The Production of Complement Taking Verbs Across Complement Clause Types By Typically Developing Preschool Children

By

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To my husband, David, my greatest love and my rock;
to my children, Amelia and Benjamin, my greatest joys;
and to my parents, John and Kathy, my greatest supporters

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CHAPTER I

INTRODUCTION

There is a dearth of research in complex syntax (CS) development of typical children as compared to research in grammatical morphology. Grammatical morphology and complex syntax emerge simultaneously shortly after children begin to put together two-word utterances, and complex syntax skills continue to grow into the early school-age years (Barako Arndt & Schuele, 2013), impacting social and academic communication.

Complex syntax proficiency has a substantial impact on academic success, particularly within oral and written expression (Dickinson, 2011). School-age children are expected to verbally summarize and explain complicated material, as well as to write using a variety of genres that require the use of sophisticated language, in terms of structure and content. Researchers and clinicians must understand the typical development of all facets of complex syntax in order to intervene with children with language impairment. Understanding the typical development of complex syntax provides a foundation to broaden the research describing the development of complex syntax in children with language impairment (for published studies see: Eisenberg, 2003; 2004; Barako Arndt & Schuele, 2012; Owen & Leonard, 2006; Owen Van Horne & Lin, 2011; Schuele & Dykes, 2005).

Complex Syntax

Quirk, Greenbaum, Leech, and Svartik (1985; p. 987) noted that “a complex sentence is like a simple sentence in that it consists of only one main clause, but unlike a simple sentence, it

has one or more subordinate clauses functioning as an element in a sentence." In our work we have opted to use a broader term, complex syntax, over complex sentence. Complex syntax encompasses the production of dependent clauses whether or not those clauses are produced within complete sentences (see Barako Arndt & Schuele, 2013). It is often unclear in individual studies whether then analysis set includes only complex sentences or rather complex syntax. Nevertheless, we adopt the term complex syntax.

Complex syntax emerges in the oral language of typically developing children between the ages of two and three (see for review, Diessel, 2004). Growth in complex syntax involves learning a variety of dependent clause types that; typical children are generally quite proficient with complex syntax at entry to kindergarten (Bloom, et al., 1984; Paul, 1981; Tyack & Gottsleben, 1986). Bloom, Lahey, Hood, Lifter, and Fiess (1980) categorized dependent clauses into three types: subordination, relativization, and complementation. They explored three types of complement clause production: (a) infinitival complement clauses (e.g., *I remembered to go to the store*) and two types of sentential complements: (b) full propositional complement clauses (e.g., *Sarah remembered (that) she left her books at home*), and (c) WH-finite complement clauses (e.g., *Sarah remembered where the books are*).

All three types of complement clauses involve complement taking verbs in the main clause (e.g., *remember, guess, know*). Development of complement clauses involves both semantic and syntactic learning, as the dependent clause is an argument of the complement taking verb in the main clause. Pinker (1994) suggests that a child learning a verb in a variety of syntactic frames can assist a child in attending to the specific meaning of that verb in that frame. In the present study, we were interested in the complement taking verbs produced in infinitival complement clauses, full propositional complement clauses, and WH-complement clauses. The

purpose of this study was to examine complement taking verbs across complement clause types in relation to child age.

Complement Taking Verbs

One measure of syntactic complexity is verb complement structure. A relation between syntactic complexity and frequency of complement taking verb production has been suggested in the literature (de Villiers & de Villiers, 2000; Norbury & Bishop, 2003), with frequency positively impacting comprehension of verbs, but little is known about the relation between frequency and production of complement taking verbs. Complement taking verbs include a variety of verbs, including mental state verbs that describe abstract inner cognitive, emotive, or perceptive events (Montgomery, 2002) and verbs of communication, desire, and perception. Mental state verbs include verbs such as *know*, *think, forget, remember, guess*, and *wonder*. Communication verbs include such verbs as *ask, tell, say, explain, express,* and *alert.* For all speakers, mental state verbs and communication verbs lend themselves to a bias toward usage in complement clauses as compared to a basic action verb like *run*, *jump*, or *play* (Owen Van Horne, Curran, & Hall, 2017). Complement taking verbs can subcategorize for finite and nonfinite clauses but they subcategorize for nonclausal complements, as well, though they may be less likely to be used in a nonclausal framework. For example, the verb *forget* can be used in the following grammatical structures:

1. You *forgot* your lunch. (Simple sentence)
2. She *forgot* to call her mom. (Infinitival complement clause)
3. Dad *forgot* when Sue likes to eat breakfast. (WH-finite complement clause)
4. He *forgot* how to ride a bike. (WH-nonfinite complement clause)

5. I *forgot* (that) you can't stay out past midnight. (Full propositional complement clause)

A child can be competent with a verb like "forget" within one or more but not all grammatical structures. Some verbs might lend themselves to production more often in one argument structure than other, and this tendency toward one structure is likely based not only on knowledge of semantics, but knowledge of the semantics in conjunction with syntax. Hence, what is likely driving the bias for a complement taking verb to be more often produced in a complex structure opposed to a simple structure, is a relationship between the specific syntactic requirements of that verb and the related semantics. A more complete concept of the semantics of a complement taking verb may impact use of these verbs or the syntactic forms used with these verbs.

Mental State Verbs and Communication Verbs

Some complement taking verbs may be more difficult than others to acquire based on the abstractness or certainty factor of the verb meaning. For example, *forget* and *remember* might fall into this category, due to the requirement that one must understand the presence of prior knowledge in order for one to forget or to remember something (Johnson & Wellman, 1980; Wellman & Johnson, 1979). Reasons for this might include the child's age, exposure to the verb, or the child's theory of mind (Lyon & Flavell, 1994). An understanding of the typical development of these mental state verbs in conjunction with the complex syntax of embedded complement clauses will lend itself to a greater understanding of the nature of impaired learning of mental state verbs and these complex syntax forms. This difference in abstractness between

mental state verbs and communication verbs, and how it might affect the relationship between syntax and semantics, is of interest in the current study.

To date, mental state verbs have been studied with a focus on emergence of specific mental state verbs alone or in relation to children's theory of mind, or ability to represent mental states (Lyon & Flavell, 1994). It is important to note that these verbs were not studied specifically within the complex syntax frames of interest to this current study, nor with development in mind beyond the correct usage semantically. Emergence of mental state verbs such as *know*, *forget*, and *remember* has been explored across several studies (Brown, Donelan-McCall, & Dunn, 1996; Johnson & Wellman, 1980; Lyon & Flavell, 1994; Shatz, Wellman, & Silber, 1983). In these studies, the mental state verbs emerged in simple syntax prior to the age three (e.g., *I don't know*), although verbs often did not express what the authors considered to be a "true mental state" until five months or more post-emergence. The authors differentiate a functional, conversational usage of a verb like *remember* (e.g., *He remembered his bicycle*) from a true mental state that demonstrates knowledge of the act of remembering (e.g., *He remembered how to get home from school on his bicycle*) (Lyon & Flavell, 1994; Shatz, Wellman, & Silber, 1983). Although the authors made this distinction between meaning, there was no focus on the emergence of the related syntactic structures related to the emergence of that true mental state.

Differences were found across verbs, with children being producing utterances with an earlier emerging or slightly higher-frequency verb like *forget* earlier than *remember* (Lyon & Flavell, 1994). Additionally, the children required memory tricks in order to have produce an utterance with *remember* (Johnson & Wellman, 1980), indicating that both experience with these verbs and theory of mind to understand the internal states that coincide with these verbs matter. Theory of mind involves the ability to understand social interactions by attributing emotions,

intentions, desires, and beliefs to another person (Astington & Jenkins, 1999). Theory of mind develops over a similar time frame as language development, with a more robust appearance just prior to a child's second birthday. Development of theory of mind continues well through a child's fifth year of life (Gopnik, 1990). Theory of mind is so intertwined with language it is hard to know if theory of mind drives language, if language drives theory of mind, or if there is an additional factor that facilitates both (Astington & Jenkins, 1999). Production of target verbs in the targeted elicited frame in the aforementioned studies was linked to age and prior knowledge of a verb. Children were more productive with mental state verbs of interest at five years of age as compared to four years of age, and at four years of age as compared to three years of age (Lyon & Flavell, 1994; Johnson & Wellman, 1980). What was not explored were the structures or syntactic frameworks in which these verbs were used as development occurred and the children gained success with these verbs, nor were comparisons made to less-abstract verbs such as verbs of communication, that do not necessarily require theory of mind.

Cognitive Development

Cognition likely plays a role in the emergence of grammar, generally, as well as in the emergence of complement clauses, specifically, with the development of theory of mind at the center of this relationship. There are several cognitive prerequisites to a child's development of grammar (Slobin, 1973). A child must be able to perceive the social and physical events that will ultimately be coded in language, and beyond that, a child must be able to make use of linguistic information. Linguistic information must be perceived, processed, organized, stored, and remembered. Slobin (1973) noted that these prerequisites, then, relate to both form and meaning

of grammatical utterances. Thus, cognition and the development of theory of mind, in relation to complement taking verbs, may impact syntactic development.

The argument structure of complement taking verbs in embedded clauses is such that semantics and syntax are hard to separate from each other, and from cognition. Children can produce both complex language that is not meaningful, due to their cognitive abilities not yet being sophisticated enough to match their selected vocabulary, and within the same timeframe, children can also produce very meaningful intentions with agrammatical language due to not having the linguistic abilities to express their wants, needs, or thoughts (Slobin, 1973). In the current study, we were interested in the overlap among the development of complement taking verbs across preschoolers, the syntactic structures required of those verbs, and characteristics of those verbs ranging from more to less abstract (mental state versus communication verb), and the frequency at which a child hears that verb (low versus high frequency).

Explaining Emergence of Complement Clauses

Tomasello (2003) proposed that children initially produce complement clauses that are most frequently produced in the adult input, though he argues that children are not simply imitating these verbs in the syntactic frames they heard in which they heard them, but that they are driven, in part, by usefulness. He further proposed that children produce matrix clauses plus embedded complement clauses initially as single propositions, or rather only one action associated with the two verbs, as opposed to two propositions, with a separate action associated with each of the two verbs. This is similar to the concept described previously in representing a "true mental state" as opposed to merely a functional verb (Lyon & Flavell, 1994; Shatz, Wellman, & Silber, 1983). For example, for young children, the phrase "I think" in an utterance

like “I think I want candy,” can be equivalent to an attention or politeness marker like “Hey,” as in “Hey, I want candy,” and is not truly expressing two separate ideas of “thinking” and “wanting.” In contrast, an utterance such as “I think I like candy” demonstrates both “thinking” and the concept “liking.” After the age of three, children’s verb repertoire increases to include a more diverse set of complement taking verbs and matrix clauses as well as embedded complement clauses.

Beyond emergence, researchers have examined the roles of argument structure and finiteness in the development of complement clauses. In a comprehensive longitudinal analysis of the complex syntax acquisition of five children, from 1;8 through 5;1, in the CHILDES database, Diessel (2004) argued that early infinitival complements relate a single proposition and thus, they do not involve embedding. He suggested a close semantic link between the complement taking matrix verb and the complement verb in early infinitival complements (e.g. *I want to go; I hafta eat*). This is very similar to the process of development in sentential complement clauses.

Gaps in the Current Literature

Complement taking verbs, specifically mental state verbs, have been examined in young children to describe emergence and use across ages in relation to correct semantic usage and children’s development of theory of mind over time (Brown, Donelan-McCall, & Dunn, 1996; Johnson & Wellman, 1980; Lyon & Flavell, 1994; Shatz, Wellman, & Silber, 1983). These same verbs have not been examined with the development of complex syntax in mind related to age and productivity with complement taking verbs. Nor have these verbs been targeted specifically within an elicited language task during this period of emergence, with an aim to elicit

complement verbs in complex syntax frames. Owen Van Horne and Lin (2011) and Steel, Rose, and Eadie (2016) both elicited the target frames of interest as in the current study, reporting on typically developing children. In Steel, Rose, and Eadie (2016), the typically developing children in the comparison group were as young as 3;11, with a mean age of 4;7; the same mean age as the oldest group of interest in this current study. In Owen Van Horne and Lin (2011), their typically developing children ranged from 5- to 8-years-old and therefore were well beyond the age of emergence of mental state verbs, as well as beyond emergence of complex syntax such as complement clauses. Evidence on the emergence of infinitival complement clauses and sentential complement clauses, in relation to specific complement taking verbs, during this period of emergence, will add to the understanding of development of complement clauses in general. Data on factors that might affect child productivity at different ages, including verb frequency from the adult input (high frequency versus low frequency) and verb category (mental state verb versus communication verb), will add to a general base of knowledge on the development of complex syntax and the nature of the verbs used with complement clauses.

Elicited language tasks examining infinitival complement clauses (Crain & Thornton, 2000; Eisenberg, 2004; Barako Arndt & Schuele, 2012) and relative clauses (Schuele & Nicholls, 2000) have added to the base of knowledge drawn from the study of spontaneous language samples. Prior to Owen Van Horne and Lin (2011), data on complement clause production had been limited to spontaneous language samples. As evidenced in the literature, conversational language samples are not as informative as narrative or expository samples (Nippold, Hesketh, Duthie, & Mansfield, 2005). Elicited language tasks can examine the production of complex syntax within specifically targeted complex syntax types, and in the case of some complex syntax types, with specific complement taking verbs. Elicited tasks may

provide a more complete picture of a child's complex syntax proficiency than a language sample, due to increasing the opportunities for specific complex syntax types and tokens. Using both elicited tasks and language samples to examine complex syntax proficiency might provide the most representative picture of all (Eisenberg, 1997; Nippold, et al., 2008; Steel, Rose, Eadie, & Thornton, 2013). For the current study, an elicited language task used to target complement clause production was preferable to spontaneous language sampling as it allowed for a focus on six specific complement taking verbs, and multiple opportunities to use those verbs in three targeted syntactic structures.

Elicited tasks were used in Owen Van Horne and Lin (2011) as evidence for children with SLI having the syntax but not the semantic knowledge necessary for producing complement clauses in conjunction with mental state verbs, as children's productions of complement clauses with high frequency verbs were found to be more "flexible" than their productions with low frequency verbs. This meant that the children used the high frequency verbs across more syntactic frames. Yet, this evidence could be flawed due to the nature of the elicitation, itself. These elicitations (from Owen & Leonard, 2006) did not require the children to repeat the complement taking verb, but rather required the children just to complete the complement clause. For example, if a target utterance was "*The boy decided (that) the dog was too wild*," the child could produce "*the dog was too wild*," in completion of the carrier phrase provided by the examiner, "*The boy decided…"* and the child's response was counted as correct (i.e., complex syntax). It is possible that children were producing complement clauses, but it is also possible that children were producing a simple sentence about the task that appeared to be a complete complement clause (e.g. "*The dog was too wild*" is an independent clause and may or may not be a complement clause). Thus, we cannot draw the conclusion that children are lacking the

semantic knowledge in relation to complement clause production, as they may have been over-credited regarding their syntactic production. Manner of elicitation in the requirement of elicited elements impacts child output (Barako Arndt, Weiler, & Schuele, 2012; Eisenband, Schuele, & Barako Arndt, 2011). An elicited task requiring both the verb and the complement clause to be produced, as in the current study, arguably provides a more stringent test of a child's ability to produce complement clauses. The current study is similar to Owen Van Horne & Lin (2011) in that it is eliciting complement clauses with a variety of targeted complement taking verbs, including some high frequency and some low frequency; yet the current study focused on elicitation of complement clauses during the period of emergence of complement clauses (across three age groups of preschoolers), and it required the complement taking verb to be produced by the child, in order to dependably account for accuracy with the target verb and target structure.

Research Questions

The current investigation engaged preschoolers from three age groups (twos, threes, fours) in two elicited tasks to produce complement taking verbs plus complement clauses with six verbs. Each complement taking verb was selected for study because it was a mental state verb (n = 3) or a communication verb (n = 3) that could be produced across infinitival and sentential complement clauses. Each verb could further be identified as high frequency or low frequency in the ambient language input. The following research questions were of interest:

1a. Is there an age effect for typically developing preschoolers on mean proportion target responses and mean proportion complex responses in an infinitival complement clause elicited task?

1b. Is there an age effect for typically developing preschoolers on mean proportion target responses and mean proportion complex responses in a sentential complement clause elicited task?

2. Is there an age and task effect for typically developing preschoolers on productivity in elicited complement clause tasks?

3a. Is there a task and verb category effect for typically developing preschoolers on productivity in elicited complement clause tasks?

3b. Is there a task and verb frequency effect for typically developing preschoolers on productivity with elicited complement clause tasks?

CHAPTER II

METHOD

Overview of Study Design

Study procedures were approved by the Vanderbilt University Institutional Review Board (IRB).

Participants

Participants included 27 typically developing preschoolers (14 male, 13 female) who were mainstream monolingual English speakers, recruited by age, to explore development across the preschool time period. Three age groups were pre-defined prior to data collection in an effort to characterize emergence and developmental change across the preschool years: Two-Year-Olds: 2;10 to 3;0 (n = 10), Three-Year-Olds: 3;8 to 3;10 (n = 8), and Four-Year-Olds: 4;6 to 4;8 (n = 9). We hypothesized that complex syntax would be emerging for the Two-Year-Olds, that Three-Year-Olds would have variable complex syntax proficiency, and that Four-Year-Olds would be approaching a more adult-like level of complex syntax proficiency, thus demonstrating higher performance on the tasks. Participants were recruited in Nashville, Tennessee and Louisville, Kentucky (and surrounding areas). See Table 1 for participant characteristics.
To participate a child had to have normal hearing, per parent report and a nonverbal IQ score ≥ 85 on the *Primary Test of Nonverbal Intelligence* (PTONI; Ehrler & McGhee, 2008). A battery of descriptive measures (see Table 2) was administered to assure that all participants had typical language development (i.e., standard scores ≥ 85): *Peabody Picture Vocabulary Test-4* (PPVT-

4; Dunn & Dunn, 2007), *Expressive Vocabulary Test-2* (EVT-2; Williams, 2007), and *Structured Photographic Expressive Language Test Preschool 2nd Edition* (SPELT-P 2; Dawson, Stout, Eyer, Tattersall, Fonkalsrud, & Croley, 2004), as well as met age group criterion on the *Test of Early Grammatical Impairment* (TEGI; Rice & Wexler, 2001). See Table 3 for participant performance on individual study measures[1]. A requirement for inclusion was also participation task compliance (i.e., excluded if provided no responses on either elicited tasks); no consented child was excluded upon this basis.

Table 1

Participant Characteristics

Variable	Two-Year-Olds (*n* = 10)	Three-Year-Olds (*n* = 8)	Four-Year-Olds (*n* = 9)
Mean Age	2;11	3;10	4;7
n by months	2;10: n = 2	3;8: n = 0	4;6: n = 2
	2;11: n = 4	3;9: n = 1	4;7: n = 4
	3;0: n = 4	3;10: n = 7	4;8: n = 3
Maternal Education			
High School or GED	2	1	1
Bachelor's Degree	3	2	5
Post-baccalaureate	5	5	3
Race			
Caucasian	9	7	9
African American	1	0	0
Asian	0	1	0

Procedures

Parents provided consent for children to participate in the study; children provided verbal assent. Children completed two one-hour visits with the examiner (i.e., author), either at the child's

[1] Note that children in Group 1 (2;10 to 3;0) who were below 3 years of age (*n* = 6 out of 10) were compared to norms for children 3 years, 0 months on the *SPELT-P 2* and *PTONI*, which are not normed with a population below three years of age.

Table 2

Descriptive Measures

Measure	Description
PPVT-4	a norm-referenced assessment of receptive vocabulary
EVT-2	a norm-referenced assessment of expressive vocabulary
SPELT-P 2	a norm-referenced assessment of a child's ability to generate early developing morphological and syntactic forms.
TEGI Screener	an individually-administered clinical tool used as a screener of tense and agreement in young children
PTONI	a norm-referenced measure that assesses reasoning abilities in young children

Note: Dawson, J., Stout, C., Eyer, J., Tattersall, P., Fonkalsrud, J., & Croley, K. (2004). *Structured Photographic Expressive Language Test-Preschool 2 (SPELT-P 2).* DeKalb, IL: Janelle Publications.; Dunn, L. M. & Dunn, D. M. (2007). *PPVT-4: Peabody Picture Vocabulary Test*. Pearson: Minneapolis, MN.; Ehrler, D. J. & McGhee, R. L. (2008). *PTONI: Primary Test of Nonverbal Intelligence*. ProEd Inc: Austin, TX.; Williams, K. (1997). *Expressive Vocabulary Test-2*. (2007). Circle Pines, MN: American Guidance Service.

Table 3

Participant Performance on Individual Study Measures

		Measures			
		PPVT-4	*EVT-2*	*SPELT-P 2*	*PTONI*
Age Group	*n*	M *(SD)*	M *(SD)*	M *(SD)*	M *(SD)*
Two-Year-Olds	10	116.00 *(13.89)*	117.70 *(13.02)*	110.20 *(10.62)*	113.60 *(18.37)*
Three-Year-Olds	9	118.50 *(13.05)*	116.00 *(9.15)*	112.13 *(12.11)*	113.63 *(11.98)*
Four-Year-Olds	8	125.44 *(9.99)*	113.22 *(15.28)*	115.56 *(7.57)*	129.00 *(9.89)*

school or home, or at the Child Language and Literacy Lab at Vanderbilt University. In visit 1, children completed the PPVT-4, the TEGI, the PTONI, and the two elicited tasks. In visit 2 children completed the EVT-2 and the SPELT-P 2. Children completed their second visit one to seven days after their first visit. Child responses on the standardized measures were recorded online; elicited tasks responses were audio recorded and transcribed on line. A research assistant

was trained to check scoring on all descriptive measures. The author transcribed the elicited task responses from the audio recordings. The dissertation advisor, alongside the author, reviewed the audio-recordings for 10% of the samples, with reliability at 100% for transcription. Thus, the author's original transcriptions of elicited task responses were analyzed.

Dependent Measures: Elicited Language Tasks

Two elicited language tasks were administered to examine the production of complement taking verbs in (a) infinitival complement clauses (18 items), and (b) full propositional complement clauses and WH- complement clauses (heretofore collectively referred to as sentential complements; 18 items). The tasks were modified from two elicited complex syntax tasks that were developed by Schuele (no date) and informed by Eisenberg (2004) and Crain and Thornton (2000). Modifications allowed for the same set of verbs used across tasks. Prior work in our lab indicated that the tasks were feasible with typically developing children in the age range studied.

The elicited language tasks were play-based elicitation tasks, using small toys and pictures. For each target utterance, a scenario was presented with the toys and pictures accompanied by scripted verbal prompts that obligate or guide a child to produce the desired complex syntax structure. See Appendix A for the Infinitival Complement clause task protocol and see Appendix B for Sentential Complement clause task protocol. See Table 4 for Target Responses by Verb and Clause Type.

Complement taking verbs were selected based on two criteria. First, selected verbs subcategorized for infinitival complement clauses as well as for sentential complements (i.e., full

Table 4

Target Responses by Verb and Clause Type

Verb	Clause Type			
	Infinitival Clause	FPC (that) clause	FPC If/whether – obligatory	WH- finite
Ask	Mickey asks (Goofy) to stand up. Mickey asks Goofy to push him (on the swing). Mickey asks (Goofy) to go to the nurse.		Buzz asked if he could play ball too.	The girl asked where the candy went. Ask Minnie what her favorite present is.
Forget	Mickey forgot to put the note (in his backpack). Mickey forgot to pump his legs. Mickey forgot to take the ice.		Chicken Little forgot whether/if he brought the glove.	The girl forgets where the candy is. Minnie forgot who brought her the slinky.
Like	Goofy likes to send a nice note home. Mickey likes to swing. Mickey likes Goofy to throw the ball.	Buzz likes that CL tries his best		Elmo likes how candy tastes. Tigger likes how Pooh wrapped his gift.
Remember	Mickey remembers to take his backpack. Mickey remembers to pump his legs. Mickey remembers to ice his hand.	Pooh remembers (that) it is Minnie's birthday. CL remembered (that) he left his ball at home		The girl remembers where the candy is.
Say	Goofy says to sit down. Goofy says to swing higher. Minnie says to put ice on Mickey's hand.	Elmo says that he knows where the candy is. Minnie says that all the gifts are her favorite. CL says that Buzz can borrow a glove.		
Tell	Goofy tells Mickey to take the note (in his backpack). Goofy tells Mickey to pump his legs. Minnie tells Mickey to sit down.	Elmo tells the girl (that) he will share the candy. Pooh told her (that) he brought the slinky. The man told CL (that) the glove is in the box.		

propositional complement clauses and/or WH-complement clauses). Second, three high frequency and three low frequency verbs were selected (see Table 5). Investigations of spontaneous language samples suggest that children's early productions of infinitival and sentential complements are limited to a limited range of verbs (Bloom, et al., 1989). Frequency was of interest in the current study to further examine the role input might play in usage. In order words, are the limited verbs used related to the verbs children hear most frequently?

Table 5

Target Complement Taking Verbs for Elicited Language Tasks

High Frequency Verbs	Low Frequency Verbs
like*	ask**
say**	forget*
tell**	remember*

Note: *Mental State Verb; **Communication Verb

Verbs were balanced by frequency of usage (e.g., three high frequency: *like, say, tell* and three low frequency: *ask, forget, remember*) from reported lexical frequencies compiled from counts of adult-usage in the CHILDES database language samples (Li & Shirai, 2000; MacWhinney, 2000; Owen Van Horne & Lin, 2001). These studies designated verbs with frequency values that were greater than 3.75 as high frequency verbs, distinguishing them from other verbs thus designated as low frequency verbs. *Like, say,* and *tell* were verbs that scored above 3.75 on counts of lexical frequency and are thus considered high frequency verbs in this study. *Ask, forget, and remember* scored below 3.75 on counts of lexical frequency and are thus considered low frequency verbs in this study. Verbs were also identified as either Mental State Verbs (*forget, like, remember)* or Communication Verbs (*ask, say, tell).*

Coding System. See Appendix A for target utterances for the Infinitival Complement clause task and see Appendix B for target utterances for the Sentential Complement clause task. The coding system for child responses on the elicited task was derived initially from prior studies in the Child Language and Literacy Lab at Vanderbilt University. The coding classification considered whether the child's response included the target verb (i.e., the verb provided in the elicitation prompt), the grammatical structure of the child's response, and the grammaticality of the child's response. For example, in the Infinitival Complement clause task, the target structure included the subject, the target verb, the obligatory *to*, and the complement taking verb (Code 1a in Table 6; see Table 6 for coding). The author assigned codes to each response. Additional codes were added to the coding system as needed so that all child responses were assigned a code. As we coded responses, if a child's response did not align with an existing codes, a new code was added. The author and dissertation advisor then reviewed the code assigned to each child to achieve agreement on assigned code.

Variable Derivation and Data Analysis

To answer Research Questions 1a and 1b, variables were derived for mean proportion target responses and mean proportion complex responses within each task (i.e., two variables per child per task). Proportion of target responses was the mean number of child responses that included the target verb plus the targeted complement clause, out of the total number of opportunities per task (denominator 18 items). For the Infinitival Complement clause task, after all utterances were coded, a child received a score of 1 for codes 1a or 2a, and a 0 for all other codes. A total proportion of target responses was derived from the average number of child responses assigned the codes 1a or 2a (receiving a score of 1) out of the total number of items

(18). For the Sentential Complement clause task, a child received a score of 1 for the assigned codes 5a, 5d, 5e, or 7, and proportion of target responses was derived by determining a mean score for that child. If a child produced a grammatically correct, non-target structure with a target verb (e.g., a WH-complement clause for a full-propositional complement clause or vice-versa), this was not counted as a correct target response.

Proportion of complex responses was the mean score of child responses that included any complement taking verb plus a complement clause. For proportion of complex responses, a score of 1, indicating a correct use of any complement taking verb plus a complement clause, was given for a child who received the codes for percent target responses (above) as well as codes 1b, 1c, 1d, 1f, 1g, 1h, 3a, 5b, 5c, 5f, 6a, or 6b. All scores of 1 were averaged (denominator 18) to derive a mean proportion of complex responses.

To answer Research Questions 2, 3a, and 3b, target verb productivity was defined as production of the target verb followed by a grammatical use of the targeted complex syntax type in two out of three opportunities within each elicited task (codes 1a or 2a for the infinitival complement task, and codes 5a, 5d, 5e, or 7 for the sentence complement task). Thus, each verb in each task was designated as productive or not for each child. To answer Research Question 2, the mean proportion of productive verbs (denominator 6 verbs) for each group was calculated for each elicited task. To answer Research Questions 3a and 3b, the number of the productive verbs was summed for each verb category (i.e., mental state verb or communication verb and frequency, i.e. high or low frequency). A child could score 0, 1, 2 or 3 on productive uses of a verb within a task, as there were three opportunities with each verb type in each task (e.g., three low frequency verbs versus three high frequency verbs; three mental state verbs versus three

communication verbs). A frequency of total number of productive use with verbs by category per task was derived for each group of children (maximum score of 3).

Table 6

Complex Syntax Coding System

Code	Structure Produced by Child
0	Unscorable (sound effect, single noun or other one-word response (exception: target verb)
1a	Target Verb + to + INF
1b	Target Verb - to + INF
1c	Target Verb Ungrammatical + to + INF
1d	Non-target Verb + UIC
1e	no CTV + to + verb
1f	target verb + to -INF
1g	UIC
2a	Target Verb + N + to + INF
2b	No CTV + N + to + INF
3a	2N reduced to 1N + Target V (grammatical)
3b	2N reduced to 1N + Target V (ungrammatical)
4a	Target Verb + Simple Structure
4b	Non-target Verb + Simple Structure
5a	Target Verb + FPC + required If
5b	Target Verb + FPC - Required That
5c	Target Verb + FPC - Required If
5d	Target Verb + FPC (No optional that)
5e	Target Verb + FPC (+ optional that)
5f	Target + wrong complement
6a	Non-target verb + to + INF
6b	Non-target Verb - to +INF
7	Target Verb + WFC
8	target verb alone
9	participle clause
10	subordinate clause

To explore the developmental progression of complement clause production (Research Question 1a and 1b), Analysis of Variance (ANOVA) was used to compare means between groups for (a) proportion of target responses in the Infinitival Complement clause task and the Sentential Complement clause task and (b) proportion of complex responses in the Infinitival Complement clause task and the Sentential Complement clause task. Age group was the between-subjects factor in each analysis. Cohen's *d* was calculated using the difference in group means divided by the pooled standard deviation and derived using SPSS (Statistical Package for the Social Sciences).

To examine target verb productivity in the Infinitival Complement clause task as compared to target verb productivity in the Sentential Complement clause task (Research Question 2), group differences were examined using a 3 (Group) x 2 (Elicited Task) Repeated Measures ANOVA (RMANOVA). Statistical analysis for Research Question 3 was planned to analyze means of numbers of productive verbs per child across verb category and frequency by task, but due to low productivity with verbs in target complex structures, descriptive measures were used. Productivity comparisons for mental state verbs and communication verbs, as well as for high frequency versus low frequency verbs (RQ3), were reported as the number of children in each group by number of productive verbs (maximum 3).

CHAPTER III

RESULTS

Table 7 summarizes the group means and standard deviations for percent target response and percent complex response by elicited task. Levene's Test of Homogeneity of Variances revealed a non-standard distribution of scores across groups. As these scores violate homogeneity of variance, a non-parametric analysis would have been more appropriate; however, scores are reported based on a One-Way Analysis of Variance (ANOVA) and followed by Linear Contrasts, which did take into account unequal variances.

Table 7

Proportion Target and Complex Responses by Task and Age

		Proportion Target Response		Proportion Complex Response	
Group	*n*	Infinitival Complements M *(SD)*	Sentential Complements M *(SD)*	Infinitival Complements M *(SD)*	Sentential Complements M *(SD)*
Two-Year-Olds	10	0.03[a,b] *(.05)*	0.02[a,b] *(.04)*	0.06[a] *(.08)*	0.07[a, b] (*.09)*
Three-Year-Olds	9	0.30[a] *(.17)*	0.12[a] *(.08)*	0.40[c] *(.23)*	0.27[a] *(.16)*
Four-Year-Olds	8	0.38[b] *(.24)*	0.29[b] *(.23)*	0.48[a,c] *(.31)*	0.42[b] *(.29)*

[a] = significant between-group difference for Two-Year-Olds and Three-Year-Olds; [b] = significant between-group difference for Two-Year-Olds and Four-Year-Olds; c = significant between-group differences for Three-Year-Olds and Four-Year-Olds

Research Question One

To answer Research Question One, means for proportion target responses and means for proportion complex responses were compared across age groups by task using a One-Way ANOVA with age group as the independent variable and a *p* value of $p < .05$.

Research Question 1a: *Is there an age effect for typically developing preschoolers on proportion target responses and proportion complex responses in an infinitival complement clause elicited task?* A One-Way ANOVA revealed a main effect for age for the mean proportion target response in the Infinitival Complement Clause task *($F(2,24) = 10.85$, $p = .01$,* $\eta^2 = .47$). Follow up comparisons using linear contrasts with a Bonferroni correction (.05/3) revealed a between-group difference for the Two-Year-Olds and Three-Year-Olds with a large effect size, *$F(2,9) = -3.47$, $p = .01$, $d = 2.14$,* as well as for the Two-Year-Olds and the Four-Year-Olds, (*$F(2,8) = -4.35$, $p = .01$, $d = 2.09$)* with a large effect size. No difference was found between the Three-Year-Olds and Four-Year-Olds.

A One-Way ANOVA revealed a main effect for age group for the mean proportion complex response in the Infinitival Complement clause task *($F(2,24) = 9.86$, $p = .01$,* $\eta^2 = .45$). Follow up comparisons using linear contrasts with a Bonferroni correction (.05/3) a between-group difference for the Two-Year-Olds and the Three-Year-Olds *($F(2,10) = -4.29$, $p = .01$, $d = 2.06$)* with a large effect size, as well as for the Two-Year-Olds and Four-Year-Olds (*$F(2, 8) = -3.77$, $p = .01$, $d = .83$),* also with a large effect size. No difference was found between the Three-Year-Olds and the Four-Year-Olds.

Research Question 1b: *Is there an age effect for typically developing preschoolers on proportion target responses and proportion complex responses in a sentential complement clause elicited task?* A One-Way ANOVA revealed a main effect for age group for the mean

proportion target response in the Sentential Complement clause task *(F(2,24) = 9.38, p =.01,* η^2 = .44). Follow up comparisons using linear contrasts with a Bonferroni correction (.05/3) revealed a between-group difference for the Two-Year-Olds and the Four-Year-Olds, *F(2,11) = -3.61, p = .01, d = 1.77,* with a large effect size, as well as for the Three-Year-Olds and the Four-Year-Olds (*F(2,11) = -3.33, p = .01, d = 1.04),* also with a large effect size. No difference was found between the Two-Year-Olds and Three-Year-Olds.

A One-Way ANOVA revealed a main effect for age group for the mean proportion complex response in the Sentential Complement clause task *(F(2,24) = 7.68, p =.01,* η^2 = .39). Follow up comparisons using linear contrasts with a Bonferroni correction (.05/3) revealed a between-group difference for the Two-Year-Olds and the Four-Year-Olds, *F(2,11) = -3.31, p = .01, d = 1.73,* with a large effect size, as well as for the Two-Year-Olds and Three-Year-Olds (*F(2,8) = -3.33, p = .01, d = 1.52),* also with a large effect size. No difference was found between the Three-Year-Olds and the Four-Year-Olds.

Research Question Two

Research Question Two: *Is there an age and task effect for typically developing preschoolers on productivity with elicited complement clause tasks?* See Table 8 for mean proportion productivity by task. Group differences examined using a 3 (Group) x 2 (Elicited Task) RMANOVA and revealed a main effect for group for productivity with target verbs on the Infinitival Complement clause task (*F (1, 7) = 19.44, p = .01,* η^2 *= .74*). Pairwise comparisons using a Bonferroni correction (.05/3) indicated a group difference between the Two-Year-Olds and the Four-Year-Olds on productivity with the target verbs in the Infinitival Complement clause task (Two-Year-Olds and Four-Year-Olds, p = .01, partial η^2 = .76).

Table 8

Proportion Productivity by Task

Group	*n*	Infinitival Complement Clause Task M *(SD)*	Sentential Complement Clause Task M *(SD)*
Two-Year-Olds	10	.02[a] *(.02)*	0 *(0)*
Three-Year-Olds	9	.28 *(.07)*	.09 *(.12)*
Four-Year-Olds	8	.44[a] *(.09)*	.29 *(.08)*

[a] = significant between-group difference for Two-Year-Olds and Four-Year-Olds

A 3x2 RMANOVA revealed a main effect for group for productivity with target verbs on the Sentential Complement clause task (F (1, 7) = 12.70, p = .01, η^2 = .65). Pairwise comparisons using a Bonferroni correction (.05/3) indicated no significant group differences on the Sentential Complement clause task.

Research Question Three

Research Question 3a: *Is there a task and verb category effect for typically developing preschoolers on productivity with elicited complement clause tasks?* Number of participants who achieved productivity by verb category and elicited task were reported (see Table 9). Descriptively, growth with age is seen across groups by task, but the more productive verb category varies across the two tasks. In both tasks, a developmental progression is noted in that Four-Year-Olds are productive with more verbs in each verb category than Three-Year-Olds, and Three-Year-Olds are more productive than Two-Year-Olds. In the Infinitival Complement clause task, children are more productive with mental state verbs, as opposed to communication verbs,

but in the Sentential Complement clause task, children are more productive with communication verbs, as opposed to mental state verbs.

Research Question 3b: *Is there a task and verb frequency effect for typically developing preschoolers on productivity with elicited complement clause tasks?* Number of participants who achieved productivity by verb frequency and elicited task were reported (see Table 10). As with verb category, descriptively, growth with age is seen across groups by task, but differences were seen in the more productive verb frequency in the Infinitival Complement clause task. In both tasks, a developmental progression is noted in that Four-Year-Olds are productive with more verbs in each verb category than Three-Year-Olds, and Three-Year-Olds are more productive than Two-Year-Olds, although Three-Year-Olds and Four-Year-Olds performed very similarly with low frequency verbs on the Infinitival Complement clause task. In the Infinitival Complement clause task, children are more productive with low frequency verbs, as opposed to high frequency verbs, but in the Sentential Complement clause task, little difference was noted between the two verb frequency types for each age group.

For Research Questions 3a and 3b, descriptives are reported as opposed to the previously planned statistical analyses due to the overall low productivity by children on these tasks. Amongst Two-Year-Olds, only one child was productive with one category – the mental state verbs in the Infinitival Complement task. No other Two-Year-Old was productive with any set of verbs across either task. To further illustrate the lack of productivity, for that same variable (productivity with mental state verbs in the Infinitival Complement clause task), only 13 of the 27 children were productive across the 3 groups. At less than 50% productivity, this was actually the highest scoring variable. Its comparison variable (productivity with communication verbs in the Infinitival Complement clause task), for contrast, had only 4 children scoring as productive,

and those four children were all Four-Year-Olds. Though productivity increased with age, total productivity across each task was so low that descriptive analysis was the most informative method of reporting on this data.

Table 9

Number of Participants Who Achieved Productivity by Verb Category and Elicited Task

		Infinitival Complement Clause Task								Sentential Complement Clause Task							
		Mental State Verbs				Communication Verbs				Mental State Verbs				Communication Verbs			
		Number of Productive Verbs															
		0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
Group	*n*																
Two-Year-Olds	10	9	1	0	0	10	0	0	0	10	0	0	0	10	0	0	0
Three-Year-Olds	9	3	0	5	1	7	2	0	0	7	2	0	0	6	3	0	0
Four-Year-Olds	8	1	2	3	2	3	4	1	0	5	3	0	0	2	2	3	1

Table 10

Number of Participants Who Achieved Productivity by Verb Frequency and Elicited Task

		Infinitival Complement Clause Task								Sentential Complement Clause Task							
		High Frequency Verbs				Low Frequency Verbs				High Frequency Verbs				Low Frequency Verbs			
		Number of Productive Verbs															
		0	1	2	3	0	1	2	3	0	1	2	3	0	1	2	3
Group	*n*																
Two-Year-Olds	10	10	0	0	0	9	1	0	0	10	0	0	0	10	0	0	0
Three-Year-Olds	9	6	3	0	0	2	2	5	0	6	3	0	0	7	2	0	0
Four-Year-Olds	8	2	3	3	0	1	3	3	1	3	3	2	0	2	4	2	0

CHAPTER IV

DISCUSSION

The aim of the present study was to examine the production of complement clause types in two elicited language tasks (an Infinitival Complement clause task and a Sentential Complement clause task). Comparisons were made between tasks on production and productivity with complement taking verbs (*ask, forget, like, remember, say, tell)* by three different age-groups of typically developing children (Two-Year-Olds, Three-Year-Olds, Four-Year-Olds). Verbs were additionally analyzed by category (mental state: *forget, like, remember* or communication verb: *ask, say, tell*) and frequency (high frequency: *like, say, tell* or low frequency: *ask, forget, remember*).

Emergence and use of complement taking verbs have been examined in young children in relation to correct semantic productions and children's development of theory of mind over time. These same verbs have not been examined in the framework of the development of complex syntax, nor have these verbs been targeted specifically within an elicited language task during this period of emergence, with an aim to elicit complement verbs in complete complex syntax frames. The current study required both the verb and the complement clause to be produced in each elicited clause, providing evidence of production and productivity with each of the six verbs across the two tasks by age, for typically developing preschoolers.

Findings from the present study confirm established research regarding development of complex syntax types broadly by age (Bloom, Tackeff, & Lahey, 1984; Diessel, 2004; Eisenberg, 2004) and offer a thoughtful reflection upon the expected range of timing for

development of infinitival and embedded complement clauses in regards to the specific requirements of the clauses (e.g., verb selection, obligatory elements for grammaticality). Related to how specific verbs interact with different complement clause structures, children in the present study were more productive with low-frequency verbs in infinitival complement clauses, although productivity with low-frequency verbs and high-frequency verbs was similar across the Sentential Complement clause task. This finding, in relation to the more complex infinitival complement clauses, complements that of Owen Van Horne and Lin (2011), who reported that typically-developing children utilized low-frequency verbs in narrative and expository language samples in complex structures. Taken together, these findings suggest that low-frequency verbs may be of use in explicit teaching of complex structures, as the verbs often subcategorize as one of the target complex structures. A discussion on how frequency in input was determined and possible limitations follow, as well as future directions in considering adult input specific to complex syntax structures.

Developmental Progression by Age

Research Question 1 examined differences among three age-groups of typically developing children, focusing on both proportion of overall utterances using complement taking verbs in the target structure and proportion of overall utterances using complement taking verbs in a complex structure, each in an elicited Infinitival Complement clause task as well as in an elicited Sentential Complement clause task. Differences among groups were present in both mean proportion target response and mean proportion complex response within the Infinitival Complement clause task and the Sentential Complement clause task. As expected, developmental progression (increased accuracy with age) was evident across age group in mean

proportion target response and mean proportion complex response, as well as in mean proportion target response by verb, for both the elicited Infinitival Complement clause task and the Sentential Complement clause tasks.

On the Infinitival Complement clause task, significant differences were found differentiating the Two-Year-Olds from the Three-Year-Olds and Four-Year-Olds, indicating that a change in ability to produce infinitival complement clauses occurs between the ages of 3;0 and 3;8. As we hypothesized, this finding supports the literature as the timeframe in which infinitival complements are emerging initially in usage, and developing by expanding in depth with that grammatical frame, through an increased lexicon of complement taking verbs utilized with that structure.

In the Sentential Complement clause task, significant differences were found differentiating the Two-Year-Olds and Three-Year-Olds from the Four-Year-Olds (in Mean Percent Target Response) and between the Two-Year-Olds and the Four-Year-Olds (in Mean Percent Complex Response), indicating that growth occurs generally between the ages of 3;10 to 4;6. These findings are not surprising; however, they do elicit reflection upon the expected range of timing for development of infinitival and embedded complement clauses, as well as reflection upon the specific requirements of the clauses (e.g., verb selection, obligatory elements for grammaticality). What is occurring between those ages to account for the usage of the mental state and communication verbs of interest to be utilized in infinitival complement clauses closer to three years of age and yet not be used until closer to four years of age, on average, for sentential complements like full propositional and WH- complement clauses? A closer examination of the verbs utilized with these structures follows.

Productivity Across Tasks

Research Question 2 examined the differences in productivity with each verb across the three age-groups of children. In other words, can a child use a target verb in the target form more than one time within the same task? In this case, regarding our definition of productivity: can a child use a target verb in the target form in two out of the three opportunities? Significant differences were found that suggest periods of development for these complex structures.

On the Infinitival Complement clause task, there was a significant difference between the Two-Year-Olds and Four-Year-Olds on productivity. This finding indicates that development is occurring between the ages of the participants in the Two-Year-Olds and the Four-Year-Olds (between the ages of 2;10 – 4;7), where a shift in productivity occurs. On the Sentential Complement clause task, there was no difference among any of the groups. This indicates a wider window of development for productivity with Sentential Complement clauses occurring later than with the Infinitival Complement clause task, and beyond the age at which we tested. This is the same general pattern of development found in production in Research Question 1. These findings are useful in continuing to establish a timeline for the development of embedded complement clauses, beyond emergence, specific to productivity. An understanding of when typically developing children are productive with complex syntax structures, such as embedded complement clauses, can better inform clinicians as to when to begin targeting such structures in children with developmental language disorders. If we consider the higher rates of productivity with the target verbs and the target structures for the Three- and Four-Year-Olds in the Infinitival Complement clause task, and for the Four-Year-Olds in the Sentential Complement clause task, then productivity was seen among typically developing children by the mean age of 3;10 for

Infinitival Complement clauses and by the mean age of 4;7 for Sentential Complement clauses elicited: full propositional complement clauses and WH- complement clauses.

This evidence for productivity in typically developing pre-school age children confirms that productivity with infinitival complement clauses and full propositional/WH- complement clauses is occurring at the same time that many of Brown's 14 grammatical morphemes are moving toward mastery; thus, it is not a later developing skill to embed complement clauses (Barako Arndt & Schuele, 2013), and should be a target of intervention with pre-school age children.

Complement Taking Verbs

Research Question 3 examined productivity with complement taking verbs by verb category and verb frequency, as one way to focus targeting these structures in intervention is by a systematic selection of verb vocabulary that elicits these target structures. This study focused on two categories of verbs used with sentential complements: mental state verbs (*forget, like, remember)* and communication verbs (*ask, say, tell).* We wanted to know if children would be more productive with mental state verbs or communication verbs in elicited language tasks. Here, frequency of total number of productive use with verbs by category per task were counted for each group of children, and it was determined that **c**hildren were more likely to be productive with mental state verbs in the Infinitival Complement clause task but were more likely to be productive with communication verbs in the Sentential Complement clause task. It is possible that the selected mental state verbs more easily elicit the frame for Infinitival Complement clauses and communication verbs more easily elicit the frame for Sentential Complement clauses; however, two of the three target mental state verbs were also low frequency verbs

(*forget, remember*), and children were also more likely to use low frequency verbs with the Infinitival Complement clause task. Thus, is it hard to differentiate with these selected verbs, the impact of verb category as opposed to verb frequency, in particular in relation to infinitival complement clauses. A closer examination of the unique argument structure for the target complement taking verbs was warranted.

The verbs *say* and *tell* (which are both high frequency, communication verbs) were particularly problematic for all children. Chomsky (1981) describes the notion of the phonetically null subject, PRO, which, in infinitives, is coindexed by an antecedent via a controlling noun phrase (NP). The majority of infinitival complements are considered "obligatory-control complements" that require PRO to have an internal reference, and that reference can be in the subject position (subject-controlled) or in the object position (object-controlled). The verb *say* is an exception to obligatory control in the production of infinitives, and *tell* requires object control (Eisenberg & Cairns, 1994).

In the Infinitival Complement clause task, the Three- and Four-Year-Olds produced infinitives with *say,* no child across all three groups was productive with this verb. The referent for PRO with a verb like *say* in the production of an infinitive is external to the sentence, despite a c-commanding NP. For example, in the target utterance *Goofy says to sit down,* Goofy is a c-commanding NP but the referent for PRO is external to the sentence (*Goofy says* [PRO *to sit down*]). It is possible that the development of a structure with an exception to obligatory-control is more sophisticated or later-developing. Eisenberg and Cairns (1994) found that children between the ages of three and five struggled with the production of referents with this verb, likely to use an ambiguous referent.

Tell, as noted above, is object-controlled, and requires a second noun functioning as the object of the verbs in a *noun-verb-noun-to-verb* structure (e.g., *Goofy tells Mickey to take the note; Goofy tells Mickey* [PRO *to take the note*]); as opposed to a *noun-verb-to-verb* (e.g., *Goofy tells to take the note* (ungrammatical)), as something must be told *to someone,* and what is told to that someone is a third required argument of the verb *tell*. This structure, in itself, is more complex than a single-noun subject-controlled infinitival complement clause, potentially due to both the noun that functions as the direct object of the verb (and is obligatory in the grammatical structure), as well as the cognitive awareness involved. Thus, it is difficult to discern if challenges with use of *tell* stem from confusion about the semantics of the verb and its similarity to *say* (yet different structure required of each), or, if it is because of the additional arguments required by the syntax.

Like, across tasks, was not a productive verb, nor did children achieve even a basic minimal skill in using *like* in a complex structure. *Like* is the third high frequency verb (along with *say* and *tell*). Although *like* was produced by one child in the Two-Year-Olds and one child in the Four-Year-Olds with full propositional complement clauses, no child was productive with the verb *like* in the Sentential Complement clause task. In the Infinitival Complement clause task, two items with *like* were subject-controlled (e.g., *Mickey likes to swing*) and one was object-controlled (e.g., *Mickey likes Goofy to throw the ball*). Children seemed to have more success with the subject-controlled items, indicating that object-control is a later developing skill, similar to use of the object-controlled *tell.* This inclusion of an object-controlled item may have limited productivity; however, it is possible that this high frequency mental state verb may just simply be more likely to be used in simple sentence frames, as least at these ages. Again, the selected verbs were designated as high or low frequency by data from the overall adult input;

however, what might be a more appropriate selection of high and low frequency verbs for an examination of complement clauses would be verbs which were used at high or low frequencies in syntactically complex utterances.

The findings across these three age-groups, with the uniqueness of the object-controlled PRO in *tell* and in one of the targets with *like*, as well as the exception to obligatory control in *say*, indicate that preschool-age children are more productive at the individual verb level, with structures involving subject-controlled verbs in Infinitival Complement clauses. It is likely, then, that the specific clausal structure and grammatical requirements of target verbs like *like, say*, and *tell* make these verbs more challenging for young children. These findings are in line with Steel, Rose, and Eadie (2016), as typically developing children in their study also struggled with *tell* and *say*. When selecting target verbs to elicit infinitives, verbs like *ask, forget*, and *remember* might be more appropriate during this period of language development.

The selected verbs were designated as high or low frequency by data from the overall adult input. Upon examination of the data, what might be a more appropriate selection of high and low frequency verbs for an examination of complement clauses would be verbs which were used at high or low frequencies in syntactically complex utterances. Owen Van Horne and Lin (2011) reported that narrative and expository language samples elicited more low frequency verbs as compared to conversational language samples, and found that children with language impairment were less likely to use these low frequency verbs in complement clauses, as compared to vocabulary and age-matched peers. Thus, typically developing children were using low-frequency verbs in complement clauses. That children were more likely to be productive with low frequency verbs in our Sentential Complement clause task, along with the data reported from Owen Van Horne and Lin (2011), suggest that introducing low frequency verbs to pre-

school age children at the appropriate ages for expected productivity for Sentential Complement clauses, could be a useful way to target these structures while expanding vocabulary.

Kidd, Lieven, and Tomasello (2006) found that children were more likely to repeat utterances with sentential complements when they included a high frequency complement taking verb, and that children were more likely to correct agrammatical utterances using sentential complements with high frequency complement verbs. Diessel (2004) suggested that specific verbs impact the development of complement clauses and that input plays a role. More data is needed to examine the effect of frequency on children's productions of embedded complement clauses. It could be that the category of verb (Mental State Verb or Communication Verb) impacted children's use of the target verb with the target structure. Considerations of specific verbs selected for the elicited tasks should be examined, in general, as the elicited task is refined.

Theory of Mind

Mental state verb development in relation to emergence and theory of mind has been examined in typically developing children. This study examined mental state verbs in relation to complex syntax development and targeted those verbs via an elicited task, alongside verbs of communication. The children in this study were more productive mental state verbs in infinitival complement clauses and more productive with communication verbs in sentential complement clauses, which are later emerging in typical development compared to infinitives. This indicates that the children in the current study are still in the process of developing the theory of mind necessary to productively use mental state verbs with sentential complement clauses.

Variation in input may also play a role in children's ability to understand mental states. Adrian, Clemente, & Villanueva (2007) examined mothers' use of cognitive verbs in a book-

reading task with their child, and the child participated in false-belief tasks to assess his or her understanding of mental states. Relevant findings from this study include a correlation between mothers' early use of mental state verbs and children's understanding of mental states via false belief tasks, as well as that mothers' use of mental state verbs increased to match the developing cognition of their child from Time 1 to Time 2 in the study. Thus, input increases with development, and growth is seen in comprehension of these verbs. It would be expected, then, that growth in expressive language would been seen, as well. Importantly, mothers' use of mental state verbs were characterized by frequency but not by complex syntax structure. An examination of mental state verb use in the adult language input with a focus on complex syntax structure would be more descriptive than the current measure of verb input frequency, and perhaps would better illuminate differences seen in child production between verbs as well as complex syntax types.

Syntax and Semantics

The theories of generative grammar continue to evolve since first proposed by Chomsky (1965) but one constant remains in Chomsky's theory: syntax is the root of all linguistic organization (Chomsky, 1965, 1981, 1995). Jackendoff (2003) counters this theory with a parallel theory of the generative nature of semantics. Syntax and semantics interface at the point of the syntactic head (e.g., verbs) and due to the required argument structure of that syntactic head, such as a subject, object, or possibly even an indirect object. The semantics of verbs can be determined by this syntactic structure, but the structure is also determined by the desired semantics (Jackendoff, 2003). At the level of embedded complement clauses, this is what seems to be evident. The findings of the current study indicate differences may be evident in complex

syntax usage across sentential categories based on qualities of verbs (mental state versus communication; high frequency versus low frequency), but are likely highly driven by the specific argument structure of those verbs. Further examination of the usage of the selected verbs in the adult input children are exposed to is warranted in order to better understand usage by typically developing children, as well as more information on the development of Theory of Mind in relation to these specific verbs.

CHAPTER V

LIMITATIONS AND FUTURE DIRECTIONS

Task and Item Analysis

Future data collection should take into account limitations with the task based on verb selections and/or the actual target story and elicitation target. There were several items where ten percent or fewer of the children responded with a target response. In the Infinitival Complement clause task, those items were Items: 1, 2, 8, 10, 13, and 16. These items included all instances of *say*, two instances of *ask*, and one instance of *like*. When items were examined for a complex response, and not just a target response, only Items: 2 and 10 (both *say*) remained at ten percent or under. In the Sentential Complement clause task, those items where ten percent or fewer of the children responded with a target responses included Items: 1, 5, 9, 11, 12, 13, 14, and 17. These items included all instances of *forget* and *like*, as well as two of the three instances of *remember*. When items were examined for a complex response, and not just a target response, only Items: 5 and 14 (both *like*) remained at ten percent or under. This suggests several things: First, the task can be improved upon. Additional "stories" with target verb and utterance should be trialed per verb in future iterations of these elicited tasks in order to ensure the test item does elicit the desired structure in expected age groups. Second, some verbs may be more likely to lend themselves to both complex structures, in general, and to specific complement clause structures. For example, although *forget*, *like*, and *remember* did not elicit the desired embedded complement clause structures, *forget* and *remember* did elicit complex utterances, whereas *like*,

seldom did. Additional analysis of the verbs used in the current study as well as research into expanding into usage of other potential mental state verbs is warranted.

Sample Size and Participant Characteristics

In order to confirm the above findings and to move toward establishing clear age ranges for productivity with embedded complement clauses, more data should be collected, with more participants in each age group. In addition, additional age groups should be added to narrow down the windows where there is a shift in productivity with each specific type of embedded complement clause. In the Infinitival Complement clause task, the window is more narrow than in the Sentential Complement clause task, with a significant difference between the Two- and Three-Year-Olds on productivity (and no difference between the Three- and Four-Year-Olds); however, the window is less narrow on the Sentential Complement clause task. The significant difference occurs between the Two-Year-Olds and Four-Year-Olds, which leaves a wide range of ages in which a shift is occurring to move toward productivity. Additional children participating in the elicited tasks (both in number in each group and in the addition of groups at difference age ranges) may narrow that range down and thus better inform clinicians as to when productivity should be expected for typically developing children.

Additionally, as evidenced in the Participant Characteristics (Table 1) and the Participant Performance on Individual Study measures (Table 3), this group of children had parents who were primarily college-educated, and often with post-baccalaureate degrees, as well as these children had above average language scores, which is common amongst children of parents from a higher socio-economic status. Future data collection should include children from a wider variety of socio-economic statuses (as determined by maternal or a combination of maternal and

paternal education). A long-term goal would be to establish expected norms for productivity in a variety of embedded complement clause types for typically developing children with low, mid-, and high socio-economic statuses (if differences are indeed found). One benefit of the current study's group of high-language ability children is that these findings highlight the ages at which children with the advantage of a high socio-economic status are productive with the target structures, and thus sets the bar for expectations high.

Data Analysis

As productivity was not normally distributed across participants, non-parametric statistical analysis may be a better fit for this data. Alternative statistical analyses will be considered prior to publication and in anticipation of future data collection.

Data Collection with Children with Developmental Language Disorders

Following data collection with additional typically developing children, in number, in wider age ranges, and with a greater diversity in maternal education, future research should move toward data collection with children with developmental language disorders, matching children by age-equivalent scores. Knowing the age ranges for productivity for typically developing children is helpful in informing goals for clinical intervention, as well is having a set of target verbs; however, that information is not enough. Children with developmental language disorders struggle with specific elements of complex syntax in embedded complement clauses; specifically, the obligatory *to* in Infinitival Complement clauses and the obligatory *that, if,* and *whether* in Full Propositional Complement clauses. More data on language impaired children's abilities with these structures is warranted.

Clinical Implications

The structure of linguistic input has been proven to positively impact the oral expression of children with language impairment in the realm of grammatical morphology, and research and clinical practice should move in the direction of extending those findings from grammatical morphology into complex syntax. Hearing a grammatical marker with a high-variability of verbs significantly impacted use of that grammatical marker (Plante, Ogilvie, Vance, Aguilar, Dailey, Meyers, Lieser, & Burton, 2014). Owen Van Horne, Fey, and Curran (2017) found that variability in the verbs used with grammatical markers; in particular, use of lower frequency verbs initially (as compared to verbs that were higher frequency and easier to inflect), resulted in greater gains. It is possible that this same impact will be seen with complex syntax structures, in that if a highly-variable verb input is utilized with each complex syntax structure, a greater amount of that target structure will be utilized by the child.

Certain verbs lend themselves to these complex structures. When cognitive verbs were selected as vocabulary words for Head Start teachers, frequency of use of that verb in a complex structure by teacher was significantly higher than when action verbs were selected (Owen Van Horne, Curran, & Hall, 2017). Based the findings of the current study, low frequency, mental state verbs would be useful targets for vocabulary in a goal of moving toward productivity with infinitival complement clauses. Verbs of communication may be better suited toward eliciting sentential complement clauses; however, more research is warranted to determine these suggested clinical targets. As only six verbs were of focus in this study, a greater breadth of verbs would be even more informative in moving forward to understand development and to inform clinical practice. An examination of language samples available from databases such as CHILDES, to determine frequency of verbs specific to complex syntax types, would be

informative as to the true high or low levels of frequency at which children are exposed to these verbs in each sentence frame.

Complex syntax it all too often addressed only with older, school-age children, and a focus on complex syntax should begin at the preschool age (Barako Arndt & Schuele, 2013; Vasilyeva, Waterfall, & Huttenlocher, 2008). The findings of this study show that ability with these structures is present before the age of three and is continuing to develop during the preschool years. Productivity with target verbs in target structures (Infinitival Complement clauses and Sentential complement clauses) occurred between the third and fourth year for typically developing preschoolers; thus, these structures are in place during the time that grammatical morphemes are continuing to develop. These are not later language skills, and speech-language pathologists may not have enough specificity on typical development in order to best intervene with children who struggle with syntax (Proctor-Williams, 2009). With the impact that complex syntax has on academic achievement and social language skills, it is critical that research continue to address the development of embedded complement clauses.

APPENDIX A

Infinitival Complement Clause Task

Adapted from: Eisenberg & Cairns (1994);
Eisenberg (1989, 2004, 2006) Further adapted from
Schuele for Barako Arndt dissertation

INFINITIVE TASK ELICITATION PROCEDURES

TASK: One or two adults (examiner, partner) are present; the partner can aid in handling presentation items. Typically the items will be presented in the order on the response form but the order can be varied if necessary to maintain the child's interest (e.g., you need to let the child choose the order for compliance).

For each task item, the examiner's actions are in square brackets. The story presented by the examiner is in capital letters, with italics indicating character talk. The examiner presents the story and the prompt to the child. The child begins with the subject and completes the sentence.

INTRODUCTION TO TASK:
Examiner: *We are going to play a game. I am going to start the story and you will finish it.*

FOR EACH ITEM: The examiner presents the script, STORY IN CAPITAL LETTERS, and acts out the story.

After the examiner reads the story script, he/she first presents the prompt as listed,

MICKEY ASKS ~ and then continues with NOW YOU FINISH THE STORY, MICKEY ~ [rising intonation] [After the first one or two items are presented, it may be possible to eliminate saying, *now you finish the story,* and just provide the remainder the prompt.]

To obtain a complete sentence, as needed prompt the child to begin his/her response with the subject, for example, START YOUR STORY WITH MICKEY or START YOUR STORY WITH MICKEY ASKS. However, it is fine if the child consistently begins with the verb.

IF THE CHILD HAS DIFFICULTY: Prompt with NOW YOU FINISH THE STORY. START WITH
MICKEY ASKS ~ with the goal of having the child produce the subject and main verb.

COMPLETE ADMINISTRATION: Administer ALL test items.

INFINITIVE SCRIPTS

TASK 1: Elicitation of simple infinitives, same subject, N + Vs + *to* + V, e.g., *Mickey wants to stand up*.

SCENE 1: CLASSROOM

1. **Target: Mickey asks (Goofy) to stand up.**
   [set up: Mickey sitting; Goofy standing, facing him].
   MICKEY & GOOFY ARE PLAYING SCHOOL. GOOFY IS THE TEACHER.
   [raise Mickey's hand].
   MICKEY RAISES HIS HAND.
   Mickey to Goofy: *CAN I STAND UP?*
   MICKEY ASKS ~ YOU FINISH THE STORY, MICKEY ~

2. **Target: Goofy says to sit down.**
   [set up: Mickey and Goody standing, facing each other]. NOW MICKEY IS STANDING. OOPS! TEACHER GOOFY DIDN"T SAY OKAY.
   Goofy to Mickey: *YOU'RE STANDING. THIS IS READING TIME. PLEASE SIT DOWN.*
   GOOFY SAYS ~ YOU FINISH THE STORY, GOOFY ~

3. **Target: Goofy likes to send a nice note home.**
   [props: note]
   [set up:
   Goody
   holding
   note]
   MICKEY
   WAS A
   GOOD
   LISTENER
   !
   Goofy: *WHAT A GOOD LISTENER. I WILL SEND A NICE NOTE HOME. I LIKE DOING THAT. YES, I WILL SEND A NOTE HOME.*
   GOOFY LIKES ~ YOU FINISH THE STORY, MICKEY ~

4. **Target: Mickey forgot to put the note (in his backpack).**
   [props: note, backpack]
   [set up: Mickey with backpack but without note]
   TEACHER GOOFY WROTE A NICE NOTE. MICKEY DIDN'T PUT THE NOTE IN HIS BACKPACK. HE FORGOT! OH, NO! MICKEY FORGOT~YOU FINISH THE STORY, MICKEY~

5. **Target: Goofy tells Mickey to take the note (in his backpack).**
   [props: note, backback]
   [set up: G & M facing each other]
   Goofy: *MICKEY, PLEASE TAKE THIS NOTE IN YOUR BACKPACK!*
   Mickey: *OKAY!*
   GOOFY TELLS~YOU FINISH THE STORY, GOOFY~

6. **Target: Mickey remembers to take his backpack.**
   [props: note, backback]

[set up: G & M facing each other; M will leave with bag] Goofy: *NOW TAKE YOUR BACKPACK HOME!*

REMEMBER. Mickey: *I WILL TAKE MY BACKPACK. I'LL REMEMBER.*
MICKEY REMEMBERS~YOU FINISH THE STORY, MICKEY~

SCENE 2: PLAYGROUND

1. **Target: Mickey likes to swing.**
   [props: swing]
   [set up: Mickey & Goofy standing away from the swing

MICKEY & GOOFY ARE AT THE PLAYGROUND [move Mickey closer to swing]
MICKEY SEES THE SWING.
Mickey to Goofy: *I WILL SWING. THAT'S MY FAVORITE GAME.*
MICKEY LIKES ~ YOU FINISH THE STORY, MICKEY ~

2. **Target: Mickey asks Goofy to push him (on the swing).**
   [props: swing]
   [set up: Mickey is on the swing]
   MICKEY: *GOOFY, I NEED HELP. WILL YOU PUSH ME ON THE SWING?*
   MICKEY ASKS~YOU FINISH THE STORY, MICKEY~

3. **Target: Goofy tells Mickey to pump his legs.**
   [props: swing]
   [set up: Mickey is on the swing; Goofy is behind,
   pushing] GOOFY PUSHES MICKEY A LITTLE.
   GOOFY: *I PUSHED YOU. NOW YOU CAN SWING BY YOURSELF. JUST PUMP YOUR LEGS.*
   MICKEY*: WHAT SHOULD I DO?*
   GOOFY: *PUMP YOUR LEGS.*
   GOOFY TELLS~YOU FINISH THE STORY, GOOFY~

4. **Target: Goofy says to swing high(er).**
   [props: swing]
   [set up: Mickey is swinging; Goofy is standing near the
   swings] MICKEY IS SWINGING. GOOFY IS
   WATCHING.
   Goofy to Mickey: *SWING HIGH, MICKEY! YOU SHOULD SWING HIGHER.*
   GOOFY SAYS ~ YOU FINISH THE STORY, GOOFY ~

5. **Target: Mickey forgot to pump his legs.**
   [props: swing]
   [set up: Mickey is swinging; Goofy is standing near the swings
   MICKEY ISN'T SWINGING HIGHER. HE DID NOT PUMP HIS LEGS. HE
   FORGOT! OH NO! MICKEY FORGOT~YOU FINISH THE STORY, MICKEY~

6. **Target: Mickey remembers to pump his legs.**
   [props: swing]
   [set up: Mickey is swinging; Goofy is standing near the swings
   MICKEY: *WHY DID MY SWING STOP? GOOFY SAID, PUMP YOUR LEGS. OH, I REMEMBER. PUMP MY LEGS!*
   MICKEY REMEMBERS~YOU FINISH THE STORY, MICKEY~

SCENE 3: PLAYGROUND TO NURSE'S OFFICE

7. **Target: Mickey likes Goofy to throw the ball.**
   [props: ball]
   [set up: Goofy with the ball; Mickey at a distance from Goofy] NOW GOOFY HAS A BALL. [make Goofy throw the ball]
   GOOFY THROWS THE BALL TO MICKEY. [make Mickey bring the ball to Goofy]

Mickey to Goofy: *THAT WAS FUN! GOOFY, THROW THE BALL TO ME AGAIN.* [move Mickey farther away]
MICKEY LIKES ~ YOU FINISH THE STORY, MICKEY ~

8. **Target: Mickey asks (Goofy) to go to the nurse.**
   [props: ball]
   [set up: Mickey and Goody throw ball]
   MICKEY AND GOODY THROW THE BALL. OUCH! MICKEY HURT HIS FINGER.
   Mickey to Goofy: *OH, MY FINGER IS HURT. I NEED THE NURSE. CAN I GO? IS IT OKAY?*
   Goofy to Mickey: *THANKS FOR ASKING! YOU CAN GO.*
   MICKEY ASKS ~ YOU FINISH THE STORY, MICKEY ~

9. **Target: Minnie tells Mickey to sit down.**
   [set up: Mickey walks away from Goody; Minnie is present]
   MINNIE IS THE NURSE.
   MINNIE: *HI, MICKEY! WHAT IS WRONG?*
   MICKEY: *MY FINGER HURTS.*
   MINNIE: *OKAY. PLEASE SIT DOWN.*
   MINNIE TELLS~YOU FINISH THE STORY, MINNIE~

10. **Target: Minnie says to put ice on Mickey's hand.**
    [props: ice pack]
    [set up: Minnie and Mickey facing each other]
    MINNIE: YOUR FINGER IS HURT. YOU NEED ICE. PUT THIS ICE ON YOUR HAND, MICKEY. MINNIE SAYS~ YOU FINISH THE STORY, MINNIE~

11. **Target: Mickey forgot to take the ice.**
    [props: ice pack]
    [set up: Minnie and Mickey facing each other; Mickey turns to leave] MICKEY: *THANKS, NURSE MINNIE. I FEEL BETTER.*
    MINNIE: *WAIT! MICKEY, TAKE THE ICE. YOU FORGOT!*
    MICKEY FORGOT~ YOU FINISH THE STORY, MICKEY~

12. **Target: Mickey remembers to ice his hand.**
    [props: ice pack]
    [set up: Mickey is alone]
    MICKEY'S HAND STILL HURTS A LITTLE.
    MICKEY: *WHAT SHOULD I DO? MY HAND HURTS. OH, I REMEMBER! ICE MY HAND.*
    MICKEY REMEMBERS~ YOU FINISH THE STORY, MICKEY

APPENDIX B

Sentential Complement Clause Task

FULL PROPOSITIONAL CLAUSE AND WH CLAUSE TASK PROCEDURES

TASK: One or two adults (examiner, partner) are present; the partner can aid in handling presentation items. Four scripted scenes are presented and several target utterances are elicited within each scene. Typically the items will be presented in the order on the response form but the order of scenes can be varied, if necessary, to maintain the child's interest (e.g., you need to let the child choose the order for compliance). However, items must be administered in order within a scene.

For each task item, the story presented by the examiner is in capital letters, with italics indicating character talk. The examiner presents the story and the prompt to the child. The child response should begin with the subject provided and complete the sentence. If the child changes the verb to another complement taking verb, accept the response provided. If the child changes the verb to a non-complement taking verb, the examiner can repeat the prompt to cue the child on the target verb.

Because these stories and this task may be cognitively challenging for some children, it is important to be very clear and explicit in acting out the stories. Placement of objects in the story, use of varied intonation, and movement of the characters and props may be very important to children's ability to complete the task. Be sure to take enough time to present the stories in a manner that is comprehensible to the children.

INTRODUCTION TO TASK:
Examiner: *We are going to play a game and tell some stories. I'll start the story and you'll finish the story.*

FOR EACH ITEM: The examiner presents the script, STORY IN CAPITAL LETTERS, and acts out the story.

> After the examiner reads the story script, he/she first presents the prompt as listed.
>
> So that the child is likely to produce an embedded clause, for each target, the examiner will provide the matrix clause (e.g., *Elmo knows~*) and prompt the child to begin with this matrix clause: ELMO KNOWS ~ and then continues with NOW YOU FINISH THE STORY. ELMO ~ [rising intonation]. Provide the complete prompt for each item. <u>If the</u>

child begins to respond before the prompt is completed, remind the child to wait until you have finished talking.

To obtain a complete sentence, including a noun and verb for the matrix clause, as needed prompt the child to begin his/her response with the subject, for example, START YOUR STORY WITH ELMO or START YOUR STORY WITH ELMO KNOWS. The goal is to elicit the entire complex sentence not just a completion to the sentence (i.e., not just the embedded clause). However, if a child consistently begins with the verb, rather than the subject and verb of the matrix clause, this is acceptable.

IF THE CHILD HAS DIFFICULTY: Prompt with NOW YOU FINISH THE STORY. START WITH ELMO KNOWS ~ with the goal of having the child produce the subject and main/matrix verb.

COMPLETE ADMINISTRATION: Administer ALL test items. In rare instances, you may discontinue the task because the child is simply not able to complete the task. Unlike the relative clause tasks where we elicit a series of utterances of the same form, each target response in this task is rather different (e.g., different verbs, different complement clauses types).

FULL PROPOSITIONAL CLAUSE AND WH CLAUSE TASK SCRIPTS

Within each of these story sequences, note that the inclusion or introduction of props is important to the story making sense to the child. Include and introduce the props as indicated. Put the remaining props behind your back, out of sight, or clearly away from the "story area". Use interjections as appropriate to keep the child's attention on what you are presenting (e.g., *oh, wow, look*). Also, add emphasis to the complement taking verb to help the child focus on that verb. Vary your intonation when presenting the character talk.

SCENE 1: Candy
Props: box with candy, Elmo, girl, Horsey

1. **Target: The girl forgets where the candy is**.
Place box with candy on the table. Open the box and show the child the candy.
Examiner: LOOK. SOME CANDY. HERE COMES ELMO.
Elmo: Elmo comes in, looks around, and opens box of candy. *I SEE SOME CANDY*. Elmo eats candy. Place Elmo standing near the box of candy.
Girl: Girl comes in, and says to Elmo, *HEY ELMO, I CAN'T FIND MY CANDY*.

Prompt: [to child] OH NO! THE GIRL FORGETS~ YOU FINISH THE STORY. THE GIRL~

2. **Target: The girl asked where the candy went.**
Girl: *HMM..WHERE IS MY CANDY? WHERE DID THE CANDY GO?*

Prompt: THE GIRL ASKED~ YOU FINISH THE STORY. THE GIRL ~

3. **Target: Elmo says that he knows where the candy is**.

Elmo: *I SAW SOME CANDY.*

Girl: *WHERE IS THE CANDY?*

Elmo: *I KNOW.*
Prompt: [to child] YOU TELL THE GIRL. ELMO SAYS~ YOU FINISH THE STORY. ELMO~

*4. **Target:*** **The girl remembers where the candy is.**
Girl: *WAIT, I REMEMBER! WHERE'S THE CANDY? I KNOW WHERE.*
Prompt: [to child] [NAME OF CHILD] THE GIRL REMEMBERS~ YOU FINISH THE STORY. THE GIRL~

5. **Target: Elmo likes how candy tastes.**
Elmo: *MMM…CANDY TASTES YUMMY. I LIKE IT.*

Prompt: [to child] YOU FINISH THE STORY. ELMO LIKES~ YOU FINISH THE STORY. ELMO~

6. **Target: Elmo tells the girl (that) he will share the candy.**
Examiner: [to child] [CHILD'S NAME], WHEN ELMO CAME IN THE ROOM, WHAT DID HE DO?

Prompt: ELMO ASKED~ YOU FINISH THE STORY. ELMO~

SCENE 2: Baseball
Props: Chicken Little, Buzz, baseball glove, bat, man, box

7. **Target: Buzz asks if he can play ball too.**
CL LIKES TO PLAY BASEBALL. HE LIKES TO HIT THE BALL. BUZZ WANTS TO PLAY. BUZZ ASKS A QUESTION.
Buzz: *CAN I PLAY BALL TOO?*

Prompt*:* BUZZ ASKS ~ YOU FINISH THE STORY. BUZZ~

8. **Target: CL says that Buzz can borrow a glove.**
CL IS BATTING. BUZZ CAN CATCH THE BALL. BUT HE NEEDS A BASEBALL GLOVE.
Buzz: *I DON'T HAVE A BASEBALL GLOVE!*
ChickenLittle: *DON'T WORRY. YOU CAN BORROW MY GLOVE.*

Prompt: CL SAYS~ YOU FINISH THE STORY. CL~

9. **Target: CL forgot whether/if he brought the glove.**

Buzz: *CL, WHERE IS THE GLOVE?*
ChickenLittle: *OHNO, A GLOVE! DID I BRING A GLOVE?*

Prompt: CL FORGOT~ YOU FINISH THE STORY. CL~

10. **Target: The man told Chicken Little (that) the glove is in the box**
Examiner: Man comes in. THIS MAN IS SMART. HE'LL TELL CHICKEN LITTLE.
Man: *CHICKEN LITTLE, LOOK IN THE BOX! THE GLOVE!* Open the box but don't take the glove out. If the child wants to take the glove out, take it out and put it on CL's hand.

Prompt: THE MAN TOLD~ YOU FINISH THE STORY. THE MAN~

11. **Target: CL remembered (that) he left his ball at home.**
ChickenLittle: CL reaches in box and gets glove. *I'VE GOT MY GLOVE. BUT WHERE IS MY BALL? MY BALL IS AT HOME.* OHNO!

Prompt: CL REMEMBERED~ YOU FINISH THE STORY. CL~

12. **Target:Buzz likes that Chicken Little tries his best.**
ChickenLittle: *I FORGOT THE BALL. I LET EVERYONE DOWN.*
Buzz: *IT'S OKAY. YOU TRIED YOUR BEST. I LIKE IT!*
WHAT DOES BUZZ SAY?

Prompt*:* BUZZ LIKES ~ YOU FINISH THE STORY. BUZZ~

SCENE 3: Birthday Party
Props: Pooh, Tigger, Minnie, slinky in green present bag, suction ball in blue present bag. Put toys in the bag with tissue paper so child cannot see the toy.

13. **Target: Minnie doesn't remember if Tigger is coming to the party.**
Examiner: TODAY IS MINNIE'S BIRTHDAY.
Minnie: *HI, POOH! THANKS FOR COMING TO MY PARTY. IS TIGGER COMING?*

Prompt: MINNIE DOESN'T REMEMBER~ YOU FINISH THE STORY. MINNIE~

14. **Target: Tigger likes that Minnie has is dressed up.**
Examiner: TIGGER CAME TO THE PARTY.
Minnie: *HI, TIGGER! YOU CAME.*
Tigger: *YES, YOU INVITED ME. YOU ARE DRESSED UP FOR YOUR PARTY. I LIKE THAT.*

Prompt: TIGGER LIKES~ YOU FINISH THE STORY. TIGGER~

15. **Target: Ask Minnie what her favorite present is.**
Minnie, Pooh, and Tigger in the scene.

Examiner: MINNIE OPENED HER PRESENTS. Take each of the presents out of the bags.
Pooh: To Tigger. *MY FAVORITE PRESENT IS THE SLINKY. DOES MINNIE HAVE A FAVORITE?*
Tigger: *I DON'T KNOW.*

Prompt: [to child] TELL TIGGER, ASK~ YOU FINISH THE STORY. ASK~

16. **Target: Minnie says that all the gifts are her favorite.**
Minnie: *ALL THE PRESENTS ARE MY FAVORITE!*

Prompt: [to child] MINNIE SAYS~ YOU FINISH THE STORY. MINNIE~

17. **Target: Minnie forgot who gave her the toy.**
Examiner: POOH GAVE MINNIE THE BALL. TIGGER GAVE MINNIE THE SLINKY.
Minnie: *POOH, THANKS FOR THE COOL SLINKY.*
Pooh: *HEY MINNIE, I DID NOT GIVE YOU THAT SLINKY,!*

Prompt: OHNO, MINNIE FORGOT~ YOU FINISH THE STORY. MINNIE~

18. **Target: Tigger told her (that) he brought the present/the slinky.**
Tigger: *THAT'S OKAY, MINNIE. I BROUGHT YOU THE SLINKY.*

Prompt: TIGGER TOLD~ YOU FINISH THE STORY. TIGGER~

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