

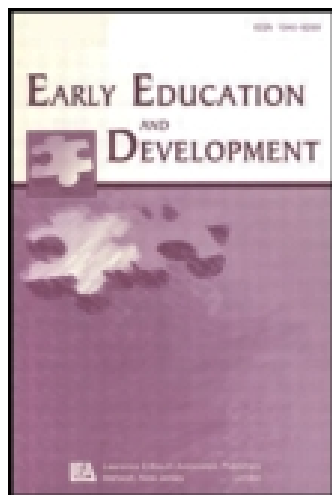
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Preschoolers' Exposure to Language Stimulation in Classrooms Serving At-Risk Children: The Contribution of Group Size and Activity Context

Khara Pence Turnbull ^a , Angela Beckman Anthony ^b ,
Laura Justice ^c & Ryan Bowles ^d

^a Washington, DC

^b Communication Sciences and Disorders, Eastern Illinois University

^c School of Teaching and Learning, The Ohio State University

^d Department of Psychology , Michigan State University

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Preschoolers' Exposure to Language Stimulation in Classrooms Serving At-Risk Children: The Contribution of Group Size and Activity Context

Khara Pence Turnbull
Washington, DC

Angela Beckman Anthony
*Communication Sciences and Disorders
Eastern Illinois University*

Laura Justice
*School of Teaching and Learning
The Ohio State University*

Ryan Bowles
*Department of Psychology
Michigan State University*

Research Findings: This research examined preschoolers' exposure to 6 types of language stimulation techniques (LSTs) in classrooms serving at-risk children and considered whether specific activity contexts were associated with educators' rate of use of different LSTs. Several teacher-directed and child-directed activity contexts were videotaped in 14 classrooms. Adult utterances were coded for group size, activity context, and use of LSTs. A total of 5,017 utterances were analyzed. Descriptive analyses were used to determine frequency of LST use, and logistic regressions were used to predict the likelihood of LST use based on group size and activity context. About one third of adult utterances were classified as LSTs, and there was significant variation in educators' rate of use of LSTs. LSTs were more likely in small-group

child-directed contexts than other contexts. Educators' use of child-dependent LSTs was relatively less frequent in relation to child-independent LSTs in teacher-directed contexts than in child-directed contexts. *Practice or Policy*: Results suggest that preschoolers attending at-risk classrooms are exposed to modest amounts of high-quality language, with some variability in exposure reflective of activity context and group size. These findings suggest the importance of professional development for educators to provide high-quality language learning environments within their classrooms.

Individual differences in the quantity and quality of the language input children experience appear to contribute to the wide variation in children's language development, with children reared in economically disadvantaged circumstances receiving lower quality input than their more advantaged peers (e.g., Hart & Risely, 1995). Given that well more than one half of American children between the ages of 3 and 4 receive care outside of the home (Snyder, Tan, & Hoffman, 2006), it is important to consider not only the home environment but also other caregiving environments in which children spend considerable amounts of time when evaluating the potential impact of the language input children receive. The extant literature reveals that the language children experience in the context of the preschool classroom can and does exert considerable influence on children's language growth (e.g., Girolametto & Weitzman, 2002; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). That the language children experience in the preschool classroom can exert considerable influence on children's own language development bodes well for children who may receive less-than-optimal input in the home, such that the language children experience in the preschool classroom might potentially serve to compensate for a lack of high-quality input in the home. The current study examines the amount and kinds of high-quality language economically disadvantaged children experience in the preschool classroom and considers how the contextual factors of group size and activity context relate to the quality and quantity of language children experience.

Theoretically, the premise that the language input children receive is a strong predictor of their own language development is well established (Dickinson & Smith, 1994; Girolametto, Hoaken, Weitzman, & van Lieshout, 2000; Girolametto & Weitzman, 2002; Girolametto, Weitzman, van Lieshout, & Duff, 2000; Hart & Risley, 1995; Hoff, 2003; Huttenlocher et al., 2002; Weitzman, & Greenberg, 2002). *Language stimulation techniques* (LSTs) are an important subset of the input children receive and are defined as caregiver interactive techniques designed to target key linguistic structures that are potentially helpful for children's language development (Rice & Hadley, 1995). Specific LSTs include focused contrasts, models, event casts, open questions, expansions, recasts, redirects, and prompted initiations (Rice & Wilcox, 1995). The Appendix provides definitions and examples of these LSTs. Increased use of LSTs in the preschool classroom

has been found to support language development for children with diagnosed speech and language disorders as well as those at risk for problems in these areas (e.g., Girolametto, Hoaken, et al., 2000; Rice & Hadley, 1995; Wilcox & Morris, 1995).

Although a number of studies have characterized the quality of educators' language input in the preschool classroom, it is not clear how this input may vary as a function of classroom context. Some studies have suggested that characteristics of teachers' language, such as the frequency of open-ended questions, may be related to contextual features of the classroom, including the type of instructional activity taking place (e.g., Girolametto, Hoaken, et al., 2000; Girolametto & Weitzman, 2002; Kontos & Keyes, 1999) or the size of the group in which children and teachers are interacting (Weitzman & Greenberg, 2002). In the present research, we addressed this important gap in the literature by studying how specific classroom contextual features that are amenable to modification co-occur with specific types of high-quality language input. More specifically, we studied the frequency with which preschool educators use LSTs and consider whether contextual features in the classrooms—activity context and group size—predict educators' use of LSTs. This study contributes to the literature concerning language quality within preschool classrooms by addressing two aims: (a) to describe the relative frequency of educators' use of LSTs versus non-LSTs in preschool classrooms serving economically disadvantaged children, and (b) to explore the effects of activity context (teacher-directed vs. child-directed) and group size (small group vs. large group) on the frequency with which preschool educators use LSTs. Understanding the relationship between classroom activity context, group size, and teacher use of LSTs may have implications for how preschool educators could intentionally structure activities to increase the likelihood of high-quality language use.

WHY CLASSROOM CONTEXT MATTERS

Systems theory is a useful approach for conceptualizing the potential power of classroom environments for enhancing young children's developing competencies (see Pianta, 1999). Systems theory emphasizes that a child's competencies at any given point in time are greatly influenced (and bidirectionally so) by a variety of factors, or contexts, within the child's sociocultural environment. Systems theory also emphasizes that one cannot study children's development without also considering the contexts in which development occurs. These contexts include the child in dyadic systems (e.g., teachers, parents), the dyadic system within small social groups (e.g., classroom, family), and small social groups within a larger culture or community (e.g., school, neighborhood; Pianta, 1999). Our interest in this research is examining (a) the preschool classroom environment as an important context in which young children develop their language abilities and (b) the impor-

tance of characterizing the classroom context as a compensatory mechanism for language development in economically disadvantaged populations. Specifically, this article explores group size and activity context as potentially important features of preschool classrooms related to children's exposure to high-quality language.

Numerous studies have underscored the importance of the quality and quantity of the linguistic input children experience for language growth (e.g., Girolametto, Weitzman, & Greenberg, 2003; Huttenlocher et al., 2002; McCartney, 1984). Particular aspects of the preschool classroom milieu that seem to matter most to children's language acquisition include the quality and quantity of adult-to-child conversation (McCartney, 1984), the arrangement of the physical space (Vincent, 1995), the number of children in a group (Kontos & Keyes, 1999; Smith & Dickinson, 1994), the ratio of children to adults (Howes, Phillips, & Whitebook, 1992; National Institute of Child Health and Human Development Early Child Care Research Network [NICHD ECCRN], 2000; Palmerus, 1996), and the activity context (e.g., dramatic play, art) in which language is used (Girolametto & Weitzman, 2002; Peets, 2003).

Children's Exposure to Language in the Preschool Classroom

One factor that is strongly related to children's language development is exposure to adult talk (e.g., Hoff, 2006; Hoff & Naigles, 2002; Huttenlocher et al., 2002), and, for this reason, the quality and quantity of adult-child talk in the preschool classroom has been an oft-studied developmental phenomenon (e.g., Girolametto & Weitzman, 2002; Howes et al., 1992; Huttenlocher et al., 2002). Children's language growth is strongly associated with the amount of time they spend talking with and listening to adults (McCartney, 1984), and when educators use more syntactically complex speech, children achieve greater syntactic growth as a result (Huttenlocher et al., 2002). Adult use of pragmatic strategies such as waiting, turn taking, face-to-face interaction (i.e., by positioning oneself to be on the child's level), and including uninvolved children in interactions increases children's language use and participation in conversations (Girolametto et al., 2003). In addition, redirecting children's verbal initiations to peers rather than to adults increases opportunities for children to interact in peer-to-peer conversation (Schuele, Rice, & Wilcox, 1995).

Despite the importance of educators' use of such strategies in the preschool classroom (e.g., use of open-ended questions), studies show that classrooms vary substantially in these characteristics. As an example, de Kruif, McWilliam, Ridley, and Wakely (2000) classified 63 child care teachers of 1- to 3-year-old children into four clusters based on their frequency of use of directive and nondirective behaviors, including both physical behaviors (e.g., providing an activity) and lan-

guage behaviors (e.g., providing information to expand on a topic). The “average” group of teachers ($n = 24$) demonstrated a balance of directive and nondirective behaviors and engaged in both types of behavior some of the time. “Elaborative” teachers ($n = 11$) spent much of the time expanding on child activities, following the child’s interest to elicit responses, and showing a high level of affect. “Controlling” teachers ($n = 18$) frequently tried to curtail children’s behavior and redirect them to a teacher-initiated activity, and rarely elaborated on child activities or interests, whereas “nonelaborative” teachers ($n = 10$) frequently introduced children to new activities, provided information, and acknowledged children’s responses without elaboration. As these findings show, preschool educators vary considerably in the interactive techniques they use in the classroom, a result consistent with other reports (Dickinson & Keebler, 1989; Girolametto, Weitzman, et al., 2000; Mahoney & Wheeden, 1999). It is important to note that the prevalent interaction style used by a given teacher is a powerful mediator of the type of language children experience and, ultimately, children’s language growth within the preschool classroom (e.g., de Kruif et al., 2000; Girolametto et al., 2003; Huttenlocher et al., 2002). Put another way, children in classrooms led by an “average” or “elaborative” teacher may receive considerable language-learning opportunities as their teachers expand their utterances and follow their lead in nondirective responsive styles. Children in classrooms led by a “controlling” or “nonelaborative” teacher may have relatively few language-learning opportunities by comparison.

In a recent summary of research on the quality of educators’ language use in the preschool classroom, Dickinson and Tabors (2001) identified the following trends. First, relatively few extended conversations occur between individual children and adults or between children during a typical school day. Second, conversations that typically take place in preschool classrooms only occasionally include decontextualized language, characterized as language that goes beyond the here-and-now to describe objects or events that are not immediately present (Smith & Dickinson, 1994). Third, complex language interactions tend to occur during free play when children are engaging with peers, but are less likely to occur during interactions with adults. Although Dickinson and Tabors’s (2001) observations are both important and timely, they also make it clear that much remains to be explored in the area of teacher–child interaction in the preschool classroom. This is particularly true when one considers that preschool classrooms are dynamic milieus that feature a range of contexts, particular activities (e.g., dramatic play, circle time, art time), and group sizes (e.g., one on one, small group, large group). The aim of this article is to add to this area of the literature by exploring variations in adult language use within the preschool classroom and to consider how such language varies as a function of classroom contexts. Understanding this relationship may have implications for how preschool educators structure activities and group sizes within their own classrooms to increase the likelihood of using language that is particularly beneficial to children’s own language development.

Group Size and Activity as Contexts for Language Interactions

Teachers' interactions with students are not determined solely by teachers' individual styles or personal preferences, as studies have suggested that features of the classroom environment, such as group size and activity context, are related to the ways in which teachers interact with children (Peets, 2003; Weitzman & Greenberg, 2002). For example, teachers are more likely to interact in relatively complex ways (e.g., responding to, extending, and/or elaborating on children's social bids; engaging in prolonged conversation; playing interactively) when working with children one-on-one or in the context of dramatic play activities as compared to other activities (Kontos & Keyes, 1999).

Group size. Group size is a variable that has received much attention in the literature on child care and early childhood classrooms. Some studies have suggested that group size may relate to the quality of interactions between children and adults (Howes et al., 1992; Kontos & Keyes, 1999; NICHD ECCRN, 2000; Palmerus, 1996; Rimm-Kaufman, La Paro, Downer, & Pianta, 2005; Smith & Dickinson, 1994). More complex language interactions between teachers and children have been observed in one-on-one interactions than on occasions when a teacher is working with a group of children. For example, Kontos and Keyes (1999) found that teachers were more likely to extend or elaborate on children's social bids and engage in prolonged conversation when they worked individually with children. Other studies have shown that when the number of children in a classroom increases, children demonstrate less pretend talk and more general (i.e., less cognitively challenging) activity talk during play (e.g., Smith & Dickinson, 1994). Some studies have further suggested that children are more likely to engage in off-task behavior in whole-group settings rather than small-group settings (e.g., Rimm-Kaufman et al., 2005). Given that group size is related to a number of important classroom processes, it seems plausible that it may also play a role in children's exposure to high-quality language input in the form of LSTs.

Activity context. Typical early childhood settings offer a variety of activity contexts to engage children throughout the day, such as block centers, dramatic play, art, and library or story time. Each of these activity contexts potentially offers unique opportunities for language learning. Such activities generally occur in a predictable sequence over the day (e.g., dramatic play in the morning, story time after lunch) and occur repeatedly across the week. Implementing a predictable daily schedule is important to creating an effective preschool learning environment, as routines can help children feel safe and secure and provide opportunities for children to increase their independence. Daily schedules for preschoolers should include a balance of several types of activities that incorporate active and

quiet times, large- and small-group activities, indoor and outdoor play, and time for teacher- and child-directed activities (Dodge, Colker, & Heroman, 2002).

The frequency and quality of teacher–child interaction has been shown to vary according to the classroom activity observed. For example, Kontos and Keyes (1999) compared complexity of interactions in four different activity contexts: art, dramatic play, manipulatives, and “other” (i.e., less frequently observed activities such as books, blocks, sand/water, music, and computer). Comparisons revealed that the dramatic play context provided the highest probability of complex interactions (e.g., adults responding to children’s social bids, extending or elaborating on those bids, or engaging in prolonged conversation) between teachers and children. Examples of variation in quality of interaction have been found among other contexts as well. For example, play dough activities foster teachers’ use of an elaborative style (e.g., asking open questions; imitating, labeling, and commenting about objects or actions of joint interest) as compared to book reading activities. Thus, it is possible that activity context in the preschool classroom may facilitate specific types of high-quality input by educators, which in turn influences more productive language use by children.

THE PRESENT STUDY

The current study explores children’s exposure to adult language input in the preschool classroom with a specific focus on identifying the association among teacher use of LSTs (Bunce, 1995), group size, and activity context. By definition, LSTs are a set of explicit strategies designed to increase the quality of verbal interaction between adults and children in early childhood classrooms. In the present work, we studied preschool educators’ use of LSTs to identify the overall rate of use. We also examined the extent to which two variables, group size and activity context, were associated with LST use by educators. Two specific goals were (a) to describe the relative frequency of educators’ use of LSTs versus non-LSTs within economically disadvantaged preschool classrooms and (b) to explore the effects of activity context (teacher-directed vs. child-directed) and group size (small group vs. large group) on educators’ frequency of use of LSTs.

METHOD

Participants

Fourteen preschool teachers and fourteen teacher assistants participated in this study. These professionals were involved in a larger study of the effectiveness of various preschool curricula for children at risk for language, social, and academic

difficulties. Seven of the teachers implemented a language-rich preschool curriculum, namely the *Language-Focused Curriculum* (Bunce, 1995), and seven of the teachers implemented the *High/Scope Curriculum* (Hohmann & Weikart, 2002). Both curricula exhibit similarities in their focus on improving the dynamic, relational aspects of classroom instruction: Each provides a general framework for organizing classroom experiences to address a range of developmental domains (e.g., language, social/emotional, cognitive) and emphasizes the use of responsive interactions and high-quality language conversations throughout the classroom day. For the purposes of this article, we collapsed all teachers into a single group, regardless of curriculum, as there was no statistically significant effect of curriculum on educators' use of LSTs as evaluated by a Mann-Whitney U test ($z = 1.69$, $p = .092$).

The classrooms were affiliated with three funding agencies. Six of the classrooms, serving 100 children, were affiliated with Title I (teacher-to-student ratio of 1:8); 6 classrooms, serving 70 children, were affiliated with Head Start (ratio of 1:6); and the remaining 2 classrooms, serving 27 children, were affiliated with the state's public pre-kindergarten (pre-K) initiative (ratio of 1:7). Classrooms had an average of 13.3 students ($SD = 2.1$; range 10–16), and all programs were a full day in duration. The classrooms were located in two distinctly different regions of the state: The Title I classrooms were located in a large dispersed rural mountainous region, whereas the Head Start and pre-K classrooms were located in a more confined light industrial region. Regardless of program affiliation or location, all programs prioritized certain risk factors to determine eligibility. Admission in the Head Start classrooms was based on federal poverty guidelines to serve children residing in homes below federal poverty limits for the year 2003. Admission to the state pre-K program was prioritized for children and families exhibiting any one of several indicators of risk, including household income; parental education; family stress, health, or developmental concerns; or limited English proficiency. For the purposes of the present study, the 14 classrooms were aggregated, and differences among programs based on curricula, setting, or teacher characteristics were not examined.

The 14 teachers and their assistants were female and reported their race/ethnicity to be White/Caucasian. Additional demographic data were available for the lead teachers in each classroom, but not for teacher assistants. Teachers averaged 41.9 years of age ($SD = 9.1$; range 24–53) and had an average of 11.4 years of experience as teachers ($SD = 8.3$; range 3–27). Two teachers had a Child Development Associate (CDA) as their highest degree, one teacher had an associate's degree in early childhood education, 10 teachers had a bachelor's degree (5 in elementary education, one in early childhood education, one in psychology, one in another field of education, and two in unspecified majors), and one teacher had a master's degree in elementary education.

A total of 197 children were enrolled in these classrooms in the fall of the academic year; 103 were males and 94 were females. Children ranged in age from 4

years to 4 years, 11 months, upon study entry. In terms of race and ethnicity, 143 children were White/Caucasian, 36 were Black/African American, 8 were Hispanic, and 7 were mixed or an unspecified race or ethnicity. Race/ethnicity information was not reported for 3 children. It was reported that 191 of the children spoke English at home and 6 children spoke Spanish at home.

Classroom Observations

Data for the present study were based on systematic observations conducted in each classroom in the fall of the academic year, about 6 weeks after the school year commenced. Trained researchers observed in each classroom for 90 to 120 min, collecting a DVD recording that captured teachers' behaviors and children's experiences and interactions in a range of contexts (e.g., opening circle, dramatic play, art). The camera was primarily focused on the adults in the classroom (i.e., teacher and assistant) in order to capture use of educators' LSTs during a range of activities. However, children were also included within the view of the camera in order to capture group size (i.e., the number of children participating in the activity).

Once the videos were captured, written transcripts were developed for a total of 24 min of the video for each classroom observation using the Systematic Analysis of Language Transcripts (Miller & Chapman, 2000) computer software. To capture a representative sample of classroom activity contexts recorded during the observation, transcripts were created to include up to 12 consecutive minutes of a randomly selected classroom activity (e.g., large-group instruction), after which the transcriber paused and waited until the next activity began and continued to transcribe until a total of 24 min were transcribed. Selection of a 24-min sample is consistent with previous research examining classroom-based teacher-child interaction for similar purposes (e.g., de Rivera et al., 2005; Girolametto, Hoaken, et al., 2000; Girolametto & Weitzman, 2002).

Transcription was conducted by research personnel who had completed a self-study training program that included a computer-based tutorial on transcription conventions, three practice transcripts, and a reliability assessment requiring 90% or greater accuracy across three consecutive transcripts. To ensure the accuracy of transcription, 100% of the transcripts were checked by a second trained transcriber. During transcription, all adult utterances were transcribed and parsed at the utterance level. Because teachers and assistants occasionally produced utterances off-camera, it was not always possible to identify the speaker reliably. For this reason, all analyses of adult utterances in the 14 preschool classrooms represent a combination of teacher and teacher assistant input. Recent work by Gest et al. (2006) found no appreciable differences in the rate of child-directed talk in 17 Head Start classrooms when comparing lead and assistant teachers; similarly, Massey, Pence, Justice, and Bowles (2008) found that lead teachers and assistant teachers use decontextualized language at similar rates. Thus, it seemed method-

ologically appropriate to collapse data from teachers and assistants in the present study, thus representing children's language experiences more globally than we would if we examined teacher language alone. Child utterances that preceded and followed adult utterances necessary for interpreting adult utterances for coding purposes were also transcribed. Any adult utterances that were direct quotes from songs (during singing) or books (during reading) were excluded from transcription and analysis.

Coding of Transcripts

A three-tier coding system was developed for this study by the first two authors to code each adult utterance for (a) classroom context (Tier 1), (b) group size (Tier 2), and (c) adult language input (Tier 3). Tier 3 codes included six LSTs based on descriptions by Bunce (1995) and two additional codes for categorizing additional types of adult utterances. The coding system of each tier was designed to be mutually exclusive and exhaustive. See the Appendix for a full description of the coding system.

Tier 1: Classroom context. The classroom context tier included six mutually exclusive and exhaustive codes: *circle*, *story*, *group*, *play*, *center*, and *art* (see the Appendix). For the purposes of analysis, the *circle*, *story*, and *group* contexts were classified as teacher-directed contexts; teacher-directed contexts are those in which the teacher/assistant directs or manages children's attention. The *play*, *center*, and *art* contexts were classified as child-directed contexts; child-directed contexts are those that are primarily child-centered or child-initiated, with adults following children's interests and requests. Context classifications were based on work by Bunce (1995), Girolametto and Weitzman (2002), and Connor, Morrison, and Slominski (2006); however, it should be acknowledged that the field of early childhood education has not achieved consensus concerning how classroom learning activities should be classified (see Connor et al., 2006, for a discussion). It is plausible that educators might plan activities and subsequently make adjustments to the activities based on children's responses. Conversely, teachers might join in to support and guide activities that children initiate.

Tier 2: Group size. The group size tier included two mutually exclusive and exhaustive codes. The code *large group* was applied to adult utterances that occurred in the presence of the majority of children in the classroom (e.g., 6–10 children). The code *small group* was applied to adult utterances that occurred in the presence of one or a few children in the classroom (e.g., 1–5 children). Differentiating large group from small group in this way is supported by the work of Weitzman and Greenberg (2002), who recommended that teachers work with chil-

dren in small groups (i.e., groups of 5 or fewer children) as often as possible to best promote high-quality language interactions.

Tier 3: Adult LSTs. This tier included eight mutually exclusive and exhaustive codes, including six LSTs (i.e., *models*, *event casts*, *open questions*, *recasts/expansions*, *redirects/prompted initiations*, and *focused contrasts*) and two non-LSTs (i.e., *other* and *praise/acknowledgment*). LSTs can be differentiated according to two distinct communicative functions: initiations, used by educators to evoke children's participation in conversations or to teach them specific language forms or functions; and responsives, used by educators to respond contingently to children's communicative acts. Three LSTs were in the former category, and we refer to these as child-independent LSTs, as they are designed to evoke participation rather than respond to children: models, event casts, and open questions. Three LSTs were in the latter category, and we refer to these as child-dependent LSTs, as they generally occur in response to a child behavior: recasts/expansions, redirects/prompted initiations, and focused contrasts. The final two codes in Tier 3 were classified as non-LSTs and were included to describe directive adult utterances and adult utterances that provided general praise or acknowledgment.

Reliability of codes. The first two authors developed a coding protocol and trained research assistants to an agreement criterion of 85% or greater accuracy with a set of master-coded transcripts. The master-coded transcripts, which represented about one third of the sample, were created by consensus coding and were included as part of the data used in the present study. Trained and reliable coders subsequently coded each adult utterance in the remaining two thirds of the transcripts by applying three tiers of codes using the established protocol. Although interrater reliability was not calculated for the coded transcripts, 100% of the transcripts were checked by a second reliable coder to ensure accuracy, and all coding discrepancies were resolved via discussion.

Data Analysis

Context, the first tier, included two categories as described previously: (a) teacher-directed (group, story, and circle) and (b) child-directed (play, art, and center). Context was also coded as a dummy variable, with 1 indicating child-directed activities and 0 indicating teacher-directed activities. The second tier, group size, included two categories as described previously: (a) small group and (b) large group. Group size was coded as a dummy variable, with small group set equal to 1 and large group set equal to 0. Finally, utterances were grouped into three categories as described previously: (a) child-independent LSTs (model, event cast, and open question), (b) child-dependent LSTs (recast, redirect/prompted initiation, and focused contrast), and (c) non-LSTs (other, general praise and acknowledgment).

We used a logistic regression framework, first with type of utterance (LST vs. non-LST) as the outcome, then with type of LST (child-independent vs. child-dependent) as the outcome. For both outcome variables, we began with a simple logistic regression that included group size, activity context, and their interaction as predictors. We then moved to a multilevel framework with utterances nested within teachers to examine classroom differences in both the use of LSTs and the effect of group size and activity context. All analyses were performed in SAS using either PROC LOGISTIC or PROC NL MIXED. Scripts are available by request.

RESULTS

LST Use by Preschool Educators

Table 1 provides descriptive findings concerning preschool educators’ use of LSTs compared to non-LSTs. As these data show, of the 5,017 educator utterances transcribed and coded for this study, 1,817 (36%) were LSTs and 3,200 (64%) were not. Thus, about two thirds of the utterances to which children were exposed in their preschool classroom were not LSTs. These descriptive data also show there to have been considerable variability among the classrooms in LST use, as indicated by the range data. More specifically, classrooms varied from only 61 instances of LST use within the 24-min observational period to more than 211 instances.

Table 2 provides additional descriptive data regarding the means, standard deviations, and rates of occurrence for the six types of LSTs. These are presented in order from most frequent to least frequent and are differentiated between two categories: child-independent and child-dependent. As these data show, for the 1,817 educator utterances that were coded as LSTs, 60% were models and occurred at a rate of 3.2 per minute on average. Recasts and open questions also occurred relatively frequently, representing about 18% and 15% of LSTs, respectively. Recasts occurred at a rate of about 1 per minute, whereas open questions occurred at a rate of 0.7 per minute. The remaining three LSTs—event casts, focused contrasts, and prompted initiations—occurred infrequently by comparison and represented only about 5% of total LST use. Each of these LSTs occurred at negligible rates. For il-

TABLE 1
Children’s Exposure to Language Stimulation Techniques (LSTs)
in 14 Preschool Classrooms

<i>Educator Utterance Type</i>	<i>Raw Frequency</i>	<i>Range Across Classrooms</i>
Total utterances	5,017	195–510
Non-LSTs	3,200	104–361
LSTs	1,817	61–211
Child-independent	1,451	36–192
Child-dependent	366	8–57

TABLE 2
Educators' Language Stimulation Technique (LST) Rate of Use in Order
of Preference

<i>LST Type</i>	<i>LST Category</i>	<i>Raw Frequency</i>	<i>M (SD)</i>	<i>Rate per Minute (SD)</i>	<i>Percentage of LSTs</i>
Model	Child-independent	1,084	77.43 (41.00)	3.23 (1.71)	59.66
Recast	Child-dependent	321	22.93 (15.68)	0.96 (0.65)	17.67
Open question	Child-independent	269	17.43 (18.60)	0.73 (0.78)	14.80
Event cast	Child-independent	98	8.86 (7.10)	0.37 (0.30)	5.39
Focused contrast	Child-dependent	27	1.93 (3.29)	0.08 (0.14)	1.49
Prompted initiation	Child-dependent	18	1.29 (2.02)	0.05 (0.08)	0.99

Note: Mean and standard deviation reflect raw frequency of use by preschool educators during a 24-min classroom observation.

lustrative purposes, Figure 1 is a pie chart depicting the proportional use of the six LSTs studied.

Predicting Educators' Utterance Types From Group Size
and Activity Context

Table 3 provides the frequencies of utterances within each classroom context, broken down into the six activities and two group sizes. Table 4 provides a descriptive summary of the occurrence of LSTs across various classroom contexts. These data show that most LST types occurred more frequently in large groups as compared to small groups, with the exception of prompted initiations, which were more likely in small groups (55.56% of prompted initiations) than in large groups (44.44%). When considering activity contexts, most LST types occurred more frequently in

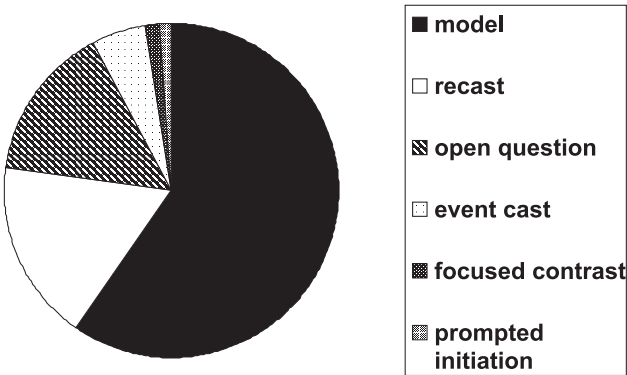


FIGURE 1 Percentage of occurrence for six language stimulation techniques in 14 economically disadvantaged preschool classrooms.

TABLE 3
Co-occurrence of Activity Context With Group Size

Activity Context	Group Size	
	Small Group	Large Group
Child-directed		
Play	117	241
Center	205	30
Art	142	493
Teacher-directed		
Circle	14	2,252
Story	0	205
Group	89	1,209

Note: Data are the frequency of utterances in each context and group size.

TABLE 4
Preschool Educators' LST Use by Group Size and Activity Context

LST Type	Group Size		Activity Context		Interaction
	Small (<i>n</i> = 565)	Large (<i>n</i> = 4,452)	Child-Directed (<i>n</i> = 1,222)	Teacher-Directed (<i>n</i> = 3,767)	Small Group Child-Directed (<i>n</i> = 459)
LST	251	1,566	481	1,334	217
Child-independent	216	1,235	410	1,040	193
Model	117	967	282	801	104
Event cast	25	73	48	50	22
Open question	74	195	80	189	67
Child-dependent	35	331	71	294	24
Recast	25	296	55	265	17
Prompted initiation	10	8	13	5	7
Focused contrast	0	27	3	24	0
Non-LST	314	2,886	741	2,433	242

Note: The total number of utterances coded was lower for activity context because of missing data when an utterance was coded but the context could not be reliably identified. LST = language stimulation technique.

teacher-directed contexts than in child-directed contexts. Again, the exception was use of prompted initiations, which occurred more frequently in child-directed contexts (72.22% of prompted initiations) than in teacher-directed contexts (27.78%).

We conducted several analyses to determine whether these differences were statistically significant. Our first set of analyses studied educators' use of LST versus non-LST utterances to determine whether LST use was predicted by contextual features of the classroom. For this analysis, the utterance category (LST, non-LST)

served as the outcome variable, and we used a logistic regression model to predict the likelihood of an utterance being an LST based on group size, activity context, and their interaction. Neither group size ($b = -0.16$, odds ratio [OR] = 0.85, $p = .46$) nor activity context ($b = -0.04$, OR = 0.96, $p = .63$) was significantly different from 0, meaning that neither variable predicted LST use by itself. However, the interaction between the two variables was significant such that in small groups featuring a child-directed activity, an utterance was 2.01 times more likely to be an LST than a non-LST ($b = 0.70$, $p < .01$) compared to other classroom situations (i.e., small group/teacher-directed, large group/child-directed, or large group/teacher-directed). Predicted probabilities of LSTs are displayed in Figure 2.

As a follow-up analysis, we used a multilevel framework to study individual differences among classrooms in predicting LST versus non-LST use from group size, activity context, and their interaction. This analysis accounted for dependence among utterances arising from nesting of utterances within teachers. We eliminated variance terms that were either not significant or for which the standard error could not be estimated. The final model included significant variance in the intercept ($Var(intercept) = .13$, $SE = .06$, $p = .03$), indicating that classrooms differed significantly in the baseline relative rate of use of LSTs compared to non-LSTs, but there were no significant differences among the classrooms in the effect of group size or activity context. Consistent with the previous logistic regression, neither the main effect for group size ($b = -0.012$, OR = 0.99, $p = .96$) nor that for activity context ($b = -0.13$, OR = 0.88, $p = .31$)

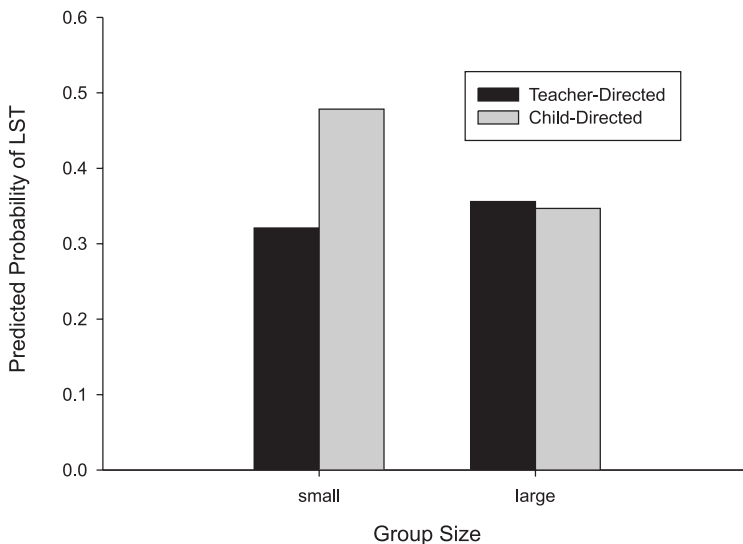


FIGURE 2 Predicted probability of language stimulation technique (LST) versus non-LST for logistic regression.

was significant. The interaction was no longer significant, although the OR was similar and the effect approached significance ($b = 0.54$, $OR = 1.7$, $p = .07$). Predicted probabilities for the average classroom are displayed in Figure 3.

To summarize, this first set of analyses suggested that the combination of a small group size and child-directed activity context resulted in a greater likelihood of an LST compared to other classroom contexts. However, findings from the multilevel framework suggested that at least some of the interaction effects seen in the logistic regression could be accounted for by an indirect effect, such that teachers who tended to employ child-directed activities in small groups also tended to use more LSTs in general.

Our second set of analyses focused specifically on LST use to examine whether the category of LST (child-independent, child-dependent) could be predicted from group size, activity context, and/or their interaction. Similar to the previous procedures, we first used a simple logistic regression to predict the LST category from the three predictor variables (group size, activity context, Group \times Activity interaction). Results showed that neither group size ($b = 0.54$, $OR = 1.72$, $p = .15$) nor activity context ($b = -0.25$, $OR = 0.78$, $p = .15$) significantly predicted the category of LST; however, there was a significant interaction ($b = -1.10$, $OR = 0.33$, $p = .02$) between small group size and child-directed activities. These results showed that in small-group child-directed activities, child-dependent LSTs (recasts, focused contrasts, prompted initiations) were only one-third as likely to occur as in other group sizes or activity contexts. Predicted probabilities are displayed in Figure 4.

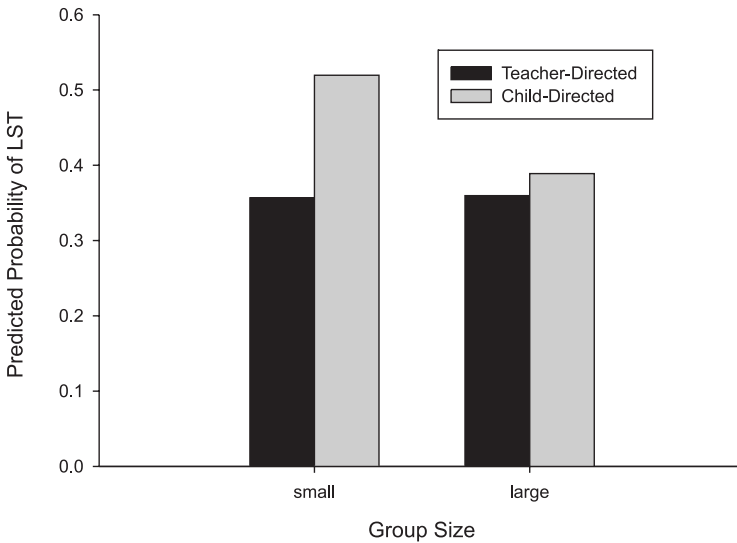


FIGURE 3 Predicted probability of language stimulation technique (LST) versus non-LST for multilevel logistic regression.

As before, we followed our initial analysis with a multilevel framework to study individual differences among classrooms. The final model included a variance term for the intercept ($Var(intercept) = .56, SE = .24, p = .04$) but no other significant variance terms. The main effect for context was significant, such that child-dependent LSTs were about half as likely to occur in child-directed contexts as in teacher-directed contexts ($b = -0.54, OR = 0.58, p = .04$). Neither the main effect for group size ($b = -0.007, OR = 0.99, p = .99$) nor the interaction ($b = -0.002, OR = 1.00, p = 1.00$) was significant. To summarize the findings of this second analysis, results showed that child-dependent LSTs occurred less often when small groups and child-directed contexts occurred together. However, when considering variation among classrooms, only the influence of activity context was evident. Identifying the source of the divergent results is difficult, so we highlight what is consistent: Child-dependent LSTs were less frequent in child-directed activity contexts compared to teacher-directed activity contexts, although it is unclear whether this effect occurred only in small groups or regardless of group size. Predicted probabilities for the average classroom are displayed in Figure 5.

DISCUSSION

This study examined the quality of language input experienced by children attending preschool programs serving at-risk populations. In the following sections, we

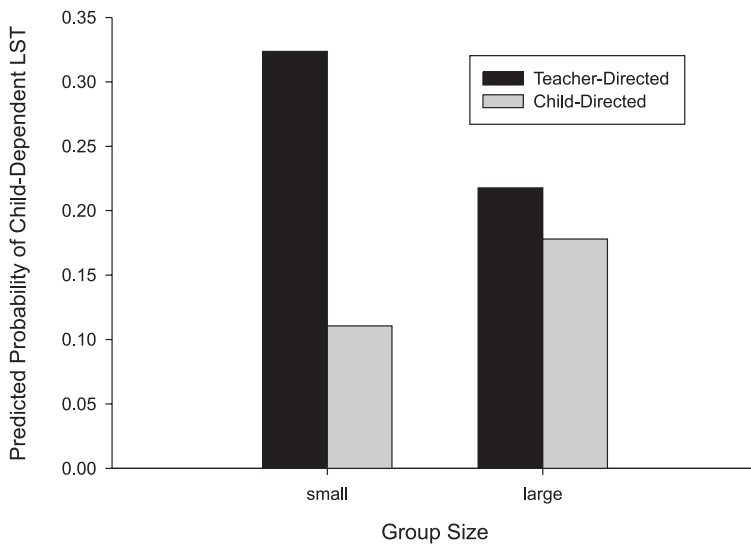


FIGURE 4 Predicted probability of child-initiated language stimulation technique (LST) versus teacher-initiated LST for logistic regression.

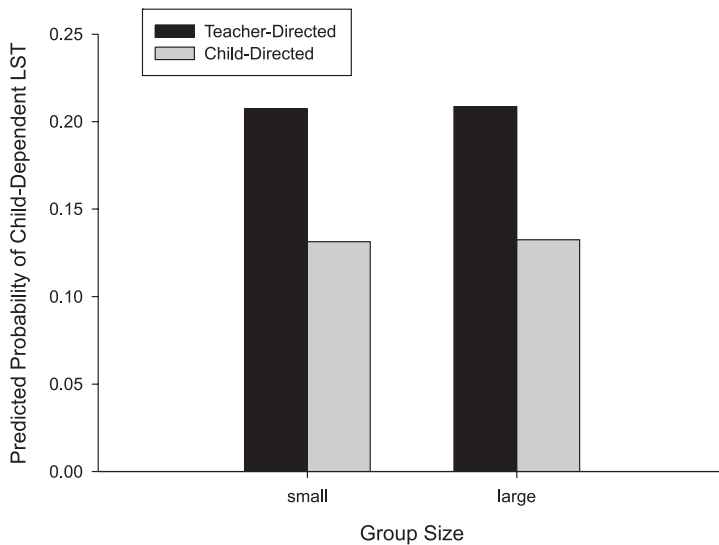


FIGURE 5 Predicted probability of child-initiated language stimulation technique (LST) versus teacher-initiated LST for multilevel logistic regression.

discuss three major findings of this work as well as limitations and future directions.

Discussion of Major Findings

The first major finding was that LSTs composed only about 36% of preschool educators' utterances. Thus, only about one-third of the language these children experienced in their preschool classrooms consisted of utterances that are believed to actively support language growth. The remaining two-thirds of utterances children experienced in this study represented less complex language (i.e., directives, closed-ended or rhetorical questions, or general praise). Even for the most frequently used LSTs—models and recasts—the average rate of occurrence was relatively low at 3 and 1 occurrences per minute, respectively. Three of the LSTs—event casts, focused contrasts, and prompted initiations—occurred at negligible rates.

The finding of such a low rate of occurrence for many of these techniques is a sobering one, particularly in light of numerous state and national initiatives currently focused on improving the language experiences of economically disadvantaged children enrolled in publicly funded preschool programs (e.g., Early Reading First; see U.S. Department of Education, n.d.; or the National Institute for Early Education Research; see Barnett, Lamy, & Jung, 2005). Such initiatives are

grounded in a large research base supporting the importance of LSTs for promoting children's language development. For instance, adult use of open-ended questions, repetitions, and expansions of children's utterances has been found to relate to children's performance on measures of syntax and vocabulary (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Lonigan & Whitehurst, 1998; Valdez-Menchaca & Whitehurst, 1992; Whitehurst et al., 1988). Likewise, redirecting a child to initiate conversation with another peer rather than an adult has been shown to increase peer interactions for preschoolers with specific language impairment (SLI; Schuele et al., 1995), and using focused contrasts in the preschool classroom has been shown to provide measurable gains in phonology for children with SLI (Wilcox & Morris, 1995).

Of the LSTs used, the largest proportion were child-independent (79.85% of LSTs), most of which were models (59.66% of LSTs). Educators' rate of use for open-ended questions is consistent with rates of use by untrained parents (less than 1 per minute; Crain-Thoreson & Dale, 1999). By comparison, far fewer utterances were child-dependent LSTs (20.15% of LSTs). Of these, the largest proportion included recasts (17.67% of LSTs). The finding that far fewer utterances were child-dependent LSTs than child-independent LSTs shows that of the LSTs preschool educators are using, most are not occurring in response to children's discourse. Rather, the LSTs they use most often occur independent of children's discourse. Educators' rate of use for recasts in particular is similar to rates of use for untrained parents (approximately 1.2 per minute; Fey, Cleave, Long, & Hughes, 1993). Although research has not established a suggested threshold of use for child-dependent LSTs, there is evidence that conversational responsiveness characterized by educator use of recasts and expansions and prompted initiations and redirects is particularly influential to children's language learning (Hargrave & Sénéchal, 2000). Thus, in the preschool classrooms we observed, educators did not make frequent use of the kinds of techniques that target active participation by the child in responsive conversational interactions (e.g., Ewers & Brownson, 1999; Haden, Reese, & Fivush, 1996; Hargrave, & Sénéchal, 2000).

The second major finding was that significant variation was observed among the preschool classrooms in the frequency of educators' use of LST versus non-LST utterances; these differences occurred independently of the effects of group size and activity contexts. Within the 24-min observational period, child-independent LSTs ranged in use among classrooms from 36 occurrences (amounting to 1.5 times per minute) to 192 occurrences (amounting to 8 times per minute); use of child-dependent LSTs ranged from 8 occurrences (amounting to about one use per 3 min) to 57 occurrences (amounting to more than two uses per minute). The variability in educators' use of child-dependent LSTs is consistent with previous evidence showing that preschool educators vary in the interactive techniques they use (e.g., de Kruif et al., 2000). Most important, evidence suggests that such variability has important consequences for children's language acquisition. For in-

stance, Huttenlocher et al. (2002) and Vasilyeva, Huttenlocher, and Waterfall (2006) have demonstrated that individual differences in children's language development are significantly related to variations in the language input they receive in both naturalistic and experimentally manipulated contexts, including the pre-school classroom.

The third major finding concerns the predictive value of group size and activity context on educator use of LSTs relative to other types of utterances (i.e., non-LSTs, such as praise) and on the use of child-independent versus child-dependent LSTs. Specifically, this study shows that neither group size nor activity context alone serves as a good predictor of LST use or nonuse or the category of LST. Nonetheless, we did find an interaction between group size and activity context in predicting the likelihood of occurrence for LSTs versus non-LSTs. That is, LSTs occurred relatively more frequently when the group size was small (i.e., 1–5 children) and the activity context was child-directed (i.e., dramatic play, art, and centers) than in other contexts. This finding supports previous reports demonstrating that the amount and quality of language interactions is negatively related to group size (Kontos & Keyes, 1999; Palmerus, 1996) and is positively related to activities that require the adult to follow the child's lead and build upon the child's focus of interest (Weitzman & Greenberg, 2002). Within the category of LSTs, we observed that educators' use of child-dependent LSTs decreased in the context of child-directed activities as compared to teacher-directed activities. Concerning this finding, it appears that teacher-directed activities are more amenable to child-dependent strategies, perhaps because teachers exert more control over the structural characteristics of these interactions compared to those in child-directed contexts. It is also possible that educators in teacher-directed activities pose a large number of closed-ended or test questions but then follow up by recasting children's responses to those questions. Additional research that examines interactions over longer sequences would help to further elucidate the interaction between activity context and group size as these relate to educators' use of specific LSTs.

Limitations and Future Directions

There are some important limitations to the present study that warrant note. The first limitation concerns the extent to which we can generalize the findings. Given that this study involved only 14 classrooms, it is not clear whether the patterns we observed in educators' LST use would be observed in classrooms serving other populations of children and those in more diverse settings; replication of our findings is an important direction for future research. Related to the issue of the generalizability of findings, it is important to note that the findings were derived from a 24-min sample of classroom activities occurring on a single day. It is possible that educators' language use may vary according to a number of factors that we did not consider in the present analyses. Potential factors include the time of day;

the time of year; and teacher demographic factors such as age, level of education, race/ethnicity, and so on. All of these factors are important avenues for future research. Also related to the generalizability of findings, we caution that half of the teachers in the present study were trained to implement a language-rich curriculum. Although we did not detect statistically significant differences in LST use between the trained and untrained teachers, we do not know the extent to which participation in the language-rich curriculum might have contributed to educators' use of LSTs or the way they might have structured activity contexts to promote language exchanges.

The second limitation involves our analytical focus on educators' language behaviors, with only limited attention to the children with whom the educators were interacting. Specifically, we did not study how children responded to different types of LSTs or the effect of LSTs on children's language achievements. We do not know, for instance, if LSTs elicited greater conversational participation from children as compared to non-LSTs, or whether specific types of LSTs supported longer conversational exchanges between educators and children. Future research might address the immediate effects of LSTs on children's conversational exchanges with adults in the preschool classroom, as well as a direct examination of children's language outcomes as a function of their exposure to various LSTs.

The nonindependent nature of the utterances also represents a limitation. Although the effective sample size were 5,017 utterances, the utterances were not derived from 14 educators and their assistants (28 adults). A related issue is that this study did not consider the potential contribution of the temporal dependence of utterances on the findings. It is possible that the likelihood of LST use may be related to previous utterances, which is a limitation given the non-independent nature of the sample of utterances used in the study. Additionally, activity contexts were confounded with the classroom(s) in which they were observed, and this may have contributed to the variability observed in LST use between classrooms.

A final limitation concerns the method for determining the interrater reliability of the coding system used in this study (percentage agreement between coders). Because some of the category combinations had relatively low occurrences (e.g., story activities in small groups, center activities in large groups) in comparison to other category combinations (e.g., circle activities in large groups, group activities in large groups), inter-rater reliability may have been inflated in the category combinations with lower rates of occurrence. Future studies should consider more rigorous methods for calculating inter-rater reliability.

Implications

The results of this study suggest that careful attention needs to be paid to the language-learning environment that children experience within preschool classrooms. The present study reveals that the co-occurrence of classroom variables

such as activity context, group size, and teacher use of LSTs may have implications for how preschool educators could intentionally structure activities to increase the likelihood of high-quality language use. This in-depth examination of 14 classrooms shows that children generally had little exposure to many techniques believed to heighten children's language accomplishments within the preschool classroom, with children's experiences highly variable across classrooms. The present findings suggest that preschool administrators and teachers need to carefully examine the extent to which children in their programs experience high-quality language input, and increase educator use of those language-stimulating techniques that occur at low rates.

The results of this study also show that the combination of two structural variables, namely, small groups and child-directed activity contexts, may influence the language processes occurring within these contexts. Group size and activity context are variables that educators can easily manipulate in the classroom, given that an adequate number of adults is available to divide children into groups of five or fewer. Typical preschool classroom activities such as dramatic play, art, and centers should be conducted in small groups to increase opportunities for facilitative language use. However, use of small groups and child-directed activity contexts together should not be deemed the ultimate solution for increasing language opportunities in the classroom. Findings of this study suggest that although small-group, child-directed contexts may lead to use of more LSTs (as compared to non-LSTs), this combination of structural variables does not lead to equal use of child-dependent and child-independent LSTs. A differing combination of structural variables may be necessary to elicit use of child-independent LSTs, such as models, open questions, event casts, and the like. Early child care centers should consider the roles that additional adults, especially trained paraprofessionals, might play in facilitating not only enriched language processes but also manipulation of the structural features of classrooms that summon richer language interactions between teachers and children.

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REFERENCES

- Arnold, D. H., Lonigan, C. J., Whitehurst, G. J., & Espstein, J. N. (1994). Accelerating language development through picture book reading: Replication and extension to a videotape training format. *Journal of Educational Psychology*, 86, 235–243.
- Barnett, W. S., Lamy, C., & Jung, K. (2005). *The effects of state prekindergarten programs on young children's school readiness in five states*. New Brunswick: National Institute for Early Education Research, Rutgers, The State University of New Jersey.
- Bunce, B. H. (1995). *Building a language-focused curriculum for the preschool classroom: A planning guide* (Vol. 2). Baltimore: Brookes.
- Connor, C. M., Morrison, F. J., & Slominski, F. J. (2006). Preschool instruction and children's emergent literacy growth. *Journal of Educational Psychology*, 98, 665–689.
- Crain-Thoreson, C., & Dale, P. S. (1999). Enhancing linguistic performance: Parents and teachers as book reading partners for children with language delays. *Topics in Early Childhood Special Education*, 19, 28–39.
- de Kruif, R. E. L., McWilliam, R. A., Ridley, S. M., & Wakely, M. B. (2000). Classification of teachers' interaction behaviors in early childhood classrooms. *Early Childhood Research Quarterly*, 15, 247–268.
- de Rivera, C., Girolametto, L., Greenberg, J., & Weitzman, E. (2005). Children's responses to educators' questions in day care play groups. *American Journal of Speech-Language Pathology*, 14, 14–26.
- Dickinson, D., & Keebler, R. (1989). Variation in preschool teachers' styles of reading books. *Discourse Processes*, 12, 353–375.
- Dickinson, D. K., & Smith, M. W. (1994). Long-term effects of preschool teachers' book readings on low-income children's vocabulary and story comprehension. *Reading Research Quarterly*, 29, 105–122.
- Dickinson, D. K., & Tabors, P. O. (2001). *Beginning literacy with language: Young children learning at home and school*. Baltimore: Brookes.
- Dodge, D. T., Colker, L. J., & Heroman, C. (2002). *The creative curriculum for preschool* (4th ed.). Washington, DC: Teaching Strategies.
- Ewers, C. A., & Brownson, S. M. (1999). Kindergarten's vocabulary acquisition as a function of active vs. passive storybook reading, prior vocabulary, and working memory. *Reading Psychology*, 20, 11–20.
- Fey, M. E., Cleave, P. L., Long, S. H., & Hughes, D. L. (1993). Two approaches to the facilitation of grammar in children with language impairment: An experimental evaluation. *Journal of Speech and Hearing Research*, 36, 141–157.
- Gest, S., Holland-Coviello, R., Welsh, J., Eicher-Catt, D., & Gill, S. (2006). Language development subcontexts in Head Start classrooms: Distinctive patterns of teacher talk during free play, mealtime, and book reading. *Early Education and Development*, 17, 293–315.
- Girolametto, L., Hoaken, L., Weitzman, E., & van Lieshout, R. (2000). Patterns of adult-child linguistic interaction in integrated day care groups. *Language, Speech, and Hearing Services in Schools*, 31, 155–168.
- Girolametto, L., & Weitzman, E. (2002). Responsiveness of child care providers in interactions with toddlers and preschoolers. *Language, Speech, and Hearing Services in Schools*, 33, 268–281.
- Girolametto, L., Weitzman, E., & Greenberg, J. (2003). Training day care staff to facilitate children's language. *American Journal of Speech-Language Pathology*, 12, 299–311.
- Girolametto, L., Weitzman, E., van Leishout, R., & Duff, D. (2000). Directiveness in teachers' language input to toddlers and preschoolers in day care. *Journal of Speech, Language, and Hearing Research*, 43, 1101–1114.
- Haden, C. A., Reese, E., & Fivush, R. (1996). Mothers' extratextual comments during storybook reading: Stylistic differences over time and across texts. *Discourse Processes*, 21, 135–169.

- Hargrave, A. C., & Sénéchal, M. (2000). A book reading intervention with preschool children who have limited vocabularies: The benefit of regular reading and dialogic reading. *Early Childhood Research Quarterly*, 15, 75–90.
- Hart, B., & Risely, T. B. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore: Brookes.
- Hoff, E. (2003). The specificity of environmental influence: Socioeconomic status affects early vocabulary development via maternal speech. *Child Development*, 74, 1368–1378.
- Hoff, E. (2006). How social contexts support and shape language development. *Developmental Review*, 26, 55–88.
- Hoff, E., & Naigles, L. (2002). How children use input to acquire a lexicon. *Child Development*, 73, 418–433.
- Hohmann, M., & Weikart, D. P. (2002). *Educating young children: Active learning practices for pre-school and child care programs* (2nd ed.). Ypsilanti, MI: High/Scope Press.
- Howes, C., Phillips, D. A., & Whitebook, M. (1992). Thresholds of quality: Implications for the social development of children in center-based child care. *Child Development*, 63, 449–460.
- Huttenlocher, J., Vasilyeva, M., Cymerman, E., & Levine, S. (2002). Language input and child syntax. *Cognitive Psychology*, 45, 337–374.
- Kontos, S., & Keyes, L. (1999). An ecobehavioral analysis of early childhood classrooms. *Early Childhood Research Quarterly*, 14, 35–50.
- Lonigan, C. J., & Whitehurst, G. J. (1998). Relative efficacy of parent and teacher involvement in a shared-reading intervention for preschool children from low-income backgrounds. *Early Childhood Research Quarterly*, 13, 263–290.
- Mahoney, G., & Wheeden, C. A. (1999). The effect of teacher style on interactive engagement of preschool-aged children with special learning needs. *Early Childhood Research Quarterly*, 14, 51–68.
- Massey, S. L., Pence, K. L., Justice, L. M., & Bowles, R. P. (2008). Educators' use of cognitively challenging questions in economically disadvantaged preschool classroom contexts. *Early Education and Development*, 19, 340–360.
- McCartney, K. (1984). Effect of quality of day care environment on children's language development. *Developmental Psychology*, 20, 244–260.
- Miller, J., & Chapman, R. (2000). *Systematic Analysis of Language Transcripts (SALT)*. Madison: University of Wisconsin, Madison Language Analysis Laboratory.
- National Institute of Child Health and Human Development Early Child Care Research Network. (2000). Characteristics and quality of child care for toddlers and preschoolers. *Applied Developmental Science*, 4, 116–135.
- Palmerus, K. (1996). Child-caregiver ratios in day care center groups: Impact on verbal interactions. *Early Child Development and Care*, 118, 45–57.
- Peets, K. F. (2003). *Context and classroom discourse patterns in children with language impairment*. Unpublished doctoral dissertation, Harvard University, Cambridge, MA.
- Pianta, R. C. (1999). *Enhancing relationships between children and teachers*. Washington, DC: American Psychological Association.
- Rice, M. L., & Hadley, P. A. (1995). Language outcomes of the language-focused curriculum. In M. L. Rice & K. A. Wilcox (Eds.), *Building a language-focused curriculum for the preschool classroom: Vol. 1. A foundation for lifelong communication* (pp. 155–170). Baltimore: Brookes.
- Rimm-Kaufman, S. E., La Paro, K. M., Downer, J. T., & Pianta, R. C. (2005). The contribution of classroom setting and quality of instruction to children's behavior in kindergarten classrooms. *Elementary School Journal*, 105, 377–394.
- Schuele, C. M., Rice, M. L., & Wilcox, K. A. (1995). Redirects: A strategy to increase peer initiations. *Journal of Speech and Hearing Research*, 38, 1319–1333.
- Smith, M. W., & Dickinson, D. K. (1994). Describing oral language opportunities and environments in Head Start and other preschool classrooms. *Early Childhood Research Quarterly*, 9, 345–366.

- Snyder, T. D., Tan, A. G., & Hoffman, C. M. (2006). Digest of Education Statistics 2005: NCES 2006-030. U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics.
- U.S. Department of Education. (n.d.). *Early Reading First—Purpose*. Retrieved September 30, 2006, from www.ed.gov/programs/earlyreading/index.html
- Valdez-Menchaca, M. C., & Whitehurst, G. J. (1992). Accelerating language development through picture book reading: A systematic extension to Mexican day-care. *Developmental Psychology*, 28, 1106–1114.
- Vasilyeva, M., Huttenlocher, J., & Waterfall, H. (2006). Effects of language intervention on syntactic skill levels in preschoolers. *Developmental Psychology*, 42, 164–174.
- Vincent, S. A. (1995). *Environmental arrangement language strategies in the classroom: Functional effects on language and social behaviors in preschool children*. Unpublished doctoral dissertation, University of Oregon, Eugene, OR.
- Weitzman, E., & Greenberg, J. (2002). *Learning language and loving it* (2nd ed.). Toronto, Ontario, Canada: Hanen Centre.
- Whitehurst, G. J., Falco, F., Lonigan, C. J., Fischel, J. E., DeBaryshe, B. D., Valdez-Menchaca, M. C., et al. (1988). Accelerating language development through picture-book reading. *Developmental Psychology*, 24, 552–558.
- Wilcox, K. A., & Morris, S. R. (1995). Speech outcomes of the language-focused curriculum. In M. L. Rice & K. A. Wilcox (Eds.), *Building a language-focused curriculum for the preschool classroom: Vol. 1. A foundation for lifelong communication* (pp. 171–180). Baltimore: Brookes.

APPENDIX
Three-Tier Coding System

Tier 1: Classroom Context	
Teacher-Directed Contexts	
CIRCLE	opening circle/greetings, may include a focus on calendar, daily theme, jobs, and so on
STORY	teacher reading a book or books
GROUP	large- or small-group lessons
Child-Directed Contexts	
PLAY	activities dedicated specifically to thematic/dramatic play
CENTER	classroom centers or free-time activities including blocks, computer, puzzles, and so on
ART	art and creative activities
Tier 2: Group Size	
LG	group containing the majority of the children in the classroom (e.g., 6+ children)
SG	group containing a small number of children in the classroom (e.g., 1–5 children)
Tier 3: Language Stimulation Techniques (adapted from Rice & Wilcox, 1995)	
Child-Independent Strategies	
M	Model: Provides a target sound, word, or syntactic structure that a child might not yet produce. Usually takes the form of a statement or comment, and may use emphasis or stress to highlight the target. Example: Adult: I like your <i>lavender</i> shirt. <i>Lavender</i> is a way of saying light purple.
EC	Event cast: Provides a description of an ongoing event or activity. Example: Adult: I'm painting a rainbow in the sky. Wow, Jim is painting the sun on his paper.
OQ	Open question: Questions with a variety of possible answers. The adult asking the question does not necessarily know the answer, making open questions different from test questions. Example: Adult: What do you think will happen next in the story?

Child-Dependent Strategies

REX Recast/Expansion: An utterance that alters the syntactic structure of a prior utterance while preserving the semantic information, and also fills in any missing features of the child's utterance.

Example:

Child: She eat chip.

Adult: Yes, she's eating chips.

PI Redirect/Prompted initiation: An utterance that directs a child to initiate with a peer instead of the adult.

Example:

Adult: I see you have been waiting patiently for a turn. Tell Bob that you want a turn next. Say "It's my turn now."

FC Focused contrast: Contrasts differences between two or more lexical items, speech sounds, or syntactic structures in corrective feedback provided to a child.

Example:

Child: I eated my cereal.

Adult: Try to say "I ate my cereal" instead of "I eated my cereal."

Non-Language Stimulation Strategies

PR Praise/acknowledgment: utterances that acknowledge, evaluate, or praise a child

O Other: yes/no questions, rhetorical questions, utterances that make requests, utterances that direct child behavior, comments not otherwise classified
