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Do Second Graders Adjust Their Language by Discourse Context?

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ABSTRACT

Purpose: Children's ability to adjust one's language according to discourse context is important for success in academic settings. This study examined whether second graders vary in linguistic and discourse features depending on discourse contexts, that is, when describing pictures in contextualized (describing the picture to an examiner while looking at it together) and decontextualized (pretending to describe the picture to a friend while sitting in front of the examiner) conditions.
Method: A total of 330 English-speaking second graders in the United States (M_{age} = 7.33 years; 53% boys; 55% Caucasian children, 35% African American children) described three pictures in contextualized and decontextualized conditions. Children's picture descriptions were transcribed verbatim and coded for linguistic (e.g., elaborated noun phrase) and discourse (e.g., proper character introduction, degree of decontextualization) features.
Results: Type–token ratio was higher in the contextualized condition than in the decontextualized condition, whereas certain types of elaborated noun phrases (e.g., simple descriptive noun phrase, noun phrase with postmodification), coordinating conjunctions, and nonclauses occurred more frequently in the decontextualized condition, controlling for total productivity and student demographics. The proportion of proper character introduction was higher in the decontextualized condition, whereas higher degrees of decontextualization and complex perspective-taking were found in the contextualized condition.
Conclusion: Various linguistic and discourse cues illustrated the extent to which primary grade students employ their discourse knowledge when producing oral language.

Children develop their oral language competencies throughout their preschool years into adolescence (A. E. Barnes et al., 2014; Rowe, 2012). Children as young as 3 years old learn to use oral language for appropriate purposes and discourse contexts while engaging in natural conversations with their parents (Beals & Snow, 1994; De Temple & Beals, 1991). For example, as young children engage in shared reading and oral storytelling with their parents, they are prompted to talk about objects and events that are not in their immediate setting, and they are prompted to construct discourse that revolve around a theme (Curenton et al., 2008; Curenton & Justice, 2004). Through such interactions, children develop not only their language skills but also their knowledge of discourse contexts while figuring out ways to adjust their language to suit the situational context (Kim, 2016; Kintsch, 1988; Rowe & Weisleder, 2020; Snow et al., 1987).

Talking about objects and events that are not in the immediate setting is an example of decontextualized language. *Decontextualized language* reflects the extent of shared context between interlocutors (i.e., communication partner; Curenton & Justice, 2004; Davidson et al., 1986; De Temple et al., 1991). In comparison, *contextualized language* refers to language used in contexts where interlocutors talk about objects or events that are part of their shared physical environment (Curenton et al., 2008; Snow & Uccelli, 2009). In general, decontextualized language

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requires more precise vocabulary and formal syntactic marking than contextualized language, as the speaker is removed from the immediate context with their interlocutor (Curenton & Justice, 2004). Research has found that decontextualized language is necessary for the abstract thought process required for academic success (Gillam et al., 2012; Schleppegrell, 2001; Snow, 1991), as it is related to higher quality oral narratives and reading comprehension (Griffin et al., 2004; Rowe, 2012; Uccelli et al., 2019). Measures used to examine decontextualized language include picture description, word definition, narrative retell, and production tasks (e.g., A. E. Barnes et al., 2014; Beals & Snow, 1994; De Temple et al., 1991; Greenhalgh & Strong, 2001; Grimminger et al., 2020; Kim et al., 2021; Snow et al., 1995). However, despite the measures used, studies examining oral language have not yet employed experimental designs to compare discourse contexts.

In this study, we examined the extent to which diverse linguistic (e.g., elaborated noun phrase [ENP]) and discourse (e.g., proper character introduction; degree of decontextualization—description, evaluation, prediction) features in second graders' oral language use differ depending on discourse contexts: contextualized versus decontextualized. In the contextualized condition, there was a shared context with the communication partner (the examiner); the child described a picture while looking at it together with the examiner. In the decontextualized condition, there was no shared context with the communication partner (a friend); rather, the child described a picture to a friend who was not in the room. This study identifies the linguistic and discourse features that vary by context, thereby empirically testing the differences in children's oral language use as a function of discourse settings. Second graders are at a developmental point where their oral language and discourse knowledge are growing; thus, we expect to see some differences in their oral language use by context.

Oral Language and the Role of Discourse Context

Discourse oral language skills include the comprehension and production of multi-utterance conversations, stories, and passages. According to the direct and indirect effects model of text comprehension (Kim, 2016), discourse language skills including language use in various contexts draw on foundational language skills (e.g., vocabulary, grammatical knowledge) and higher order cognitive skills (e.g., inference, perspective-taking, comprehension monitoring; Kim, 2020a). Furthermore, discourse knowledge—the knowledge of various discourse forms, such as genre, procedures, and strategies, that is activated when using oral or written language—enables one to appropriately comprehend and produce discourse oral language (Kim, 2020a). Specifically, discourse knowledge is necessary for successful comprehension and for producing or adjusting one's language to deliver their message effectively (Kim et al., 2020; Kintsch, 1988; Rowe & Weisleder, 2020). In fact, discourse knowledge is closely related to perspective-taking—one's knowledge of their own mental and emotional states and inferences about others' mental and emotional states—in such ways that one accounts for their interlocutors and their shared knowledge base in adjusting oral language (Curenton et al., 2008; Kim, 2015, 2016, 2020b). Thus, perspective-taking is closely related to discourse knowledge as one effectively navigates various discourse contexts (Cho et al., 2021; Kim, 2016, 2020a; Kim & Park, 2019).

Oral language used in distinct settings can be examined in multiple ways, including linguistic knowledge (e.g., vocabulary, connectives, syntax) and discourse knowledge and skills (e.g., register, text structure, perspective-taking, referential inference; Uccelli et al., 2015). In the subsequent sections, we review the linguistic and discourse features that have been discussed to be used differentially by discourse contexts.

Linguistic Features of Oral Language Production

Researchers have studied how the usage of certain parts of speech is characteristic of oral language use in different contexts (Benson, 2009; Curenton et al., 2008). Frequent usage of adverbs was discussed as a characteristic of decontextualized speech because adverbs describe manner, time, degree, or frequency in a way that makes the discourse more elaborate and easier to picture for those who do not share the same context as the speaker (Curenton & Justice, 2004). In contrast, using pronouns (e.g., "he," "you") as subjects resembles more informal everyday conversations, as interlocutors share immediate context and can communicate via gestures or deictic pronouns, whereas in academic texts, shared situational knowledge is suspended, and a more sophisticated lexicon, instead of pronoun, is used as subjects or themes (Schleppegrell, 2001).

The sophistication of nouns has also been found to vary by context. Specifically, decontextualized language requires the use of more complex ENPs in explaining sophisticated concepts or describing objects or situations that are not of the immediate context (Curenton et al., 2008; Schleppegrell, 2004; Scott & Balthazar, 2010). Moreover, the use of more complex ENPs comes with increased processing capacity, as interlocutors have to identify the noun and hold it in working memory to make connections to the appropriate verb (Fang, 2008; Lundine & McCauley, 2016). In fact, researchers studying children's language development have found that noun phrase postmodification (e.g., "the boy who threw the snowball"), classified as being a complex ENP, is a notable growth area in the school-age years (Curenton & Justice,

2004; Nippold et al., 2008). Children grow from using a simple ENP with a single modifier plus a noun structure (e.g., "pretty hat") to using a more complex ENP with two or more modifiers followed by the noun (e.g., "the girl with the dog walking"; Eisenberg et al., 2008; Greenhalgh & Strong, 2001).

Moving beyond the word level, certain types of conjunctions are posited to be used more frequently in decontextualized language as they signal relations among multiple meaning units (Curenton et al., 2008). Specifically, coordinating (e.g., "and," "or," "but") and correlative (e.g., "both," "either," "if," "then") conjunctions provide information about connectivity between phrases and clauses, whereas subordinating conjunctions (e.g., "because," "since," "until," "when," "although") contain information about time, causality, continuality, or oppositional relations between meaning units (Koutsoftas & Petersen, 2017). Furthermore, embedded clauses, such as relative, nominal, and adverbial clauses, function within another clause or as part of the nominal group to make contributions to a more sophisticated or decontextualized discourse (Lundine & McCauley, 2016; Nippold et al., 2008; Schleppegrell, 2004). In contrast, paratactic clauses (e.g., "I came, I saw, and I conquered") that are linked with coordinating conjunctions or merely juxtaposed are used more frequently in colloquial language (E. M. Barnes et al., 2016; Snow, 2010). Therefore, embedded clauses are considered more typical of texts where abstract and complex ideas are delivered (Schleppegrell, 2004).

Discourse Features of Oral Language Production

Researchers have also examined how discourse features in oral language vary by contextual demands to reflect one's understanding of various agents' mental and emotional states (Curenton et al., 2008; Kim et al., 2021). For one, mental state verbs (e.g., "think," "know," "believe," "remember") provide information on one's ability to take on different perspectives as they think and talk about their mental and emotional states as well as the mental and emotional states of their interlocutors and of characters in stories or books (Dore et al., 2018; Kim & Phillips, 2014; Pinto et al., 2016). Studies found that children increasingly use more mental state verbs as they grow older (Curenton & Justice, 2004) and that mental state verbs are used more frequently in situations where interlocutors are not communicating face-to-face (e.g., communication via phone; Pinto et al., 2016).

Moreover, appropriate character introduction is a developmental skill that taps into children's ability to adjust language according to their understanding of their audience's perspectives, that is, audience awareness (Villaume, 1988). Children aged 6 or 7 years were able to introduce characters in ways that accommodate their listener's background knowledge by using pronouns as well as definite and indefinite noun phrases (Villaume, 1988; Wigglesworth, 1990). A. E. Barnes et al. (2014) examined the quality of character introduction when a child introduced the character for the first time in their narrative and found that it accounted for a small but statistically significant amount of variance in oral language measures.

Furthermore, researchers have distinguished a continuum of contextualized-to-decontextualized discourse, based on the abstractness and specificity of discourse (Curenton et al., 2008; Kang et al., 2009; Rowe, 2012; Uccelli et al., 2019). For example, Curenton et al. (2008) operationalized contextualized talk to include elements such as descriptions of objects or events or using gestures, whereas decontextualized discourse entailed much more explanations, predictions, extensions, or print/story conventions (e.g., "once upon a time," "the end"). The middle ground between contextualized and decontextualized talk was intermediate utterance, which included utterances that addressed characters' psychological states and showed the speaker's reflections and opinions or recalled everyday life events linked with the events or characters. Other scholars have identified that explanatory, pretend, and narrative types of talk were all representative of decontextualized talk as they go beyond simple descriptions of what is shared between interlocutors in the immediate context (Rowe, 2012; Uccelli et al., 2019).

Another approach to looking at discourse features in oral language use is through examining the extent of perspective-taking represented in texts (Cho et al., 2021; Taylor et al., 2019). *Perspective-taking* is a higher order cognitive skill that contributes to oral language use, especially as it pertains to gauging the shared knowledge base between oneself and their interlocutors and adjusting oral language accordingly (Curenton et al., 2008; Kim, 2015, 2016, 2020b). For example, Cho et al. (2021) coded for multiple levels of perspective-taking (i.e., own side, dual, and integrative) represented in written essays, identifying various agents such as the student writers themselves, potential audience, and characters in a story. In fact, studies have shown that essays containing more complex perspectives had higher writing quality scores (Cho et al., 2021; Taylor et al., 2019). Although they have so far been examined exclusively in written discourse, similar approaches can be taken to examine how perspective-taking in oral language varies by discourse contexts.

This Study

The ability to use language effectively according to contexts is increasingly more important as children encounter various discourse contexts upon entering school. Prior literature suggests that oral language used in

different contexts may exhibit unique linguistic and discourse features. However, previous studies were mostly limited to analyzing the occurrences of hypothesized decontextualized oral language features from naturalistic discourse and were sometimes confounded with the issue of language used for different purposes (e.g., academic, colloquial language) and in different modalities (i.e., spoken, written; Scarcella, 2003; Schleppegrell, 2001). To address these issues, this study examined second graders' oral language use in picture description tasks to investigate linguistic and discourse features in two distinct conditions, namely, contextualized and decontextualized. Below are the specific research questions.

1. What are the characteristics of *linguistic* (e.g., ENP) and *discourse* (e.g., proper character introduction, degree of decontextualization) features in second graders' picture description in contextualized and decontextualized conditions?
2. Do the *linguistic* features vary by contextualized versus decontextualized conditions, controlling for total productivity and student demographic backgrounds?
3. Do the *discourse* features vary by contextualized versus decontextualized conditions, controlling for total productivity and student demographic backgrounds?

We hypothesized that second graders use more sophisticated and elaborate word-level features such as complex ENPs and adverbs in the decontextualized condition because they are likely to attempt to describe the picture more specifically to the listener who does not have access to the picture (De Temple et al., 1991). We also posited that they are able to introduce characters more properly in the decontextualized condition as they are developing audience awareness, which enables them to adjust their language accordingly (A. E. Barnes et al., 2014).

Method

Participants

Participants were 330 second-grade students (M_{age} = 7.33 years) from 58 classrooms in the southeastern part of the United States. The sample was drawn from a larger longitudinal study of children's language and literacy development, and previous studies focusing on reading skills have been reported (Kim, 2017, 2020a). This study obtained ethics approval, and informed consent was obtained from participating children's parents/guardians (HSC No. 2017.20455). The sample consisted of 53% boys (n = 174). There were approximately 55% Caucasian (n = 181), 35% African American (n = 116), 4% Hispanic (n = 14), 1% Asian American (n = 2), and 5% multiracial or other ethnicity (n = 17) students. A large proportion (72%; n = 239) of the students were eligible for free or reduced-price lunch. Only around 1% of the students (n = 3) were identified as English language learners (ELLs), as determined by the statewide assessments conducted annually. According to the district record, children with exceptionality, majority of whom received speech services, consisted of 21% (n = 70) of the sample.

Measures

Oral Language Production

Children were presented with three pictures. The first one was a girl in a sofa chair reading a book, with her green shoes off and a cat sleeping next to her. The second one was a child on his belly drawing an animal, with crayons scattered around and a cat watching the child on a stool. The third one was a red-dressed girl pulling a cow out of the water in a forest. They were asked to describe each picture twice, that is, once in a contextualized condition and once in a decontextualized condition (De Temple et al., 1991). For the contextualized condition, the examiner said, "Look at the picture carefully and describe the picture to me" while they were looking at the same picture at the same time. For the decontextualized condition, the examiner prompted, "I want you to pretend that you are describing the picture to a friend that cannot see the picture. Pretend the friend will listen to your description on the tape recorder later, so please describe this picture in a way that your friend could draw the picture just by listening to your description." Here, the child and their intended audience (i.e., friend) were not sharing the same picture, reflecting a more decontextualized discourse setting. The order of the presentation of each condition was counterbalanced for two groups, such that for one group, children responded to the decontextualized condition first for Pictures 1 and 3, followed by the contextualized condition, whereas for Picture 2, it was the other way around. The other group responded in the reverse order of conditions for each picture. The pictures were presented in an identical order across the two groups. This was done to avoid the effect of repetition either benefiting or reducing the response in the second condition across the two groups (Shadish et al., 2002).

Children's description of the pictures was digitally recorded (WAV file) and transcribed verbatim following the Systematic Analysis of Language Transcripts (SALT; Miller & Iglesias, 2012) guidelines. The transcripts were segmented into communication units (C-units), which adhere to a clausal structure, containing a subject and a verb, followed by any dependent clauses or phrases (Loban, 1976). Given that not all utterances in oral language adhere to a clausal structure, some that were not complete but contained key information (e.g., missing a

BE verb) were regarded as one C-unit (e.g., "a family having a campfire" as one C-unit). Then, SALT transcripts were transported to CLAN (Computerized Language ANalysis) software (MacWhinney, 2000) as CHAT files to run additional analyses.

General linguistic indexes. Some general descriptive indexes of linguistic features in the picture description tasks were generated automatically for each condition and picture through the SALT Standard Measures Report (Miller & Iglesias, 2012) and by using the CLAN software's KIDEVAL command (MacWhinney, 2000). They include total productivity indexes such as the number of words and C-units. They also include sentence-level indexes such as the mean length of unit in words and morphemes and the number of verbs per unit. Type–token ratio representing lexical diversity was calculated as the number of different words divided by the total number of words.

Parts of speech. The number of words belonging to certain parts of speech was counted using the CLAN software's FREQ command (MacWhinney, 2000).

- *Adverbs.* The number of adverbs used in each description task was counted. Words were counted as adverbs in the CLAN morpheme if they modify verbs, adjectives, or other adverbs.
- *Pronominals.* The frequency of pronominal usage or the number of pronouns (e.g., "he," "you," "they") used as the subject of a clause was counted for each description task.
- *Coordination.* The number of coordinating conjunctions used in each description task was counted. The coordinating conjunctions included in the CUT file from CLAN were the following: "and," "either," "or," "or else," "versus," "neither," "nor," "and," "or," and "plus."
- *Conjunctions.* The number of conjunctions used in each description task was counted. The conjunctions included in the CUT file from CLAN were those that were not used as coordinating conjunctions listed above.

Linguistic features. Children's use of specific linguistic features was manually identified every time they appeared on the transcript. The frequency of each type of linguistic features was calculated through SALT code summary analysis (Miller & Iglesias, 2012).

- *ENP.* Fifteen types of ENP were coded (Butler et al., 2004) and counted in their frequency for each description task. ENPs were categorized by (a) their level of complexity and (b) their grammatical role in the unit (i.e., subject, predicate, nonapplicable). There were five types of ENP, and within each, they could take on one of the three grammatical roles mentioned above. The first type of ENP was referred to as *simple designating noun phrase* and included those with nouns that were preceded by articles (e.g., "a boy"), demonstratives or determiners (e.g., "that doll"), possessives (e.g., "her cow"), and quantifiers (e.g., "many trees"). The second type of ENP was designated as *simple descriptive noun phrase*, where adjectives or noun modifiers preceded the noun (e.g., "a tall tree"). The third type of ENP was called *complex noun phrase* and included those with two or more modifiers plus the noun (e.g., "the big red house"). The fourth type of ENP was called *noun phrase with noun postmodification* and included those that had a simple designating noun phrase followed by relative clauses (e.g., "the girl that drew the picture"), qualifiers (e.g., "the boy with the glove"), or participial modifiers (e.g., "the number of crayons"). The final type of ENP was called *complex noun phrase with postmodification*, which took the form of a simple descriptive or complex noun phrase followed by postmodifications (e.g., "the brown cat that is sleeping") or a simple noun phrase followed by two or more post-modifications (e.g., "a girl wearing a pajama sleeping"). All ENPs that were identified in their types were also coded for their grammatical role, depending on whether they served as the subject or predicate or were unidentifiable, thus 15 types in total. A total of 615 C-units included in 54 picture description tasks were independently coded, and exact agreement rates were 91% for ENP type and 93% for grammatical role.
- *Type of clause.* Eight types of clauses were coded and counted in their frequency for each description task. Broadly, they were divided into categories of (a) nonclause, (b) independent clause, (c) participial phrase, and (d) subordinating clause. First, *nonclauses* were those that were missing a verb, which is the core element of a clause. Next, *independent clauses* were divided into three types: single independent clause, independent clause missing only the *BE* verb, and independent clause missing an obvious subject that was stated before. The reason for including them into one category of independent clause was to account for dialectal variance in the use of *BE* verbs (Cukor-Avila, 2002) and the nature of oral language where subjects may be missing when they can be commonly assumed within the discourse context. Moreover, *participial phrases*, where present or past participles were used to shorten a main clause, were counted in their occurrences. Last, *subordinating clauses* were classified into nominal, relative, and adverbial and counted for their frequency. A total of 615 C-units included in 54 picture description tasks were independently coded, and the exact agreement rate was 95%.

Discourse features. The frequency of children's use of discourse features was counted for each picture and

condition by either generating a list of words to be identified (e.g., mental state talk) or manually coding for their occurrences.

- *Mental state talk.* A list of words representing mental and emotional states was created based on previous coding schemes (Kim et al., 2021; Meins & Fernyhough, 2015; Ruffman et al., 2002). The FREQ command was run to identify how often such mental state talk (e.g., "think," "know," "feel," "forget") put in a CUT file (MacWhinney, 2000) was used in each description task.
- *Proper character introduction.* The appropriateness of children's attempt at introducing the characters for the first time was coded into three categories: proper, improper, and depending on context (A. E. Barnes et al., 2014). There were two animate characters that could be introduced in the respective pictures; hence, the maximum number of proper introductions for each description task was two. A *proper* code was assigned when the character was introduced using an indefinite article (e.g., "a girl"), a name (e.g., "John"), or a reference to the previously introduced character (e.g., "a girl and her cat"). An *improper* code was given in cases where the character was introduced using a definite article (e.g., "the boy") or pronouns without a referent (e.g., "they," "he") or when missing an article when needed. A *dependent* code was assigned when the character was introduced using a demonstrative determiner (e.g., "this girl"). Then, all the dependent codes were reassigned to either proper or improper depending on condition: For the contextualized condition, such introduction was deemed proper given that determiners can be used to indicate objects in shared context; for the decontextualized condition, they were considered improper given that the audience cannot look at the picture being described. A total of 615 C-units included in 54 picture description tasks were independently coded, and the exact agreement rate was 99%.
- *Degree of decontextualization.* Each C-unit was coded in their degree of decontextualization for each description task (Curenton et al., 2008). They were classified into three categories depending on their complexity in terms of the degree of decontextualization: (a) low, (b) mid, and (c) high. *Low degree of decontextualization* focused on information present in the immediate context, encompassing descriptive statements or clarification of the meaning of words. Next, *mid degree of decontextualization* was assigned to units that required reflection using information that was not available in the immediate context but still related to it. These included C-units that were addressing the character's psychological states, recalling information, or making judgments. *High degree of decontextualization* was for units that required extrapolation from the picture, including those that predict what happened or will happen, state hypothetical situations, or employ story conventions (e.g., "once upon a time"). Incomplete or incomprehensible units were also flagged. A total of 735 C-units included in 54 picture description tasks were independently coded, and the exact agreement rate was 97%.
- *Perspective-taking*. Each C-unit was coded for their level of perspective-taking, which were divided into four categories of (a) no perspective-taking, (b) own perspective-taking, (c) dual perspective-taking, and (d) incomprehensible (Cho et al., 2021). *No perspective-taking* was assigned to units that were unopinionated descriptions, with no inference and connections to anything beyond the picture itself. *Own perspective-taking* was given for units that portrayed the student's own perspective, including those that had evaluative statements. *Dual perspective-taking* was for those units that contained perspectives beyond the students' own, such as those of the characters in the pictures. *Incomprehensible* units were identified. A total of 735 C-units in 54 picture description tasks were independently coded, and the exact agreement rate was 97%.

Procedure

Children were individually assessed by trained research assistants in a quiet place in the schools. The majority of the examiners were White females from the local community where the study was conducted.

Data Analysis Strategy

For data analysis, we included only those students who spoke at least one C-unit or a word across the two conditions. To prepare the data for analysis, composite scores across three pictures within the same condition were calculated so that each child has one score for each linguistic and discourse index for the contextualized and decontextualized conditions, respectively. A few additional indexes for certain linguistic and discourse features were generated. For example, clausal density across all three pictures was calculated by adding up the total number of independent and subordinating clauses and dividing it by the total number of C-units (Nippold et al., 2008). A score for the proportion of properly introduced characters was calculated by the number of proper character introduction divided by the total number of attempts at introducing characters. Moreover, a total degree of decontextualization score was generated by adding the number of low degree of decontextualization multiplied by 1, the number of mid degree of decontextualization multiplied by 2, and the number of high degree of decontextualization multiplied by 3.

Similarly, a total perspective-taking score was generated by summing up the number of own-side perspectives multiplied by 1 and the number of dual perspectives multiplied by 2. This way, degree of decontextualization and perspective-taking scores reflected the greater weight put to more complex levels. Applying weighting to a higher order or more complex perspective is akin to a widely used approach in evaluating short-constructed responses where different weights are assigned to reflect the precision of response (e.g., 0 for an incorrect response, 1 for a partially correct response, and 2 for a precise response).

To address the first research question regarding the extent to which second-grade children exhibit linguistic and discourse features in picture description, descriptive statistics for all general linguistic indexes (e.g., mean length of unit in words, type–token ratio), linguistic features, and discourse features were examined. To test whether the linguistic and discourse features vary by contextualized versus decontextualized conditions, we conducted multiple paired-samples *t* tests and calculated effect sizes (i.e., Cohen's *d*) for the variables that exhibited normal distribution (see the variables without the superscript "a" in Table 1). For the 11 variables that exhibited nonnormality in the univariate distribution (i.e., total number of units, total number of words, mean length of unit in words, conjunction, mental state talk, complex noun phrase, mid degree of decontextualization, degree of decontextualization score, own perspective-taking, dual perspective-taking, and perspective-taking score), we conducted a nonparametric test (i.e., Wilcoxon signed-ranks test) and reported their *z* scores and *r* values. In examining bivariate correlations and multiple regression models, however, severe outliers (i.e., values that exceeded 3 times the interquartile range) were winsorized to meet the assumptions of univariate and multivariate normality. It should be noted that winsorization maintains the rank order of values, which is key information for correlational analysis. The extreme outliers were due to overly lengthy and repetitive utterances in some language samples. Winsorization can reduce Type 1 error without introducing much bias when the sample size is sufficient and the extent of a few outliers is not large (Liao et al., 2016), which was the case in our data. Also, note that we did not employ corrections for multiple testing for bivariate correlation analysis because there is no consensus on whether it is necessary or not (Streiner & Norman, 2011), and because this study is situated within a theoretically sound approach, the addition of a correction was not considered obligatory.

To address Research Questions 2 and 3 on the relations between contextualization and children's use of linguistic and discourse features, multilevel regression analyses were conducted, which account for students being nested within classes/teachers, using the Stata IC 15.1 "mixed" command (StataCorp, 2017). Multilevel models are beneficial as they produce unbiased estimates of the relations between variables with precise standard errors and *p* values (Raudenbush & Byrk, 2002). For the analyses, the dummy variable of contextualized condition, with 1 denoting contextualized condition and 0 denoting decontextualized condition, predicted each and every linguistic and discourse feature, controlling for the total C-units and student demographics. The intraclass correlation coefficient (ICC) provides the dependence of scores between students (Level 1) in the same classroom (Level 2); in other words, it represents the percentage of variance that is attributable to the classroom (Level 2).

Results

Research Question 1: Characteristics and Comparisons of Linguistic and Discourse Features by Condition

Descriptive statistics for the sample by condition are reported in Table 1. The mean number of C-units, a measure of total productivity, was 19.81 (*SD* = 12.51) in the decontextualized condition and 18.66 (*SD* = 9.98) in the contextualized condition. Type–token ratio, representing lexical diversity, was 0.61 (*SD* = 0.13) in the decontextualized condition and 0.64 (*SD* = 0.11) in the contextualized condition. The total number of ENPs used was 28.23 (*SD* = 17.51) in the decontextualized condition and 25.79 (*SD* = 13.96) in the contextualized condition. Among the ENPs, the most commonly used forms were simple or simple descriptive noun phrases, followed by noun phrases with postmodification, for both conditions. Clausal density, a measure of syntactic complexity, was 0.98 (*SD* = 0.30) for the decontextualized condition and 1.01 (*SD* = 0.21) for the contextualized condition. Regarding discourse features, the proportion of proper character introduction was 0.57 (*SD* = 0.34) for the decontextualized condition and 0.52 (*SD* = 0.33) for the contextualized condition. For both conditions, the majority of the C-units consisted of low degrees of decontextualization (17.84 for decontextualized, 16.52 for contextualized) and non–perspective-taking units (17.89 for decontextualized, 16.54 for contextualized) compared to the more complex degrees of decontextualization and perspective-taking units. All linguistic and discourse features had sufficient variations around their means.

To test whether there were mean differences in the linguistic and discourse features across the two conditions, we conducted paired-samples *t* tests and a Wilcoxon signed-ranks test according to the distributional properties of the variables (see the Measures section and Table 1). The total number of words was significantly higher in the

Table 1. Descriptive statistics of general linguistic indexes and linguistic and discourse features in decontextualized and contextualized conditions (N = 330).

Variable	Decontextualized				Contextualized				$t(329)$	p	d
	M	*SD*	Min	Max	*M*	*SD*	Min	Max			
General indexes											
Total number of units[a]	19.81	12.51	0.00	94.00	18.66	9.98	2.00	54.00	1.70	.089	0.07
Total number of words[a]	143.29	94.60	0.00	712.00	130.38	73.02	7.00	445.00	3.33	< .001	0.13
MLU in words[a]	7.55	2.77	0.00	33.00	7.25	2.27	1.54	22.67	2.83	.005	0.11
Type–token ratio	0.61	0.13	0.00	0.97	0.64	0.11	0.29	0.92	–3.97	< .001	–0.22
Number of words											
Adverb	5.25	4.13	0.00	24.00	5.06	3.83	0.00	19.00	1.03	.305	0.06
Conjunction[a]	0.82	1.61	0.00	12.00	0.89	1.53	0.00	12.00	–1.54	.124	–0.06
Coordinating	14.00	11.29	0.00	87.00	12.31	9.00	0.00	63.00	4.29	< .001	0.17
Pronominal	6.70	5.50	0.00	30.00	7.12	5.49	0.00	30.00	–1.70	.089	–0.08
Mental state talk[a]	1.01	1.60	0.00	10.00	1.12	1.84	0.00	12.00	–0.46	.644	–0.02
Elaborated noun phrases											
Total elaborated NP	28.23	17.51	0.00	120.00	25.79	13.96	1.00	94.00	4.24	< .001	0.15
Simple NP	18.02	9.88	0.00	61.00	17.49	8.67	1.00	62.00	1.28	.200	0.06
Simple descriptive NP	6.84	6.94	0.00	47.00	5.59	5.51	0.00	27.00	4.86	< .001	0.20
Complex NP[a]	1.21	1.84	0.00	12.00	0.95	1.48	0.00	9.00	3.70	< .001	0.14
NP with postmodification	1.29	1.57	0.00	8.00	1.04	1.33	0.00	6.00	3.23	.001	0.18
Complex NP with postmodification	0.87	1.37	0.00	8.00	0.72	1.26	0.00	8.00	2.53	.012	0.12
NP as subject	5.83	5.36	0.00	32.00	6.33	4.95	0.00	26.00	–2.31	.021	–0.10
NP as predicate	20.68	13.79	0.00	98.00	18.34	10.86	0.00	75.00	4.92	< .001	0.19
NP as fragment	1.72	3.72	0.00	26.00	1.12	2.74	0.00	21.00	4.22	< .001	0.18
Types of clauses											
Non	2.24	4.40	0.00	34.00	1.52	3.07	0.00	24.00	4.69	< .001	0.19
IC	17.42	12.07	0.00	80.00	17.05	9.89	1.00	52.00	0.90	.368	0.03
Subordinating	1.90	2.40	0.00	13.00	1.77	2.40	0.00	23.00	1.06	.291	0.06
Participial phrase	1.34	1.49	0.00	10.00	1.15	1.27	0.00	8.00	2.46	.014	0.14
Clausal density	0.98	0.30	0.00	3.00	1.01	0.21	0.08	2.15	–1.97	.050	–0.10
Character introduction											
Proper	3.20	2.01	0.00	6.00	2.95	1.98	0.00	6.00	2.98	.003	0.13
Improper	2.25	1.87	0.00	6.00	2.66	1.88	0.00	6.00	–4.65	< .001	–0.22
Total	5.45	1.08	0.00	6.00	5.61	0.89	1.00	6.00	–2.40	.017	–0.15
% proper	0.57	0.34	0.00	1.00	0.52	0.33	0.00	1.00	3.95	< .001	0.17
Degree of decontextualization											
Low	17.84	12.37	0.00	91.00	16.52	10.01	0.00	51.00	3.09	.002	0.12
Mid[a]	1.13	1.46	0.00	11.00	1.39	1.58	0.00	9.00	–4.00	< .001	–0.16
High	0.27	0.76	0.00	6.00	0.33	0.93	0.00	7.00	–1.34	.182	–0.07
Exclude	0.57	1.04	0.00	8.00	0.43	0.79	0.00	4.00	2.40	.017	0.15
Score[a]	20.91	12.50	0.00	91.00	20.27	10.32	2.00	54.00	0.80	.424	0.03
Perspective-taking											
Non	17.89	12.37	0.00	91.00	16.54	10.03	0.00	50.00	3.17	.002	0.12
Own[a]	0.47	1.05	0.00	9.00	0.54	1.25	0.00	9.00	–1.20	.230	–0.05
Dual[a]	0.90	1.18	0.00	8.00	1.17	1.40	0.00	9.00	–4.15	< .001	–0.16
Exclude	0.55	0.97	0.00	7.00	0.42	0.78	0.00	4.00	2.43	.016	0.15
Score[a]	2.27	2.84	0.00	18.00	2.87	3.34	0.00	19.00	–4.56	< .001	–0.18

Note. Clausal density is calculated as the sum of independent clauses and subordinating clauses divided by the total number of units. Min = minimum; Max = maximum; MLU = mean length of unit; NP = noun phrase; IC = independent clause; Non = nonclause.

[a]For nonparametric variables, a Wilcoxon signed-ranks test, instead of paired-samples t tests, was conducted; z statistic and r values are reported, instead of t statistic or Cohen's d.

decontextualized condition (Mdn = 124) than in the contextualized condition (Mdn = 117) with a small effect size, $z = 3.33$, $p < .001$, $r = .13$. Similarly, the mean number of words in C-units was also significantly higher in the decontextualized condition (Mdn = 7.37) than in the contextualized condition (Mdn = 6.95) with a small effect size, $z = 2.83$, $p = .005$, $r = .11$. In contrast, type–token ratio was higher in the contextualized condition than in the decontextualized condition ($t = -3.97$, $p < .001$) with a small effect size ($d = 0.22$). Regarding linguistic features, more coordinating conjunctions ($t = 4.29$, $p < .001$; $d = 0.17$), ENPs ($t = 4.24$, $p < .001$; $d = 0.15$), and nonclauses ($t = 4.69$, $p < .001$; $d = 0.19$) were used in the decontextualized condition. With regard to the discourse features, the proportion of proper character introduction was higher in the decontextualized condition ($t = 3.95$, $p < .001$; $d = 0.17$), although more characters were introduced in the contextualized condition ($t = -2.40$, $p = .017$; $d = -0.15$). In

addition, mid degree of decontextualization was shown more often in the contextualized condition ($z = -4.00$, $p < .001$, $r = -.16$), similar to the case for dual perspective-taking ($z = -4.15$, $p < .001$, $r = -.16$) and perspective-taking score ($z = -4.56$, $p < .001$, $r = -.18$). There were no statistically significant differences in the number of adverbs, conjunctions other than coordinating conjunctions, pronominals, mental state talk, and clausal density.

Table 2 presents the bivariate correlations among the contextualized condition, general linguistic indexes, linguistic features, and discourse features. The selected linguistic and discourse variables were those that exhibited significant differences between discourse conditions (see Table 1) and were serving as representative indexes of the given features (e.g., proportion of proper character introduction representing proper, improper, or total number of character introduction). All the selected indexes, except for the total number of units and mean number of words per unit, were significantly related to discourse conditions. The total number of utterances was positively and strongly related to the number of coordinating conjunctions ($r = .73$) and ENPs ($r = .90$), positively and weakly related to the number of nonclauses ($r = .24$) and the proportion of proper character introduction ($r = .21$), and negatively related to the mean length of unit in words ($r = -.19$) and type–token ratio ($r = -.47$). Mid degree of decontextualization, dual perspective-taking, and perspective-taking score were not significantly correlated with the total number of utterances.

Research Question 2: Linguistic Features Predicted by Discourse Condition

Table 3 shows multilevel regression models where linguistic features were predicted by discourse condition, controlling for the total number of C-units and student demographics. Intraclass correlations in the linguistic features ranged from .01 to .10. In other words, approximately 1%–10% of the total variance in the linguistic indexes in children's picture descriptions was attributed to differences among classes. Children produced a higher type–token ratio in the contextualized condition ($p < .01$), after accounting for the total number of C-units and student demographic variables in the model. On the other hand, children produced a higher number of coordinating conjunctions, nonclauses, simple descriptive noun phrases, and noun phrases with postmodification in the decontextualized condition ($ps < .05$), after controlling for all other variables. Discourse condition was not related to other types of ENP (i.e., complex noun phrase, complex noun phrase with postmodification), after accounting for total productivity and student demographic variables. African American students had lower performance on type–token ratio and ENPs compared to their White peers ($ps < .005$), controlling for all other variables. Students coming from low socioeconomic backgrounds showed lower performance on most of the ENPs compared to students who were not from low socioeconomic backgrounds ($ps < .01$), controlling for all other variables.

Research Question 3: Discourse Features Predicted by Discourse Condition

Table 4 shows multilevel regression models where discourse features were predicted by discourse condition, controlling for the total number of C-units and student demographics. Intraclass correlations in the discourse features ranged from .03 to .10. In other words, approximately 3%–10% of the total variance in the discourse indexes in children's picture descriptions was attributed to differences among classes. Children had a higher proportion of proper character introduction in the decontextualized condition

Table 2. Correlations between discourse context, general linguistic indexes, linguistic features, and discourse features ($N = 330$).

Variable	Ctxtd	Tot utts	MLU	TTR	Coord	ENP	Non	Cha intro	DoD—mid	PT—dual
Ctxtd	1.00									
Tot utts	−.05	1.00								
MLU	−.06	−.19***	1.00							
TTR	.11**	−.47***	−.05	1.00						
Coord	−.08*	.73***	.13***	−.50***	1.00					
ENP	−.08*	.90***	.09*	−.49***	.79***	1.00				
Non	−.09*	.24***	−.33***	.09*	.08*	.16***	1.00			
Cha intro	−.09*	.21***	.08*	−.05	.18***	.27***	.22***	1.00		
DoD—mid	.09*	.03	.09*	−.01	−.02	−.03	−.19***	−.23***	1.00	
PT—dual	.11**	−.01	.12**	−.00	−.04	−.06	−.19***	−.24***	.83***	1.00
PT—score	.10**	.00	.12**	−.00	−.03	−.07	−.20***	−.27***	.90***	.94***

Note. Ctxtd = contextualized condition; Tot utts = total number of units; MLU = mean length of unit in word count; TTR = type–token ratio; Coord = coordinating conjunction; ENP = elaborated noun phrase; Non = nonclause; Cha intro = proportion of proper character introduction; DoD = degree of decontextualization; PT = perspective-taking.

*$p < .05$. **$p < .01$. ***$p < .001$.

Table 3. Multilevel models: linguistic features predicted by contextualized condition controlling for total productivity and student demographics (N = 330).

Variable	TTR	Coord	SDNP	CNP	NPP	CNPP	Non
Fixed effects							
Intercept	0.75***	−1.34	−0.76	−0.56	−1.75*	−0.89	3.09
	(0.06)	(3.91)	(2.35)	(0.76)	(0.69)	(0.64)	(2.04)
Contextualized	0.02**	−1.02*	−0.85**	−0.17	−0.20*	−0.12	−0.62*
	(0.01)	(0.51)	(0.32)	(0.10)	(0.10)	(0.09)	(0.27)
Total utterance	−0.01***	0.67***	0.39***	0.07***	0.06***	0.04***	0.09***
	(0.00)	(0.03)	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)
Age in months	−0.00	0.03	0.02	0.01	0.02**	0.02*	−0.03
	(0.00)	(0.04)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
Male	−0.01	−0.23	−0.90**	−0.14	0.26*	−0.17	0.79**
	(0.01)	(0.54)	(0.33)	(0.11)	(0.10)	(0.09)	(0.28)
FRPL dummy	−0.00	0.27	−1.41***	−0.38**	−0.14	−0.48***	−0.18
	(0.01)	(0.68)	(0.41)	(0.13)	(0.12)	(0.11)	(0.36)
ELL dummy	−0.06	−2.13	−1.54	−0.39	−1.37*	−0.20	−2.41
	(0.05)	(3.17)	(1.93)	(0.63)	(0.58)	(0.53)	(1.66)
Exceptionality	−0.00	−1.52*	−0.50	−0.35**	−0.27*	−0.06	0.33
	(0.01)	(0.68)	(0.41)	(0.13)	(0.12)	(0.11)	(0.35)
African American	−0.02*	−0.69	−1.33***	−0.43***	−0.63***	−0.44***	−0.24
	(0.01)	(0.65)	(0.39)	(0.13)	(0.12)	(0.11)	(0.34)
Asian American	0.06	0.44	1.94	−0.37	1.08	−0.76	0.54
	(0.05)	(3.48)	(2.11)	(0.68)	(0.63)	(0.58)	(1.82)
Hispanic	−0.00	−0.61	−0.96	−0.53	−0.06	−0.50	0.82
	(0.02)	(1.52)	(0.93)	(0.30)	(0.28)	(0.26)	(0.80)
American Indian	−0.13	0.25	−4.38	−1.65	−0.79	−1.38	−1.01
	(0.07)	(4.78)	(2.93)	(0.96)	(0.89)	(0.82)	(2.50)
Multiracial or other	0.01	−0.32	−0.46	0.27	0.56*	−0.27	1.51*
	(0.02)	(1.34)	(0.80)	(0.26)	(0.24)	(0.22)	(0.70)
Variance components							
Classroom	0.00	4.93	0.92	0.05	0.01	0.01	1.14
Child	0.01	43.56	16.48	1.77	1.54	1.32	11.97
Intraclass correlations	.03	.10	.05	.03	.01	.01	.09

Note. Standard errors are in parentheses. White students are the reference group. TTR = type–token ratio; Coord = coordinating conjunction; SDNP = simple descriptive noun phrase; CNP = complex noun phrase; NPP = noun phrase with postmodification; CNPP = complex noun phrase with postmodification; Non = nonclause; FRPL = students receiving free and reduced-price lunch, indicating low socioeconomic status; ELL = English language learner; Exceptionality = students with exceptionality.

*p < .05. **p < .01. ***p < .001.

(p < .05), after accounting for the total number of C-units and student demographic variables. On the other hand, children produced more mid degree of decontextualization and dual perspective-taking and had a higher perspective-taking score in the contextualized condition (ps < .05), after controlling for all other variables. African American children showed higher performance on complex degrees of decontextualization and perspective-taking (ps < .01) compared to their White peers but had lower performance on proper character introduction (p < .001), after controlling for all other variables.

Discussion

Children's ability to adjust one's language according to discourse context is increasingly more important for success in academic settings where more decontextualized language is used (Rowe, 2013; Schleppegrell, 2004; Uccelli et al., 2019). This study examined whether second graders in the United States vary in linguistic and discourse features when describing pictures in two distinct discourse conditions. Overall, second graders used more ENPs and exhibited precise character introduction in the decontextualized setting, whereas higher lexical diversity and discourse beyond simple description occurred more often in the contextualized setting. These features illustrate the areas in which discourse knowledge and perspective-taking played roles in their oral language.

Linguistic Features by Contextualized and Decontextualized Conditions

Type–token ratio was higher in the contextualized condition than in the decontextualized condition, controlling for total productivity and student demographics. It can be inferred that the contextualized condition allowed for a more varied and detailed explanation due to the ease of describing pictures because the child knew that the interlocutor concurrently had access to the same material. Alternatively, it can be interpreted that children did not have

Table 4. Multilevel models: discourse features predicted by contextualized condition controlling for total productivity and student demographics (N = 330).

Variable	Proportion of proper character intro	Degree of decontextualization—mid	Perspective-taking—dual	Perspective-taking score
Fixed effects				
Intercept	0.79***	0.63	−0.24	0.80
	(0.17)	(0.83)	(0.67)	(1.63)
Contextualized	−0.05*	0.27*	0.27**	0.60**
	(0.02)	(0.11)	(0.09)	(0.21)
Total utterance	0.00***	0.00	−0.00	0.00
	(0.00)	(0.01)	(0.00)	(0.01)
Age in months	−0.00	0.01	0.01	0.01
	(0.00)	(0.01)	(0.01)	(0.02)
Male	−0.04	−0.07	−0.08	−0.16
	(0.02)	(0.12)	(0.09)	(0.23)
FRPL	−0.03	−0.27	−0.22	−0.43
	(0.03)	(0.15)	(0.12)	(0.28)
ELL	−0.18	−0.05	0.15	0.47
	(0.14)	(0.69)	(0.56)	(1.32)
Exceptionality	−0.02	−0.01	0.04	0.05
	(0.03)	(0.15)	(0.12)	(0.28)
African American	−0.25***	0.38**	0.40***	1.00***
	(0.03)	(0.14)	(0.11)	(0.27)
Asian	−0.09	0.30	0.49	0.69
	(0.15)	(0.75)	(0.61)	(1.45)
Hispanic	−0.12	0.01	0.28	0.65
	(0.07)	(0.33)	(0.27)	(0.64)
American Indian	0.15	0.41	1.74*	2.62
	(0.21)	(1.05)	(0.84)	(1.99)
Multiracial or other	−0.08	0.15	0.15	0.29
	(0.06)	(0.29)	(0.23)	(0.56)
Variance components				
Classroom	0.005	0.08	0.06	0.88
Child	0.09	2.10	1.37	7.56
Intraclass correlations	.06	.03	.04	.10

Note. Standard errors are in parentheses. White students are the reference group. intro = introduction; FRPL = students receiving free and reduced-price lunch, indicating low socioeconomic status; ELL = English language learner; Exceptionality = students with exceptionality.
*$p < .05$. **$p < .01$. ***$p < .001$.

a full grasp of discourse knowledge, as more descriptions are needed in the decontextualized condition because of a lack of material shared between the interlocutors. This explanation is supported by previous literature showing that lexical diversity is higher when adult ELLs were writing about more familiar or personal topics (Yu, 2010) because oral language production in the contextualized condition resembles more familiar discourse contexts. However, it is divergent with other studies showing that lexical diversity is positively related to more complex discourse contexts for children and adolescents (Lundine & McCauley, 2016; Schleppegrell, 2001). The mixed findings in the previous literature may be due to differences in how lexical diversity was compared in terms of target population (e.g., age group, ELL status) and discourse contexts (e.g., topic familiarity, discourse genre). Thus, more research is needed on the effect of decontextualization in children's oral language production regarding lexical diversity.

Decontextualized condition was uniquely and positively related to the number of simple descriptive noun phrases and noun phrases with postmodification, after controlling for all other variables. The result implies that second-grade children are at least implicitly aware that more precise and descriptive language is needed for explaining pictures in the decontextualized condition, which is in line with previous literature showing that more sophisticated linguistic features such as ENPs were more often found in decontextualized discourse for preschoolers and adolescents (Curenton et al., 2008; Scott & Balthazar, 2010). It is also interesting to note that only selective types of ENP (i.e., simple descriptive noun phrase, noun phrase with postmodification), that is, not all types, were used more often. Thus, these selective indexes can serve as evidence of children's growing discourse knowledge, indicating how they are capable of adjusting their language by discourse context.

It is also notable that coordinating conjunctions were used more frequently in the decontextualized condition than in the contextualized condition, controlling for all other variables. Greater use of coordinating conjunctions in the decontextualized condition may be due to the greater cognitive demand required in the decontextualized condition, leading children to resort to simpler forms of connecting sentences (Berninger et al., 2010). This appears

to contrast with the findings of text analysis that showed that more sophisticated linguistic features such as conjunctions other than coordinating ones (e.g., subordinating) are found in academic texts (Schleppegrell, 2004) or decontextualized settings (E. M. Barnes et al., 2016; Nippold et al., 2008). Furthermore, children had a greater number of nonclauses in the decontextualized condition, after controlling for all other variables. It can be inferred that children had more difficult time forming complete sentences when describing pictures in the decontextualized condition, most likely due to the greater cognitive load in adjusting their language to suit the needs of their audience who are not sharing their immediate context (Lundine & McCauley, 2016; Nippold, 2009). Further research is warranted to examine these speculations.

Discourse Features by Contextualized and Decontextualized Conditions

The proportion of proper character introduction was higher in the decontextualized condition, controlling for total productivity and student demographics. This is noteworthy because it shows that children took the perspective of their audience in the decontextualized condition to produce more accurate introductions of the characters than in the contextualized condition, where character introduction was less important given the shared context (A. E. Barnes et al., 2014; Villaume, 1988). In contrast to proper character introduction, a more complex degree of decontextualization (i.e., mid degree of decontextualization) and higher perspective-taking (i.e., dual perspective-taking) were found in the contextualized condition, controlling for all other variables. This contrasts with previous literature showing that contextualized talk involves more simple descriptions of objects and events, whereas decontextualized talk is characterized by more explanations, predictions, and extensions, such as in parent–child book reading or story-creating interactions (Curenton et al., 2008; van Kleeck et al., 1997). This finding may be due to the children's ability to modulate language according to their understanding of the intended audience (A. E. Barnes et al., 2014) and suggests that adjusting language according to the audience may be a lower order form of perspective-taking than taking the perspectives of the characters in the picture to talk from their mental and emotional states (Cho et al., 2021; Curenton et al., 2008). Future studies are warranted to examine the different levels of perspective-taking portrayed in oral language production.

Finally, the intraclass correlations for the linguistic and discourse measures showed that less than 10% of the variance in the results was explained at the classroom level. This means that the variance in the linguistic and discourse features in second graders' oral language use was mostly attributed to individual differences rather than differences across classrooms. Also noteworthy is that African American children's language sample had more complex discourse features (i.e., degree of decontextualization, perspective-taking) than their White peers, whereas White peers had more complex linguistic features (i.e., type–token ratio, ENPs) than African American children, after controlling for total productivity and other demographic variables. These findings indicate the importance of examining discourse features in addition to linguistic features in understanding children's oral discourse. The findings also suggest a need for future work to investigate mechanisms that explain differences in discourse and linguistic features as a function of racial/ethnic backgrounds.

Although this study advances the discussion around the various linguistic and discourse indexes that point to children's growing discourse knowledge in oral language production, there are several limitations to be noted for future research. First, this study was restricted to examining the linguistic and discourse features in picture description tasks, which may have limited the extent to which children engaged in higher order thinking beyond simple descriptions. Future studies can explore children's discourse features in a diverse range of oral tasks (e.g., story retelling) to examine how they vary by task type as well as the extent of shared context between the speaker and the listener. Another limitation is that the contextualized and decontextualized conditions in this study assumed different audience or interlocutors (i.e., contextualized condition—examiner, decontextualized condition—friend), which may have been associated with the discourse features exhibited in children's picture descriptions. In other words, depending on the target audience, children would have a different understanding of the shared knowledge and may exhibit different degrees of decontextualization or perspective-taking. Future research can look into oral language production with different communication partners as part of the situational context. Moreover, although all the assessors/examiners were from the local community where the study was conducted, there may have been a potential cultural mismatch between some participating children and assessors, and this may have influenced the way the children engaged in the picture description tasks. Relatedly, the illustrations used in the study lacked diversity, and familiarity with the content of the pictures (e.g., "girl with a cow") may have differed across children. Consequently, this may have impacted the linguistic features used, such as lexical diversity and ENPs. Future studies are encouraged to use images that are reflective of students' diverse backgrounds and environments.

Despite these limitations, this study contributed to better understanding primary grade students' discourse knowledge in oral language production. Specifically, the distinctive linguistic and discourse indexes showed that differences in communication partner or setting may impact

oral discourse. We recognize that school-based speech-language pathologists work with constraints such that they may not be able to routinely use language sample analysis (Pavelko et al., 2016). Nonetheless, there is much to be explored on children's discourse knowledge through language sample analysis such as Monitoring Indicators of Scholarly Language (Gillam et al., 2017). Moreover, alternatives such as automated evaluation systems using natural language processing may be considered for exploring children's oral discourse across different conditions, given the need for more scaled-down and clinically practical approaches.

Data Availability Statement

Data files used for the analysis are available from the authors upon reasonable request.

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