presented below.

Question 3a

Is there a relationship between the PPVT-III and the comprehension tasks for all argument structures and question types in the RVCT for both AAE and SAE participants?

A correlation analysis was conducted to see if there was a relationship between the PPVT-III and the RVCT for both groups. To conduct this analysis the two dialects, six question types, and argument structures were collapsed together. The purpose was to obtain as complete a picture regarding the relationship between the two variables. The results of the correlation analysis indicate that there was a relationship between the PPVT-III and the RVCT. Refer to Table 5.10 for the results of the correlation analysis.

Table 5.10. Results of correlation of PPVT-III and RVCT.

		PPVT-III
RVCT	Pearson Correlation	.312
	Significance (2-tailed)	.015*
	N	60

This finding implies that both the PPVT-III and the RVCT assess similar processes. The PPVT-III is a standardized tool that assesses acquired lexical knowledge. The RVCT was designed to assess knowledge of acquired verbs; more specifically, the knowledge of the relationship of familiar verbs to their arguments. In essence, the similar process that is being tapped into by both the PPVT-III and the RVCT is acquired semantic/lexical knowledge.

In order to examine a specific relationship between the PPVT-III, the RVCT and the two dialects, additional correlation analyses were computed. These analyses revealed no significant relationship between the PPVT-III and the RVCT for AAE speakers. Nor was there a relationship found between the PPVT-III and the RVCT for SAE speakers (see Table 5.11). The lack of the significant relationship between the PPVT-III and RVCT for dialect may be attributed to the relatively small size of the two sample groups.

Table 5.11. Results of correlation for PPVT-III and RVCT by dialect.

		PPVT-III
RVCT/SAE	Pearson Correlation	.293
	Significance (2-tailed)	.116
	N	30
RVCT/AAE	Pearson Correlation	.253
	Significance (2-tailed)	.117
	N	30

Correlations were not significant

Question 3b

Is there a correlation between the PPVT-III and the comprehension tasks for all argument structures and question types in the NVCT for both AAE and SAE participants?

A correlation analysis was used to examine whether a relationship existed between the PPVT-III and the NVCT. The dialects, question types, and argument structures were collapsed together to conduct this analysis. The rationale for this was to determine if a relationship existed between the two variables (PPVT-III and NVCT). The results of the correlation analysis indicated that there was not a statistically significant correlation between the PPVT-III and the NVCT (see Table 5.12 for results). This implies that the NVCT is tapping into a slightly different process than the PPVT-III. As previously mentioned, the PPVT-III assesses acquired lexical/semantic knowledge. The NVCT was designed to assess one's ability to acquire meaning from new verbs. Both the PPVT-III and the NVCT are assessing semantic knowledge in children, but in slightly different ways. The PPVT-III is assessing acquired lexical/semantic knowledge and the NVCT is assessing the ability to acquire lexical/semantic knowledge.

Table 5.12. Correlation of PPVT-III and NVCT.

		PPVT-III
NVCT	Pearson Correlation	.170
	Significance (2-tailed)	.195
	N	60

Correlation was not significant

Additional correlation analyses were conducted to examine a possible relationship between the PPVT-III and the NVCT and the two dialect groups represented in this study. Results suggested no significant relationship between the PPVT-III and the NVCT for either AAE or SAE participants. The lack of a significant relationship may be attributed to the relatively small size of the two sample groups. Refer to Table 5.13 for the results of the correlation between the PPVT-III and the NVCT by dialect.

Table 5.13. Correlation of PPVT-III and NVCT by dialect.

		PPVT-III
NVCT/SAE	Pearson Correlation	.094
	Significance (2-tailed)	.612
	N	30
NVCT/AAE	Pearson Correlation	.258
	Significance (2-tailed)	.168
	N	30

Correlations were not significant

Question 4

Is there a difference between AAE and SAE participants' performance on the PPVT-III?

The AAE and SAE participants ranged in age from 4:0-6:11. The participants in both dialect groups displayed intellectual functioning within normal limits as indexed by a score of 85 or above on the Columbia Mental Maturity Scale (CMMS; Burgemeister, Blum, & Lorge, 1972). The two dialect groups differed in language performance on the PPVT-III as observed by the data. On the PPVT-III some AAE participants received scores below one standard deviation below the mean of 85; whereas each SAE participant

received scores above 97. Table 5.14 contains a summary of the PPVT-III and CMMS scores.

Table 5.14. Summary of PPVT-III and CMMS scores for AAE and SAE participants.

	AAE Participants (N=30)			SAE Participants (N=30)		
	M	SD	Range	M	SD	Range
PPVT-III[a]	97.67	11.37	70-126	110.17	11.13	97-136
CMMS[b]	99.96	7.74	86-118	105.50	10.69	90-137

[a]Peabody Picture Vocabulary Test-III, Standard Score reported.
[b]Columbia Mental Maturity Scale, Age Deviation Score reported.

The AAE participants' performance on the PPVT-III in this study mirrors the findings from the Washington and Craig (1999) study. In the Washington and Craig study and the present study, the African American participants displayed a normal distribution. In addition, the mean scores for African American participants for both studies were within normal limits. The mean score for the Washington and Craig study was 91, whereas the mean score for the AAE participants in this study was 97. Although in the present study, the scores were normally distributed for the AAE speaking participants, the scores for the SAE speaking participants were skewed to the left. See Table 5.15 for the skewness statistics for the AAE and SAE speaking participants. The skewness statistic for AAE speaking participants indicates a normal distribution.

Table 5.15. Skewness statistics for AAE and SAE participants for PPVT-III.

Dialect	Statistic	Standard Error
AAE	-.237	.427
SAE	.870	.427

This chapter provided analyses and results of two comprehension tasks; one of which involved fast mapping (NVCT). This chapter revealed the similarities and differences in fast mapping the meanings of novel verbs for four different argument structures in AAE and SAE speaking children. The following chapter will discuss the theoretical and clinical implications of these results and the limitations of the study.

CHAPTER VI

DISCUSSION

The purpose of this investigation was to construct a means to assess semantic competency in children using the processing-dependent measure of fast mapping. This was accomplished through two experimental comprehension tasks involving real and novel verbs. The experimental comprehension task involving real verbs (Real Verb Comprehension Task [RVCT]) was designed to determine if AAE and SAE participants understood four argument structures (intransitive, transitive, transfer, and complement). In addition, the RVCT served as a control for the Novel Verb Comprehension Task (NVCT), that is, it was included to determine whether the participants could carryover their performance on the experimental tasks from real to novel verbs.

In this chapter, the results of this investigation are discussed. The format for the discussion follows the material that was presented in Chapter 5. Each of the experimental questions will be presented followed by a discussion of the associated test results. For purposes of clarification and further explanation, some additional analyses are provided. Also, a discussion of clinical implications and limitations of the study and the conclusions are provided.

RVCT and NVCT Argument Structure Analysis

Argument Structure Differences

Significant differences were found between AAE and SAE participants in their comprehension as it related to two argument structures (transitive and transfer) for the RVCT. However, no significant differences between AAE and SAE participants were found for the intransitive and complement argument structures. With respect to the

NVCT, only performance on the transfer argument structure task was significantly different between the two dialect groups.

An important finding in this study was the fact that AAE and SAE participants were able to transfer their knowledge from the RVCT to NVCT and fast map verb meanings from argument structures. Evidence that participants were able to fast map verb meanings from argument structures is supported by the relatively high NVCT mean percentages of the expected responses for the intransitive (AAE: 74; SAE 67), transitive (AAE: 67; SAE 62), and complement (AAE: 56; SAE 55) argument structures. Although, the mean percentage of expected responses for NVCT transfer argument structure is relatively high for SAE participants (67), the mean percentage of expected responses of the AAE participants was considerably lower (47). As reported earlier, significant differences were found between AAE and SAE participants for NVCT transfer argument structure. Thus, in the case of the transfer argument structure for AAE speakers, the evidence for fast mapping is less clear. This issue will be explored further in this chapter.

Question Type Analysis for RVCT and NVCT

Question Type Differences

The finding that differences existed between AAE and SAE speakers regarding the six different question types helps explain why differences were found between the participating groups for argument structures. No significant differences were found for question types one (*-ing*), two (*-er*), five (OC), and six (SC). Significant differences were found between AAE and SAE participants for question types three ($-ed_{\text{passive}}$) and four (*-able*). While significant differences were found for question type four (*-able*), it must be noted that the performance for both the AAE and SAE participants was considered to be poor. The mean percentages of expected responses across RVCT and NVCT for the AAE and SAE participants were 22% and 36%, respectively.

The decreased performance for these participants on *–able* may be characteristic of development. For typically developing children, explicit knowledge of some suffix meanings is in place by preschool age (Clark & Cohen, 1984), with increasing knowledge occurring during the school years (Windsor, 1994). Windsor (1994) showed that comprehension accuracy of *–able* for 5th through 8th graders was significantly higher than that of third through fourth graders.

As noted above, the only differences between the AAE and SAE participants were noted for the transitive and transfer argument structures for the RVCT and the transfer argument structure for the NVCT. Question type three ($-ed_{passive}$) appeared to be driving the differences on these three measures between the two populations. The mean differences between AAE and SAE participants for this question type were relatively large for the transfer argument structure compared to the other question types in both the RVCT and NVCT. These differences were 28.33 and 16.66, respectively (see Tables 5.5 and 5.9).

Because of the semantic nature of question type three, containing the bound morpheme $-ed_{passive}$, the expected response was the object.

> Example:
> Stimulus: The mailman is handing the letter to the girl.
> QT-4: Which one got handed? (expected response: letter)

However, when the raw data from the RVCT and NVCT were examined, it was noted that a relatively large number of AAE participants would reply with the recipient choice. Following the above example the recipient choice would be "girl." Forty percent (N=12/30) of the AAE participants supplied a recipient response, whereas only 17% (N=5/30) of the SAE participants supplied the recipient response. Due to this large mean difference further investigation and analysis of "recipient responses" was warranted.

To see if a significant difference between the two participant groups would remain when the recipient choice was recoded as "correct" for AAE and SAE participants, a mixed-model ANOVA was conducted. The within participants variable

was recipient choice and the between-participant variables were dialect and age. Although an age effect was found [F (1, 54)=12.733, p< .001], no significant difference now existed between AAE and SAE participants (see Table 6.1).

Table 6.1. Mixed-model ANOVA for recipient choice (RVCT and NVCT).

Tests of Within-Participants Effects			
Source	df	F	Significance
Recipient Choice (RC)	1	.910	.344
RC x Dialect (D)	1	.082	.776
RC x D x Age (A)	2	.555	.577
Error	54	(366.481)	
Tests of Between-Participants Effects			
D	1	3.521	.066
A	1	12.733	.000*
D x A	2	1.468	.239
Error	54	(1296.111)	

*p<.001
**p<.01
Note: Values enclosed in parentheses represents mean square errors.

Dialect and/or developmental factors may be the explanation for these results on recipient responses. In order to explore this possibility further, 16 adult AAE and SAE speakers (8 AAE; 8 SAE) were surveyed. Each adult participant was administered the RVCT and NVCT in the same manner as the younger participants. However, after both tasks were completed the adults were asked if there was another possible response for each type three question (*-ed* $_{\text{passive}}$), transfer argument structures only. Results showed that 100% of AAE and SAE adult speakers initially responded with the expected object choice (letter). But when asked for another possible response, 30% of the responses offered by AAE speakers and 25% of the responses offered by SAE speakers indicated that the subject choice (i.e., girl) could be an optional answer.

Although lacking certain controls, the results of this informal survey suggest an apparent dialect effect in the difference in response patterns between the two dialect groups. However, even more dramatic is the contrast between children's responses and the adults' responses. The initial 100% selection by adults of the object choice compared

with children's 40% initial choice for the non-object (girl) implies that the child AAE speakers still may be in a developmental stage.

Support for the developmental claim may be found in the work of Randall (1987). Randall suggested that dativizable verbs are represented as having two obligatory internal arguments. Dative verbs can be defined as verbs that designate the recipient of an object or action with or without a preposition (Bloom & Lahey, 1988). All of the transfer argument structures presented to the participants contained three arguments:

The mailman(1) handed the letter(2) to the girl(3).

The dative verb, *hand*, has two obligatory arguments. Therefore, one of the arguments has to be optional. The next step is to see which argument is optional.

Dativizable verbs specify both their objects as obligatory arguments (Randall, 1987). Since predicates and their obligatory arguments are adjacent within a phrase, optional arguments are typically outside of the phrase (Jackendoff, 1977; Pinker, 1989). Using the above example in combination with the proposed theory, *mailman* and *letter* would be the obligatory arguments and *girl* would be optional.

One possible explanation for the increased recipient responses given by child AAE speakers is that the third argument holds equal status, and therefore, is just as available as a viable answer to question type three, "Which one got handed?" In addition, with increased maturation and possible exposure or access to SAE in the schools, the third argument looses its equal standing. Hence, responses to question type three would be more similar to SAE responses with increased age.

Another assumption is related to the semantic properties of dative verbs. For dative verbs, the referent of the second object must eventually be possessed by the referent of the first object. In the sentence, "The mailman_X handed the letter_Y to the girl_Z"

the girl (second referent) gets the letter (the object). In essence, double-object dative verbs use an X causes Y to have Z thematic argument structure (de Villiers & de Villiers, 1999).

There is a general assumption that you can transform

(a) X handed Y to Z (The mailman handed the letter to the girl)

into

(b) X handed Z, Y. (The mailman handed the girl the letter; Erteschik-Shir, 1979).

In the thematic argument structure (b), all three arguments have equal status.

It is possible that in AAE more dative verbs allow the (a) to (b) transformation. Hence, when the question "Which one got handed" is asked, AAE speakers are not making the mistake of thinking the answer is the subject, but they presume that Y_{letter} is assumed and therefore answer Z_{girl}. The differences noted between AAE and SAE speakers may be attributed to the fact that child SAE speakers treat (a) as the default and child AAE speakers use (b) as the default allowing more transformation for dative verbs. With increased maturation and possible exposure or access to SAE in the schools, the default parameter may be "reset" for AAE speakers and responses to question like type three ($-ed_{passive}$) would be more similar to SAE.

Another possibility is that AAE can leave out the indirect object (i.e., letter) as in Asian languages. Asian languages have more flexibility in regards to leaving things unsaid and relying on the context to fill in the blanks. This context-sensitivity is considered a "hot" language (Huang, 1982). The PRO-drop parameter, as in Spanish languages, permits deletion of subject pronouns because the verb has a marker on it that indicates what the subject would be, whereas Asian languages lack that marking on the verb, and drop the subject because it is assumed in context. Therefore, there appear to be two types of PRO-drop:

1. Asian-type languages where the subject is dropped because it is given by context (i.e., "hot" language), and

2. Spanish-type languages where the grammatical marking is on the verb so one can drop the subject because it is grammatically marked elsewhere (i.e., "cool" language).

Hence, if AAE is similar to Asian languages in that it can omit the indirect object and SAE, a "cool" language, cannot, then it may be possible that the Asian parameter is a default initially for all languages. The parameter may be set against the Asian parameter for SAE speakers, but AAE speakers retain it. Again, with additional exposure to SAE the parameter becomes reset for AAE speakers. The two assumptions presented are made in the absence of other evidence and are worthy of further exploration.

PPVT-III Comparison

PPVT-III Differences

A significant relationship was found between PPVT-III and performance on the RVCT, but no such relationship existed between the PPVT-III and the NVCT. Moreover, no relationship was found between PPVT-III and the RVCT for either the AAE or SAE group when viewed separately. This finding of a no relationship for either dialect also prevailed for the NVCT. The finding of a relationship between PPVT-III and the RVCT with dialect group scores combined, but no difference for either dialect group viewed separately, may be due to small sample size of the dialect groups.

The comparisons between the PPVT-III to the experimental tasks were made because presumably all three tasks tap into lexical/semantic knowledge. The RVCT was a processing-dependent task designed to assess lexical knowledge of familiar/acquired verbs. Because the PPVT-III assesses acquired lexical/semantic knowledge, this implies that the PPVT-III and RVCT are assessing similar processes, which was supported by the correlation analysis ($r = .312$, $n=60$, $p < .05$). The positive relationship between the PPVT-III and the RVCT implies that they both assess similar, or at least related, processes. The PPVT-III is a standardized tool that assesses acquired lexical knowledge. The RVCT was

designed to assess knowledge of acquired verbs; more specifically, the knowledge of the relationship of familiar verbs to their arguments. In essence, the similar process that is being tapped by both the PPVT-III and the RVCT is acquired semantic/lexical knowledge.

On the other hand, the PPVT-III and NVCT did not show a significant relationship ($r = .170$, $n=60$, $p > .05$), suggesting that they assess slightly different aspects of semantics. The NVCT was designed to assess the capacity to acquire lexical/semantic knowledge. As a follow-up to the correlation analysis a multiple regression analysis was conducted to see if the scores received by the participants could be predicted by the dialects represented in the experimental task. Included in the multiple regression equation were age, dialect (AAE or SAE), NVCT, and PPVT-III. Results of the multiple regression showed that it did not matter if the participants were AAE or SAE speakers; the dialect spoken does not moderate the relationship between the PPVT-III and the NVCT. There was no reliable relationship between the PPVT-III and the NVCT (see Table 6.2). However, it is conceivable that there were variables that may have influenced these findings (i.e., the lack of a relationship) and if these variables were included in the equation significance would have been found. This lack of relationship continues to lend support to the premise that the NVCT and PPVT-III are measuring slightly different processes.

Table 6.2. Results of the multiple regression analysis (PPVT-III and NVCT).

Coefficients	Standard Error	*t*	Significance
Dialect	10.996	1.593	.117
NVCT	.282	.067	.947
Age	1.726	.160	.874

If in fact there is a different semantic knowledge represented in the two tasks, (i.e., the PPVT-III versus the NVCT), the question arises as to which test is more valid in measuring semantics in speakers of AAE. Relevant to this question is the finding that the

AAE group performed significantly poorer than the SAE group on the PPVT-III. In fact, the AAE participants' performance on the PPVT-III in this study mirrors the findings from the Washington and Craig (1999) study. In the Washington and Craig (1999) and present study, the African American participants' scores for the PPVT-III displayed a normal distribution. Although the scores were normally distributed, both groups of participants' scores were skewed to the left. See Table 5.15 for the skewness statistics for the AAE and SAE speaking participants. The mean score for the Washington and Craig study was 91, whereas the mean score for the AAE participants in this study was 97.

It must be noted that the PPVT-III also measures receptive knowledge of nouns as well as verbs. It is possible that the performance of the AAE participants on the subset of verb items the PPVT-III for verbs only would closely match their performance on the NVCT. However, this analysis was not competed. An important distinction between PPVT-III and the NVCT is the variable of fast mapping. Tasks such as fast mapping are intended to be more dependent on psycholinguistic processing, and less dependent on language knowledge than most tasks found in standardized language tests (Campbell, Dollaghan, Needleman, & Janosky, 1997). Processing-dependent tasks have been used as a means to reduce test bias when assessing the language skills of African American children. Dollaghan and Campbell (1998) have identified non-word repetition, which is a processing-dependent measure, as a culturally fair procedure for assessing at-risk African American children as it does not penalize them for their possible lack of world knowledge. Hence, processing-dependent measures, such as fast mapping, may prove to be superior to knowledge-based measures (i.e., PPVT-III) when attempting to identify speakers whose poor language performance reflects psycholinguistic deficits, rather than different experiential and cultural backgrounds (Campbell et al., 1997).

In order to examine the efficacy of the fast mapping task more closely, all task scores were converted to standardized (z) scores. The z scores were a subset of the experimental comprehension tasks. In order to have as complete and balanced an analysis

as possible; all four of the argument structures and question types one (*-er*) and two (*-ing*) were included. The three figures that follow represent standardized (*z*) scores comparing the two language groups for:

1. combined RVCT and NVCT conditions and the PPVT-III (see Figure 6.1);
2. the RVCT condition and the PPVT-III (see Figure 6.2); and
3. the NVCT condition and the PPVT-III (see Figure 6.3).

It should be noted that the difference between the *z* scores of the AAE and SAE participants for the NVCT (Figure 6.3) subset is almost nonexistent.

It was noted that there was an obvious transference of skills from the RVCT to the NVCT (Figure 6.4). The *z* score analysis is further evidence of this transference. The difference between the *z* scores of the AAE and SAE participants for the RVCT was minimal; and the difference between the two groups on the NVCT was virtually non-existent (see Figure 6.4). It appears as though the participants' performance increased in the NVCT. This apparent increase in performance may be attributed to the decreased number of trials presented during the NVCT.

Figure 6.1. Standardized (z) scores for AAE and SAE participants comparing combined RVCT and NVCT conditions and PPVT-III.

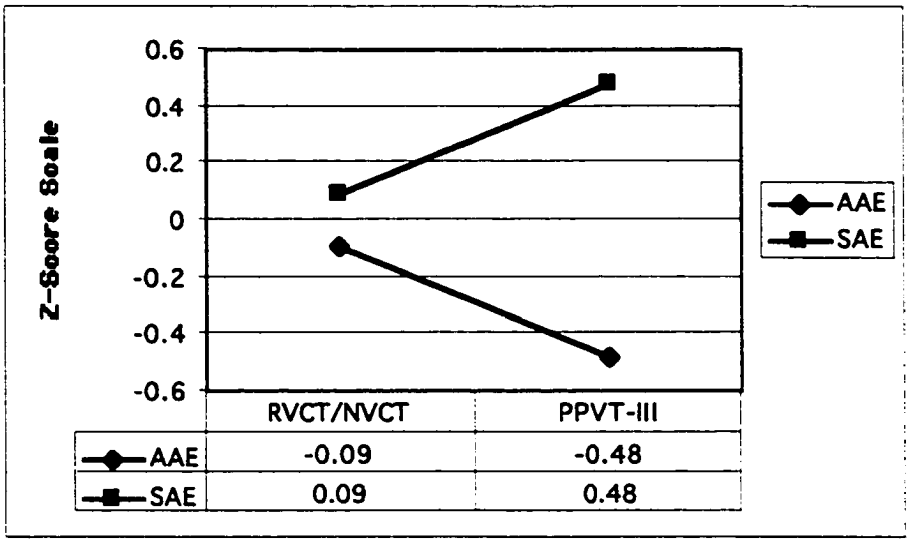


Figure 6.2. Standardized (z) scores for AAE and SAE participants comparing RVCT and PPVT-III.

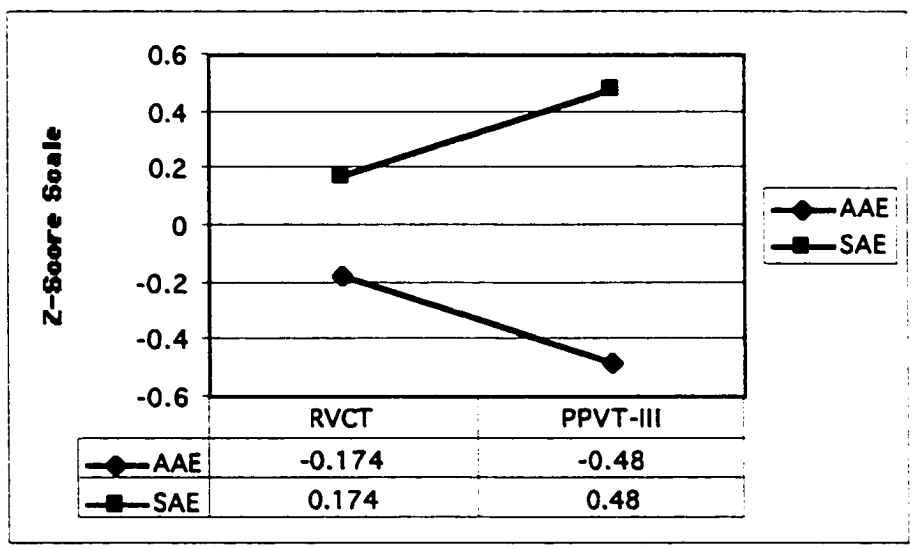


Figure 6.3. Standardized (z) scores for AAE and SAE participants comparing NVCT and PPVT-III.

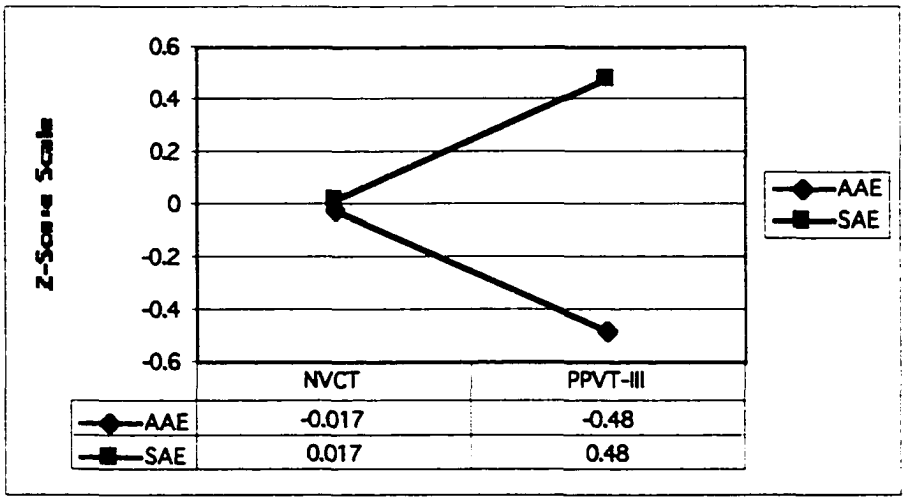
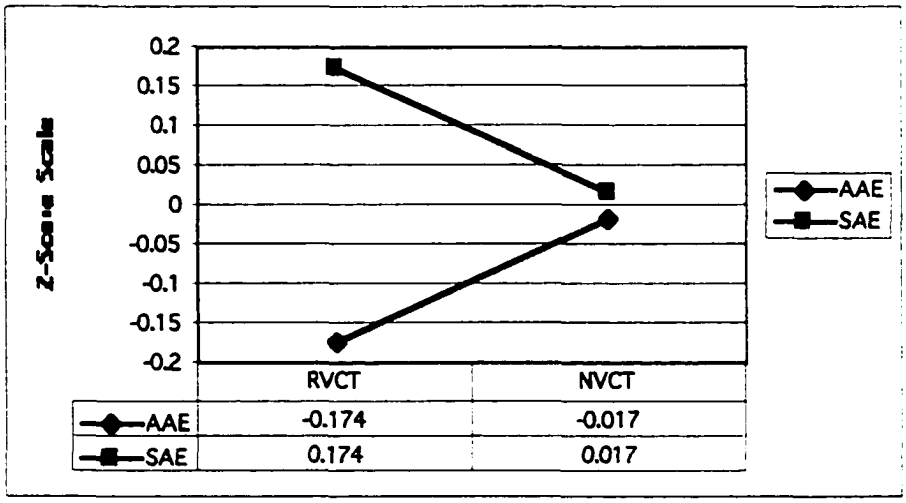


Figure 6.4. Standardized (z) scores for AAE and SAE participants for the RVCT and NVCT.



The participants' ability to fast map novel verbs further supports the theory of syntactic bootstrapping. Gleitman (1990) and Landau and Gleitman (1985) proposed that children learn verb meaning from the syntactic frames in which the verb appears. Naigles (1990) tested this and found that syntactic bootstrapping accounted for how children learned novel verb meanings. The present study demonstrates that children have the skills

to fast map verb meanings from intransitive, transitive, transfer, and complement argument structures.

Although the participants performed at varying levels of accuracy, they were able to obtain some information about the novel verbs' meaning. In this study information about the verbs' meaning could not be obtained through the pictures presented because ambiguity between the contrasting argument structures (intransitive/transitive and transfer/complement) were built in each picture set. Therefore, the only information that was initially available to the participants was the stimulus sentence.

In summary, the results of the RVCT revealed what the participants knew regarding the verbs' argument structures and what knowledge they possessed about the bound morphemes incorporated into four of the six question types. In general, results of this study indicated that AAE participants might prefer verbs. This is based on their performance on the RVCT (constructed exclusively of verbs) to the PPVT-III (comprised of nouns, adjectives, and verbs). The results of the NVCT demonstrated the participants' initial understanding of the argument structures in addition to their knowledge regarding bound morphology. However, they did not obtain the full meaning of the novel verbs from only the argument structures. The picture set(s) presented and context assisted them in obtaining their representations of the meaning of the verbs.

Clinical Implications

It is clear from this study that a performance gap continues to exists between AAE and SAE speakers on the PPVT-III. The PPVT-III mean standard score for AAE participants was lower than the mean score for the SAE participants in the current study. Specifically, the mean standard score for the AAE participants was 97 with a standard deviation of 11.37. The mean standard score for the AAE participants was 110 with a standard deviation of 11.13. The mean performance of AAE and SAE participants was characteristic of performance at the 42nd and 75th percentiles, respectively. Hence, despite

efforts by test developers to decrease inherent test bias (i.e., establishing a review panel of minorities to review items that might have been biased and including African Americans in the standardization population), significant performance differences between AAE and SAE speakers continues to be visible.

Contrary to conclusions drawn by Washington and Craig (1999), the PPVT-III does not seem to be a "culturally fair instrument" (p. 75) that is appropriate to administer to at-risk African American children. The performance difference exhibited by African American children in the Washington and Craig study (1999) and the present investigation support this contention. Moreover, until the performance spread is nonexistent between AAE and SAE population, the PPVT-III should not be administered to AAE speaking children.

Even using the PPVT-III and accepting lower norm levels for African American children is unacceptable. Such an approach can have very negative outcomes. In accepting lower norms for any group of people implies that lower test scores are indicative of lower potential. Also, such an approach can contribute to a self-fulfilling prophecy of lower expectations and reinforce a "genetic-inferiority argument" or deficit perspective (Vaughn-Cooke, 1986).

The comparison of lexical development (e.g., Hart & Risley, 1995) versus semantic relations (e.g., Stockman & Vaughn-Cooke, 1982b, 1986,) is in some ways like comparing apples to oranges. A deeper understanding of argument structure and semantic relations is masked by this superficial awkward comparison. Argument structure (various elements of a sentence that are set in relation to one another by a verb) is closely related to semantic relations (semantic concepts and cause-effect relations). Hence, argument structure is preserved across cultures and socioeconomic status; whereas lexical knowledge is subject to cultural variation. This has implications for children with language disorders. Children with true language disorders will display difficulty comprehending the relationship of the verb to its argument(s). The diagnosis of children

as language impaired, particularly child AAE speakers, based on lack of lexical knowledge is less accurate due to possible cultural influences (i.e., exposure to certain terms).

Based on the findings of this study, one possible option for testing semantics in AAE speaking children is to use fast mapping tasks. Clearly, further research into the nature of fast mapping verb meaning from argument structure in AAE and SAE children is warranted. However, information obtained in this investigation should add to the theoretical knowledge of syntactic bootstrapping in both AAE and SAE speaking children. Although previous studies (i.e., Gleitman, 1990; Landau & Gleitman, 1985; Naigles, 1990) used participants under the age of three, the results of this investigation indicated that there is a potential to use this procedure with older children. In addition, this investigation revealed differences between AAE and SAE speakers for dative verbs in argument structure. This particular finding is definitely worthy of further investigation.

Furthermore, the results of this investigation support the notion that processing-dependent measures may be more suitable than knowledge-based measures in identifying speakers whose poor language performance is an indication of psycholinguistic deficits, rather than different experiential and cultural backgrounds. This was illustrated by the performance differences displayed by the AAE and SAE participants' comprehension of the argument structures and their performance similarities on the NVCT. The diagnosis of language impairment should not be based on language tests that identify differences in background and experiences in minority populations; but rather on tests that assess differences in fundamental psycholinguistic abilities (Campbell et al., 1997).

As an effective and non-biased diagnostic tool of semantic competency in children, a task such as the NVCT holds considerable promise. It is well documented that processing-dependent measures can be used to differentiate children with language disorders (i.e., those children whose poor language performance is a result of fundamental psycholinguistic deficits) from those with language differences attributable

to differing experiential backgrounds (Campbell et al., 1997; Weismer, Tomblin, Zhang, Buckwalter, Chynoweth, & Jones, 2000). However, certain considerations need to be made in designing an unbiased semantic competency.

The fact that no differences were found for intransitive, transitive, and complement argument structures and question types one (*-er*), two (*-ing*), five (OC), and six (SC) on the NVCT suggests that these structures could be included on an assessment instrument that could be free of cultural bias. The inclusion of question type four (*-able*) would not be recommended for diagnostic consideration for two reasons. First, significant differences were detected for this question type between AAE and SAE participants on the NVCT. Second, the performance of both participant groups was noted to be less than 50% on this question type on the RVCT and the NVCT. Because performance was decreased on question type four, (*-able*) may not be a suitable item for differential diagnosis (i.e., language normal from language disordered).

Another recommendation for development of diagnostic tools would be to not incorporate question type three ($-ed_{passive}$). Significant differences were noted between the two dialect groups for this question type in the transfer argument structure. Due to the performance differences noted in the present investigation, question type three ($-ed_{passive}$) may not be a useful item for the purpose of differential diagnosis.

Results of these investigations have supported the inclusion of verb usage in a comprehensive language evaluation for. Watkins, Rice, and Moltz (1993) showed that preschool-age children with SLI used a more limited variety of verbs than MLU-matched controls as well as age-matched controls, though the verbs that they did use frequently (e.g., *do* as a main verb, *go get*, *put*, *want*) were also among the most frequently used by both control groups. These types of discrepancies between children with SLI and MLU/age controls have not been found for other types of words; indeed, verbs appear to be salient items in diagnosing language impairment in this population.

On a deeper level, fast mapping verb meaning connects to one's ability to learn vocabulary, especially verbs, in not just what has been acquired, but the extent to which scaffolding take place. Presumably, fast mapping is the first step to developing an initial guess of word meaning; however, processes, such as contrast and conventionality (Clark, 1993), may be also be helpful. These two principles work together such that the speaker and listener (language learner) agree that the speaker is communicating an intended meaning to the listener (language learner). Hence, the language learner can continue to constrain the meaning of a novel term by following up on the speaker's intended meaning. The follow-up may be contingent upon what the language learner already knows. For example, *give* and *get* are two verbs that describe the same transfer of possession between two parties; however, the mental perspective of the speaker separates the meanings of these two verbs. Research has shown that the meaning is likely to be fixed if language learners take advantage of the clues provided in the structure of the sentence (syntactic bootstrapping) as opposed to interpreting the set of verb doublets. In essences, lexical acquisition is dependent upon a myriad of components, of which fast mapping is the initial phase.

Limitations of the Study

The purpose of this investigation was twofold: (1) to ascertain information about the nature of fast mapping verb meaning from argument structure; and (2) to determine if fast mapping is a viable tool to reduce assessment bias of semantic knowledge. These objectives were met. However, there were limitations with some of the picture designs and how subjects were matched across age which warrant further discussion.

The purpose of the three-picture sequence was to simulate a movie event. During the administration of the RVCT and NVCT, it was observed that a number of participants, both AAE and SAE, would point to the middle picture after the sentence was presented. I perceived this action as the participants interpreting the middle picture as the

one that best represented the presented "movie". It is possible that this extra processing affected their responses. Perhaps the participants initially became involved with choosing the picture that depicted the stimulus sentence, but when the questions were presented, they had to redirect themselves to a different task.

Although it is possible that pointing to the middle picture may have affected their responses, the relatively high mean scores for the experimental tasks across participants does not support this prospect. However, to reduce any imaginable negative effects, one picture that depicts the action could be presented to the children. This adjustment could improve the task and not compromise the goal of the task.

The other limitation noted refers to the number of subjects. Preferably, groups of matched subjects larger than 10 across ages for both dialect groups would have provided a more representative sample population. This might have made for a stronger and more precise inference of what occurred among and between subject groups. It is possible that a larger data set would permit a clearer picture about what was occurring between AAE and SAE participants regarding the transfer argument structure. However, all of the judgements offered as explanations of what AAE speaking children were doing with dative verbs have been scrutinized carefully and offered as possible explanations.

Conclusion

This study has been concerned with investigating an alternative method to traditional methods of assessing semantic knowledge in children. This research was based on documentation that processing-dependent measures reduce assessment bias in minority children. AAE and SAE speaking participants were selected from working class backgrounds from Hartford, CT and Turners Falls, MA, respectively. Two experimental fast mapping comprehension tasks involving real (RVCT) and novel (NVCT) verbs were administered to 60 participants (30 AAE; 30 SAE). These two comprehension tasks incorporated four different argument structures (intransitive, transitive, transfer, and

complement) and six different question types. In addition, the participants' performances on the comprehension tasks were compared to a traditional standardized vocabulary test (PPVT-III).

Among the findings were:

1. Significant differences existed between AAE and SAE speakers for transitive and transfer argument structures on the RVCT;
2. Significant differences between AAE and SAE speakers for transfer argument structures on the NVCT;
3. Significant differences between AAE and SAE speakers for question types three (*-ed* $_{passive}$) and four (*-able*) on the RVCT;
4. Significant differences between AAE and SAE speakers for question type three (-ed $_{passive}$) on the NVCT;
5. Significant differences between AAE and SAE speakers on the PPVT-III; and
6. No significant differences between RVCT and NVCT when balanced for question type.

Children from different language and dialects groups have different grammars. These differences need to be captured in a assessment procedure that can accommodate the similarities among language and cultural groups so the behaviors being tested are free from bias (Seymour, 1992). Research of this nature can be conducted to document the underlying principles of language. This type of documentation can be implemented into clinical methods for evaluating children's capacity to acquire lexical knowledge.

APPENDIX A

REAL VERBS

Intransitive:

1. The dog is barking.
   a. Which one was the barker
   b. Which one was barking?
   Foil: Which one was in the tree?

2. The lady is yawning.
   a. Which one was the yawner?
   b. Which one was yawning?
   Foil: Which one was she watching?

3. The girl is sleeping.
   a. Which one was the sleeper?
   b. Which one was sleeping?
   Foil: Which one was she sleeping in?

4. The man is mopping.
   a. Which one was the mopper?
   b. Which one was mopping?
   Foil: Which one did he use to mop?

5. The boy is skating.
   a. Which one was the skater?
   b. Which one was skating?
   Foil: Which one did he wear on his feet?

Transitive:

1. The woman is pouring is pouring the juice.
   a. Which one was the pourer?
   b. Which one was pouring?
   c. Which one was pourable?
   d. Which one got poured?
   Foil: Which one did she pour the juice in?

2. The man is polishing the shoes.
   a. Which one was the polisher?
   b. Which one was polishing?
   c. Which one was polishable?
   d. Which one got polished?
   Foil: Which one was watching?

3. The cook is stirring the soup.
   a. Which one was the stirrer?
   b. Which one was stirring?
   c. Which one was stirable?
   d. Which one got stirred?
   Foil: Which one was sitting at the table?

4. The boy is raking the leaves.
   a. Which one was the raker?
   b. Which one was raking?
   c. Which one was rakable?
   d. Which one got raked?
   Foil: Which one was the boy holding?

5. The baby is picking the flower.
   a. Which one was the picker?
   b. Which one was picking?
   c. Which one was pickable?
   d. Which one got picked?
   Foil: Which one was watching the baby?

Transfer:

1. The mailman is handing the letter to the girl.
   a. Which one was the hander?
   b. Which one was handing?
   c. Which one was handable?
   d. Which one got handed?
   Foil: Which one was wearing a dress?

2. The waiter is passing the pie to the lady.
   a. Which one was the passer?
   b. Which one was passing?
   c. Which one was passable?
   d. Which one got passed?
   Foil: Which one was sitting at the table?

3. The man was delivering the package to the girl.
   a. Which one was the deliverer?
   b. Which one was delivering?
   c. Which one was deliverable?
   d. Which one got delivered?
   Foil: Which one was wearing the blue skirt?

4. The man is pitching the ball to the boy.
   a. Which one was the pitcher?
   b. Which one was pitching?
   c. Which one was pitchable?
   d. Which one got pitched?
   Foil: Which one was holding the bat?

5. The woman is tossing the ball to the dog.
   a. Which one was the tosser?
   b. Which one was tossing?
   c. Which one was tossable?
   d. Which one got tossed?
   Foil: Which one has four legs?

Complement:

1. The policeman is signaling the man to stop the car.
   a. Which one was the signaler?
   b. Which one was signaling?
   c. Which one did he signal him to stop?
   d. Which one did he signal to stop the car?
   Foil: Which one was crossing the street?

2. The daddy is expecting the girl to hit the ball.
   a. Which one was the expecter?
   b. Which one was expecting?
   c. Which one did he expect her to hit?
   d. Which one did he expect to hit the ball?
   Foil: which one did she use to hit the ball?

3. The lady is asking the man to throw the key.
   a. Which one was the asker?
   b. Which one was asking?
   c. Which one did she ask him to throw?
   d. Which one did she ask to throw the key?
   Foil: Which one was she holding in her hand?

4. The boy is wanting the man to lift the box.
   a. Which one was the wanter?
   b. Which one was wanting?
   c. Which one did he want him to lift?
   d. Which one did he want to lift the box?
   Foil: Which one were the boxes on?

5. The boy is begging his dad to give him a dollar.
   a. Which one was the begger?
   b. Which one was begging?
   c. Which one did he beg him to give?
   d. Which one did he beg to give him the dollar?
   Foil: Which one was the dad carrying?

APPENDIX B

NOVEL VERBS

Intransitive/Transitive

1. tem /tɛm/

Intransitive: The boy is temming.
   a. Which one was the temmer?
   b. Which one was temming?
   Foil: Which one was the boy standing on?

Transitive: The woman is temming the boy.
   a. Which one was the temmer?
   b. Which one was temming?
   c. Which one was temmable?
   d. Which one got temmed?
   Foil: Which one was the boy standing on?

2. cheen /tʃin/

Intransitive: The clown is cheening.
   a. Which one was the cheener?
   b. Which one was cheening?
   Foil: Which one was the clown holding?

Transitive: The woman is cheening the clown.
   a. Which one was the cheener?
   b. Which one was cheening?
   c. Which one was cheenable?
   d. Which one got cheened?
   Foil: Which one was the clown holding?

3. saip /seɪp/

Intransitive: The woman is saiping.
   a. Which one was the saiper?
   b. Which one was saiping?
   Foil: Which one was the woman standing on?

Transitive: The clown is saiping the woman.
   a. Which one was the saiper?
   b. Which one was saiping?
   c. Which one was saipable?
   d. Which one got saiped?
   Foil: Which one was the woman standing on?

4. lell /lɛl/

Intransitive: The clown is lelling.
a. Which one was the leller?
b. Which one was lelling?
Foil: Which one was the clown sitting on?

Transitive: The man is lelling the clown.
a. Which one was the leller?
b. Which one was lelling?
c. Which one was lellable?
d. Which one got lelled?
Foil: Which one was the clown sitting on?

Transfer/Complement

1. meep /mip/

Transfer: The boy is meeping the flowers to the girl.
a. Which one was the meeper?
b. Which one was meeping?
c. Which one was meepable?
d. Which one got meeped?
Foil: Which one was wearing pink shorts?

Complement: The girl is meeping the boy to send the flowers.
a. Which one was the meeper?
b. Which one was meeping?
c. Which one did the girl meep the boy to send?
d. Which one did the girl meep to send the flowers?
Foil: Which one was wearing pink shorts?

2. zan /zæn/

Transfer: The girl is zanning the ball to the clown.
a. Which one was the zanner?
b. Which one was zanning?
c. Which one was zannable?
d. Which one got zanned?
Foil: Which one has a big, red nose?

Complement: The clown is zanning the girl to send the ball.
a. Which one was the zanner?
b. Which one was zanning?
c. Which one did the clown zan the girl to send?
d. Which one did the clown zan to send the ball?
Foil: Which one has a big, red nose?

3. gan /gæn/

Transfer: The waiter is ganning the drink to the lady.
   a. Which one was the ganner?
   b. Which one was ganning?
   c. Which one was gannable?
   d. Which one got ganned?
   Foil: Which one was wearing a dress?

Complement: The lady is ganning the waiter to send the water.
   a. Which one was the ganner?
   b. Which one was ganning?
   c. Which one did the lady gan the waiter to send?
   d. Which one did the lady gan to send the water?
   Foil: Which one was wearing a dress?

4. sug /sʌg/

Transfer: The woman is sugging the ball to the girl.
   a. Which one was the sugger?
   b. Which one was sugging?
   c. Which one was suggable?
   d. Which one got sugged?
   Foil: Which one was wearing pants.

Complement: The girl is sugging the woman to send the ball?
   a. Which one was the sugger?
   b. Which one was sugging?
   c. Which one did the girl sug the woman to send?
   d. Which one did the girl sug to send the ball?
   Foil: Which one was wearing pants?

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