Influence of Context on the Production of Complex Sentences by Typically Developing Children

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Describing elicitation contexts for children with disorders in expressive language can be a daunting task. This may be especially true if the preferred context is naturalistic, one in which the child can play freely and express his or her interests, ideas, and emotions without adult directives. Such a communicative context is arguably the most nurturing of language learning, promoting representative samples of a child’s productive linguistic system. Although a naturalistic elicitation context is most desirable, it is also most unpredictable. This unpredictability may be related to the child’s own ever-changing intentionality. Implicit in the production of language is the child’s intention to create specific relations among objects and events and to have these relations acknowledged by others (Bloom & Tinker, 2001). The verbal expressions of these relations have been observed during play and related social and linguistic encounters with typically developing children (e.g., Bloom, Lahey, Hood, Lifter, & Feiss, 1980). Play and related social/linguistic encounters, therefore, have been recommended as contexts for the assessment of language disorders in children (e.g., Lahey, 1988; Lund & Duchan, 1993).

The Nature of Complex Sentences

The challenge of designing naturalistic assessment contexts may be intensified when the clinician is attempting to elicit specific linguistic targets, especially complex sentences. Complex sentences are later developing linguistic structures, containing two or more

ABSTRACT: **Purpose:** This study was designed to identify types of complex-sentence meanings (i.e., content) produced in selected elicitation contexts by typically developing children within 3 different age groups. The research was motivated by the need for additional evidence-based assessments and interventions for children with language disorders.  
**Method:** Participants included 3 groups of typically developing children, mean ages 2;8 (years;months; Cohort 1), 3;4 (Cohort 2), and 4;7 (Cohort 3). Four elicitation contexts distinguished on the basis of degree of spontaneity and the potential for eliciting complex sentences were used: free-play, script-play, elicited description, and story retelling. Tasks within these contexts were presented to each child over two 1-hr sessions.  
**Results:** Significant differences were found among the cohorts for proportion of complex-sentence productions overall, across contexts, and across content categories. Significant relationships were found between content and contexts and between adult model and content of the child’s following utterance.  
**Conclusions:** Findings suggest that children’s complex-sentence production changes with development and is sensitive to features of linguistic and nonlinguistic contexts. These data provide evidence for the types of complex-sentence content that may be expected in specified contexts, thus serving as a basis for planning assessment and intervention for children with language disorders.

KEY WORDS: complex sentences, language content, typically developing, elicitation contexts

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LSHSS
The Relationship Between Meaning and Syntax

The meaning relationships or mental meanings intended by the child provide the generative force for the syntax of complex sentences (Bloom, 1993). The primacy of meaning for the production of complex sentences has been expressed by researchers who view the syntax of complex sentences as grammatical constructions that emerge from the child’s use of language to express meaning (e.g., Atanassova, 2001; Bloom et al., 1980; Bloom, Rispoli, Gartner, & Hafitz, 1989; Diessel, 2004; Weist, Atanassova, Wysocka, & Pawlak, 1999). According to Diessel (2004), for example, complex syntactic schema are organized and represented to facilitate comprehension and expression of “specific relationship(s) between two (or more) situations in two or more clauses” (p. 41). Situations are defined as conceptual units that are relational and temporal. These units express (a) changes of state, (b) presence or absence of relations among objects, and (c) temporal aspect (continuity). The structure of syntax reflects the nature and complexity of the conceptual situations.

The seminal study by Bloom et al. (1980) on the development of complex sentences identified a strong relationship between semantic relations and the syntactic structures acquired to express them. The authors found that “conjunction was used with utterances that expressed Additive, Temporal, Causal and Adversative relations” (p. 249) and “complementation was used with utterances that expressed Epistemic and Notice relations” (p. 249). In a subsequent study, Bloom et al. (1989) reported that complementation was acquired in connection with three verbs: think, know, and see. These matrix verbs were expressed to represent two underlying attitudes, certainty or uncertainty, about information expressed in the sentence complement.

A series of studies by Weist et al. (1999) examined the acquisition of complex sentences coding temporal relations cross-linguistically (Finnish and English). Results were interpreted as signifying that the syntactic expression of temporal relations evolves from the child’s ability to represent spatial and temporal relations—most significantly, the child’s position as speaker in relation to the orientation of the child’s communication partner.

The literature on verb knowledge stands as another approach to explaining the relation between meaning and syntax. Children’s representation of a verb includes knowledge of the kinds of complements that can be used with the verb in order to express the semantic relation intrinsic to the verb’s meaning. This syntactic knowledge includes knowing a verb’s selectivity for sentential complements (e.g., Pinker, 1989; Shapiro, Zurif, & Grimshaw, 1987). For example, when children learn to use verbs that represent acts of cognition (e.g., know, think), they also learn that the object of the cognitive act can be a subject-verb-object relation (e.g., the sentential clause in the complex sentence, “I know that mommy likes flowers”).

If meaning relations drive the expression of complex sentences, then elicitation procedures should provoke children to create and represent the meaning relations (i.e., content) intrinsic to these sentences. There have been few attempts to systematically study the effects of elicitation context on the production of language content. Moreover, most studies that have examined the influence of context on language production have not specifically targeted complex sentences; instead, the dependent variable in these studies has generally been increased linguistic complexity as measured by selected syntactic features. None of the studies has systematically examined the relationship between elicitiation contexts and specific content categories expressed by the child. The studies that have examined the influence of context on language production have focused on syntax. These studies vary from one another with reference to the context manipulated and the specific area of language examined.

Research on the Influence of Context on Language Production

Contexts have been characterized with reference to a number of factors. Some of these are (a) degree of permissible spontaneity on the part of the child (e.g., free-play vs. responses to directed requests; e.g., Evans & Craig, 1992; Longhurst & File, 1977; Stalnaker & Creaghead, 1982), (b) degree of perceptual support and amount of listener’s shared knowledge (i.e., familiarity with events or narrative; Atkins & Cartwright, 1982; Gummereal & Strong, 1999; Masterson & Kamhi, 1991), (c) play group size and composition as these variables interact with different types of material (e.g., McCabe et al., 1996), and (d) type of play material (e.g., Wanska, Bedrosian, & Pohlman, 1986).

Degree of permissible spontaneity was manipulated by Longhurst and File (1977) across four contexts: (a) descriptions of single-object pictures, (b) descriptions of toys, (c) descriptions of a multi-object picture, and (d) conversation during free-play. Typically developing children ages 3;11 (years;months) to 5;0 achieved the highest Developmental Sentence Screening (DSS; Lee & Canter, 1971) scores in the least structured free-play context. Stalnaker and Creaghead (1982) examined language production in 12 preschool children (ages 4.0 to 5.6) in Head Start within three contexts: story retelling, responding to questions during play, and commenting about play. Retelling a story yielded the highest mean length of utterance (MLU), and responding to questions during play yielded the greatest number of utterances (but the lowest MLU). Evans and Craig (1992)
compared the linguistic performance of children (ages 8;1–9;2) with language learning disabilities in two contexts: free-play and interview (i.e., descriptions of toys in response to the examiner’s request). No significant differences were manifested in syntactic features (DSS scores, MLU, phrase structure, auxiliary and conjunction use) in the two contexts. Interview, however, elicited a greater number of utterances and more complex semantic features (based on content categories identified by Bloom & Lahey, 1978, and Lahey, 1988). It was noted that comment was the most frequent communication function in both the free-play and interview contexts.

With reference to perceptual support and shared knowledge, Masterson and Kamhi (1991) evaluated three sampling conditions with two groups of children ages 6–9: typically developing children and those with reading and language disorders. The sampling conditions included descriptions of science experiments with objects present, explanations of experiment results, and story retelling without perceptual support. Clause structure and grammatical accuracy were most complex when the referent was absent and the child was providing explanations and telling stories to adults who did not have prior knowledge of the child’s information.

Akins and Cartwright (1982) manipulated listener knowledge and perceptual support in their three elicitation tasks: picture interpretation (e.g., “Tell me what is happening in this picture”), responses to verbal imperatives (e.g., “Tell me what you would do if you got chewing gum stuck in your hair”), and story retelling. Picture interpretation yielded the most frequent verbalization and greatest MLU in typically developing children ages 3–5.

Gummersall and Strong (1999) manipulated perceptual support with the addition of another variable—practice. Typically developing children and children with language disabilities, ages 8–9, produced narratives in three different conditions: after (a) listening to a story and viewing related pictures and then imitating each sentence with the picture in view, (b) listening to a story and viewing related pictures and then listening again to each sentence in the story (without imitating), and (c) listening to a story and viewing related pictures. Conditions (a) and (b) yielded the most complex story and sentence structures, as measured by utterance length, number of T-units, words per T-unit, and production of subordinate clauses. The authors concluded that modeling and practice beyond exposure facilitated complex language production.

McCabe et al. (1996) evaluated how participant group size (groups of 2 and 4) and composition (typically developing children and children with language delays, integrated and segregated) in preschoolers interacted with play material (sensory vs. dramatic). Results indicated no effect for type of group or type of material. There were, however, two effects of group size: Children who played in groups of 4 had a higher mean utterance rate, but children in groups of 2 used a greater lexical variety.

The toys a child played with spontaneously also have been shown to affect language production, more specifically, utterance function. Wanska et al. (1986) observed 24 preschool children, ages 4:8–5:3, playing with (a) Legos, (b) a miniature hospital set, and (c) hospital props. Resulting utterances were organized according to topic categories (e.g., attention getters, comments). The frequency of comments was significantly greater with the hospital set than with the Legos. Utterances that were not about ongoing play were most frequent with the Legos. There was also much sound play reported for the boys while playing with the miniature hospital set.

In summary, a number of studies have examined the effect of context on language production, primarily, features of syntax. It has been shown that linguistic complexity is sensitive to characteristics of the elicitation context, but results have been inconclusive. These ambiguous findings may be partially due to uncontrolled differences in linguistic and nonlinguistic features characterizing the contexts and the context effects (dependent variables) compared in the different studies.

The studies reviewed above explicitly examined the effect of context on linguistic complexity. In addition to these sources, information about context has been identified in texts on language disorders recommending elicitation procedures (e.g., Lahey, 1988; Lund & Duchan, 1993; McCormack, 2003) and in developmental studies designed to elicit specific complex sentence structures (e.g., Atanassova, 2001; Weist et al., 1999).

**Additional Efforts to Support the Effect of Context on Language Production**

Recommendations from texts support the elicitation of complex sentences in naturalistic contexts with the recognition that “some content categories need rather complex situations to elicit descriptions of the desired content/form interactions (e.g., State, Notice, Epistemic, Recurrence)” (Lahey, 1988, p. 346). For example, Lahey (1988) suggested the creation of complicating events within scripts or the use of sociodramatic play such as doctor and patient to encourage the production of causal chains. Lund and Duchan (1993) suggested telling children stories that include event relations such as temporal, causal, or adversative. The efficacy of these procedures, however, has not yet been documented by research evidence.

In their studies focusing primarily on the language–cognition relationship, Weist and colleagues (Atanassova, 2001, Weist et al., 1999) revealed the potential influence of context on complex-sentence production. In order to elicit temporal utterances, the experimenter in these studies presented children with a blindfolded puppet and then acted out several event sequences, illustrating simultaneous or sequential temporal events. The participant was asked to describe to the puppet “what happened” and then, depending on the child’s response, the additional query “When did it happen?” was posed.

It is important to recognize that the research by Weist et al. (1999), like studies that served as the foundation for textbook recommendations (Bloom et al., 1980, 1989), focused on language development. Contexts were created to elicit target structures under investigation. The contexts themselves were not treated as variables to evaluate their influence on language production. What remains to be examined is how various contexts affect the production of specific types of complex sentences, characterized by semantic relations or content, and whether these effects are age related.

The present study was designed to investigate the influence of context on complex-sentence content produced by typically developing children between the ages of 2 and 5. Play contexts varied in their degree of spontaneity and their linguistic and non-linguistic characteristics promoting the expression of specific complex-sentence content. The following questions guided this investigation:

- Are there differences in the frequency with which children produce complex sentences across contexts according to age group?
- Are there differences among age groups with reference to the content categories produced?
• Are there differences among contexts in the generation of complex sentence content?
• Is there a relationship between the content of the adult model and the content of the child’s following utterance?

METHOD

Participants

Participants included three groups of typically developing children, mean ages 2;8 (Cohort 1), 3;4 (Cohort 2), and 4;7 (Cohort 3). Parents of participants provided informed consent consistent with the policies of the Internal Review Board at the first author’s university. Each group included 4 children (2 boys and 2 girls). The foundational study on complex sentences (Bloom et al., 1980) identified a variety of complex sentence types in children between 2 and 3 years of age. We chose to extend the age range to 5 years of age because the development of language continues throughout the preschool period and beyond.

Children were recruited from a neighborhood day school and a pediatric practice servicing a large and diverse cross-section of families from the lower Manhattan area. Children passed a hearing screening and scored within typical limits on the Test of Early Language Development, Third Edition (TELD–3; Hresko, Reid, & Hammill, 1999). These qualifying measures were administered at a preliminary session. Reports from each child’s pediatrician and preschool also supported classification as typically achieving. A description of the children is provided in Table 1.

Procedure

Elicitation tasks. Four elicitation contexts were used: free-play, script-play, elicited description, and story retelling. Activities within each context were selected because of their potential to provide the content and discourse structure facilitative of target complex-sentence types. Elicitation contexts were distinguished on the basis of spontaneity afforded the child. (See Appendix B for associated protocols.)

Free-play. This context was viewed as the most spontaneous for the child (Evans & Craig, 1992; Longhurst & File, 1977). Here we provided two symbolic props with the potential to elicit distinctive forms of play: a crane and car ramp with an assortment of cars, trucks, and vehicle lifts and a doll house with doll families and furniture. Although the elicitation context was considered to be spontaneous, the activities within this context contained features encouraging the expression of specific sentence content. The crane activity, containing pulleys, ramps, and vehicles, was consistent with the expression of temporal, causal, adversative, and epistemic content. The doll house was perhaps less predictable because it was less restrictive; depending on the child’s focus and experiences, all of the content categories were equally likely in this activity.

Script-play. We considered this context to be relatively spontaneous; while the script was set, the children were free to talk without constraints. Tasks in this category were designed to promote the enactment of familiar experiences: a visit to the doctor and to a McDonald’s restaurant (see Lahey, 1988). We anticipated that these script contexts would yield a variety of content categories. We did, however, expect that causal and epistemic content would be expressed while enacting the doctor script (e.g., “She’s sick, so she needs a shot”; “I think she has a cold”). We also expected that additive, temporal, and causal would be expressed in describing the procedures for making burgers or ordering food.

Elicited description. This context was viewed as directive because the children were instructed to describe an action. This category involved an activity derived from Weist et al. (1999) in which children are required to describe ongoing events to a doll who cannot see the actions. In this task, the child must describe an action sequence performed by the examiner to a blindfolded doll (Big Bird). The children observe miniature boys and girls engaged in playground activities such as swinging, going on a slide, and falling and crashing into playground structures. Thus, this activity is facilitative of the expression of additive and temporal event relations.

Story retelling. This category was considered to be the most directive because the children were asked by the examiner to relate a story. (Such an activity was suggested by Lund and Duchess, 1993.) This category involved storytelling with perceptual support. Storytelling has an intrinsically temporal component: It involves relaying a sequence of events (Labov & Waletzky, 1967). In addition to the predictable temporal content, specific stories may encourage the expression of other content categories. Children’s storybooks contain routines in repeated action form that may be represented by complex sentences. In the present study, two familiar stories were presented: Goldilocks and the Three Bears (Marshall, 1998) and The Three Little Pigs (Galdone, 1998). Adversative and communication content are particularly highlighted in the repetitive dialogue of Goldilocks, as in “Papa Bear said, ‘SomeOne’s been sitting in my chair,’” (communication) while the narrator tells us that “Goldilocks tries Momma Bear’s porridge but it was too cold” (adversative).

The Three Little Pigs offered a routine conducive primarily to the expression of additive and temporal content (e.g., “I’ll huff and I’ll puff and I’ll blow your house in”).

For each elicitation task described above, we developed a linguistic protocol to encourage the child’s engagement with the activities. The protocols consisted of a set of prompts and an interaction format. This format was intended to support the child’s spontaneity and allow the adult to follow the child’s lead. In addition,

Table 1. Participant description (age in years, months).

<table>
<thead>
<tr>
<th>Participant</th>
<th>Cohort</th>
<th>Gender</th>
<th>Age</th>
<th>Standard score</th>
<th>Percentile</th>
</tr>
</thead>
<tbody>
<tr>
<td>BG</td>
<td>1</td>
<td>M</td>
<td>2;7</td>
<td>125</td>
<td>95</td>
</tr>
<tr>
<td>NJ</td>
<td>1</td>
<td>M</td>
<td>2;8</td>
<td>131</td>
<td>98</td>
</tr>
<tr>
<td>SR</td>
<td>1</td>
<td>F</td>
<td>2;6</td>
<td>147</td>
<td>99</td>
</tr>
<tr>
<td>TK</td>
<td>1</td>
<td>F</td>
<td>2;9</td>
<td>136</td>
<td>99</td>
</tr>
<tr>
<td>JC</td>
<td>2</td>
<td>M</td>
<td>3;0</td>
<td>133</td>
<td>99</td>
</tr>
<tr>
<td>LW</td>
<td>2</td>
<td>F</td>
<td>3;7</td>
<td>123</td>
<td>94</td>
</tr>
<tr>
<td>TM</td>
<td>2</td>
<td>F</td>
<td>3;1</td>
<td>123</td>
<td>94</td>
</tr>
<tr>
<td>TB</td>
<td>2</td>
<td>M</td>
<td>3;9</td>
<td>117</td>
<td>87</td>
</tr>
<tr>
<td>AD</td>
<td>3</td>
<td>F</td>
<td>4;5</td>
<td>124</td>
<td>95</td>
</tr>
<tr>
<td>CR</td>
<td>3</td>
<td>F</td>
<td>4;9</td>
<td>106</td>
<td>66</td>
</tr>
<tr>
<td>JB</td>
<td>3</td>
<td>M</td>
<td>4;5</td>
<td>122</td>
<td>93</td>
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<tr>
<td>LR</td>
<td>3</td>
<td>M</td>
<td>4;8</td>
<td>122</td>
<td>93</td>
</tr>
</tbody>
</table>

*Test of Early Language Development, Third Edition (TELD–3; Hresko, Reid, & Hammill, 1999) results (standard scores and percentile ranks) are reported with reference to the Spoken Language Quotient.
within free-play and script-play, the investigator interacting with a child produced at least one model utterance within each content category and no less than 10 models per session. These interaction procedures ensured some degree of consistency in the linguistic context provided across children.

Data Collection

Children were seen at a university speech and hearing center, and materials were presented in a playroom that was free of ambient noise. After the initial screening, each child was seen for two 1-hr sessions. Two activities were presented at each session: One that imposed greater constraints on the child’s responses (elicited description or story retelling) was paired with a less constraining activity (free- or script-play). The order of activities was counterbalanced across children in each cohort. The adult interacting within a particular activity remained constant across children to maintain a degree of contextual consistency. All interactions were videotaped using a Sony DCR-TRV38. All recordings were transferred to DVD; the PC-based InterVideo playback system was used for detailed transcriptions and analysis of interactions.

Transcription and Coding Procedures

Adult and child utterances were transcribed by one of the researchers and four graduate students according to video transcription conventions presented in Lahey (1988). Before undertaking transcriptions for the study, each student transcriber was required to achieve at least 90% correspondence with one of the researchers for transcription of a 30-min training video of pilot data. Based on these transcriptions, complex sentences produced by the children were identified and time coded by the three authors. As discussed above, complex sentences were defined as sentences with two clauses that represent a relationship between events. This designation was supported by context (nonlinguistic surroundings) and prosody (pause and terminal contour indicative of sentential boundaries).

Complex sentences were distinguished from consecutive sentential clauses (i.e., individual sentences joined by a conjunction serving the pragmatic function of cohesion rather than representing a semantic relation). In some instances, the context was essential in determining whether the clauses were related semantically and the nature of the relationship between clauses (i.e., content category). This utterance identification process is illustrated in a problem raised by the following utterance, “She can walk/ but/ they both need shots.” Although the two clauses appear to comprise a complex sentence in conjunct form, the clauses do not seem to relate to one another. Another example of a consecutive sentential clause is, “You put her nose because she ran into a tree.”) (See Appendix A for definitions and examples of the content categories of complex sentences.)

The children’s utterances were described further with reference to any adult utterance that appeared before the child’s production of complex sentences (see Appendix B for descriptions of linguistic protocols for the play contexts). Some adult utterances were considered planned models; these were part of the linguistic protocols for the various activities (see Appendix B). Planned models were statements or questions provided by the adult that were complex sentences and contained one of the content categories targeted. If such a sentence occurred within five utterances before the child’s utterance, it was coded for its content. This criterion was based on Bloom, Hood, and Lighthoun’s (1974) findings that imitations would not likely occur after five intervening utterances. The adult utterance was later compared with the child’s subsequent utterance for possible influence (i.e., a match between the content category in the adult and child utterance).

Finally, the functions of language, that is, the objectives the utterance appeared to serve for the child, were categorized with reference to Lahey’s (1998) taxonomy (see Appendix C). These data had the potential of elucidating relationships between adult and child utterances.

Each complex sentence was identified and coded independently for the above categories in child and adult utterances by two of the three authors. Independent codings were compared, and agreement among coders was > 95% across children. Items for which consensus was not achieved were coded by the third author and were included for further analysis if agreement was reached with one of the other two authors.

RESULTS

Across three cohorts and four contexts, 7,590 utterances were collected; of these, 1,025 (.14) were complex sentences: Cohort 1 = 141 (.02); Cohort 2 = 294 (.04); Cohort 3 = 590 (.08). Comparisons between proportions of complex sentences produced by cohorts were subjected to a chi square test of independence, incorporating a Bonferroni correction. Significant deviations between Cohorts 1 and 3, and Cohorts 2 and 3 were observed, \( \chi^2(2, N = 12) = 203.61, p < .01 \).

A series of analyses was undertaken applying a repeated-measures linear mixed-model F test, alpha set at .05, with associated partial eta square (\( \eta^2 \)) to detect interaction effects among within- and between-subject variables derived from questions that directed the study. Although children were observed for approximately 30 min within each context, there was some variation in time that children were observed across contexts. That variation was a product of the children’s engagement in specific activities that comprised each context. Time variation in repeated measures across contexts was addressed by treating context as a random effect, thereby adjusting the estimates of the F values.

To better understand which cohorts or contexts accounted for significant differences detected by the F test, individual-value t tests (a set at .05) were conducted. These t tests were applied to determine if the probability of production of the dependent variables was significantly greater than chance (represented by 0). Chance variance includes the possibility of no instance of the dependent variable.
The effect size is represented by $\eta^2_p$ (as recommended by Cohen, 1973), which represents the proportion of the total variance accounted for by the independent variable subcategory under consideration. For $\eta^2_p$ analyses, Cohen (1973) outlines the following rule of thumb for interpreting effect sizes: small (0.01), medium (0.06), and large (0.14). The effect size varied among the t test analyses, affected by the number of subcategories of the independent variable considered in each analysis.

The following sections present results including frequencies, proportions, means, and standard deviations. For each analysis, significant t-test results are reported with associated effect size. Results are reported with reference to the research questions posed.

**Question 1**

Are there differences in the frequency with which children produce complex sentences across contexts according to age group? The assessment of the relationship between context and cohort (Table 2) revealed the following: The greatest proportions of complex sentences produced by the youngest cohort (mean age 2;8) were in the context of free-play and script-play. Contrastively, the oldest cohort (mean age 4;7) produced a greater proportion of complex sentences while engaging in script-play and retelling stories. A repeated-measures linear mixed-model $F$ test ($\alpha$ set at .05) indicated a significant interaction effect for age and context, associated with a large effect size, $F(2, 9) = 16.88$, $p < .01$, $\eta^2_p = .385$. A series of individual-value t tests ($\alpha$ set at .05) indicated that the production of complex sentences was statistically significant for Cohort 1 in the context of free-play and script-play; Cohort 2 in the context of free-play, script-play, and story retelling; and Cohort 3 in all contexts. Effect sizes (proportions of variance accounted for by interactions examined) associated with significant results ranged from small to large (see Table 2). The smallest effect sizes were with Cohort 1 in the contexts of free-play and script-play, and the greatest effect sizes were with Cohort 3 in the contexts of script-play and story retelling.

**Question 2**

Are there differences among age groups with reference to the content categories produced? As shown in Table 3, each cohort produced sentences coding all content categories. For Cohort 1, additive utterances were proportionally greater than any other content category. Additive content decreased proportionally with age, and epistemic content increased proportionally with age. The repeated-measures analysis of these distributions revealed a significant interaction effect and a large effect size for the variables of age and production of complex-sentence content, $F(2, 9) = 19.95$, $p < .01$, $\eta^2_p = .457$. A series of individual-value t tests ($\alpha$ set at .05) indicated that the production of additive and temporal content was statistically significant for Cohort 1; the production of temporal, causal, adver- sative, and epistemic content was statistically significant for Cohort 2; and the production of additive, temporal, causal, adversative, and epistemic content was statistically significant for Cohort 3. Effect sizes related to these interactions ranged from small to large (see Table 3). The smallest effect size occurred for temporal content with Cohort 1, and the greatest effect size occurred for epistemic content with Cohort 3.

**Table 2.** Proportion (prop.), frequency (freq.), mean, standard deviation, and individual-value t ($\eta^2_p$) associated with complex sentences produced according to contexts and cohorts.

<table>
<thead>
<tr>
<th>Context</th>
<th>Cohort 1 (Mean age 2;8)</th>
<th>Cohort 2 (Mean age 3;4)</th>
<th>Cohort 3 (Mean age 4;7)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Prop.</td>
<td>Freq.</td>
<td>M</td>
</tr>
<tr>
<td>Free-play</td>
<td>.36</td>
<td>51</td>
<td>12.75</td>
</tr>
<tr>
<td>Script-play</td>
<td>.38</td>
<td>56</td>
<td>14.00</td>
</tr>
<tr>
<td>Elicited description</td>
<td>.11</td>
<td>15</td>
<td>3.75</td>
</tr>
<tr>
<td>Story retelling</td>
<td>.13</td>
<td>19</td>
<td>4.75</td>
</tr>
</tbody>
</table>

**Note.** Cohen’s (1973) effect sizes: small (0.01), medium (0.06), and large (0.14).

*p < .05, **p < .01.
A series of individual-value t tests (α set at .05) yielded the following statistically significant results: for Cohort 1, production of utterances that functioned as comments; for Cohort 2, production of utterances that functioned as comments and responses; and for Cohort 3, production of utterances that functioned as comments, responses, and routines. Effect sizes related to these interactions ranged from small to large (see Table 6). The smallest effect size was related to comment by Cohort 1; the greatest effect size was related to respond by Cohort 3.

Table 7 illustrates the distribution of functions of complex sentences according to context with cohorts collapsed. Within free-play and script-play, the proportionately greatest function observed was comment, followed by respond; within elicited description, the proportionately greatest function was respond; and within story retelling, the proportionately greatest function was routine, followed by respond. A repeated-measures analysis of an interaction effect between context and the functions of complex sentences, however, failed to reach alpha, $F(2, 9) = 2.78, p = .06$, $\hat{\eta}^2_p = .410$. Although the $F$ failed to reach significance, the proportion of variance accounted for by the interaction of function and context was large.

**DISCUSSION**

The present research involved the creation of contexts designed explicitly to evoke the production of complex sentences in typically developing children. Our intent was to create contexts that were as naturalistic as possible but that had the potential to provoke complex-sentence production. We anticipated that results would yield preliminary baseline data on the production of complex sentences in typically developing children across selected contexts; such information could guide clinicians in designing contexts for the elicitation of complex sentences from children with language delay.

We chose familiar activities that would be of interest to children between 2 and 5 years of age and that varied in their degree of structure. Protocols were developed to encourage engagement and verbalization in children and consistency among adults. The degree of spontaneity afforded by the activities determined the nature of

---

**Table 3. Proportion, frequency, mean, standard deviation, and individual-value t (t\_p) associated with complex sentence content according to cohort.**

<table>
<thead>
<tr>
<th>Content</th>
<th>Cohort 1 (age 2;8)</th>
<th>Cohort 2 (age 3;4)</th>
<th>Cohort 3 (age 4;7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additive</td>
<td>.28</td>
<td>39</td>
<td>9.75</td>
</tr>
<tr>
<td>Temporal</td>
<td>.26</td>
<td>36</td>
<td>9.00</td>
</tr>
<tr>
<td>Causal</td>
<td>.13</td>
<td>19</td>
<td>4.75</td>
</tr>
<tr>
<td>Adversative</td>
<td>.04</td>
<td>6</td>
<td>1.50</td>
</tr>
<tr>
<td>Epistemic</td>
<td>.18</td>
<td>26</td>
<td>6.25</td>
</tr>
<tr>
<td>Notice</td>
<td>.06</td>
<td>9</td>
<td>2.25</td>
</tr>
<tr>
<td>Communication</td>
<td>.04</td>
<td>6</td>
<td>1.50</td>
</tr>
</tbody>
</table>

**Total** 141 294 590

**Note.** Cohen’s (1973) effect sizes: small (0.01), medium (0.06), and large (0.14).

* p < .05, ** p < .01.

**Question 4**

**Is there a relationship between the content of the adult model and the content of the child’s following utterance?** Table 5 displays the content relationships between the adult models and the child’s productions. As shown in this table, 371 utterances out of a total of 1,025 complex sentences across children (.36) followed an adult model. Of the 371 utterances, only 130 (.35) matched the adult utterance by content category. It should be noted that adult models varied in frequency across content categories. The highest frequency occurred with epistemic (n = 122 adult models) and the lowest with communication (n = 16 adult models). A chi square test of independence was conducted to evaluate the relationship between the content of the adult model and the content of the follow-up utterance. This test involved evaluating the production of content of complex sentences generated by the child and the content of the prior adult model. Deviations from the mean production were identified, then the adjusted chi square residuals were examined on a cell-by-cell basis to locate the most extreme interactions. A Bonferonni correction was used in assessing the significance of these individual interactions. The relationship between adult model and child production of content reached significance for four of the categories: temporal, epistemic, notice, and communication, $\chi^2(36, N = 12) = 112.42, p < .01$.

Because the majority of the utterances were not influenced by adult models, we wondered what linguistic function may have motivated complex-sentence production. To this end, we asked a fifth question: What are the functions of complex sentences and are there any differences with reference to cohort and context? (See Appendix C for a list of functions considered in the study.) Table 6 displays the distributions of functions according to cohort with contexts collapsed. As shown in this table, comment was a frequent function across cohorts, although use of this function decreased proportionally as age increased. Contrastively, respond and routine increased proportionally with age; the greatest difference in the respond function was observed between Cohorts 1 and 2 and in the routine function between Cohorts 2 and 3. A repeated-measures analysis of these distributions revealed a significant interaction effect between age and the function of complex sentences produced across contexts and a large effect size, $F(2, 9) = 12.28, p < .001$, $\hat{\eta}^2_p = .804$. 

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Table 4. Proportion, frequency, mean, standard deviation, and individual-value $t$ ($\eta^2$) associated with complex-sentence content according to context.

<table>
<thead>
<tr>
<th>Content</th>
<th>Free-play</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Script-play</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Elicited description</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>Story retelling</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Additive</td>
<td>.11</td>
<td>36</td>
<td>3.00</td>
<td>2.83</td>
<td>2.25*</td>
<td>.016</td>
<td>.10</td>
<td>31</td>
<td>2.58</td>
<td>3.55</td>
<td>1.96*</td>
<td>.012</td>
<td>.21</td>
<td>24</td>
<td>2.00</td>
<td>2.04</td>
<td>1.53</td>
<td>.007</td>
<td>.16</td>
<td>47</td>
<td>3.92</td>
</tr>
<tr>
<td>Temp.</td>
<td>.12</td>
<td>39</td>
<td>3.00</td>
<td>1.95</td>
<td>2.25*</td>
<td>.016</td>
<td>.18</td>
<td>53</td>
<td>4.41</td>
<td>3.68</td>
<td>3.31**</td>
<td>.034</td>
<td>.33</td>
<td>39</td>
<td>3.25</td>
<td>3.01</td>
<td>2.44*</td>
<td>.019</td>
<td>.36</td>
<td>107</td>
<td>8.92</td>
</tr>
<tr>
<td>Causal</td>
<td>.18</td>
<td>55</td>
<td>4.59</td>
<td>7.01</td>
<td>3.44**</td>
<td>.037</td>
<td>.24</td>
<td>70</td>
<td>5.83</td>
<td>6.06</td>
<td>4.38**</td>
<td>.059</td>
<td>.17</td>
<td>20</td>
<td>1.67</td>
<td>1.97</td>
<td>1.25</td>
<td>.005</td>
<td>.17</td>
<td>54</td>
<td>4.50</td>
</tr>
<tr>
<td>Advers.</td>
<td>.08</td>
<td>24</td>
<td>2.00</td>
<td>2.30</td>
<td>1.50</td>
<td>.007</td>
<td>.08</td>
<td>24</td>
<td>2.00</td>
<td>2.22</td>
<td>1.50</td>
<td>.007</td>
<td>.07</td>
<td>9</td>
<td>0.75</td>
<td>.97</td>
<td>.56</td>
<td>.001</td>
<td>.14</td>
<td>41</td>
<td>3.42</td>
</tr>
<tr>
<td>Epistem.</td>
<td>.43</td>
<td>134</td>
<td>11.17</td>
<td>11.97</td>
<td>8.38**</td>
<td>.186</td>
<td>.35</td>
<td>103</td>
<td>8.53</td>
<td>9.75</td>
<td>7.13**</td>
<td>.142</td>
<td>.17</td>
<td>20</td>
<td>1.67</td>
<td>2.64</td>
<td>1.25</td>
<td>.005</td>
<td>.04</td>
<td>11</td>
<td>0.91</td>
</tr>
<tr>
<td>Notice</td>
<td>.07</td>
<td>21</td>
<td>1.75</td>
<td>2.05</td>
<td>1.31</td>
<td>.006</td>
<td>.04</td>
<td>12</td>
<td>1.00</td>
<td>0.74</td>
<td>.69</td>
<td>.002</td>
<td>.03</td>
<td>3</td>
<td>0.25</td>
<td>0.62</td>
<td>.19</td>
<td>.000</td>
<td>.01</td>
<td>2</td>
<td>0.17</td>
</tr>
<tr>
<td>Comm.</td>
<td>.03</td>
<td>8</td>
<td>0.67</td>
<td>1.78</td>
<td>.50</td>
<td>.001</td>
<td>.01</td>
<td>4</td>
<td>0.65</td>
<td>.25</td>
<td>.000</td>
<td>.000</td>
<td>.01</td>
<td>1</td>
<td>0.08</td>
<td>0.28</td>
<td>.06</td>
<td>.000</td>
<td>.12</td>
<td>36</td>
<td>3.00</td>
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<tr>
<td>Total</td>
<td>314</td>
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<td>296</td>
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<td></td>
<td>116</td>
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<td></td>
<td></td>
<td>299</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. Cohen’s (1973) effect sizes: small (0.01), medium (0.06), and large (0.14).

* $p < .05$. ** $p < .01$. 
the linguistic protocols. Thus, adult statements were scripted for adult-directed activities (e.g., elicited description and story retelling). More spontaneous activities (free- and script-play) involved the researcher following the child’s lead while prompting and reflecting on child or adult actions. In the course of these verbalizations, attempts were made to model each content category. Given the naturalistic quality of the less structured activities, frequency of modeling each content category varied across contexts. The results of our study suggest that complex-sentence production changes with development and is sensitive to both linguistic and nonlinguistic contexts.

The Effect of Age on Context Utilization

The child’s age affected the type of activity that was most facilitative of complex-sentence production. The youngest cohorts produced complex sentences most frequently during play (free-play and script-play contexts); the oldest cohort, however, produced complex sentences most frequently in the context of story retelling, while continuing to produce a high frequency of complex sentences in the play contexts. These results may be explained with reference to cognitive–linguistic interactions in language learning.

Older children are less dependent than younger children on perceptual support for language production. Older children, therefore, have the potential to produce complex sentences across a variety of contexts coding a variety of content. While playing, young children have the opportunity to make relationships among objects and events and to comment on these relationships. These hands-on activities provide perceptual support, which is essential for the production of complex sentences by younger children (e.g., Bloom & Lahey, 1978; Lahey, 1988); furthermore, relationships that children themselves make and reflect on provide the semantic/syntactic foundation for the development of complex sentences (e.g., Bloom et al., 1989; Karmiloff-Smith, 1986).

Contrastively, story retelling assumes an ability to use complex-sentence structures offered by the narrative. Syntactically, children need to have the resources to produce conjunctions and sentential complements and know the kinds of complements that verbs permit (Bloom et al., 1989; Shapiro et al., 1987). Once this basic semantic–syntactic organizational foundation is established through play, children can make use of models provided in more linguistically based tasks, such as story retelling (e.g., Bloom, 1993; Bloom & Tinker, 2001; Karmiloff-Smith, 1986). As stated earlier, the oldest cohort produced complex sentences most frequently with story retelling.

Table 5. Frequency and proportion of correspondences between adult models and child production of complex-sentence content.

<table>
<thead>
<tr>
<th></th>
<th>Additive</th>
<th>Temporal</th>
<th>Causal</th>
<th>Adversative</th>
<th>Epistemic</th>
<th>Notice</th>
<th>Communication</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Additive</td>
<td>3 .07</td>
<td>.07</td>
<td>9 .20</td>
<td>.11</td>
<td>19 .43</td>
<td>2 .05</td>
<td>3 .07</td>
<td>.12</td>
</tr>
<tr>
<td>Temporal</td>
<td>3 .05</td>
<td>16 .24**</td>
<td>8 .12</td>
<td>4 .06</td>
<td>23 .35</td>
<td>2 .03</td>
<td>10 .15</td>
<td>.18</td>
</tr>
<tr>
<td>Causal</td>
<td>3 .04</td>
<td>.11</td>
<td>15 .21</td>
<td>12 .17</td>
<td>22 .31</td>
<td>3 .04</td>
<td>7 .10</td>
<td>.19</td>
</tr>
<tr>
<td>Adversative</td>
<td>4 .12</td>
<td>.12</td>
<td>8 .24</td>
<td>3 .09</td>
<td>10 .29</td>
<td>1 .03</td>
<td>4 .12</td>
<td>.09</td>
</tr>
<tr>
<td>Epistemic</td>
<td>2 .02</td>
<td>.07</td>
<td>10 .08</td>
<td>7 .06</td>
<td>80 .66**</td>
<td>12 .10</td>
<td>3 .02</td>
<td>.33</td>
</tr>
<tr>
<td>Notice</td>
<td>0 .00</td>
<td>1 .05</td>
<td>3 .16</td>
<td>2 .11</td>
<td>5 .26</td>
<td>7 .37**</td>
<td>1 .05</td>
<td>.05</td>
</tr>
<tr>
<td>Communication</td>
<td>0 .00</td>
<td>.19</td>
<td>1 .06</td>
<td>2 .13</td>
<td>3 .19</td>
<td>1 .06</td>
<td>6 .38**</td>
<td>.04</td>
</tr>
<tr>
<td>Total</td>
<td>15 .04</td>
<td>.43</td>
<td>43 .16</td>
<td>54 .15</td>
<td>35 .09</td>
<td>162 .44</td>
<td>28 .08</td>
<td>.36</td>
</tr>
</tbody>
</table>

**p < .01.

Table 6. Proportion, frequency, mean, standard deviation, and individual-value t (tπ)^2 associated with complex-sentence functions according to cohort with contexts collapsed.

<table>
<thead>
<tr>
<th>Function</th>
<th>Cohort 1 (Mean age 2:8)</th>
<th>Cohort 2 (Mean age 3:4)</th>
<th>Cohort 3 (Mean age 4:7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment</td>
<td>.60</td>
<td>84</td>
<td>21.0</td>
</tr>
<tr>
<td>Regulate</td>
<td>.03</td>
<td>4</td>
<td>1.00</td>
</tr>
<tr>
<td>Request</td>
<td>.00</td>
<td>0</td>
<td>0.00</td>
</tr>
<tr>
<td>Respond</td>
<td>.28</td>
<td>39</td>
<td>9.75</td>
</tr>
<tr>
<td>Routine</td>
<td>.10</td>
<td>14</td>
<td>3.50</td>
</tr>
</tbody>
</table>

Note. Cohen’s (1973) effect sizes: small (.01), medium (0.06), and large (0.14).

*p < .01. **p < .001.
The Effect of Specific Activities on Production of Content

Interacting with the developmental influences on a child’s utilization of particular contexts are the specific activities themselves. In this study, the activities presented to the children influenced the production of particular content categories. The following content category/context relationships reached significance: additive, temporal, causal, and epistemic in the contexts of free-play (crane and house) and script-play (doctor’s office and McDonald’s); temporal in the context of elicited description; and additive, temporal, causal, and adversative in the context of story retelling (The Three Little Pigs [Galdone, 1998] and Goldilocks and the Three Bears [Marshall, 1998]).

These findings suggest that relationships among events that characterize specific activities and language that represents such event relations influence the expression of complex sentences. For example, in the story retelling task category, Goldilocks and the Three Bears (Marshall, 1998) promoted adversative content, consistent with the events and types of sentences that appeared in that text (e.g., adversative was expressed in passages such as “She tried the porridge but it was too hot”). Communication, though it did not meet our criterion for significance, occurred frequently in passages such as “Baby bear said that it broke.” In the story, The Three Little Pigs (Galdone, 1998), additive and temporal, respectively, were encouraged by sentences such as “He huffed and he puffed” and “He got the sticks and then he built the house.”

Similar relationships between context and content were found within the contexts of free-play, script-play, and elicited description. Within the free-play context, we observed that the two representative tasks differentially influenced the children’s performance: A greater proportion of causal statements was associated with the crane task than with the task involving the house. This finding is consistent with the means-end orientation of the crane activity (involving a pulley system, ramps, etc.). In addition, the crane task lent itself to expressions of epistemic content. Two factors may have contributed to this finding. First, the types of actions possible with this apparatus may have promoted the expressions of anticipation and reflection (e.g., “I wonder what this does” or “I think that the car is going to crash); second, uncertainty associated with anticipation naturally led to epistemic comments by adults, which may have provided linguistic models supporting children’s subsequent productions. Similarly, within the script-play structure, scripts like “doctor” promoted the expression of epistemic content. In this case, diagnostic possibility and uncertainty may have been the motivating factor for epistemic content (e.g., “I think she needs a shot”).

Bloom et al (1989) concluded in their developmental study of complementation that children’s frequent use of the verbs know and think was motivated by their intent to comment on their own certainty or uncertainty about information. In the elicited description context, the blindfolded “Big Bird” required the children to describe the actions of characters who were engaged in simultaneous and sequential actions, resulting in frequent temporal expressions.

The Elicited Description Context

An unexpected finding of this study was the relative paucity of complex-sentence production in the context of elicited description across cohorts. This task was one of the more directive in which children were instructed to describe action sequences enacted by the examiner. Although the children had perceptual support available for the construction of complex sentences, there were few produced. There are a number of possible explanations for this outcome. First, perceptual support was provided primarily by the adult rather than the child’s creative act; thus, the child did not have feedback available from his or her own actions as a foundation for the construction of complex semantic relations. Second, even though Big Bird was blindfolded, it is possible that the children felt that the examiner’s questions were inauthentic (i.e., that she actually knew the answers). The children may have been talking to the examiner rather than to Big Bird. A similar hypothesis was formulated by Emslie and Stevenson (1981) to explain conflicting results, for indefinite/definite article acquisition, between their study and one done by Warden (1976). Children’s egocentric overuse of the was attributed to the possible assumption by the children that the experimenter, who was also the listener, was familiar with the referents. Lastly, this outcome may have resulted from requiring the children to generate utterances to encode complex event relationships without a model; such a task may have been more challenging than story retelling, which provided adult models.

Context and Function

Beyond the content/context relations reported above, relationships between context and complex-sentence function were evident. Free-play and script-play yielded the greatest proportion of comment. This is not surprising because comment is among the earliest and most frequent functions of child language (e.g., Bloom & Lahey, 1978). Comment is the most direct expression of ideation, which is best facilitated by a free-play context. The more adult-directed elicited description and story retelling encouraged complex-sentence production for the function of respond in the older cohorts in response
to questions and prompts. Retelling stories that incorporated routines (e.g., “huff and puff,” etc.) promoted a higher proportion of routine in the oldest cohort.

The Effect of Models on Sentence Content

Overall, the majority of complex sentences were spontaneous and were not apparently related to a planned model. This finding is consistent with those reported by Bloom et al. (1980). When planned models were available to the older cohorts, these models appeared to influence the expression of some content more than others. Temporal, epistemic, notice, and communication content expressed by children matched adult content significantly more than the other content categories. It is possible that children were motivated to spontaneously imitate these models because they were in the process of learning the relationships between the inherent content and form interactions of these event relations (Bloom et al., 1974).

Another factor influencing imitation of specific content categories may have been the syntactic component of verb knowledge. Epistemic, notice, and communication categories are characterized by verbs that take sentential complements (e.g., tell, think, watch). If children are influenced by any of these verbs, the probability that a complex sentence will be produced may be increased. DeVilliers and Pyers (2002), who studied epistemic and communication verbs longitudinally, suggested that these verbs were the foundation for learning sentential complements. Perhaps the verb provided support for the content and syntactic structure of the sentence (e.g., Bloom, 1993; Shapiro et al., 1987).

Bloom et al. (1989) found that the epistemic verbs think and know were used most frequently by children to differentiate certainty about information being conveyed. Along these lines, the frequency of use of epistemic models may have been motivated by children exploring and practicing relationships between “theory of mind” and its expression. It has been more recently suggested that mental and communication verbs reflect theory of mind (Miller, 2006). Children within the age range of our participants may be in the process of learning to understand false beliefs and may be naturally drawn to verbs that allow for complements expressing belief in adult statements.

Clinical Implications

Given the small number of children who participated in the present study, the findings must be viewed as preliminary; these results, nevertheless, begin to provide evidence-based guidelines for planning assessment and intervention targeting complex sentences. Assessment involves the creation of a variety of contexts in order to identify those that facilitate and those that challenge a child’s productions. In designing such contexts, one should consider the age of the child and the content category targeted. Our findings indicate that younger children require manipulable materials and the freedom to enact relationships that will be expressed linguistically (e.g., event sequences, cause and effect relations, contrastive states). Older children were found to perform well in contexts with defined linguistic and experiential support (e.g., script-play, retelling stories).

Our findings also suggest that activities designed to promote complex-sentence production influence the content of targeted sentences. Nonlinguistic aspects of the activity might include the possibility for children to make relationships with objects (e.g., additive, temporal, causal) that correspond to the content of target utterances. Linguistic aspects might include models that adults present to support the formulation of targeted sentences. For example, in one of our play contexts (crane), a vehicle ramp provided opportunities for children to make causal relations both physically and linguistically. In this context, a model reflecting causal content presented by the adult was, “If you push the car, it will go down the ramp.” Additional examples drawn from the more linguistically oriented story retelling activities included The Three Little Pigs (Galdone, 1998) to promote additive and temporal expressions and Goldilocks and the Three Bears (Marshall, 1998) to promote adversative and communication utterances.

CONCLUSION

This research has shown that complex-sentence production changes with age and is sensitive to both linguistic and nonlinguistic contexts. These preliminary data provide evidence for the types of complex-sentence content that may be expected in specified contexts, and thus can serve as a basis for planning assessment and intervention for children with language disorders. It is recommended that future research focusing on context sensitivity in complex language production be directed toward children with language disorders and children from a variety of cultural backgrounds.

ACKNOWLEDGMENTS

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APPENDIX A. CONTENT CATEGORIES OF COMPLEX SENTENCES (BASED ON LAHEY, 1988)

Conjunction structures

Additive: The joining of objects, events, or states without a dependency.
(e.g., “That’s a cat and that’s a dog.”)

Temporal: The dependency between events that involve a temporal sequence.
(e.g., “I get up and then I eat breakfast.”)

Causal: The dependency between events that has a cause–effect relationship.
(e.g., “Can you bend his legs so he can sit down?”)

Adversative: The relationship between two events and/or states is one of contrast.
(e.g., “This one goes up and this one goes down.”)

Complementation structures

Epistemic: This refers to mental states of affairs and includes verbs like know, think, remember, and wonder (e.g., “I think I can put him in here.”).

Notice: This refers to utterances that code attention to person, object, and/or event, and includes verbs like see, look, watch, and show (e.g., “Watch how that bird flies.”).

Communication: This refers to utterances that code communicative acts and includes verbs like say and tell (e.g., “Daddy said you have to come down.”). This term may be comparable to a concept called “reported speech,” which is a term used by Hengst, Frame, Newman-Stritzel, and Gannaway (2005) in a study involving adult discourse practices.

APPENDIX B (P. 1 OF 2). LINGUISTIC PROTOCOLS FOR CONTEXTS

Free-play

Crane: “Look what we have. Do you know what this is? This is a crane, and we have ramps, and lots of cars and trucks. Let’s see what we can do with all of these.”

Play with crane, cars, trucks, ramps.

Other verbal interactions include:

Following the child’s lead, asking what is happening, commenting on actions, use of prompts and encouragement, use of models.

House: “Look at this beautiful house. There are a lot of rooms, and a whole bunch of people and furniture. Let’s see what we can have them do. What do you think should happen here?”

Play with house, dolls, and furniture.

Other verbal interactions include:

Following the child’s lead, asking what is happening, asking what certain items are, asking where certain items go, commenting on actions, use of prompts and encouragement, use of models.

Script-play

Doctor’s office: “This is a doctor’s office. You could be the doctor. Here are all of your supplies. Would you like to be the doctor, and I’ll bring my babies to see you?”

Play with babies going to the doctor, reverse roles during play.

Other verbal interactions include:

Following the child’s lead, asking what the babies need, commenting on actions, use of prompts and encouragement, use of models.

McDonald’s: “This is a McDonald’s restaurant. Have you ever been to one? Would you like to be the worker? I’m hungry. I could come and buy something from you. Can you make me something to eat? Tell me how you make it.”

Play with the McDonald’s restaurant toy, reverse roles during play.

Other verbal interactions include:

Following the child’s lead, asking what they are doing, asking for help, commenting on actions, use of prompts and encouragement, use of models.

Elicited description (Big Bird)

“Big Bird likes to play a game. He likes to wear this blindfold. Now Big Bird can’t see. You watch the children do things, and then let Big Bird know what’s happening. Big Bird wants to know what the children are doing.”

Dolls and toys are manipulated to represent different activities. Adult may demonstrate a sequence and child may demonstrate the sequence. Adult may pretend to be Big Bird and have him ask, “What’s happening?”

If child needs more prompting:

“What’s happening?”

“Can you let Big Bird know what happened?”

“Can you tell him any more?”

Verbal praise is provided throughout activity.
Story retelling

"I’m going to read you a story, and when I’m done, I’d like you to tell the story back to me.”

Story is read, with child-directed speech and slow rate, with emphasis on attention to each page.

“Now it’s your turn. Can you tell me the story? I’ll help you if you need it.”

If child needs more prompting:
- “Ok, I’ll start, once upon a time…”
- “What happened next?”
- “And then?”
- “Can you tell me more?”

Verbal praise is provided throughout activity.

APPENDIX C. LANGUAGE FUNCTIONS EXAMINED (BASED ON LAHEY, 1988)

Comment: Utterances that are used to describe or identify objects, people, states, and/or events with no other apparent function.
Regulate: Utterances that are used to regulate others and require a response.
Request: Utterances that are used to request a specific object, event, or response.
Respond: Utterances that are a direct response to another utterance.
Routine: Utterances that consist of stereotyped utterances used in a specific setting (e.g., “He huffed and he puffed and he blew the house down.”).