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The Relation between Children‟s Socio-Economic Status and their Performance on the Passive Subtest of the Diagnostic Evaluation of Language Variation – Norm Referenced

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The Relation between Children's Socio-Economic Status and their Performance on the Passive Subtest of the Diagnostic Evaluation of Language Variation – Norm Referenced

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Introduction

Many factors can influence the acquisition of language in the early years of a child's life. One of these factors is the child's home environment. More specifically, the socio-economic status (SES) of the family has been repeatedly implicated as affecting a child's progress in different areas of language (Arriaga, Fenson, Chronan, & Pethick, 1998; Dollaghan, Campbell, Paradise, Feldman, Jonosky, Pitcairn, & Kurs-lasky, 1999; Hammer &Weiss, 1999; Hoff & Tian, 2005; Wallace, Roberts, & Lodder, 1998; Whitehurst, 1997). There are many ways to determine the SES of a family. Some researchers use enrollment in a Head Start program to classify children as low-income (Washington & Craig, 1999), while others have used eligibility for free and reduced lunch programs, caregiver income, level of maternal education (Dollaghan et al., 1999; Pruitt, 2006), or occupation of caregivers (Hart & Risley, 1995; Hollingshead, 1975).

In the current study, SES was determined by maternal education. Maternal education has been documented to influence the experiences and environments of children (Bornstein, Hahn, Suwalsky, & Haynes, 2003), and some studies have shown that a less educated parent is less likely to place an importance on a child's education or perceive a child's development as delayed (Hoff, Laursen, & Tardif, 2002). Maternal education is also a more stable (Huston, Mcloyd, & Garcia-Coll, 1994) and less intrusive measure than maternal income (Hauser, 1994). Finally and as discussed by Dollaghan et al. (1999), a mother's education level is highly correlated with a father's education level, and there is a substantial amount of mother-only homes when looking at low-SES families.

Although the amount and quality of language experiences in children's early years do make a difference in children's rates of language development and growth, it is undeniable that even children in the least advantaged situations still learn to talk (Hart & Risley, 1995). As it is,

long before one is taught the rules of English in school, children begin to show evidence of an understanding of the intricate grammar, or syntax, which governs language. Simple two word utterances are the earliest form of syntax, and children begin to produce these types of sentences between 12 and 26 months of age (Brown, 1973). From here on, the rapid accumulation of more complex syntax, such as prepositions, third person present tense, negatives, questions, and past tense, occurs incessantly (Gleason, 2005).

Moreover, it has been found that children's SES levels are correlated to their ability to produce complex syntax (Huttenlocher, 1998). Huttenlocher looked at the syntax and vocabulary of 18 four-year-olds in varying social classes. Her data were from spontaneous language samples. Complex syntax was identified as a sentence with more than one grammatical clause, for example, "I'm up here because I want to wait." Over 25% of the mid-SES children's speech included complex utterances, whereas children classified as low-SES produced complex syntax in less than 10% of their speech. It was surprising to see that there were significant differences in syntactic skills at all, and that the children's use of complex syntax was related to SES status.

The syntactic construction I will look at in this paper, however, is one that does not develop as easily and early as many others. This structure is the passive voice. In the passive, the normal word order of agent + object is reversed to highlight the object, or the recipient of the sentence's action. Although the passive voice is rare in a child's spontaneous speech, the study of this structure allows researchers to learn about children's acquisition of word order rules (Gleason, 2005).

The purpose of this study is to evaluate the relation between children's comprehension of the passive voice and their SES levels. The data for the passive is based on the children's responses to test items taken from the *Diagnostic Evaluation of Language Variation – Norm*

Referenced (DELV-NR;Seymour, Roeper, & de Villiers, 2005). As mentioned earlier, the children's SES level is determined by their maternal education levels. Also, unique to this study is a consideration of the children's dialect when examining effects of children's SES on their passive test scores. As will be demonstrated, most studies of the passive have been conducted on children who speak mainstream American English. In the current study, the children have been documented to speak one of two nonmainstream dialects of English. These dialects were African American English (AAE) and Southern White English (SWE).

The literature review that supports the current study is broken down into three sections: the effect of socio-economic status as determined by maternal education on children's language development, the development of the passive voice, and an overview of the DELV-NR. The first two sections examine studies that have been conducted with children, and the third section describes how the DELV-NR tests children's understanding of the passive construction.

Effects of SES on Language Development

Many studies have been carried out to determine if a child's low-SES status leads to delayed or below average language learning in schools (Fernald & Marchman, 2011). One such study was motivated by the statistic that over one-third of the children entering the public school system in the US do so without the skills and motivation needed to avoid early academic difficulties (Storch & Whitehurst, 2001). The authors evaluated 367 low income Head Start children once a year for four years between the ages of 4 and 8 years. Also, a profile was created on each child's family which included information about maternal education, the home environment, and other family SES characteristics. The study found that the home and family data, especially the parental characteristics, contributed to approximately 40% of the variance in the children's preschool test scores. This result was consistent with the National Center for

Education Statistics' statement that the reading and writing skills of children differ as a function of a parent's economic level (NCES, 1998).

Hart and Risley (1995) examined the differences in language input provided to children by families varying in SES. Forty-two children and their families were observed during one continuous hour every month for two and a half years in order to examine the link between children's early family experiences and their language development at age three. Each family's SES was determined based on the caregivers' occupations. This led to the following distribution: 13 families classified as upper SES, 10 classified as middle SES, 13 classified as lower SES, and 6 classified as on welfare.

In terms of parent-child interaction, the average parent spent 30 minutes per hour interacting with her child during the months the child was learning words most rapidly. This varied from the highest extreme of 48 minutes per hour in an upper SES family to the lowest extreme of only 17 minutes per hour in a family on welfare. Accordingly, the number of words addressed to a child varied between social classes with similar distributions (upper > middle > low > welfare). Hart and Risley predicted that with this pattern of language input, children in professional families hear more than 30 million words by the age of three, compared to children in working class families who hear 20 million words, and children in welfare families who hear only 10 million words.

The authors also examined the quality of the parents' speech. Classifications of language quality included the caregivers' use of vocabulary, sentence structure, discourse functions, and speech acts (i.e. as declaratives, imperatives, wh- questions, yes/no questions, and auxiliary fronted questions). Finally, the authors noted whether the parent initiated an utterance or

responded to one, and indicated the valence or emotion of an utterance as either affirmative or prohibiting.

Three measures of the children's language skills were also collected. The first, vocabulary growth, was measured over the two and half years of observations. This tells us how steadily the children acquired words for labeling and describing their surroundings. Secondly, vocabulary use was measured during 34 - 36 months of age by totaling the number of different words a child produced per hour. This measure indicates the variety and extent of experiences a child talks about. Lastly, the children's IQ as measured by the *Stanford-Binet Intelligence Scale* (Roid, 2003) was administered to the children within a month after the end of the study.

Table 1 displays the results of this study. As can be seen, all three measures were related to each other and also strongly associated with the children's SES levels. Correlation coefficients between the children's SES and their vocabulary growth, use, and IQ scores were .65, .63, and .54 respectively.

Table 1

Average scores on each language measure by SES level (Hart & Risley, 1995).

	13 Children from Professional Families	**23 Children from Working-Class Families (Middle and Low SES combined)**	**6 Children from Welfare Families**
Measures			
Recorded Vocabulary size	1,116	749	525
Average different words per hour	297	216	149
IQ score at age 3	117	107	79

The children followed by Hart and Risley were further studied by Walker (1994). During this second study, the children were between the ages of 5 and 10 years. Out of the 29 children who participated in this second study, 19% lived at or below the national poverty level, and almost half attended schools serving low-income families. A composite risk index was formulated for each child based on their level of maternal education, annual family income, and caregiver's type of employment. Language was assessed by the *Peabody Picture Vocabulary – Revised* (PPVT-R; Dunn and Dunn, 1981) and the *Test of Language Development – 2* (TOLD-2; Newcomer & Hammill, 1988). The former test measured the children's receptive, one-word vocabulary, whereas the latter assessed their listening and speaking ability of various linguistic features, including semantics and syntax.

The results showed that children in the 7 to 36 month age range who varied in SES were also shown to differ greatly in their total spoken vocabulary and MLU, and these were both significantly correlated to multiple measures of SES. Also, as the children aged into the five to ten year age group, their receptive and spoken language, verbal ability, and academic achievement was related to their SES levels, language, and IQ measures as assessed at 7 to 36 months. A correlation of .57 was found for the PPVT – R (Dunn & Dunn, 1981), and a correlation of .74 was found for the TOLD-2 (Newcomer & Hammill, 1988). The authors attribute this relation to the fact that children brought up in low-SES homes have fewer optimal early language experiences. This may come in the form of parents not playing as many language games with their children, requesting language from their children less often, and using and requiring language in a way that does not lead to later academic success.

A study by Dollaghan et al. (1999) focused chiefly on the level of maternal education as an indicator of the speech and language skills in children. Standardized and non-standardized

testing measures were administered to 240 children between 36 and 38 months of age. As seen in Table 2, four measures of speech and language were examined: mean length of utterences in morphemes (MLUm), number of different words (NDW), and total number of words (TNW). The PPVT-R (Dunn & Dunn, 1981) was also given as a measure of the children's receptive vocabulary abilities. Maternal education was divided into three levels: less than a high school degree, high school degree, and college degree.

Results showed statistically significant linear trends between the children's maternal education levels and their MLUm, NDW, TNW, and PPVT-R scores.

Table 2

Average scores on measures of speech and language by maternal education (Dollaghan et al., 1999).

	Maternal Educational Level		
Measure	**< High school**	**High school**	**College**
MLUm	2.73	2.97	3.29
NDW	118	131	143
TNW	454	501	533
PPVT-R	90	101	110

Although this study showed that children's semantic and morphological development varies significantly with their maternal education, and showed that their phonological development did not, additional research is needed to further examine the relation between children's SES levels and their acquisition of complex syntax.

The Development of the Passive

All the studies just reviewed primarily focused on children's vocabulary – its size, diversity, and growth rate. Other areas of language are briefly examined, but the authors of these studies did not complete a detailed study of other language areas such as syntax. Initially this was because it was believed that there is not much variability in the syntax of different groups of children (Huttenlocher, 1998). Huttenlocher went on to show, however, that variability can exist in children's acquisition of complex syntax, more specifically multi-clausal sentences. One syntactic feature, the passive, is the area I have chosen to examine in the current study.

Noam Chomsky (1981), an influential linguist, put together a framework called the universal grammar theory to describe the nature of the syntactic rules of language. Central to this version of his theory, called the government and binding theory, are levels at which words are connected. Two of these structures, the d-structure and s-structure, are central to the study of the passive. The s-structure shows the surface order of words in an utterance, while the d-structure is the underlying connection between the meaning of the utterance and the words in the utterance. It has often been questioned how children grasp the d-structures of a sentence when only presented with the s-structure (Gleason, 2005).

In the passive voice, the differences between s- and d- structures are broken down into the following: movement of sentence components, disjoint agents, and inclusion of an agent by-phrase (Roeper 2004). The type of movement in passives involves the object moving to the subject position. With passives, the listener has to understand that the subject and object are different, even if only the subject is mentioned outright. The agent by-phrase is an optional element of passive sentences that highlights the agent of the action, as in "*The ball was rolled by the boy*." When the by-phrase is not included in the utterance, the disjoint, or implicit, agent is hidden from the sentence's s-structure.

Bever (1970) examined children's understanding of the passive voice with an experiment that is helpful to this study. Two hundred and forty children, ages 2 to 5 years, were presented with six sentences. Some were active sentences such as "*The cow kisses the horse*," whereas others were passive, *"The horse is kissed by the cow*." The children were asked to act out each sentence with toy figurines. The youngest children, ages 2 to 3 years, performed very well on the simple active sentences, achieving 95% mastery on average. Although these children performed far less satisfactorily on the passive sentences, they scored much higher than 5%, the percentage that would imply that the children were treating every sentence as if it were an active sentence. This shows that even though the children did not understand the passive voice at this young age, they recognized it as a different syntactic structure from the active voice (Bever, 1970).

Horgan (1978) also conducted a study on children's understanding of the passive voice. The experiment consisted of a four-part test given to 54 children, aged 2 to 4 years. The section related to the passive asked each child to describe 44 pictures. The 44 pictures were developed to encourage children to produce sentences with a variety of animate, inanimate, and missing agents. They were also designed to elicit reversible as well as non-reversible passives from the children. Reversible passives are passives sentences in which the agent and object could be replaced with one another without making the sentence illogical, i.e. "The boy is kissed by the girl." To do this, pictures with differing focus was achieved by selective coloring of different objects within the larger black and white pictures. The pictures elicited 32 full passives from the children. Criterion for a full passive was at least one formal marker, a preposition, and clear intent of a passive. For example, the sentence *"Boy hit by foot"* would be considered a full passive for this age group. Many truncated passives, passives with the logical subject missing, as

in *"The lamp was broken,"* were produced but eliminated from the results. These were eliminated because as adjectival passives, they are grammatically distinct from full passives.

Of the children who produced passives, some produced only non-reversible passives at first, while the others produced only reversible passives at first. Many of the children's other picture descriptions, notably on pictures with reversible passives, incorrectly described the picture because of backwards or mixed up word order. The form was right, as in *"the girl was chased by the cat,"* but the meaning was wrong. This error in the production of reversible passives has also been documented in other research up to the age of five (Whitehurst, Ironsmith, & Goldfein, 1974).

In a second experiment by Horgan (1978), 180 children, aged 5, 6, 7, 9, 11, and 13 years, were asked to tell stories about various pictures. Using the criterion of a full passive including "a form of 'be' or 'not', a past tense marker, and a preposition followed by a noun phrase," 81 full passives were produced by this group. Example of such passives included *"They were stopped by a ferocious animal"* and *"The room was covered with bugs."* Reversible and non-reversible passives are looked at individually because they appeared to develop separately. Although one does not appear to develop earlier than the other, as we saw with the younger children's productions, there were no instances of a child producing both types until the age of 11.

A summary of the types of passives used by children's ages is shown in Table 3. All non-reversible passives before the age of 9 did not include an agent in the sentence. Agentive non-reversible passives did not show up until after age 9. Also, the younger children's (2 to 9 years) non-reversible passives all contained instrumental agents, and used only the preposition 'with' as opposed to adults' frequent use of 'by' for their preposition in similar sentences.

Table 3

Types of passives produced by age (Horgan, 1978).

Age:	Semantically reversible	Non-reversible agentive	Non-reversible instrumental
2-4	15	0	17
5-7	10	0	9
9-13	21	15	14

* 2 passives were unclassifiable because the first NP was inaudible.

The Diagnostic Evaluation of Language Variation (DELV) – Norm Referenced

The measure used in this study to look at the children's comprehension of the passive voice was the passive subtest of the syntax domain of the DELV – NR (Seymour et al., 2005). The DELV-NR measures four domains of language (i.e. syntax, semantics, phonology, and pragmatics) to determine the presence of language impairment within children's regards of their English dialect. Since the children in the current study's sample speak either AAE or SWE, it was important to use this test so that aspects of the children's syntactic development could be tested in a dialect neutral manner (Roeper, 2004).

The passive section of the DELV-NR's syntax domain includes ten short sentences. These are listed in Table 4. These ten were developed to eliminate problems of parsing and the need for extensive world knowledge and memory (Roeper, 2004). Each child is shown three pictures for each sentence and asked to point to the one being described by the examiner. Based

on the sentence's syntactic construction, and the choices of pictures presented, different questions target different elements of a child's passive understanding.

As can be seen by the items listed in Table 4, the 10 sentences vary in their syntactic elements. Eight involve passive syntax without a by-phrase. The by-phrase is not included with these items because passives that contain an agent by-phrase are easier for children to identify than passives that do not contain an agent by-phrase. Of these eight passive sentences, four sentences are classified by the creators of the test as targeting the movement construction of the passive, and four are classified as targeting the disjoint agent's role in the passive. Finally, two active sentences with location by-phrases (e.g., "*The ball was rolling by the boy"*) are included in this passive subtest. These items require that the children understand that the verb form and not the by-phrase is what signals the passive sentence construction. Including two active sentences that appear similar to a passive sentence's s-structure allows for a rigorous test of children's understanding of the requirements of the passive.

The use of the terms movement and disjoint agent are unique to this test. Recall from earlier that a disjoint agent was defined as an agent that is hidden from the sentence's s-structure instead of included in the sentence by an agent by-phrase. Of the 10 sentences of this test section, only four are classified as targeting the disjoint agent even though eight sentences, classified as either disjoint agent or movement related, have a disjoint agent.

In Roeper's (2004) analysis of the syntax subtest of the DELV-NR, he more accurately describes the two types as basic and complex passive sentences. The difference between these two types of passive sentences can be seen when the pictures presented to the children for each sentence are examined. I have also relabeled the items using Roeper's classification in Table 4. A basic passive sentence tests if the children can differentiate the agent and object of a passive

sentence. Passing this type of item does not mean the child understands the presence of a disjoint agent. The choices of pictures presented for the basic passive item, "*The elephant was pushed"* include an elephant pushing a wall, an elephant pushed by a man, and an elephant walking. By choosing the picture of the elephant that was pushed by the man, the children show that they understand the elephant is the one that is being pushed. The pictures available, as well as the context of the sentence, give no option for the action to exist without the presence of an agent.

A complex passive sentence tests the children's knowledge of the role of the disjoint agent in the passive construction. The pictures give children the opportunity to misinterpret the sentence as containing an adjective phrase. For example, "*The bear was washed*," could be read in the same way as "*The bear was brown*." The choices of pictures presented for the complex passive item, "*The cat is being hidden*" include a girl hiding a cat in a box, a cat hiding in a box, and a box with no cat in sight. Unlike the basic passive item, the possibility of the cat hiding on its own, without the presence of an agent, is possible and also a picture choice. By choosing the picture of the girl hiding the cat, the child understands the sentence is in the passive voice and carries a disjoint agent.

Table 4

DELV-NR passive items (Seymour et al., 2005).

Sentence	*Passive element tested as described by the test creators*	*Passive type as described by Roeper, (2004).*
The elephant was pushed.	Movement	Basic passive
The plant was dropping by the boy.	Agent vs. location by-phrase	Active
The boy was getting hit.	Disjoint agent	Complex passive
The dog was being walked.	Movement	Basic passive

The cat was being dressed.	Disjoint agent	Complex passive
The cat is being hidden.	Disjoint agent	Complex passive
The boy's face was being painted.	Disjoint agent	Complex passive
The horse got jumped.	Movement	Basic passive
The ball was rolling by the boy.	Agent vs. location by-phrase	Active
The fish got eaten.	Movement	Basic passive

Using data from these ten items from the DELV-NR and the demographics of the children in the current sample, three research questions were formed to guide the analysis.

Research Questions:

1) Do the children's passive scores on the syntax subtest vary by their race, gender, or dialect density?
2) Is there a relationship between children's maternal education levels and their performance on the passive section of the syntax subtest of the DELV – NR?
3) Do children score higher on items that test one aspect of the passive construction as compared to other aspects (i.e. movement vs. disjoint agent)?

Methods

Participants

The participants for the study originated from a larger study of the grammars of children who speak SAAE and SWE (Oetting, Hegarty, & McDonald, 2009). Of the 115 original participants, 111 participants, ages 60 months to 88 months, supplied information on maternal education and were therefore selected for this study. General participant and family information

was collected when consent was given by the parent and this information is summarized in Table 5. As can be seen, there were 49 males and 62 females. Sixty children were classified as African American and 51 children were classified as not African American. Of the children grouped as not African American, 48 identified themselves as white, two as American Indian, and one as Asian.

Table 5

Participant demographics.

	AA Status		Total
	Not AA	AA	
Male	24	25	49
Female	27	35	62
Total	51	60	111

Each child was given a battery of tests, including *the Primary Test of Nonverbal Intelligence* (PTONI; Ehrler & McGhee, 2008), PPVT-4, and *Goldman Fristoe Test of Articulation – 2nd edition* (GFTA-2; Goldman & Fristoe, 2000), to assess their nonverbal IQ, language, and articulation abilities. Table 6 summarizes the participants' scores on each of these tests. A standard score of 100, with a standard deviation of 15 is considered within normal limits on each test.

PTONI is a nonverbal IQ test for children between the ages of 3 years and 9 years; 11 months that strives to eliminate bias due to gender, race, ethnicity, and language. Children are asked to look at a series of pictures and point to the picture that does not belong with the others. The PPVT measures the receptive vocabulary of children and adults by saying a word and asking

the examinee to point to the picture that shows the meaning of the word. The GFTA-2 is an articulation test for individuals, aged 2 through 21 years. It measures imitative and spontaneous production of consonant sounds in individual words. Each of these tests broadens our understanding of the overall psycholinguistic abilities of the participants.

As shown in Table 6, some of the children scored below 1 SD of the normative mean on the PTONI, PPVT, and DELV-NR. For nine of the children, this was expected because they had been identified as struggling with specific language impairment (SLI). For all others, SLI was ruled out as a diagnostic condition. For the purposes of this project all children were included in the analysis to increase the heterogeneity of the sample.

Table 6

Description of children's scores on PTONI, PPVT-R, and GFTA-2.

	N	Minimum	Maximum	Mean	Std. Deviation
PTONI	111	66	140	99.51	16.24
PPVT-R	111	68	130	96.69	12.79
GFTA-2	110	91	114	105.84	5.27
DELV-NR Syntax Subtest	111	2	14	8.48	2.42

Materials

The parental consent form, shown in appendix A, was given to the parents of the participants before the original study began. The form gave an overview of the study and asked for general family information including the highest grade completed by the child's mother. Numbers 6 through 16+ were provided to indicate 6 through more than 16 years of school with

12 indicating a high school degree, 16 indicating a college degree, and 16+ indicating more than 16 years of school. Forms were signed and returned to children's schools.

Along with the PTONI, PPVT-R, and GFTA-2, the DELV-NR was administered to the participating children. The passive items on the DELV-NR are numbered 11 through 20 in the syntax subtest. The instructions for this passive section are as follows: *"Now we are going to do something different. I am going to show you some pictures and tell you about one of them. Look carefully at all of the pictures and then point to the picture that I tell you about. You don't have to say anything, just point to the picture I talk about. Let's try one."* Administrators were also advised to begin each item with *"Look at all of the pictures. Show me…"*

Items are scored either one or zero, one for correct and zero for incorrect, and totaled at the end of the section for a raw score of 0-10. The raw score was divided by 10 to get a percentage of correct passive items, and entered into an SPSS database. As mentioned in the literature review, the passive items on the DELV-NR contains four sentences that demonstrate the movement construction of the passive, and four that demonstrate the disjoint agent's role in the passive. These two types of passives were scored separately for the purpose of this study to give us a percent of movement passives answered correctly and a percent of disjoint agent passives answered correctly.

Procedures

Once parent consent forms were returned, graduate students in the Department of Communication Sciences and Disorders at LSU administered the testing battery and experimental probes to the children for a maximum of eight sessions held in a quiet room at the children's schools. Three sessions were set aside for standardized testing. The DELV-NR was one of the tests administered during this time. During one of these sessions, language samples

were collected from the children, and these elicited contextualized and decontextualized language narratives through the use of toys and pictures. Grammar probes were given during other sessions via videos shown on the laptops. Probes targeted the children's use of past tense, verbal –s, auxiliary BE, and working memory.

Results

Table 7 displays the means and standard deviations of the children's percentage of passive items marked correctly. The means were examined as a function of the children's race, gender, and dialect density. Dialect density was obtained from the DELV-ST dialect classification. Scores 1, 2, and 3, were given, corresponding to some, moderate, and strong variation from mainstream American English (MAE) respectively.

Table 7

Children's Mean Percentage of Correct Passive Items.

	Number	Mean	Standard Deviation
Gender			
Male	49	.5959	.15937
Female	62	.5919	.20748
AA Status			
Not AA	51	.6196	.19289
AA	60	.5717	.18048
Dialect Density			
Some variation from MAE	24	.6667	.16330
Moderate variation from MAE	22	.6045	.23397
Strong variation from MAE	65	.5631	.17191

One-way ANOVA tests, with group as a between-subject factor, were performed to determine if the children's percent of correct passive responses varied by their race, gender, or dialect. A significant difference was not found for any of the groups: gender, $F(1,100) = .05$, $p = .82$, AA status, $F(1, 100) = .25$, $p = .62$, partial eta² = .002, partial eta² = .001, and dialect density, $F(2,100) = 1.71$, $p = .19$, partial eta² = .033. After finding no significant difference based on these variables, the effect of the children's maternal education levels on passive performance was analyzed. A Pearson correlation revealed no relation between the children's maternal education levels and their percent of correct passive responses, $r = .05$, $p = .58$.

A comparison of means was then conducted for the percent of correct basic passives (M = .68; SD = .21), and the percent of correct complex passives (M = .49; SD = .28). A paired t-test was run to further explore the relationship between the two. A statistically significant difference was present for these two types of passives, $t(110) = 6.77$, $p < .001$. This confirms that children correctly answered questions involving basic passive sentences more often than they correctly answered questions involving complex passive sentence.

Next, each of the two types of passives was compared to the child attributes of race, gender, and dialect density. No significant difference was found between the children's scores on complex passive items according to their race, gender, or dialect density: race, $F(1,100) = .24$, $p = .62$, partial eta² = .002, gender, $F(1,100) = .17$, $p = .68$, partial eta² = .002, dialect density, $F(2,100) = 1.46$, $p = .24$, partial eta² = .028. The basic passive construction also showed no significant difference between children's scores and their race, gender, or dialect density: race, $F(1,100) = .46$, $p = .50$, partial eta² = .005; gender, $F(1,100) = 1.05$, $p = .31$, partial eta² = .010; dialect density, $F(2,100) = 1.55$, $p = .22$, partial eta² = .030.

In order to see how the children's passive scores compare with the other speech and language tests administered, a Pearson correlation was run between the children's scores on the PTONI, PPVT-R, GFTA-2, and DELV-NR syntax subtest and the percent of correct passive responses. A significant positive correlation of $r = .37$, $p = .001$; $r = .54$, $p = .001$; $r = .25$, $p = .008$; and $r = .66$, $p = .01$, was found for each of these tests.

Lastly, I examined if the passive section of the DELV-NR was sensitive to the child's clinical status. Each child was assigned to a group numbered 1 or 2. Children classified with specific language impairment (SLI) were assigned to group 1, and children classified as typically developing (TD) were assigned to group 2. The mean percent of passive items answered correctly was compared in each group. The SLI group's mean was .38 (SD = .18), and the TD group's mean was .65 (SD = .15). An independent t-test was then performed and a significant difference was present, $t(77) = 5.09$, $p < .001$. This result indicated that children with SLI consistently scored lower on the passive items than the typically developing children.

After seeing that the children with SLI scored significantly lower on the passive subtest than TD children, the children classified as SLI were excluded from the data and the same analyses were run again. There was still no significant difference found between percent of passive items the children answered correctly and their race, gender, or dialect density, AA status: race, $F(1,91) = .001$, $p = .998$, partial eta$^2 = .002$; gender, $F(1,91) = .003$, $p = .96$, partial eta$^2 = .001$; dialect density, $F(2,91) = .1.03$, $p = .36$. partial eta$^2 = .022$. Again, no significant relation between children's passive performance and their maternal education was found, $r = .01$, $p = .91$. Finally, a significant difference between performance on movement-related passives and passives with a disjoint agent was still present, $t(101) = 6.80$, $p < .001$.

Discussion

The purpose of this study was to examine the relationship between children's understanding of the passive construction on the DELV-NR and their SES levels. The results of the study will be discussed in terms of the three research questions that guided the study. The first question looked at the relation between the children's scores on the DELV-NR's passive subtest and their gender, race and dialect density. The results showed that there was not a significant difference in the children's performance on the passive subtest as a whole, on the basic passive items, or on the complex passive items, based on race, gender, or dialect density.

The second question focused on the relationship between the children's SES-level, as determined by maternal education, and their passive scores. Maternal education ranged from 6th grade level of education to more than 4 years of college. There was no correlation found between maternal education and children's passive scores.

The findings of the first two research questions differ from the studies by Hart and Risley (2005) and Dollaghan et al. (1999) which suggested that these SES factors can cause variance in language development, and the finding of Huttenlocher (1998) who found a significant correlation between children's SES level and syntactic development. These differences are accounted for by the choice to look at the specific syntactic construction the passive voice. The passive is not as broad of a category as Huttenlocher's classification of complex syntax, and may not be as affected by SES factors as areas of language others have looked at such as vocabulary.

The third research question looked at the different types of passive questions presented in the syntax subtest of the DELV-NR. Children scored significantly better on basic passive sentences than they did on complex passive sentences. This shows that the children in this study had a good grasp of word order and movement of syntactic constituents, while struggling slightly

more on passive sentences that tested the more obscure knowledge of an implicit, or disjoint, agent.

The hypothesis of children's SES levels having a relation with children's passives scores was not supported by the results of this study. Given this, I furthered the study to look at other factors that may relate to the children's passive scores. Specifically, the children's results on the passive section of the syntax subtest of the DELV-NR were compared to their scores on four other tests, the PTONI, PPVT-R, GFTA-2, and DELV syntax domain. Children who scored higher on the passive items also performed better on each of the other tests administered. The strongest correlation ($r = .66$) was between the children's passive scores and the DELV-NR syntax domain, and the weakest correlation ($r = .25$) was between the children's passive scores and their scores on the GFTA-2. These magnitudes of correlations show how children's performance on the passive subtest is better tied to their language development than to their articulation skills.

Finally, I examined the children's passive scores as a function of the children's clinical status. Children classified as typically developing performed better on the passive subtest than children diagnosed with SLI. This supports the validity of the DELV-NR to identify children with language impairments. After finding this difference of mean scores between TD children and those with SLI, prior analyses were rerun while excluding SLI children from the database. There were no significant changes in the results which verified that the lower scores of the SLI children were not confounding previous results.

Limitations of Study

There were three main limitations to this study. The first limitation was the age of the children in the data set. The youngest child was 5 years old. By age 5, children's passive skills

may be too robust for SES factors to make a significant difference. The second limitation was the low number of passive items examined. Only ten questions were available from the DELV-NR test that dealt with the passive voice. The third limitation to the study was the exclusion of mainstream English speakers (MAE) from the data set. All children in the study were speakers of nonmainstream English.

Implications of Findings and Directions for Future Research

This research focused on children's performance on the passive subtest of the DELV-NR and factors that could have a relation to this performance. The results of the research showed that there was not a significant relationship between the children's SES levels or demographic factors of gender, race, and dialect density and their passive performance. The full passive, *"The car was pushed by the truck,"* for example, is a rare syntactic form in children's language and one of the more complicated in regards to s- and d- structure; however, this syntactic construction seems resilient enough to develop despite poor environmental surrounds. Two child attributes seen from the results that could affect children's development of the passive voice are presence of SLI and subsequent skills on other language tasks.

Future directions for research include using younger children as participants. Examining a set of children aged 5 years and older may lead to children who were past the age where a significant difference in development could be examined, such as with Huttenlocher's (1998) 3 – 4 year old participants. Changing participant demographics to include speakers of MAE in future studies may also provide a more complete population sample to examine. Finally, using a lengthier passive probe, or even probing different areas of syntax, may be useful to study the relation of SES levels to this area of children's language development.

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Appendix A

Parent Signature

I have read the consent form and do not have any questions regarding the project. I also know that I may direct additional questions regarding study specifics to Dr. Oetting. If I have questions about my child's rights or other concerns, I can contact Robert C. Mathews, Chairman, LSU Institutional Review Board, (225)578-8692. I agree to participate in the study described above and acknowledge the researchers' obligation to provide me with a copy of this consent form if signed by me.

_____ _____

Parent's Signature Date

Child's Name _____ Gender: _____ Child's Date of Birth: _____

Please circle the Mother's highest grade completed.

(6 = 6th grade, 12 = high school graduate, 16 = college graduate)

6 7 8 9 10 11 12 13 14 15 16 or more

Is your child receiving services by a Speech Language Pathologist/ Speech Therapist?
Yes No

Does anyone in your child's immediate family have difficulties with speech, language, reading, or writing? Yes No

If so, may we contact you to inquire? Yes No Telephone Number_____

If you would like us to send you a gift certificate and/or results of the study, please write down your address here.