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Child Development
2018
DOI: 10.1111/cdev.13034

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Abstract

This study examines whether children's decontextualized talk—talk about non-present events, explanations, or pretend—at 30 months predicts 7th-grade academic language proficiency (age 12). Academic language (AL) refers to the language of school texts. AL proficiency has identified as an important predictor of adolescent text comprehension.Yet research on precursors to AL proficiency is scarce. Child decontextualized talk is known to be a predictor of early discourse development, but its relation to later language outcomes remains unclear. Forty-two children and their caregivers participated in this study. The proportion of child talk that was decontextualized emerged as a significant predictor of 7th-grade AL proficiency, even after controlling for socioeconomic status, parent decontextualized talk, child total words, child vocabulary, and child syntactic comprehension.

Children's early decontextualized talk predicts academic language proficiency in mid-adolescence

The term *academic language*, also called *the language of schooling* or *the language of science*, refers to the language typically used in academic texts, scientific communication, and school learning (Cummins, 1984; Halliday, 2004; Schleppegrell, 2004). After the early elementary grades, once basic code-focused skills (e.g., identifying letters, reading words) no longer pose a major challenge for most readers, academic language proficiency becomes one of the primary sources of difficulty in comprehending and learning from text (Dickinson & Tabors, 2002; Lesaux & Kieffer, 2010). By the middle school years, many students display significant challenges in text comprehension. In the U.S., an alarming majority of 8th-grade students (66%) have not reached the reading proficiency level expected by the end of middle school (National Center for Educations Statistics, 2015). In a world where large proportions of adolescents do not understand what they read (OECD, 2014), academic language skills have gained attention as a promising malleable skillset that, if expanded, can lead to improved text comprehension (Snow, 2010). Academic language skills are also essential, beyond school, for effective participation in society. Updates on scientific knowledge, health information, and civic opportunities are communicated through written or oral texts. Similar to school texts, these texts are also crafted for wide dissemination and are therefore populated with the academic language features that support precise and concise distant communication. Indeed, academic and professional achievements, as well as civic participation in today's information-based society, rely more than ever before on individuals' language and literacy skills (LeVine, LeVine, Schnell-Anzola, Rowe & Dexter, 2012; Levy & Murnane, 2013; Schleicher, 2010).

Research on the early precursors to academic language is needed to better understand how to support students' language and literacy proficiencies. Evidence from middle school classrooms suggests that academic language skills are malleable through high-quality instruction (Gámez & Lesaux, 2012), yet academic language interventions in the middle grades have achieved somewhat disappointing (although positive) results in their efforts to improve adolescents' reading skills. Thus, to foster children's academic language skills, it is likely that efforts need to start earlier, and earlier precursors need to be uncovered to inform interventions. In this longitudinal study, we investigate whether experiences in the home prior to schooling predict academic language proficiency; in particular, we ask whether children's experiences using decontextualized talk with caregivers during early childhood predict their academic language proficiency as early adolescents. *Decontextualized talk* is defined as extended discourse focused on the there-and-then and is thus removed from the surrounding physical context of the interaction, the here-and-now. During the first years of a child's life, decontextualized talk is typically found in the form of narratives about past or fictional events, comments about future events and actions, pretend play, or explanations in the context of highly scaffolded interactions with parents (Ninio & Snow, 1996; Rowe, 2013). In this study, we examine whether decontextualized talk is a predictor or later academic language proficiency.

Defining Academic Language

Taking advantage of a recent program of research, we adopt the Core Academic Language Skills (CALS) construct as our operational definition of academic language proficiency. The CALS construct was derived from an extensive synthesis that merged different lines of theoretical, developmental, and educational linguistics research followed by a series of

quantitative and qualitative empirical studies (Uccelli, Barr, Dobbs, Phillips Galloway, Meneses & Sánchez, 2015). The CALS construct is defined as a constellation of the high-utility language skills that correspond to linguistic features prevalent in oral and written academic discourse across school content areas, but that are infrequent in colloquial conversations. CALS encompass eight interrelated skillsets: *Connecting Ideas*, skill in understanding logical connectives*; Tracking Participants,* skill in tracking referential chains; *Breaking Words,* skill in decomposing morphologically complex words; *Comprehending Sentences,* skill in understanding complex sentences*; Organizing Text,* skill in sequencing components of argumentative texts; *Interpreting Writers' Viewpoints,* skill in understanding epistemic stance markers that signal the author's degree of certainty in relation to a claim (e.g., *certainly ...*; *it is unlikely that...*); *Understanding Metalinguistic Vocabulary,* skill in understanding vocabulary that refers to discourse or thinking processes (e.g., *generalization*); and *Identifying Definitions,* skill in identifying academic discourse when contrasted with more colloquial alternatives. By now, a series of studies has validated a novel and theoretically grounded CALS assessment, the CALS Instrument (CALS-I), and individual variability in CALS has been identified as a significant predictor of young adolescents' reading comprehension in grades 4 to 8, even beyond the contribution of socio-demographic factors, word reading fluency, and vocabulary knowledge (Uccelli, Barr. et al., 2015; Uccelli, Phillips Galloway, Barr, Meneses & Dobbs, 2015).

Defining Early Decontextualized Talk

To investigate early precursors of academic language proficiency, we draw from developmental theories and empirical findings on the importance of early *decontextualized talk* for later literacy-relevant language development. Before the third year of life, young children's

conversations tend to be mostly limited to the "here-and-now", i.e., talk about persons, objects or events that are present in the physical environment of the interaction. In these conversations, communication relies heavily on the physical environment, such that production and comprehension are only partially accomplished via language per se, and communication also relies on pointing and other gestures as well as other nonverbal cues supported by the surrounding physical environment. However, at around age 2, children begin to make their first forays into the non-present as they start to participate in the co-construction of narratives about past events, anticipations of future events, explanations, and pretend play with the help of more expert speakers who are typically their parents (Hemphill & Snow, 1996; Nelson, 2000; Sachs, 1983; Uccelli, 2009). In these decontextualized conversations, language needs to be used as its own context. In other words, because during talk about narratives, explanations or pretense, the people, objects, concepts or events discussed are not present in the immediate physical surrounding, speakers cannot rely on pointing or other nonverbal cues to convey meaning. Instead, language needs to rely more on itself and much less on the physical context. As a result, these conversations provide supportive interactional contexts in which children learn to communicate with increasing levels of linguistic precision. Research on children's pragmatic development documents that during the third year of life, major developmental tasks within language acquisition include perfecting lexico-grammatical skills and developing discourse skills that are essential to produce longer stretches of talk and non-present extended discourse, such as narratives, explanations and pretense (Ninio & Snow, 1996; Uccelli, Hemphill, Pan, & Snow, 2006).

Children's use of decontextualized talk is fostered by their communicative experiences with caregivers. Compared to contextualized talk focused on the here-and-now, parents' child-

directed decontextualized language has been shown to increase sharply between child ages 14 and 42 months (Rowe, 2012). Parent decontextualized language use contains more diverse vocabulary and more complex morphosyntactic structures than contextualized talk, and is a significant predictor of children's later vocabulary knowledge and narrative skills, even when controlling for input quantity or contextualized talk (Beals, 2001; Katz, 2001; Rowe, 2012; Demir, Rowe, Heller, Goldin-Meadow, & Levine, 2015). Not surprisingly, parent and child use of decontextualized language are positively associated with one another (e.g., Demir et al., 2015).

Theoretical Relations between Academic Language and Decontextualized Talk

Later academic language proficiency and early decontextualized language are typically investigated independently of one another and discussed in non-overlapping forums. Given the dramatic individual differences documented throughout language development from the onset of language to the adolescent years, in this study, we ask whether variability in children's decontextualized language in early interactions with parents is associated with children's middle school academic language proficiency. These constructs have been operationalized differently and draw from distinct theoretical frameworks. But we argue that there is sufficient overlap across them to justify an investigation of developmental continuity in literacy-relevant language proficiency, and sufficient reason to think that early experiences with decontextualized conversations may be an optimal context for fostering precursors of later academic language skills.

In terms of overlap, both academic language—or the language of academic texts—and decontextualized talk—or talk about the there-and-then—have been described as more lexically

diverse and more structurally complex than their respective counterparts, either colloquial language (Schleppegrell, 2004; Heath, 2012) or contextualized talk (Demir et al., 2015). Moreover, research identifies both academic language proficiency and participation in decontextualized talk as significant predictors of literacy-relevant constructs, such as reading comprehension (Uccelli, Phillips Galloway, et al., 2015), vocabulary knowledge, and narrative skills (Demir et al., 2015; Dickinson & Tabors, 2001; Rowe, 2012). Both are not static but dynamic and situated proficiencies that are highly influenced by developmental and environmental factors. Just as there is a continuum from contextualized to decontextualized talk (Curenton & Justice, 2004; Westby, 1991), academic language is also understood within a continuum from colloquial to academic talk (Snow & Uccelli, 2009). In both cases, the two ends of the continua differ in communicative purpose and in structural complexity. At one end, contextualized and colloquial language focus on present social interactions and concrete entities or actions, with the surrounding physical environment supporting communication through pointing, other gestures, and other nonverbal cues. At the other end, decontextualized and academic language discuss invisible entities, non-present events, or abstract ideas, using language as its own context, which requires drawing on more complex lexical, morphosyntactic, and discourse resources. Certainly, not all decontextualized language is academic (e.g., personal narratives, pretense), and not all academic language is decontextualized (e.g., explaining an experiment while conducting it). Yet, there is sufficient overlap across these constructs to hypothesize that children's early production of decontextualized talk may be a precursor of their adolescent academic language proficiency.

The Current Study

In the current study, we examine variability in typically developing children's decontextualized talk at age 30 months as a potential precursor of 7th-grade academic language proficiency. We focus on this early age because prior developmental research indicates that children's decontextualized discourse production starts in their third year of life, around the same time that caregivers' child-directed talk begins to include a higher proportion of decontextualized utterances and becomes lexically richer (e.g., Nelson, 2000; Rowe, 2012; Sachs, 1983). Indeed, aligned with this prior research, the first time point at which children in this longitudinal sample produced sufficient decontextualized talk to be coded for analysis was at 30 months.

We view these early experiences as providing children with opportunities to process and practice extended discourse, which in later phases of language development will resemble the language of school. The main hypothesis driving this study is that young children's production of decontextualized talk in the context of highly scaffolded conversations with their caregivers functions as a significant precursor of adolescent academic language proficiency.

The present study takes advantage of a longitudinal sample of 42 typically developing children who have been followed from age 14 months to mid-adolescence (Goldin-Meadow, Levine, Hedges, Huttenlocher, Raudenbush & Small, 2014), and merges two programs of research (one focused on decontextualized talk and one on academic language proficiency) to answer the following research question: Controlling for socio-economic status, parental language input and child vocabulary (at child age 30 months), does child decontextualized language production at age 30 months predict academic language proficiency at 7th-grade?

METHOD

Participants

Forty-two typically-developing children (19 female) and their primary caregivers (41 mothers, 1 father) participated in the study. Children and parents were drawn from a sample of 64 child-parent dyads participating in a larger, longitudinal study of children's language development in the greater Chicago area. Participants were initially recruited starting from child age of 14 months and were subsequently visited in their home every four months until 58 months. Starting from Kindergarten, children were visited in their home 3 times a year and administered various measures of cognitive and academic development. Children and their families were recruited from the Chicago area via mailings to families in targeted zip codes and via an advertisement in a free parent magazine. Interested families were interviewed and the sample was selected to represent the socioeconomic diversity of the Chicago area (Goldin-Meadow, Levine, Hedges, Huttenlocher, Raudenbush, & Small, 2014). As expected from prior developmental research, before the age of 30 months, children in this sample produced almost no decontextualized utterances. Consequently, to examine the contribution of child decontextualized talk—as a cutting-edge skill—to academic language proficiency, dyads were included in the current study if the family had a home visit at child age 30 months and if the child was administered the CALS-I in 7th grade. This criterion resulted in 42 families included in the present study, out of the 64 in the larger Chicago study. Based on parental report, the present study sample included 24 Caucasian children (57%), 8 African-American children (19%), 6 Hispanic/Latino children (14%), and 4 children reported as mixed race/ethnicity (10%). Only monolingual English-speaking families were recruited. The sample included in this study was

comparable to the larger Chicago sample in most aspects of its socio-demographic composition, including an almost balanced distribution by gender and a similar distribution by race/ethnicity. Our sample did not vary significantly from the larger sample in terms of parental education ($t(62)=393$, $p=.70$). However, it displayed a higher family income level ($t(62)=2.23$, $p=.03$) than the overall sample, although, as described below, family income still displayed considerable variability and a wide range.

We measured socioeconomic status (SES) as the education level of the child's primary caregiver combined with the annual family income level. Data were collected using a parent questionnaire at child ages 30 months (2003-2004) and 12 years (2013-2014). In the questionnaire, parents were asked about their highest level of education and, subsequently, parental education was transformed into a continuous scale by using the corresponding number of years of schooling (e.g., "high school or GED" was scored as 12 years, "Bachelor's degree" as 16 years, "Two-year master's degree" as 18 years, etc.). Parent education ranged from 10 to 18 years with an average of 16.2 years (*SD* = 1.9). Family income was also reported by families through the same questionnaire. Income information was subsequently transformed into a continuous scale using the midpoint of each category (e.g., the category $15,000 - $35,000 was scored as $25,000). Mean family income was $59,880 (*SD* = $32,043) with a range from less than $15,000 to over $100,000. Data on family income and parent education collected at both time points (child age 30 months and 12 years) were strongly associated with each other over time (family income: $r = .87; p < .01;$ parent education: $r = .99, < p.01);$ we therefore used only SES at child age 30 months in our analysis. Given the positive correlations between parent education and family income $(r=.40\ p<.001),$ we combined them into a single socio-economic status (SES) variable using Principal Components Analysis. The first principal component

weighted education and income positively and equally and accounted for 70 percent of the original variance. Families that scored high on the SES composite had high annual income levels and a highly educated primary caregiver.

Procedure

At the time of recruitment, families were told they were participating in a study of children's language development. At each home visit, the child and the primary caregiver were videotaped for 90 minutes engaging in ordinary daily activities. Parents were asked to interact with their children as they normally would. Typical activities included toy play, book reading and mealtime, but families were not given direction to engage in any particular activities. As described above, the current study includes data collected at child age 30 months.

Parent-child interactions were transcribed from the videotaped sessions. The unit of transcription was the utterance, defined as any sequence of words preceded and followed by a pause, a change in conversational turn, or a change in intonational pattern. All dictionary words, as well as onomatopoeic sounds (e.g., *woof-woof)* and evaluative sounds (e.g., *uh-oh),* were counted as words. A second person transcribed 20% of each transcriber's videotapes. Reliability was established when two transcribers agreed on 95% of the utterances.

In the same visit, following the naturalistic observation, children were given a test of receptive vocabulary knowledge (Dunn & Dunn, 1997) and a syntax comprehension test (Huttenlocher, Vasilyeva, Cymerman, & Levine, 2002). In 7th grade, all participants were administered an academic language assessment, the CALS-I (Uccelli, Barr, et al., 2015*)*. These measures are described below.

Measures

Parent and child naturalistic language measures at child age 30 months. Decontextualized language utterances produced by parents and children were identified and coded following Rowe (2012). Categories of decontextualized language included narrative, pretend, and explanation (see Table 1). Reliability was achieved by having two coders independently code 10% of the videotaped sessions for decontextualized language. Percent agreement averaged 95.6% with a mean Cohen's kappa value of 0.73. The proportion of utterances that were decontextualized (hereafter referred to as *proportion of decontextualized utterances*) was calculated by dividing the number of decontextualized utterances by the total number of utterances produced at the visit for each interlocutor. Proportions were transformed using arcsine transformation before analysis (Kirk, 1982). We used proportions to measure parents' and children's use of decontextualized language because they varied in how much they talked. However, the pattern of results that we describe below remained the same if we instead used number of decontextualized utterances as our measure, controlling for contextualized talk. To measure children's and parents' quantity of talk, we used total number of words (word tokens) produced during the interaction.

Child language measures

Child receptive vocabulary at age 30 months (Peabody Picture Vocabulary Test – Third Edition, PPVT-III, Dunn & Dunn, 1997). The PPVT measures receptive vocabulary. Raw scores were converted to age-appropriate standardized scores based on published norms. This measure is widely used to assess vocabulary skill and it provided data that were independent of the parent-child interaction. Two of the children were not administered the PPVT at the visit due to time constraints.

Child syntax comprehension at 30 months. Children were administered a syntax comprehension task that was developed and adapted by Huttenlocher and Levine, based on an earlier version used in Huttenlocher et al. (2002). In this task, children are asked to point to one out of three or four pictures that depicts the relation described in a sentence read by the experiment. Sentences vary in complexity from simple clauses (e.g. *The boy is behind the girl*) to multiple coordinating clauses (e.g. *The boy is looking behind the chair for the girl, but she is sitting under the table*) and complex sentences with dependent clauses (e.g. *The dog who the cat is licking is raising his paw*). The total possible score of this test was 54 points. Raw scores were used for analysis.

Child Academic Language Proficiency in 7th-grade (Core Academic Language Skills – Instrument, CALS-I) (α =.86), (Uccelli, Barr, et al., 2015): 50-minute paper-and-pencil test designed to assess academic language skills of high utility across content areas in grades 4-8. CALS-I Form 2, appropriate for grades 7 and 8, was used in this study. Tasks use various formats, including multiple-choice, matching, and short written responses, to assess skills in Connecting Ideas, Tracking Participants, Organizing Texts, Breaking Words, Comprehending Sentences, Interpreting Writers' Viewpoints, Understanding Metalinguistic Vocabulary, and Identifying Definitions, as described earlier. Most items in the CALS-I are dichotomously scored as correct or incorrect. The partial-credit items were rescaled to be between 0 and 1 so all items were equally weighted. Rasch item response theory analysis was used to generate factor scores. We report extended scale scores alongside CALS-I percent correct scores.

RESULTS

Descriptive statistics. As displayed in Table 2, decontextualized language constituted a small portion of the talk parents and children produced at child age 30 months. On average, only 6% of parents' utterances, and 7% of children's utterances, were decontextualized. However, the proportion of decontextualized utterances varied greatly for both children and parents. As can be observed in Figure 1, the proportion of decontextualized utterances ranged from 5 to 18 percent for the majority of children. Yet, three children did not produce any decontextualized utterances and for one child decontextualized utterances accounted for 33% of the total utterances produced (As a note, results presented below held even when we removed this child with the highest proportion of decontextualized utterances from the analyses). Parent proportion of decontextualized utterances also exhibited individual variability, with a range from no decontextualized utterance to a maximum of 16% of utterances identified as decontextualized.

Children's vocabulary scores (PPVT) averaged 97 (SD = 15), but exhibited a wide range (see Table 2). Child syntax scores averaged 15, but also exhibited a wide range. By 7th grade, participants' mean academic language scores (CALS-I) were above average, but with considerable variability in scores, which ranged from the 13th to the 99th percentile of the CALS-I norming sample.

Examining zero-order correlations

Table 3 displays zero-order correlations between 7th-grade academic language proficiency, socio-economic status (including parent income and parent education at 30 months), and early child and parent language measures. Parental SES (both family income and parent

education), parent and child proportions of decontextualized utterances, child word tokens, and child receptive vocabulary, but not syntax comprehension, were positively and significantly associated with children's academic language outcomes approximately 10 years later when the children were in 7th grade. Of particular interest for this study was the positive association detected between child decontextualized utterances and 7th-grade academic language proficiency.

The proportion of child utterances identified as decontextualized talk was also significantly related to the total word tokens children produced during the interaction at 30-months of age ($r = .50$, $p < .001$). As anticipated and as visually illustrated in Figure 1, child and parent proportion of decontextualized utterances were positively and strongly correlated ($r = .81$, $p < .001$). Interestingly, child proportion of decontextualized utterances held a significant positive relation to parent education, but was not related to family income. This finding was similar for parents, except that parent proportion of decontextualized utterances was only marginally related to parent education *(r*=.28, $p = .076$). Despite failing to reach significance, child and parent proportion of decontextualized utterances were positively associated with child receptive vocabulary (child: $r = .27$, $p = .10$, parent: $r = .30$, $p = .06$), and they were also positively associated with child syntax comprehension (child: $r = .12$, $p = .45$, parent: $r = .09$, $p = .56$).

Predicting CALS

Next, we conducted hierarchical regression analyses to examine the contribution of child decontextualized language to 7th-grade academic language proficiency, controlling for parental covariates, amount of child talk (word tokens), and standardized measures of child vocabulary

and syntax. As stated in the methods section, we used proportions to measure parents' and children's use of decontextualized language because they varied in the amount of their overall talk. The use of proportions also allowed us to generate a more parsimonious model with fewer predictors. However, the pattern of results that we describe remained the same whether we used proportion of decontextualized utterances as our measure, or number of decontextualized utterances controlling for overall amount of contextualized talk. To account for the impact of SES, we used the SES composite described earlier.

As observed in Table 4, in the first Model, the SES composite was found to be a significant predictor, accounting for 31% of the variance in CALS scores, our 7th grade academic language proficiency outcome measure. In Model 2, as expected, the proportion of parent decontextualized utterances was significant and accounted for an additional 8% of the variance in CALS scores after controlling for SES. In Model 3, our main predictor, proportion of child decontextualized utterances, was found to be a significant predictor of CALS scores, even after controlling for SES and parent decontextualized talk. In other words, children who produced a larger proportion of decontextualized utterances at age 30 months during parent-child converations had, on average, a higher level of academic language proficiency in 7th grade, controlling for the impact of SES and parent proportion of decontextualized utterances. Entering the proportion of child decontextualized utterances as our main question predictor in Model 3 accounted for an additional 7% of the variance in CALS scores. In this model, parent proportion of decontextualized utterances was no longer significant, likely because parent and child decontextualized measures are collinear. What this means is that parents' proportion of decontextualized utterances did not *uniquely* predict CALS scores, presumably because of its shared variability with children's proportion of decontextualized utterances. We retained parent

proportion of decontextualized utterances in the model to acknowledge that even though child decontextualized language emerged as the strongest predictor of CALS scores, parental decontextualized talk is a component of this predictive relation. The results of Model 3 held even when the total number of child word tokens was entered in Model 4, confirming that the important measure was not how much the child talked, but how much decontextualized talk the child produced. Again, these results held in Model 5 where child decontextualized utterances continued to be a significant predictor even after controlling for child vocabulary knowledge. As seen in this final model, Model 5, even after the contribution of SES, parent decontextualized talk, amount of child talk, and child vocabulary knowledge at 30 months is taken into account, every additional standard deviation increase in child proportion of decontextualized utterances was associated with a significant .46 standard deviation increase in 7th-grade CALS scores. Because the coefficients are all in the same standardized units, we can see that child decontextualized talk made a slightly greater contribution to the outcome than all the other language covariates, and that its contribution was larger than the contribution attributable to SES. Child syntax comprehension was also added to the model but, as foreshadowed by the correlational results, it was not significant.

Finally, to offer additional complementary evidence in support of our hypothesis and to address the multicollinearity between child and parent proportion of decontextualized utterances through a different approach, we ran an additional set of regression models using a composite measure of child and parent proportions of decontextualized utterances to predict children's 7th-grade academic language proficiency.

Before running the regression models, we generated a composite variable from child and parent proportion of decontextualized utterances at 30 months (r = .81, p < .001) using Principal

Components Analysis. Given that the first principal component accounted for 90 percent of the original variance, we used a single composite in our subsequent analyses. We interpret the child/parent decontextualized talk composite as an indicator of the prevalence of decontextualized talk in parent-child interactions at child age 30 months. Parents' and children's decontextualized utterances are typically interdependent in early parent-child conversations. In fact, in these early parent-child interactions, narratives, pretense or explanations are often co-constructed across interlocutors' turns. This second regression analysis thus moves away from assessing the impact of a single speaker's decontextualized talk, to measuring instead the impact of decontextualized talk as a product of parent-child interactions.

In this additional set of regression models displayed in Table 5, we first entered the covariates—SES, total number of word tokens produced by child and parent, and child vocabulary knowledge (PPVT)—to assess their impact on CALS. Consistent with our findings thus far, Model 6 revealed that SES exerted a significant impact on academic language, whereas the total number of words produced by both participants did not. Adding child vocabulary knowledge (PPVT) at 30 months to Model 7 revealed that child vocabulary was a significant predictor beyond the contribution of SES and total number of word tokens. Model 7 accounted for 37 percent of the total individual variance in academic language proficiency. Finally, Model 8 revealed that, after controlling for SES, total number of word tokens, and child receptive vocabulary knowledge at child age 30 months, the composite of child/parent decontextualized talk at child age 30 months significantly predicted children's 7th-grade academic language proficiency. Model 8 accounts for 47% of the variance in academic language proficiency scores.

Model 5 (see Table 4) is a more transparent and direct test of our main hypothesis than Model 8 since it reveals the unique predictive contribution of *child* decontextualized talk above

and beyond the impact of SES, parental decontextualized talk, children's word tokens, and child vocabulary knowledge at child age 30 months. Nevertheless, Model 8 offers a particularly parsimonious representation and conceptually rigorous solution to the question of whether early participation in parent-child decontextualized talk predicts adolescent academic language development.

As a final note, it is important to note that in this study, we could not include child decontextualized talk at age 42 months due to multicollinearity issues and the limitations of our small size. However, it is worth mentioning briefly that child proportion of decontextualized talk at 30 and 42 months were positively and significantly correlated (r =.87, p <.001). Child proportion of decontextualized talk at 42 months was also significantly correlated with 7th-grade academic language proficiency (r =.45, p = .003). Regression analyses using the 42-month language data also revealed results consistent with those reported in this paper. Child decontextualized talk at 42 months significantly predicted 7th-grade academic language proficiency, even after controlling for SES and parent decontextualized talk at child age 42 months. Entering child decontextualized talk at 42 months into a model that already contained SES and parental decontextualized talk at 42 months explained an additional 9% of the variance, and all three predictors together explained 42% of the variance in 7th-grade academic language proficiency.

DISCUSSION

To our knowledge, this is the first longitudinal study to examine children's decontextualized language at 30 months as a precursor to academic language proficiency at mid-

adolescence. Confirming our hypothesis, children who produced a larger proportion of decontextualized talk at 30 months displayed, on average, significantly higher levels of academic language proficiency approximately 10 years later in 7th grade. Importantly, these results held in this socio-economically diverse sample of 42 English-speaking parent-child dyads, even after accounting for the contribution of SES, parent decontextualized talk, amount of child talk, child receptive vocabulary, and child syntactic comprehension. Thus, child decontextualized talk (i.e., child utterances in the context of interactive narratives, pretense, or explanations) made a greater contribution to CALS scores than all other language covariates. As a complement to research on parental input (Demir et al., 2015; Hoff, 2003, 2006; Rowe, 2012), our findings extend the current research base by revealing that children's own early production of decontextualized talk is a strong predictor of their adolescent language and literacy development.

Our findings show that it was not merely the *amount* of child language that made a difference, but the *type* of language produced. Interestingly, only a small proportion of child utterances were decontextualized (an average of 7%, with a range from 0 to 33%). Children at age 2 are not yet producing academic language (as operationalized by the CALS construct). Yet, decontextualized talk, like academic language, refers to meanings that are removed from the here-and-now and thus cannot rely on nonverbal supports (e.g., pointing) as much as contextualized talk does. The gradual expansion of the child's array of language skills in the context of meaningful and supportive interactions eventually equips the child with a foundation for learning academic language, which is needed to communicate precisely about non-present topics at school.

Certainly, we do not interpret these findings as driven exclusively by the child. As discussed in the introduction, it is in the context of heavily scaffolded interactions with

caregivers that young children are able to produce decontextualized talk (Sachs, 1983; Rowe, 2012). In this study, not surprisingly, child decontextualized language was highly correlated with parent decontextualized talk, which significantly contributed to the variability in later academic language proficiency. In fact, our complementary regression analysis—in which we used a composite of parent and child decontextualized talk as our measure—revealed the positive impact of decontextualized talk conceptualized as a product of parent-child interactions on later child academic language. In addition to replicating the effect of parental decontextualized talk on child language outcomes (Demir et al., 2015; Rowe, 2012), our study extends prior research by revealing that it was the child's own decontextualized language production that added an independent contribution, beyond parental decontextualized talk, to later academic language proficiency. The results of the two sets of regression analyses offered in this study suggest that looking at the individual child's language production is crucial to understand the independent contribution of early child production to later language outcomes, above and beyond the contribution of parental input. At the same time, our findings highlight the need to situate the contribution of child language production within a larger interactional context, understanding children's decontextualized talk as intimately related to their interlocutors' talk.

Aligned with these findings, these early skills are not interpreted as fixed individual traits, but instead as the result of a child language environment, which is likely to remain fairly stable throughout development (Bornstein, Hahn, Putnick, Suwalsky, 2014; Bornstein, Tamis LeMonda & Haynes, 1999). Parents who treat young children as conversational partners by sharing narratives and explanations with their 30-month-old child are likely to be parents who will continue to engage their children in the discussion of non-present topics throughout their development. This may gradually expand the topics and resources that eventually will closely

resemble the language of school. However, despite stability over time, recent research suggests that parent use of decontextualized language is malleable and can be increased through a short intervention. Moreover, increases in parent use of decontextualized language resulted in increases in child decontextualized language (Leech, Wei, Harring & Rowe, in press).

Our study is a first step in exploring decontextualized language as a precursor to academic language proficiency. Many more questions are still in need of further investigation. Why early child decontextualized language leads to more skilled language proficiency later in life, for instance, remains unanswered in this study. The lexical diversity and syntactic complexity inherent in parent decontextualized talk have been proposed as part of the explanation of the positive impact of this type of parental input on child language skills (Demir et al., 2015; Gallerani, Saylor, & Adwar, 2009; Rowe, 2012). Research with larger samples would need to contrast the linguistic complexity of child decontextualized and contextualized talk to examine if the former tends to be indeed more complex. Alternatively, children's own production may signal their more active engagement and consequently more attentive learning from early decontextualized conversations. Growth trajectories that track individual children's school-relevant language skills throughout adolescence would offer further insight into potentially different individual profiles. Particularly, larger longitudinal samples would enable the exploration of more complex models to analyze a wider range of relations between child and contextual variables over time, as well as the exploration of possible mediating or moderating effects. How the impact of parent and child decontextualized talk on adolescent academic language outcomes may vary over time is a new question that emerges from these results. Future studies will require innovative methods to compare the impact of earlier vs. later parent-child

interaction measures on adolescent language outcomes (see, for example, Silvey, Demir-Lira, Goldin-Meadow & Raudenbush, 2017, for such a method applied to vocabulary development).

It is important to acknowledge that the association between decontextualized talk and later academic language proficiency may also involve cognitive factors that go beyond the language skills discussed so far. Understood as part of the larger sociocultural context that mediates children's minds, language interactions influence cognitive development from early on in life (Nelson, 1996). Infants in experimental studies, for instance, anticipate that two similar objects will share the same non-visible property when the same label is used for both objects (Desjardins & Baldwin, 1992 cited by Baldwin & Saylor, 2005; Gentner & Medina, 1998). Beyond language labels, talk about the non-present offers insights to young children about non-visible mental states and human intentions. Specifically, parent-child talk about mental states (desires, beliefs, emotions) contributes to children's understanding of human emotions and social cognition more broadly (Harris, de Rosnay, Pons, 2005; Lu, Su, & Wang, 2008). More specific to this study, Baldwin and Saylor (2005) argue that talk about absent references offers young children "a possible microcosm" that facilitates their understanding of human intentions in joint communication. These authors argue that when speakers refer to an absent entity during there-and-then talk (e.g., saying "dog" when a dog is not present), young learners need to map this absent reference to prior uses of the same word during here-and-now talk (e.g., saying "dog" in the presence of a dog). This mapping signals to children that speakers intend to refer to a non-present entity, thus offering cues about human intention during joint attention. Further, studies find that children who have more opportunities to reminisce about the past have better theory of mind skills than children who reminisce less (e.g., Taumoepeau & Reese, 2013), and Chernyak, Leech & Rowe (2017) found that preschoolers' who are primed to talk about their non-present

self (both near-past and near-future self) have better planning and prospection skills than children primed to talk about the present. While these findings come from experimental research, it is likely that naturalistic co-constructed decontextualized talk (narratives about the past or present, explanations, pretense) more generally socialize children's minds into the practices of remembering the past, planning the future, searching for explanations for physical and human behavior, and constructing hypothetical worlds—all of which are important for their later academic language proficiency. After all, CALS index proficiency in an array of linguistic markers that correspond to core expectations of not only scientific discourse, but also shared scientific thinking (e.g., articulating thoughts with precision, establishing logical connections between ideas, offering a reflective viewpoint). At a more speculative level, decontextualized talk—which needs language to function as its own context—may also raise children's awareness of the need to communicate with greater precision. Far from offering answers in this area, the modest hope of our study is to motivate future research on how specific aspects of naturalistic interactions can function as mechanisms that influence particular short-term or long-term linguistic and non-linguistic abilities.

Our work was, in part, motivated by the current and rapidly proliferating efforts to address the so-called "word gap"—the well-documented average socio-economic differences in children's exposure to linguistic input, and the subsequent differences in their vocabulary knowledge that are associated with poor reading comprehension in the school years (e.g., Hart & Risley, 1995). Instead of understanding vocabulary knowledge as a goal in itself, we view vocabulary as a proxy for a larger repertoire of language skills. After all, a skilled reader and writer with a rich vocabulary repertoire has also learned how to use and understand these words in academic discourse by learning to pack dense information through subordination and

nominalization, to mark conceptual relations through precise connectives, and to use various referential strategies to make linkages throughout a text. Socio-economic background is, in fact, not only associated with vocabulary knowledge, but also with academic language proficiency; and academic language proficiency predicts reading comprehension over and above vocabulary skills (Uccelli, Phillips Galloway, et al., 2015). If the ultimate goal of these interventions is to promote children's early language development in order to support their progress as readers and independent learners, more comprehensive approaches that look beyond vocabulary are needed. Thus, questions such as "How many words should families and educators expect young children to learn?" or "Which words should families and educators teach?" (Hindman, Wasik, & Snel, 2016) could be complemented, expanded, or reframed as "What types of parent-child conversations prepare children to become proficient in academic language and reading comprehension?"

In light of the present results, we argue that vocabulary intervention research that seeks to reduce the so-called "word gap" would benefit from research on ecologically valid language practices that might contribute to later school-relevant language proficiency, beyond vocabulary. Drawing from developmental linguistics, textual linguistics, and ethnographic research (Heath, 1983; 2012; Rogoff, 1991; Berman, 2004), we believe that efforts directed exclusively at expanding vocabulary knowledge as the main outcome might err on the side of being too narrow, particularly starting around the the third year of a child's life. As part of the word-gap intervention efforts, training parents to teach as many words as possible to young children, for instance, might, at best, overlook additional crucial aspects of early language development, and, at worst, perhaps even disrupt some authentic practices essential for socializing children into successful communicators (e.g., teaching words instead of focusing on discussing meaningful

events or ideas through extended discourse in engaging interactions relevant to their own cultural contexts).

The findings reported are based exclusively on monolingual English-speaking families. Research on school-relevant language precursors across cultures and on the design and implementation of culturally congruent and respectful research-based language interventions is sorely needed. Critical questions in this line of work entail expanding the lens to examine the role of these language practices or interventions in the larger context of verbal and nonverbal child socialization practices across cultural communities, including bilingual language learning contexts.

Our results suggest that encouraging parent-child co-construction of narratives, pretend play, and explanations, making sure that these practices are implemented in ways congruent with a family's cultural patterns, may be promising ways to intervene. To be clear, we do not contest the importance of advancing vocabulary knowledge from early on. Instead, we argue for expanding the lens in order to consider the broader construct of academic language proficiency as an additional literacy-relevant outcome of interest. By narrowly equating school-relevant language proficiency with vocabulary knowledge, interventions that seek to address the word gap in order to support children's literacy and school achievement might fall short of achieving their real ultimate objective of preparing children to become independent readers, thinkers, and learners, which requires more than vocabulary knowledge. As Jerome Bruner would remind us, language growth is driven by children's authentic needs to communicate their own there-and-then understandings to caring and supportive interlocutors (Bruner, 1983).

Table 1. *Definition and examples of categories of parent and child decontextualized utterances.*

Definition	Examples
Narrative: Talk about past or future events future (Beals & Snow, 1994).	Parent: "Remember when we got those cars at our vacation?" "Mom is going to go to the foot doctor tomorrow." Child: "I will buy some pants for her too." "You want a guitar for Christmas?"
Pretend: Talk during interactive pretend episodes: making an object represent another, attributing actions, thoughts or feelings to inanimate objects, assuming a role or persona, enacting scripts or routines (Katz, 2001).	Parent: "Do you think the baby wants to have some juice?" "I will save you from the wicked sister." Child: "Nichols have balloon." (referring to a pretend balloon) "This one there for Elmo."
Explanations: Talk that requests or makes logical connections between objects, events, concepts or conclusions (Beals, 2001).	Parent: "Yes, let's turn the blocks so you can see the patterns on them." "If we don't have all of our ingredients, all the things to put into the cookies, we won't be able to make them." Child: "Because I need it over here." "Because Alana might go there."

Table 2. *Descriptive statistics for naturalistic language measures and child standardized measures (n=42)*

	M (*SD*) Range
Child standardized measures	
Child academic language (7th grade)	540 (*20*) 487-578
Child receptive vocabulary (30 months)	96 (*15*) 47-130
Child syntax comprehension (30 months)	15 (*9*) 0-49
Child and parent naturalistic language measures (30 months)	
Child proportion of decontextualized utterances	.07 (*.06*) 0-.33
Child number of decontextualized utterances	38 (*35*) 0-164
Child number of total utterances	540 (*206*) 68-974
Child word tokens	1344 (*757*)128-3414
Parent proportion of decontextualized utterances	.06 (.05) 0-.16
Parent number of decontextualized utterances	63 (62) 0-271
Parent number of total utterances	906 (444) 246-1858
Parent word tokens	3772 (1923) 694-7671

Table 3. *Correlations between child 7th-grade academic language; parental SES measures; and early language measures: parent and child proportion of decontextualized utterances, child word tokens, child syntax comprehension, and child receptive vocabulary.*

	1	2	3	4	5	6	7	8
1. Academic language (7th grade)	1							
Child at 30 months								
2. Family Income	.37*	1						
3. Parent Education	.57***	.40**	1					
4. SES composite	.56***	.85***	.82***	1				
5. Parent decontextualized utterances	.42**	.23	.28~	.29~	1			
6. Child decontextualized utterances	.56***	.24	.41**	.38*	.81***	1		
7. Child word tokens	.32*	.22	.18	.24	.51***	.50***	1	
8. Child syntax comprehension	.19	-.09	.38*	.16	.09	.12	.08	1
9. Child receptive vocabulary	.48**	.08	.47**	.31~	.30~	.27~	.42**	.18

*** $p < .001$, ** $p < .01$, * $p < .05$, ~ $p < .10$

Table 4. *A series of multiple regression models predicting child 7th-grade academic language proficiency from family socio-economic status (SES composite), measures of parent and child decontextualized utterances (proportions), child word tokens, and child receptive vocabulary knowledge (PPVT) at child age 30 months.*

	CALS-I (7th grade)				
30-month measures	Standardized β				
	Model 1	Model 2	Model 3	Model 4	Model 5
SES	.56**	.47**	.40**	.39**	.31*
Parent decontextualized utterances		.29*	-.06	-.07	-.11
Child decontextualized utterances			.46*	.45*	.46*
Child word tokens				.04	-.07
Child vocabulary (PPVT)					.33*
R-Square (Adjusted R-square) (%)	. 31 (.30)	.39 (.35)	.46 (.41)	.46 (.40)	.48 (.41)

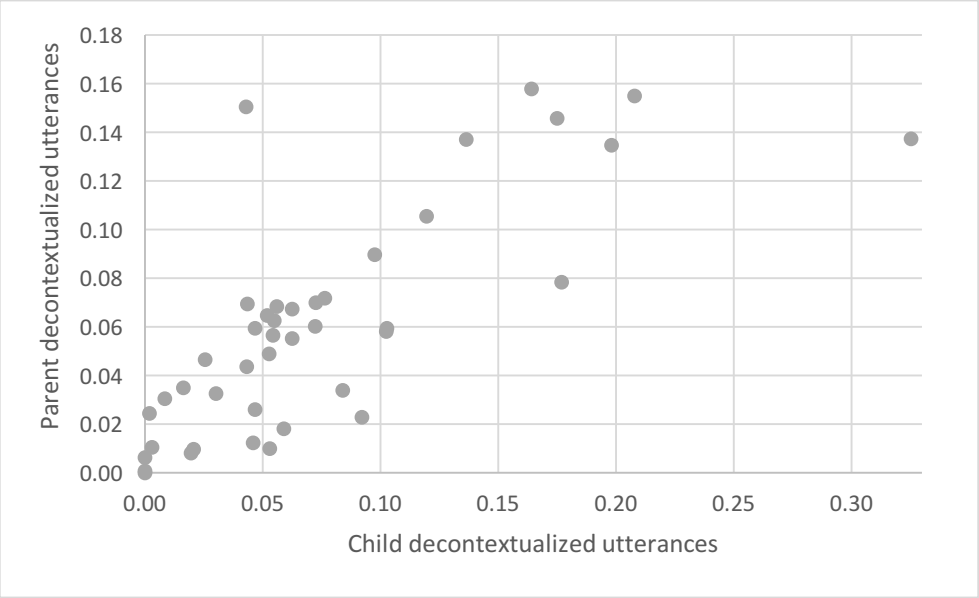
* $p < .05$, ** $p < .01$

Table 5. *A series of multiple regression models predicting child 7th-grade academic language proficiency from a composite measure of parent/child decontextualized talk, controlling for socio-economic status (SES composite), total number of word tokens produced by parent and child, and child receptive vocabulary knowledge (PPVT) at child age 30 months.*

	CALS-I (7th grade) Standardized β		
	Model 6	Model 7	Model 8
SES	.49**	.41**	.37**
Child and Parent total word tokens (30 months)	.17	-.08	-.22
Child vocabulary (PPVT) (30 months)		.40*	.39*
Child/Parent decontextualized talk composite (30 months)			.35*
R-Square (Adjusted R-square) (%)	.33 (.30)	.37(.32)	.47 (.41)

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

Figure 1. Scatterplot of child proportion of decontextualized utterances by parent proportion of decontextualized utterances at child age 30 months.



Acknowledgment

Research reported in this publication was supported by the Eunice Kennedy Shriver National Institute of Child Health & Human Development of the National Institutes of Health under Award Number P01HD040605 to Susan Goldin-Meadow and Susan C. Levine. The development of the *Core Academic Language Skills Instrument* by Paola Uccelli, Christopher D. Barr and Emily Phillips Galloway was supported by the Institute of Education Sciences of the U.S. Department of Education through grant R305F100026 awarded to the Strategic Education Research Partnership as part of the Reading for Understanding Research Initiative. The content and opinions are solely the responsibility of the authors and do not represent the official views of the National Institutes of Health, the Institute of Education Sciences, or the U.S. Department of Education.

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