



Bi-directional dynamics underlie the complexity of talk in teacher–child play-based conversations in classrooms serving at-risk pupils



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ABSTRACT

This study examined the transactional, utterance-by-utterance dependencies in the syntactic complexity of teachers' and children's talk during small-group conversations in preschool classrooms. The sample included 39 teachers and select children in their classroom, which targeted enrollment to children experiencing documentable risk factors. Patterns of sequential dependencies demonstrated a bi-directional interdependence in teachers' and children's complex syntactic use, whereby both teachers and children appeared sensitive to each other's use of complex syntactic forms. Teachers' use of complex syntax increased the likelihood that children's adjacent utterance would contain complex syntax; similarly, children's use of complex or simple syntax increased the likelihood that teachers' adjacent utterance would mirror their syntactic level. Associations were small to moderately large in strength, but varied across individual classrooms. The findings point to complex, bi-directional relationships underlying the complexity of talk within the classroom language environment.

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An interesting paradox in the developmental science of language acquisition is the need to appreciate both the commonalities among children in their development of language as well as their appreciable individual differences. The present study is motivated by the latter body of work, which has yielded considerable evidence showing that young children exhibit variability in the rate with which they develop syntax, one of the principle domains of language, and that this variability reflects, at least in part, features of their care-giving environments (Hoff, 2003; Hurtado, Marchman, & Fernald, 2008; Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). For instance, the syntactic complexity of 4-year-old children's language expression can be reliably predicted by the syntactic complexity of their parents' talk within the home environment (Hoff-Ginsberg, 1986). Findings such as these imply that characteristics of the language to which children are exposed are critical for syntactic development (e.g., Saffran, Aslin, & Newport, 1996), and also that systematic variation in this input may contribute to the individual differences in syntactic development observed among groups of children.

The focus of this study is to consider patterns of child–teacher talk within the preschool classroom environment, a key developmental context for young children, particularly those from low-socioeconomic status (SES) households and with whom this study is concerned. Specifically, we examine utterance-by-utterance sequential dependencies in the syntactically complex talk of teachers and the children in their classrooms. This type of analysis provides a complement and extension to much of the current literature on classrooms, as it lends itself to consider the transactional and bi-directional dynamic between teachers and children as it unfolds in time. Although teacher–child interactions are often theorized as the *locus of learning* for children's language acquisition, the transactional properties of these interactions are rarely studied explicitly within the classroom environment. In this regard, the present study contributes to improving our understanding of children's language development within the context of their preschool classroom environments, and complements prior studies on transactional and bi-directional properties of teacher–child interactions (e.g., Kontos, Burchinal, Howes, Wisseh, & Galinsky, 2002; Powell, Diamond, Burchinal, & Koehler, 2010).

1. Syntactic development and demographic risk

Children from low-SES households, according to a variety of studies, lag substantially behind their more advantaged peers in

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two important domains of language development, namely syntax and vocabulary (e.g., Cabell, Justice, Konold, & McGinty, 2011; Vasilyeva, Waterfall, & Huttenlocher, 2008). Interestingly, despite the importance of syntax to children's academic achievement, particularly in the area of reading (e.g., Catts, Fey, Zhang, & Tomblin, 2001), and inclusion of syntactic targets within many early education standards (e.g., children show progress in "speaking in sentences of increasing length and grammatical complexity;" U.S. Department of Health and Human Services, Administration on Children, Youth and Families/Head Start Bureau, 2003), surprisingly little research has examined children's development of syntax within the preschool classroom setting. In part, this may stem from the fact that syntax is considered a relatively resilient domain of language, more impervious or 'hard-wired' to the effects of developmental risk factors than other domains, such as vocabulary (see Shonkoff & Phillips, 2000). Yet this perception is not fully consistent with evidence that aspects of children's syntactic development show significant individual differences and that factors related to children's primary language-learning environments, such as those that accompany poverty, do exert sizeable and likely enduring impacts on young children's syntactic development (Fazio, Naremore, & Connell, 1996; Vasilyeva et al., 2008).

Children's specific accomplishments over the course of early childhood within the domain of syntax have been well documented in a number of seminal reports (e.g., Brown, 1973; de Villiers & de Villiers, 1973). Although young children show relatively little variability with respect to their achievements of simple syntactic forms, this is not the case for complex syntax, in which children show more substantial heterogeneity (Cabell et al., 2011; Huttenlocher et al., 2002; Jackson & Roberts, 2001; Vasilyeva et al., 2008). In fact, lags in comprehension and expression of complex syntax, particularly more complex verb–phrase morphologies, are considered a hallmark indicator of language impairment (Hansson & Leonard, 2003), and may place young children at risk for future difficulties in reading comprehension (Craig, Connor, & Washington, 2003).

For children reared in low-SES homes, the lags in syntactic growth that many experience as compared to children in high-SES homes have been attributed, in part, to limitations in the "complexity of input they receive" (Vasilyeva et al., 2008, p. 95). Much research has emphasized differences in the language input provided *at home* to children from low-SES backgrounds, as compared to more advantaged peers (Hart & Risley, 1995; Hoff, 2003; Huttenlocher, Vasilyeva, Waterfall, Vevea, & Hedges, 2007); however, the literature also suggests that there may be more pervasive differences in the language input these children receive across other key developmental settings, such as their early school settings. Indeed, research showing that preschoolers' gains in comprehension of complex syntax over an academic year is significantly related to their teachers' expression of complex syntax ($r = .42$, $p < .01$; Huttenlocher et al., 2002) implies that an important location in which children's syntactic development is advanced is within the preschool classroom environment. Unfortunately, recent research shows that only a minority of preschool classrooms offer children high-quality language environments (Justice, Mashburn, Hamre, et al., 2008; LoCasale-Crouch et al., 2007), and that it is unlikely for children who are poor to access these higher-quality classrooms. In fact, children who are poor are more likely than not to attend classrooms with some of the lowest quality instructional and language support (LoCasale-Crouch et al., 2007). Equally disconcerting, efforts to bolster the language support provided to children within the preschool classroom setting, particularly those preschool classrooms serving children from low-SES homes, have been largely unsuccessful (for an overview see Dickinson, 2011). Thus, questions arise about both the most effective approach to early language enhancement within early-education settings and the underlying theoretical models of change that guide such efforts (i.e., the

specific features of classrooms that affect children's language development). Stated another way, the field is still not entirely clear on why or how features of the classroom environment, such as teachers' modeling of specific language forms, may positively affect children's language, and particularly, their syntactic development.

2. Adult–child interactions and syntactic development

Researchers have long been invested in increasing our understanding of the role that specific features of adult–child interactions may play in fostering children's language development. Some studies of environmental determinants of language development have focused on macro-level characteristics of children's interactions with their caregivers, such as household organizational patterns (Johnson, Martin, Brooks-Gunn, & Petrill, 2008) and general parenting behaviors (Landry, Smith, Miller-Loncar, & Swank, 1997), whereas others have examined more proximal characteristics, such as the way in which mothers' respond to their children's verbalizations during interactions (Tamis-LeMonda, Bornstein, & Baumwell, 2001) or the complexity of parental talk to their children (e.g., Hart & Risley, 1995; Hoff-Ginsberg, 1986). The latter body of work has suggested that it is not solely children's exposure to a large quantity of parental linguistic input that facilitates their syntactic development (e.g., Hart & Risley, 1995); rather, it is a dynamic dependency *between* the language behaviors of parents and children that serves as a powerful developmental force on children's linguistic accomplishments (Hart & Risley, 1995; Hoff-Ginsberg, 1986; Landry et al., 1997; Tamis-LeMonda et al., 2001).

The transactional interplay between the language of children and their caregivers, even in the first few months of life (see Saffran et al., 1996), provides the opportunity to calculate probabilities (or dependencies) among linguistic events, which in turn are viewed as serving a key mechanism for language development (e.g., Bloom, Margulis, Tinker, & Fujita, 1996; Yoder & Warren, 2001; Zucker, Justice, Piasta, & Kaderavek, 2010). For instance, research showed that the level of adjacent, contingent responding by mothers to their 9-month olds' vocalizations predicted the time at which their children would produce their first word, use combinatorial speech, and achieve a 50-word lexicon (Tamis-LeMonda et al., 2001). Importantly, these studies demonstrate that adults are not simply guiding young children's language development through their models or input; rather, adults are working within the context of children's own skill levels to support their development. Work showing the positive effects of parents' "follow-in" comments and requests on children's vocabulary, for example, illustrate the importance of parents working explicitly with children's current attentional focus in their efforts to provide labels and build vocabulary (McDuffie & Yoder, 2010). Similarly, the positive relations between caregiver use of recasting (i.e., a technique where adults immediately re-state a child's utterance in a more complete or correct syntactic form) and accelerations in their children's language growth are presumed to reflect the importance of contingent pairing of a child's "platform" utterance (e.g., *I took the ball.*) with an adjacent syntactic form provided by a caregiver (*You are taking the ball.*; see Proctor-Williams & Fey, 2007). Such studies, some of which examine the moment-by-moment dependencies in the linguistic behaviors of parents and children, suggest that a high-quality home language environment is marked by a dynamic interdependence between the talk of adults and children and that this bi-directional dynamic matters to children's language development over time (Danis, Bernard, & Leproux, 2000; Tamis-LeMonda et al., 2001). These data suggest that what children are doing and saying is influential to their own development, as it can guide adults' support to their language development (Ellis, 2006). Such a perspective is consistent with transactional theory, which views

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