

**Talking About There-And-Then: Parent Coaching on Decontextualized Language for
Mandarin-English Bilingual Children with Developmental Language Disorder (DLD)**

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A dissertation

submitted in partial fulfillment of the
requirements for the degree of

Doctor of Philosophy

University of Washington

2025

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Program Authorized to Offer Degree:

Speech and Hearing Sciences

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Abstract

Talking About There-And-Then: Parent Coaching on Decontextualized Language for Mandarin-English Bilingual Children with Developmental Language Disorder (DLD)

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Despite extensive research on language use difficulties in children with Developmental Language Disorder (DLD), substantial gaps exist in intervention evidence. This dissertation describes a parent coaching intervention exploring associations between parental language input and parent-child conversation turns in Mandarin-English bilingual preschoolers with DLD by increasing decontextualized input (narrative and explanation language) in daily routines. The “CHILD” parent coaching program was designed for 20 Mandarin-English bilingual children (typical development/TD=11; DLD=9; mean age = 4;11). Verbal interactions across reading, play, and snack activities were recorded and analyzed before and after coaching. TD children outperformed DLD children on baseline language measures in both languages. Post-coaching, both groups increased decontextualized input and conversation turns, though TD parents consistently used more sophisticated language. The CHILD program effectively supports both populations, demonstrating that bilingual children with DLD benefit from sophisticated language input when appropriately supported, and establishing the feasibility of remote parent coaching.

Dedication

This dissertation is dedicated to my dad and mom: Yingwu Guo (郭颖悟) and Rongqing Sun (孙荣青). They are the best parents who have shown me their unconditional love and support and have instilled in me the importance of education and a strong work ethic. I am truly fortunate.

Acknowledgements

I would like to thank my mentor, Dr. Amy Pace, for her guidance and support throughout my doctoral program. Her mentorship has helped me grow as a researcher, a teacher, and a person. I am truly appreciative of the hours of meetings, document revisions, presentation feedback, and letters of support that Amy generously provided to ensure my success as a doctoral student and new scholar. Her enthusiasm for research and dedication to her students are truly inspirational. I am very fortunate to have worked with Amy. I could not imagine a better mentor.

I would like to thank my committee members: Drs. Sara Kover, Kathleen Meeker, Chan Lü, and Naja Ferjan Ramírez. I am fortunate to have worked with all of them, as each has contributed to the development of this project and to my growth as a researcher. I would also like to thank Dr. Amy Rodda, Dr. Andrew Brown, and Stanley Choi, who have generously provided guidance and support throughout my doctoral program. To my cohort members, Poornima, Tamar, and Bertan: thank you for sharing this journey with me. A special thanks to Poornima for her friendship. Our bus rides to and from campus will always be cherished memories.

I am appreciative of all who contributed to making this project happen. I am grateful for the children and their families who participated in the study. I thank the Chinese Information and Service Center in Seattle for their assistance with recruitment. I appreciate the hours of coding work completed by reliability checkers: Shannon Xu, Qiao Cui, and Yiqing Watkins-Xu. Their help made this project possible. Funding for this study was provided by a Mini-Grant Award from the Virginia Merrill Bloedel Hearing Research Center (PI: Pace). The dissertation author was the primary investigator of the project. Last but certainly not least, I would like to thank my husband and son, Qi and Ian, who have always cheered me on to pursue my dreams. I would also like to thank my mom and dad who are my cornerstones and my life role models.

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Talking About There-And-Then: Parent Coaching on Decontextualized Language for Mandarin-English Bilingual Children with Developmental Language Disorder (DLD)

Chapter 1: Developmental Cascades

For decades, a large body of research has captured the complexities of language development, revealing how young children implicitly acquire and master explicit linguistic systems. However, previous research has mainly focused on monolingual children with typical development, creating a gap in our understanding of more complex developmental scenarios. The introduction of multilingualism and language disorders presents additional layers of complexity that traditional models struggle to fully capture. The developmental cascades approach, grounded in dynamic systems theory (Thelen & Smith, 1994), offers a promising framework for understanding how language emerges from interconnected systems (e.g., linguistic, social) that influence each other over time (Hirsh-Pasek & Golinkoff, 1996) in diverse populations.

In 2010, Masten and Cicchetti defined the concept of developmental cascades for the first time as the “cumulative consequence for development of the many interactions and transactions occurring in developing systems that result in spreading effects across levels, among domains at the same level, and across different systems and generations” (p. 491). Later in 2019, Oakes and Rakison in their book *Developmental Cascades: Building the Infant Mind* made the straightforward argument that “[all developmental] changes at one point in time set the stage for changes and developments at another point in time” (p. 104).

To date, the developmental cascades approach has been applied to explain a variety of developmental topics in cross-sectional and longitudinal studies, such as the development of language, social, and cognitive skills in preterm infants before age three (Coughlan et al., 2023),

the development of visual attention in infants (Oakes, 2023), the link between walking and communication in infants (L. West et al., 2024; Libertus & Violi, 2016; Schneider & Iverson, 2022), executive functioning skills of preschoolers (Camerota & Willoughby, 2020), school readiness in kindergarten (Bernier et al., 2020), social competence in early childhood (Burt & Roisman, 2010), cognitive development and academic achievement from infancy to adolescence (Bornstein et al., 2013), and effective parent-child relationships from early childhood to young adulthood (Niec, 2022).

Despite the theoretical strength of this approach, there remains a clear absence of practical applications of developmental cascade models in empirical research, particularly for clinical purposes. The present study addresses this gap by implementing the developmental cascades approach in a parent coaching intervention on language input in daily interactive contexts. Developmental cascades approach argues that language occurs through diverse inputs and interactive contexts as “language development embedded in the nexus of social interaction” (Guo et al., 2023, p.76). As shown in Figure 1, the core components of the developmental cascades model, critical for explaining language development, include language input, language use, and social interactions.

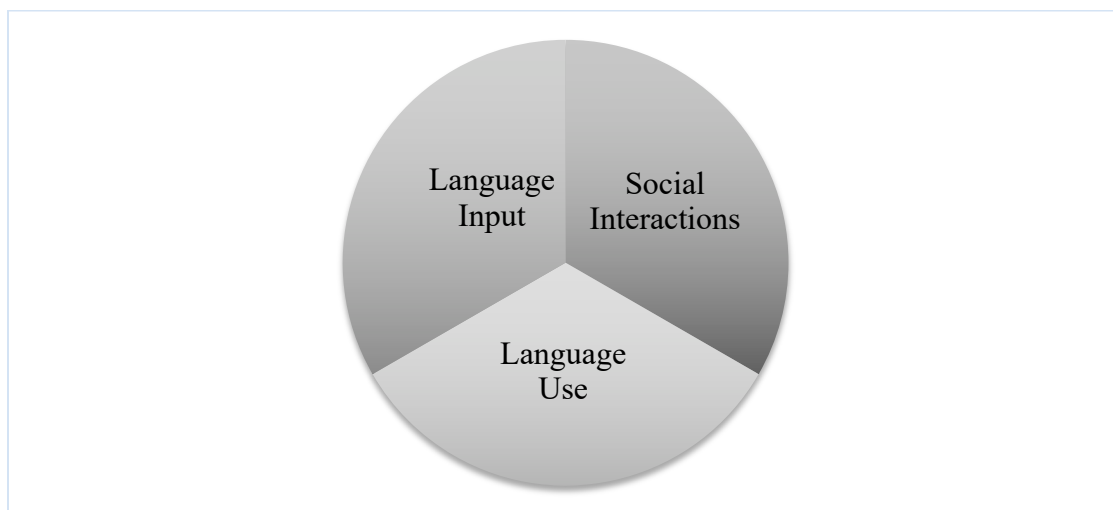


Figure 1. *Developmental Cascades Model for Language Acquisition*

By examining how modifications to parental language input create cascading effects on parent-child conversations, this research both bridges evidence-based foundations in an intervention program and extends it to a new population: bilingual preschoolers with Developmental Language Disorder (DLD). Specifically, this research compares language use profiles, parental language input, and parent-child conversations across two groups: children with typical development (TD) and children with DLD. Guided by the developmental cascades model (Figure 1), the rest of Chapter 1 reviews literature on language use difficulties in DLD, parental language input, and parent-child interactions. Chapter 1 provides a comprehensive framework for understanding how language development may differ for children with language disorders, and how targeted intervention can support optimal outcomes in bilingual children.

Language Use Difficulties in DLD

Individuals with DLD, previously termed Specific Language Impairment, have difficulties in learning, understanding, and using language(s), which can emerge in any linguistic domain including phonology, morphology, semantics, syntax, and pragmatics (Paul, 2020). DLD has been recognized as a life-long disorder, having cascading effects on other areas, such as its correlations with academic reading and learning difficulties, poor mental and physical health, and unemployment risk based on a recent questionnaire study with 46,547 adults with DLD (Nudel et al., 2023).

DLD is not caused by intellectual disabilities, syndromes, or medical incidents (Green, 2020; Leonard, 2020), but the etiology of DLD remains complex and not fully understood by researchers. Studies have shown that DLD often runs in families (Bishop, 2006; Tomblin, 1989), suggesting a genetic component (Mountford et al., 2022; Rice, 2012). A recent study (Ormieres et al., 2025) confirmed genetic variations (i.e., 15q13.3 deletion and proximal 16p11.2

duplication) linked to DLD in those without accompanying speech sound difficulties. The genetic variations in DLD might cause differences in brain morphology or function (Gauger et al., 1997), resulting in cognitive processing deficits (Ebert, 2021; Leonard et al., 2007; Weismer & Evans, 2002) and neurological differences observed through brain imaging studies (Ellis Weismer et al., 2005; Redmond & Ash, 2017; Ullman et al., 2020).

Like the language profiles of other neurodevelopmental disorders, DLD presents on a spectrum of severity, spanning from slight expressive language delays to significant disruptions in expressive language organization. Research shows that DLD impacts around 7% to 8% of the general population, with about 2% of the general population experiencing severe forms of the disorder (Law et al., 2000; Norbury et al., 2016). Although DLD manifests across a range of intensities, individuals with DLD often struggle with understanding and using complex language in narratives or conversations. For instance, as compared with their TD peers, children with DLD aged between 2 to 9 years old demonstrate difficulties in (1) conversations, where DLD showed less symbolic talk and weaker perspective-taking (Jester & Johnson, 2016), weaker emotion understanding and expression in mother-child interactions (Yuill & Little, 2018), less accuracy in answering WH-questions (Roesch & Chondrogianni, 2021), and difficulties in using morphosyntactic structures (Duinmeijer et al., 2024); and (2) narrative production, where DLD exhibited less accuracy and complexity in both macrostructure and microstructure measures (Altman et al., 2016; Govindarajan & Paradis, 2019; Hao et al., 2018; Olsen & Jensen de López, 2025) as well as weaknesses in cohesion and coherence (Fichman & Altman, 2019).

Researchers have identified DLD across all language communities studied to date (Leonard, 2014). In a systematic review by Sheng et al. (2023) on DLD in Mandarin-speaking (n = 292), Taiwanese-speaking (n = 331), and Cantonese-speaking (n = 290) children (age range =

3 to 11 years), the authors found that DLD appears across linguistic domains with varying degrees of consistency and magnitude. Grammar, the most extensively studied area with DLD, shows deficits in measures such as Mean Length of Utterance (MLU), sentence complexity, and specific constructions including aspect markers, passives, and relative clauses. Vocabulary deficits are consistently observed in lexical diversity and word learning tasks. Phonological processing, particularly nonword repetition, emerges as a key area of difficulty. Narrative discourse skills, including story macrostructure and pragmatics, are consistently impaired. However, grammaticality judgments show mixed results, contrasting with consistent findings in English-speaking children with DLD. The distinct typological features of Chinese languages, such as the reliance on word order (Wang et al., 2024; Zhu et al., 2022) rather than inflectional morphology, appear to influence how DLD demonstrates across linguistic contexts.

Therefore, this study not only investigates TD and DLD children's responses to an intervention (the CHILD program), but also compares their baseline language profiles in both of their languages (Mandarin and English) using narrative assessment measures (i.e., Multilingual Assessment Instrument for Narratives/MAIN, Mandarin version, Luo et al., 2020 and English version, Gagarina et al., 2019). Given a lack of standardized language assessment resources for bilingual children, research has shown that narrative sample analysis is an effective tool to understand language use in bilingual children with DLD (see Ortiz et al., 2024 for a review). Framed within the developmental cascades model, the current study advances our understanding of bilingual language abilities of DLD in Mandarin-English speaking children.

Parental Language Input

Birth-to-three language input is often characterized by context-based “here-and-now” language that reflects a child's daily experiences. Parents use simple language or gestures to gain

their child's attention to share contextualized information (Olson & Masur, 2011; Striano et al., 2003); parents follow children's focus of attention and provide contingent descriptive language that helps children associate words with their immediate environment to scaffold language learning (Dunham et al., 1993; Olson & Masur, 2015; Tamis-LeMonda et al., 2014).

Entering the preschool years, decontextualized input begins to emerge and increase in frequency (see Rowe & Snow, 2020 for a review). Preschoolers' verbal interactions with their parents undergo a pivotal transformation, as they are engaging in more abstract and symbolic conversations. Decontextualization in parent-child interactions was initially defined as the "ability to discuss the remote and the abstract" (Snow, 1983, p. 175). Decontextualized input allows preschool children to hear and practice "there-and-then" language, such as describing events, people, and objects that are distant in location or time (Frausel et al., 2021; Haden et al., 1997; Zhang & Harris, 2022) or explaining how things work or why we do things (Bae et al., 2023; Beals, 1993; Booth et al., 2020; Kurkul & Corriveau, 2018).

Importance of Decontextualized Input

Decontextualized input serves as a facilitator for child language development. Rowe's longitudinal investigations (2012; 2013) into the critical transition from contextualized to decontextualized input revealed three key findings: (1) during the first two years of life, the quantity of parent input (e.g., number of words, length of utterances) was the most significant predictor of vocabulary size; (2) in the third year, the diversity and sophistication of language input became more crucial; and (3) by the fourth year, the use of decontextualized language, such as narrative language, emerged as the strongest predictor of child vocabulary. These findings suggest that while quantity and diversity of language input drive child language

development, decontextualized input assumes a more prominent role as children's communicative competence grows beyond age three.

Associations between decontextualized input and language skills beyond vocabulary have also been observed in typically developing children, such as syntax and narrative skills (Demir et al., 2015), spatial and temporal referents (Peterson & McCabe, 1994), engagement in higher-thinking talk (Frausel et al., 2021), and parent-child conversation turns (Leech & Rowe, 2021; Morgan & Goldstein, 2004). Moreover, decontextualization in the early language environment is considered a key indicator for later academic achievement, as academic language often contains abstract topics and syntactically complex utterances. Longitudinal studies (Conica et al., 2023; Uccelli et al., 2019) have found positive associations between decontextualized input during preschool years and children's literacy (e.g., reading comprehension, academic vocabulary) and numeracy skills in later childhood and even mid-adolescence. For example, by elementary school, students are expected to use not only narrative but also explanatory language in oral or written forms to demonstrate their understanding of content (Blackstock-Bernstein et al., 2022; Colonnese et al., 2024), such as explaining the water cycle or the process of photosynthesis.

Across language input studies involving English-speaking and Mandarin-speaking preschoolers, narrative and explanation emerge as two primary types of decontextualized input observed during parent-child interactions in routine activities (Demir et al., 2015; Grimminger et al., 2020; Hilvert et al., 2021; Liu et al., 2021; Rowe, 2012; Snow & Beals, 2006; Su et al., 2018; Uccelli et al., 2019; Wei et al., 2020). Narrative language includes personal narratives (e.g., past or future events), fictional narratives (e.g., imaginary stories), and pretend narratives developed during play (e.g., enacting scripts or routines in play). Explanation language involves discussing logical connections between objects, events, concepts, or conclusions. Based on this established

framework, the current study teaches participating parents to increase their use of two types of decontextualized language, i.e., narrative and explanation, during parent-child interactions in daily routines.

Research indicates that explanation input emerges later and occurs at lower frequencies than narrative input during parent-child interactions in toddler and preschool years (Grimminger et al., 2020; Rowe, 2012; Wei et al., 2020). This developmental pattern occurs because explanation talk requires more advanced linguistic skills, including sophisticated vocabulary and complex conditional and causal clauses, for young children to maintain attention and engagement. Additionally, Rowe (2012) found that parental education correlated with explanation input utterances only after children reached 30 months, whereas this correlation existed for narrative input utterances before 30 months. Cross-cultural research by Wei et al. (2020) compared Chinese Mandarin-speaking parents ($n = 40$) and American English-speaking parents ($n = 36$) during snack time interactions, revealing that both groups used narrative forms more frequently than explanations. This difference is more pronounced in Chinese families (narrative = 20.0% of all parental utterances; explanation = 1.5% of all parental utterances); American English-speaking families showed a smaller but still significant gap (narrative = 13.4%; explanation = 4.6%). Given the weaker language profiles of children with DLD, the current study anticipates observing an even lower proportion of explanation input in the DLD preschoolers compared to the TD preschoolers.

However, one limitation in previous language input research has been either unclearly defined interactive contexts (e.g., Rowe's 2012 study videotaped dyads for 90 minutes without specifying or controlling which activities they engaged in) or restriction to a single activity context (e.g., mealtime interactions in Snow & Beals, 2006; Wei et al., 2020). Activity contexts

naturally affect the form and content of parental language input (see the reviews: Holme et al., 2022; Rowe & Weisleder, 2020). Parental input has been mainly studied in three interactive contexts: reading, play, and mealtime/snack activities. For example, family mealtimes offer a chance for parents of TD preschoolers to introduce abstract concepts and decontextualized language (Leech & Rowe, 2021). However, mealtimes also tend to generate more contextualized language (e.g., directive and descriptive language) compared to play, reading, and media usage settings for children before age five (Holme et al., 2022; Thompson et al., 2024). For young children with disabilities, mealtime talk often focuses on feeding-related issues, potentially limiting the child's exposure to diverse language and topics (Ferm et al., 2005). When comparing reading- and play-based interactions in toddlers, Doering et al. (2020) found that parental language during toy play contained higher linguistic complexity and more dialogue-promoting behaviors than during reading activities. For preschoolers, Holme et al.'s review (2022) identified a developmental shift. Beyond age three, book reading elicited parental language with greater lexical diversity and syntactic complexity compared to language input in other contexts (Holme et al., 2022).

To address this contextual sensitivity while collecting representative data, the current study examines parent-child interactions across three activities for preschoolers: reading, play, and snack, using standardized materials (i.e., same picture books and toys provided by the study). By investigating the parental input to bilingual preschoolers with DLD compared to TD peers across activity contexts, this study directly addresses the absence of research on decontextualized input in bilingual populations with language disorders.

To date, only two studies (Demir et al., 2015; Hilvert et al., 2021) have explored parental decontextualized input and its relation to child language in preschoolers with communication

disorders, each examining different clinical populations at different developmental stages. Demir et al. (2015) studied children with unilateral brain injury (BI; left BI = 11; right BI = 8) at 30 months of age, while Hilvert et al. (2021) studied children with Down syndrome (DS) (n = 22) at approximately 42 to 44 months. Both studies found pretend narratives to be the predominant form of decontextualized input during parent-child interactions across various activities including reading, play, and mealtime. The studies differed in their findings regarding decontextualized input quantity: Demir et al. (2015) reported no significant group differences between BI and TD children, whereas Hilvert et al. (2021) found that parents of children with DS used a significantly smaller proportion of decontextualized language compared to parents of TD children. These contrasting findings may reflect developmental timing, as parents typically increase decontextualized input dramatically after children enter their fourth year (Rowe, 2012). The studies also differed in outcome associations: Demir et al. (2015) found that decontextualized input had a greater long-term impact on language-impaired children with BI compared to TD children – predicting vocabulary, syntax, and narrative skills at age six, while Hilvert et al. (2021) observed that parental decontextualized input correlated with children's age, receptive language, and expressive language only in the TD group, not in the DS group. These contrasting findings may be explained by the timing of assessment, as the benefits of decontextualized input for children with DS might emerge later than the concurrent correlations measured in Hilvert et al. (2021), whereas the longitudinal design in Demir et al. (2015) captured long-term effects.

Studies have identified parental decontextualized input for preschoolers with communication disorders, indicating a clear opportunity to expand this line of inquiry by including more pediatric populations with communication disorders. As the first-ever

intervention study on decontextualized input including preschoolers with DLD, this current study aims to provide insights into parental decontextualized input and effective parent coaching strategies for young children with DLD.

Decontextualized Input Intervention

Emerging evidence has shown that parent coaching on decontextualized input for monolingual TD preschoolers serves as an effective intervention approach (Leech & Rowe, 2021; Morgan & Goldstein, 2004; Seven et al., 2020). This approach indicates the important role of parents in providing enriched language input during early years, as suggested by the developmental cascades approach as well as by the findings of longitudinal studies (e.g., Conica et al., 2023; Demir et al., 2015).

Previous parent coaching studies on decontextualized language employed different methodologies. Morgan and Goldstein (2004) and Seven et al. (2020) adopted single-subject designs with low-SES families (5 mother-child dyads and 4 parent-child dyads, respectively; child age range = 38 to 59 months old) during shared book reading. Both studies targeted three types of decontextualized input: personal narrative (text-to-life utterances), explanation (definitions, classifications), and interpretation (predictions, inferences, character feelings) language. In contrast, Leech and Rowe (2021) employed a group design (intervention = 18; control = 18; child age range = 48 to 60 months old) with highly educated families during mealtime conversations. Leech and Rowe (2021) taught parents the R.E.A.D.Y. framework (R.E.A.D.Y. = “recalling events”, “explaining concepts”, “asking questions”, “discussing the future”, and an empowerment message “you can make a difference”) via one coaching session consisting of watching a 20-minute video and a discussion with a researcher.

Despite these methodological differences, all three studies demonstrated positive intervention effects. The two single-subject studies (Morgan & Goldstein, 2004; Seven et al., 2020) found the largest increases in personal narratives and conversation turns; Leech and Rowe (2021) found that intervention families engaged in significantly more conversation turns with a higher proportion of decontextualized content than control families. In addition, Morgan and Goldstein (2004) and Seven et al. (2020) observed children's decontextualized language use mirroring their parents' both before and after coaching, suggesting increased dyadic use of decontextualized language because of the coaching. These findings across different populations, methodologies, and contexts strengthen the evidence supporting parent coaching on decontextualized language. Teaching parents to increase decontextualized language input appears to be a relatively simple but powerful intervention approach, naturally leading to increased dyadic decontextualized language use and more conversations.

While the evidence supporting parent coaching on decontextualized language is promising for TD children, this study extends the approach to preschoolers with DLD who may respond to increased narrative and explanation input differently. The language difficulties associated with DLD, as reviewed earlier, may prevent the children with DLD from actively participating in decontextualized talk. To understand the intervention outcomes, this research examines conversation engagement in children with DLD compared to their TD peers during interactive activities of shared book reading, toy play, and snack time. The results provide insights into effective strategies to support language disordered children's participation in abstract and complex communication.

Parent-Child Interactions

Within the context of social interactions, turn-taking is a universal feature of human language according to the interaction engine hypothesis proposed by Levinson (2022). Infants engage in conversation-like exchanges as early as three months old, well before uttering their first words (Gratier et al., 2015). By the end of the first year, infants have mastered the skills of eye gaze, gestures, and vocalizations observed in back-and-forth interactions with parents (Snow, 1977). For instance, nine-month-old infants demonstrate pointing to initiate joint attention to objects of interest (Tomasello et al., 2007); reciprocally, parents respond to their infant's gestures and vocalizations as if these communicative behaviors were turns in "protoconversation" (Bruner, 1975; Snow, 1977).

As children reach preschool age, they begin to develop more sophisticated linguistic skills to support sustained conversations with their social partners. For instance, children start to tune into prosodic and lexical-syntactic cues to anticipate upcoming conversation turns, which allows them to produce language exchanges within the constraints of time pressure, a skill observed in children as young as two and a half years old (Lammertink et al., 2015; Lindsay et al., 2019). Toddlers become better at responding contingently: providing an utterance following an adult utterance within the appropriate timeframe and staying on topic (Bloom et al., 1976; Bloom et al., 1996; Masek et al., 2023). Preschoolers show steady increases in conversation turns during parent-child interactions, especially child-initiated turns, between the ages of 3 to 5 years old (Adamson et al., 2014; So et al., 2021).

Conversation turns serve as an important indicator of child language development. Studies utilizing daylong recordings (Donnelly & Kidd, 2021; Gilkerson et al., 2017) have established that adult-toddler turn-taking explains significant variance in vocabulary

development, with bidirectional effects that strengthen as the toddlers grew up. Involving a language delayed population, Smith et al. (2018) found that conversational fluency and connectedness predicted language outcomes in at-risk infants, though with limited sensitivity for identifying language disorders. Similarly, a systematic review of 67 studies (van Witteloostuijn et al., 2025) revealed that for children with or at risk for DLD, the interactive dimension of parental input, particularly responsiveness and turn-taking, showed stronger positive associations with both expressive and receptive language development, including vocabulary growth and overall language scores. More importantly, this review found that the quantity of language input itself was not significantly associated with improved outcomes in these children. Altogether, these studies confirm that early conversational experiences, including parent-child turn-taking, are associated with language development in both typically developing and language delayed children, supporting the importance of social interactions to language development as proposed in the developmental cascades model.

Parent-Child Conversations in DLD

Literature generally shows comparable quantities of parent-child conversations between children with DLD and TD children across various contexts and age groups. Goldman and DeNigris (2015), examining past-event discussions in age-matched 11 DLD and 11 TD children (age range = 9;4 to 13;7), found no group differences in conversation duration, number of turns, number of events discussed, or turn initiation by parent and child patterns. These quantitative similarities extend to younger DLD populations. Yuill and Little (2017) reported no significant differences in total utterances in conversations between mothers and children (age range = 5;0 to 9;0) during picture book reading. Similarly, Conti-Ramsden et al. (1995) found comparable numbers of conversations, defined as two or more topic-linked turns, among children with DLD

(age range = 3;9 to 6;10), their language-matched TD siblings (age range = 2;0 to 3;3), and language-matched TD controls (age range = 1;10 to 3;1) during play activities. However, Conti-Ramsden et al. (1995) did note that children with DLD participated in shorter sustained conversations with fewer utterances per topic compared to TD peers.

The comparable performance in quantitative measures of conversations is possible due to the dyadic nature of parent-child interactions. The literature revealed qualitative differences between DLD and TD groups during parent-child conversations, where parents of children with DLD naturally provide more scaffolding, linguistic adaptations, and repair strategies to promote dyadic interactions. In terms of scaffolding, Goldman and DeNigris (2015) observed significantly more direct questions during past-event discussions and van Balkom et al. (2010a) noted increased attention-obtaining turns and topic reintroductions with preschoolers. In terms of linguistic adaptations, Majorano and Lavelli (2014) found that parents of DLD preschoolers adjusted phonological complexity and lexical sophistication rather than simply reducing speech quantity during shared book reading. In terms of repair mechanisms, Yuill and Little (2017) documented increased maternal repetitions during shared book reading; Barachetti and Lavelli (2011) observed significantly more repairs compared to age-matched TD mothers; Conti-Ramsden et al. (1995) noted differential recast patterns with more noun-phrase recasts but fewer verb-phrase recasts during play conversations. Altogether, the reviewed evidence highlights that while the quantity of parent-child conversations remains comparable between TD and DLD groups, the qualitative features differ across groups. Parents of children with language disorders tend to take a heavier load in parent-child conversations by using more strategies of scaffolding, linguistic adaptation, and repairs, compared to parents of age-matched TD children.

In conclusion, the developmental cascades model, consisting of language input, language use, and social interactions, provides a promising theoretical foundation for understanding the complex nature of language development. This approach provides guidelines for targeted interventions on one element of language acquisition (e.g., language input), which might create cascading effects on another element (e.g., social interaction). The current study shows innovation of translating this approach into practical research, particularly for clinical populations, by implementing and evaluating a parent coaching program (the CHILD program) for Mandarin-English bilingual preschoolers with DLD. The following chapter will explore evidence-based parent coaching approaches for bilingual populations, examining the cultural and linguistic considerations that inform the CHILD program's design and implementation.

Chapter 2: Parent Coaching with Bilingual Populations

Following the triadic coaching model (Brown & Woods, 2015; 2016), parent coaching in this study is defined as a collaborative approach to support families in which a trained professional works with parents or caregivers to enhance their knowledge, skills, and confidence in promoting their child's development. There is a solid body of evidence on the effectiveness of parent coaching interventions on child language development of young children with DLD or language delay (Buschmann et al., 2015; Buzhardt et al., 2019; Lavelli et al., 2019; Mettler et al., 2023; Moore et al., 2014; Pile et al., 2010; Rivera Pérez et al., 2022; Ronski et al., 2010; Sawyer et al., 2025; Vrinda & Kunnath, 2023; Zulkifli et al., 2023). The current study draws from well-established parent coaching models for birth-to-five populations while developing a collaborative, family-centered, and culturally responsive coaching program for bilingual preschoolers: the CHILd program. The acronym "CHILd" stands for Culturally Appropriate Milestones, Heritage Language Considerations, Interactive Decontextualized Input, Language Feedback, and Daily Routine Application.

Culturally Appropriate Milestones

The Early Childhood Coaching Handbook (Rush & Shelden, 2011) recommends the coaching steps of education, action, reflection, and feedback, aiming to gradually build parents' capacity to support their child's development within everyday routines and activities. As the first step of coaching, education is a key component in the CHILd program. Participating parents learn not only about the why and how of increasing decontextualized language input in parent-child interactions but also language development information in both Mandarin and English.

Due to the distributed nature of bilingual language exposure, language in bilingual children often shows uneven patterns of development (Hoff et al., 2012). It is typical for proficiency to advance more rapidly in one language compared to the other, which should not be viewed as a developmental delay or disorder. A bilingual child's language development is considered within the typical range when they achieve the expected milestones in at least one of their languages (see the review of language milestones of bilingual children in De Houwer, 2024). To support this understanding in participants, the current study provides parents with language milestone information for both Mandarin and English development in children aged 3 to 5 (see Appendix A). This resource serves as a helpful reference point when the coach answers parents' questions about their children's strengths and areas needing support based on language developmental benchmarks.

Heritage Language Considerations

Exposure-Performance Association

Bilingual children in the United States typically experience sequential language acquisition patterns: they first acquire a non-English heritage language (e.g., Spanish, Mandarin, Vietnamese) at home, then begin learning the community language (English) when they enter formal education between ages 3 to 5. As such, it is important to collect information regarding heritage language exposure at home for bilingual preschoolers and examine the effects of heritage language exposure on their language performance.

General exposure-performance associations have been observed in bilingual children with typical development before age five. A greater quantity of heritage language exposure predicts stronger phonology, vocabulary, and morphosyntax in that language (Hoff, Rumiche et

al., 2014; Hurtado et al., 2014; MacLeod et al., 2013; Parra et al., 2011; Place & Hoff, 2011; see Unsworth et al., 2016 for a review).

Only three studies (Abed Ibrahim, 2025; Ebert & Reilly, 2022; Öberg & Bohnacker, 2024) have compared the exposure-performance associations between bilingual children with DLD and bilingual children with TD in their heritage languages. Abed Ibrahim (2025), Ebert and Reilly (2022), and Öberg and Bohnacker (2024) studied bilingual children (age range = 4 to 9 years) with different language pairs: Arabic-German in Germany, Spanish-English in the United States, and Turkish-Swedish in Sweden, respectively. All studies found that children with DLD performed worse on heritage language measures compared to TD peers with similar exposure levels. However, the studies revealed mixed findings regarding the association between heritage language exposure and heritage language performance in DLD. Abed Ibrahim (2025) found that while Arabic vocabulary was most vulnerable to reduced exposure, morphosyntactic comprehension remained relatively robust in children with DLD. Ebert and Reilly (2022) observed positive associations between Spanish exposure at home and Spanish proficiency using the Clinical Evaluation of Language Fundamentals – 4th Edition in Spanish (CELF-4S) in both groups, though the correlation was stronger for TD children than for children with DLD. In contrast, Öberg and Bohnacker (2024) observed that Turkish-Swedish bilingual children with DLD showed uniformly poor performance across all Turkish language measures despite substantial heritage language exposure, unlike their TD peers who demonstrated consistent correlations between exposure and performance.

Altogether, these findings suggest that while the quantity of heritage language exposure remains important, children with DLD may show unique patterns of utilizing heritage language input that differ from the exposure-performance association seen in TD children. The current

study expands the literature on this topic by examining the Mandarin exposure-performance associations in Mandarin-English bilingual children with TD and DLD growing up in the United States.

Parents as Native Heritage Language Speakers

Another consideration is allowing non-native English-speaking parents to use their native heritage language when they implement communication strategies during parent-child interactions, reflecting the “additive” approach for supporting bilingual children with language disorders (see Moore & Pérez-Méndez, 2006 for a review). The additive approach supports “harmonious bilingual development” in young bilingual children (De Houwer, 2020). Evidence has shown that exposure to more than one language does not cause or exacerbate language impairment in children with neurodevelopmental disorders (Autism: Hambly & Fombonne, 2012 and Zhou et al., 2019; Down syndrome: Katsarou & Andreou, 2021; see Kay-Raining Bird et al., 2016 for a review).

Exposure to native heritage languages at home provides cultural and linguistic benefits for bilingual children. Parents from one Chinese-speaking and two Korean-speaking households unanimously expressed a desire to incorporate their native languages into their children’s language intervention when interviewed about their early intervention experience in the United States (Kang et al., 2023). Albin et al. (2022) conducted a scoping review of 21 studies on parent coaching interventions for children under five years of age from diverse cultural backgrounds. The researchers (Albin et al., 2022) noted several facilitative features of linguistic adaptations of intervention programs including: translations of study materials, assessments, and training resources; providing multiple language options to parents; delivering assessments in multiple languages to bilingual children; and consulting stakeholders to evaluate translations. For

example, a parent coaching study (Peredo et al., 2022) found that encouraging Spanish-speaking parents to use their native language during interventions led to more natural interactions and improved vocabulary outcomes for preschoolers with language delays. Govindarajan and Paradis (2019) even found that the quantity of non-native English exposure at Spanish-speaking households did not predict story grammar or microstructure abilities in either Spanish-English bilingual children with TD or DLD.

Regarding the mechanism behind the positive effects of native language input, Hoff, Welsh et al. (2014) found that parents employed a more diverse and sophisticated vocabulary when communicating with their preschool children in their native language compared to when they used a non-native language. Moreover, the beneficial impact of native input may also be attributed to the selective learning behaviors of young children. In word learning tasks, Sobel and Finiasz (2020) found that young children preferred native speakers who offered more relevant information with high accuracy.

Based on the reviewed evidence, the CHILD program not only delivers coaching and language assessment in both languages but also provides parents the option to use their native heritage language (Mandarin) to implement decontextualized language input during parent-child interactions in daily routines.

Language Feedback

Reflection and feedback are two important steps to empower parents in the process of gradually becoming confident and competent in implementing intervention strategies (“Early Childhood Coaching Handbook”, Rush & Shelden, 2011). Recognizing individual differences in communication styles and child-rearing practices, parent coaching studies have successfully utilized recording-based language feedback to teach targeted communication strategies.

Specifically, the coach and the parent together view audio or video recordings of parent-child verbal interactions to identify areas of strengths and potential areas of implementing target strategies (e.g., conversation turns, van Balkom et al., 2010b; Zhang et al., 2015; parentese input to infants, Ferjan Ramírez et al., 2019; spoken language environment for children with hearing loss, Charron et al., 2016; Suskind et al., 2016). Thanks to fast-evolving technology, recording-based language feedback can be provided in virtual coaching sessions now.

In addition, this strength-based approach helps parents become more aware of their interaction patterns and the impact of their communication strategies to increase their buy-in to participate in the coaching program (telepractice with parents of autistic children, Ousley et al., 2025). As such, the CHILD program uses the video recordings of parent-child interactions collected during baseline reading, play, and snack activities to provide specific feedback on the parents' use of decontextualized language.

Routine-Based Application

When working with bilingual families raising children with language disorders, cultural sensitivity and adaptability are important (Kohnert et al., 2021; Kummerer, 2012). Naturalistic, routine-based application of communication strategies is one of the effective approaches for culturally diverse populations, as this approach considers the family's cultural practices and leverages existing family strengths (see Larson et al., 2020 for a review). A key element of the routine-based application approach is getting to know the child and family and identifying the daily routines in which the parent is already actively engaging the child in interactions. This approach has been adopted in most triadic coaching models that consider both the parent and the child (Brown & Woods, 2015; Green et al., 2023). In this way, routine-based intervention focuses on recognizing a child's potential learning moments across naturalistic settings as well

as building a parent's confidence in using intervention strategies in well-established interactive activities.

Studies have shown that toddlers and preschoolers from various linguistic backgrounds experience rapid language development, characterized by increased vocabulary, grammar, and literacy skills, within the context of familiar home routines and activities (Hoff et al., 2018; Pace et al., 2022; Roberts & Rochester, 2023). Masek et al. (2024) assessed the effects of a "Routine Language Intervention" with 51 Spanish-speaking mothers in New York City, finding that the intervention group significantly increased maternal speech to toddlers, nearly doubling both vocabulary diversity and quantity. The increased vocabulary was observed during targeted daily routines (mealtime, grooming, play) and extended to untargeted routines as well. In a scoping review of 21 studies, Akamoglu and Meadan (2018) examined the naturalistic routine-based interventions for children with developmental delays and disabilities. The review found that incorporating intervention strategies into everyday family routines had positive effects on both parent implementation and child communication outcomes. However, the review noted that some parents found it more challenging to implement strategies during caregiving routines compared to play activities, as their focus was often on completing the routine tasks. This finding shows the importance of understanding the family's routine priorities and adjusting intervention plans to fit within family needs.

The common routines of preschool children from Mandarin-speaking families have been identified to include play, reading, snack and mealtime, personal care, transportation, and media use (Lin et al., 2019; Liu et al., 2021; Ren & Fan, 2019). The literature has highlighted three of the routines listed above as suitable opportunities to foster interactive language between parents and preschoolers across cultures. These routines are reading (Lavelli et al., 2019; Li & Fleeer,

2015; Pollard-Durodola et al., 2018; Shen & Del Tufo, 2022), play (Passmore & Hughes, 2024; Metaferia et al., 2020), and mealtime conversations (e.g., Beals, 1993; Hu et al., 2021; Leech & Rowe, 2021; Liu et al., 2021). Therefore, the CHILD program encourages participating parents to self-identify three to four routines that they feel comfortable and confident in promoting decontextualized input in daily routines, with the suggested routines of shared book reading, toy play, and snack/mealtime.

The Present Study

The purpose of this research was to evaluate the outcomes of a brief but intensive parent coaching intervention (the CHILD program) for Mandarin-English bilingual preschool children with DLD. Framed within the developmental cascading approach, the CHILD program was designed to impact two outcomes that are critical for children's language development: parental input of decontextualized language and conversation turns during parent-child interactions. Parents were informed about the first outcome (parental decontextualized language input) as it was the primary goal of the CHILD parent coaching program, while the second outcome (conversation turns) was measured without parental awareness. These two outcomes were compared across two groups (TD, DLD) and across three activities (Reading, Play, and Snack).

We expect to see gains in parental input of decontextualized language, which would lead to increased parent-child conversation turns for both groups. However, due to the underlying difficulties in language use associated with DLD, there is a possibility that the gain in dyadic conversation turns may show group differences. Regardless of whether these hypotheses are confirmed or rejected, the study results have the potential to enhance our knowledge about how parental language input relates to parent-child interactions among bilingual children with DLD.

Research Question 1 - Group Differences in Language Profiles

How do measures of children's language development in Mandarin and English (i.e., language exposure, story comprehension, number of utterances, Mean Length of Utterances, Number of Different Words) differ between TD children and children with DLD?

Research Question 2 - CHILD Program Outcomes

How do interaction contexts (Reading, Play, and Snack) and group status (TD, DLD) influence parental use of decontextualized language (i.e., proportion of decontextualized input) and dyadic conversation turns (i.e., turns per minute) from pre- to post-coaching?

Chapter 3: Methods

In recent years, telepractice has emerged as a reliable and widely accessible avenue for providing parent coaching for young children with communication disorders (McCarthy et al., 2021; Retamal-Walter et al., 2023; Snodgrass et al., 2017). Therefore, the CHILD program was structured as a remote mode, aiming to increase the likelihood that multilingual families can connect with a coach who shares their culture and language. The current study was implemented through synchronous and asynchronous remote settings for Mandarin-speaking families across the United States.

Synchronously, using the University's FERPA/HIPAA-compliant Zoom platform, all parent participants completed two one-on-one coaching sessions (approximately 30-45 minutes long for each session) with the author, who is a certified speech-language pathologist fluent in Mandarin and English. For assessment, all parent-child dyads met with the author via Zoom completing a pre-coaching assessment (approximately 60 minutes long) and a post-coaching assessment (approximately 45 minutes long) with a one-month interval between the two assessments. Fidelity checklists were utilized for all coaching and assessment sessions. Recordings of 10 sessions were randomly selected for the fidelity check with the fidelity score averaging 93.5% (SD = 8.5%, range = 78.0% to 100%). Refer to Table 1 for the Zoom meeting agenda and Appendix B for fidelity checklists.

Asynchronously, right after the pre-coaching/baseline assessment, each family digitally received a pack of coaching handouts, accompanied by a pre-recorded 25-minute coaching video. In the video, the author talked through handouts, providing background information and explaining technical terms. The handouts and pre-recorded video were available in both languages to provide key information about:

1. Coaching goal: increasing parental input of decontextualized language in routine activities.
2. Developmental milestones: English and Mandarin developmental milestones between ages 3 to 5 in the areas of speech, semantics, morphology, syntax, narrative, and early literacy.
3. Decontextualized language: definitions, types, and examples.

Table 1.
CHILD Program Zoom Meetings

Meeting	Attendees	Agenda
Assessment		
Pre-coaching Assessment (Baseline)	Coach	1. Child story retelling and comprehension tasks in English and Mandarin.
	Parent	2. Parent-child interactions during reading, play, and snack activities.
	Child	3. Parent interviews to fill out the LEAT and a background survey that capture language exposure, race, ethnicity, parent education level, and socioeconomic status.
Post-coaching Assessment (One Month After Baseline)	Coach	1. Parent-child interactions during reading, play, and snack activities.
	Parent Child	2. Parent interview and survey feedback on the CHILD program.
Coaching		
Coaching #1	Coach Parent	1. Coach reviews the handouts with parent to make sure that: a. Parent understands the coaching goal. b. Coach answers questions about milestones. c. Parent understands the definitions, examples, and strategies of different types of decontextualized language.
		2. Coach provides language feedback using parent-child interaction videos collected during pre-coaching assessment.
		3. Parent identifies three to four routines to increase decontextualized input with their child.
Coaching #2	Coach Parent	1. Parent shares how they have increased decontextualized input with their child on the daily basis.
		2. Coach answers questions or provides more coaching.
		3. Coach reminds parents to continue practice at home.

Note: LEAT = The Language Exposure Assessment Tool (DeAnda et al., 2016).

Participants

Child participants included 11 TD children (age range = 4;3 to 5;10; average age = 4;11) and 9 children with DLD (age range = 4;4 to 5;7; average age = 4;11). The t-test showed no significant difference in age between the TD and DLD groups ($t(15.12) = -0.04, p = 0.969$). For the total sample, 18 of the 20 child participants (90%) were born in the United States; the years of living in the United States for the remaining two participants were 3 years and 5 years, respectively. All mothers of the child participants were native speakers of Mandarin, so all child participants learned Mandarin beginning at birth.

The following were the inclusion criteria for child participants. At the time of data collection, all child participants were learning Mandarin or Mandarin and English, with Mandarin being used no less than 10% of the time at home. Participants assigned to the TD group had typical development in all major developmental areas: speech, language, cognitive, motor, and social-emotional. They were not receiving any special services. Participants assigned to the DLD group either already had a community diagnosis of DLD or were receiving speech-language therapy services on expressive or receptive language goals, without any other acquired or neurodevelopmental disorders that could cause language impairment or delay.

Participants were recruited nationally via social media platforms (e.g., Facebook groups for Mandarin-speaking families, pediatric SLPs) and local community connections (e.g., Chinese Information and Service Center in Seattle). One parent or primary caregiver was required to attend all Zoom meetings. Although all primary caregivers were welcome to participate, mothers were the exclusive parent participants in the current study ($n = 20$). All mothers had a college degree, an indicator of high socioeconomic status. Table 2 presents the demographic information of child and mother participants.

Table 2.
Demographic Information

	Typical Development (n = 11)	Developmental Language Disorder (n = 9)
	Frequency (%)	Frequency (%)
Child Race/Ethnicity		
Asian	9 (81.8%)	9 (100%)
Asian, White	2 (18.2%)	0 (0%)
Family income		
\$75k – \$100k	0 (0%)	1 (11.1%)
\$100k – \$150k	1 (9.1%)	0 (0%)
\$150k+	8 (72.7%)	6 (66.7%)
Unreported	2 (18.2%)	2 (22.2%)
State		
Washington	8 (72.7%)	3 (33.3%)
California	2 (18.2%)	0 (0%)
New York	1 (9.1%)	1 (11.1%)
New Jersey	0 (0%)	2 (22.2%)
Texas	0 (0%)	3 (33.3%)
Mother Education		
College graduate	4 (36.4%)	3 (33.3%)
Master’s	4 (36.4%)	3 (33.3%)
PhD	3 (27.3%)	3 (33.3%)
Mother in the U.S.		
5-10 years	4 (36.4%)	3 (33.3%)
11-15 years	3 (27.3%)	2 (22.2%)
15+ years	4 (36.4%)	4 (44.4%)

Measures

Language Exposure and Experience

The Language Exposure Assessment Tool (LEAT; DeAnda et al., 2016) and a background survey were used to collect information about children’s language exposure and experience. The LEAT is an Excel format questionnaire designed to quantify the relative language exposure in multilingual environments. Based on parent reports about who interacts with the child, in what languages, and for how many hours per day and week, the LEAT calculates estimates of the child’s exposure to each language. Some questions from the background survey captured information about language and literacy practice at home. The

language exposure and experience indicators (i.e., LEAT Mandarin exposure, child stronger language, mother language choice in reading) are reported in Table 3. Results indicated that the TD group had higher Mandarin exposure compared to the DLD group on average. Most TD children's stronger language is Mandarin while most DLD children's is English. TD children's mothers predominantly read only or mostly in Mandarin (90.9% combined), while DLD children's mothers showed more varied reading language choices across all categories.

Table 3.
Language Exposure and Experience

	Typical Development (n = 11)	Developmental Language Disorder (n = 9)
	Mean (SD), Range	Mean (SD), Range
LEAT Mandarin	83% (24%), 24% - 100%	62% (38%), 10% - 100%
	Frequency (%)	Frequency (%)
Child Stronger Language		
Mandarin	9 (81.8%)	3 (33.3%)
English	2 (18.2%)	6 (66.7%)
Mother Reading Language		
Mostly English	1 (9.1%)	2 (22.2%)
English & Mandarin Equally	0 (0%)	3 (33.3%)
Mostly Mandarin	4 (36.4%)	2 (22%)
Only Mandarin	6 (54.5%)	2 (22.2%)

Note: LEAT = The Language Exposure Assessment Tool.

MAIN Language Measures

The Mandarin version (Luo et al., 2020) and English version (Gagarina et al., 2019) of the Multilingual Assessment Instrument for Narratives (MAIN) were administered via Zoom. Both language versions are available for online assessment with children aged 3 to 10 years. All child participants were asked to retell two MAIN stories ("Cat" and "Dog"), which were counterbalanced across languages as these narratives were specifically developed as parallel stories (Bohnacker & Gagarina, 2019). Children began the MAIN assessment in their stronger language as reported by parents. During the MAIN assessment, the author screen-shared the

picture stimuli of each story (see Appendix C) while simultaneously playing pre-recorded audio narratives by native speakers of each target language. Following this, children were instructed to retell the story as thoroughly as possible in the target language and then answer 10 comprehension questions per story. The author's verbal interventions were limited to minimal prompts and supportive feedback (e.g., "tell me more", "how about this picture", "good job", "yes") with rising inflection to encourage further storytelling and answering questions.

All MAIN narratives produced by child participants were video-recorded and later transcribed by the author following the CHAT transcription guidelines for Mandarin and English in CLAN (MacWhinney, 2000). A Mandarin-English speaking doctoral student from the UW College of Education checked approximately 22.6% of the CLAN transcripts after a training and practice session. The reliability check task included seven out of the total 31 CLAN transcripts (four English and three Mandarin). The reliability checker listened to the narrative recordings, verified adherence to CHAT transcription conventions, and marked discrepancies. The percentages of absolute agreement, calculated at the utterance level for each CLAN transcript, averaged 85.7% (SD = 7.1%; range = 76-100%). All discrepancies were resolved, and the transcripts were revised to create a final set of transcripts for analysis with CLAN KidEval, a computational program that performs automated analysis of child language samples by calculating various linguistic metrics (MacWhinney, 2000).

All MAIN comprehension responses from child participants were video-recorded and later manually scored with a max score of 10 by the author following the MAIN scoring protocols for the "Cat" and "Dog" stories (Mandarin, Luo et al., 2020; English, Gagarina et al., 2019). After a training and practice session, a Mandarin-English speaking doctoral student from the UW College of Education independently scored 25% of the responses (i.e., 10 out of the total

40 scoring sheets; five were English and five were Mandarin). Comparing scoring results between the author and the reliability rater, the percentages of absolute agreement, calculated at the question level for each scoring sheet, averaged 98% (SD = 4%; range = 90-100%). Discrepancies were resolved and the scores were revised to generate a final set of MAIN comprehension scores.

The variables of MAIN assessment included number of utterances, Mean Length of Utterance in words (MLU-Word), Number of Different Words (NDW) per second, and story comprehension. For the participants who could not perform the retelling or comprehension task in their non-dominant language, they received a score of zero in the variables in that language. Therefore, the best scores across languages were also generated for MAIN assessment variables.

Parent-Child Verbal Interactions

During both pre- and post-assessment sessions, the verbal interactions of each parent-child dyad were video-recorded during three activities: reading, play, and snack time. Based on intervention studies on parent-child interactions (Allen & Marshall, 2011; Hatherly et al., 2025; Landry et al., 2012), three to five minutes of recorded interaction was sufficient to supply the amount of data necessary for meaningful analysis. Therefore, the author requested that each dyad engage in each activity for at least five minutes near the electronic devices they were using for the Zoom meeting (e.g., phones, tablets, laptops, computers). Once an activity started, the author turned off her video and audio, only interrupting when the dyad needed to be redirected to stay near their devices, reduce background noise, or if they had questions for the author to answer. All dyads completed the pre- and post-coaching interactions. The remote mode for data collection did not appear to prevent natural interactions between the parents and their children.

In the shared book reading activity, each dyad read two picture books: *Tuesday* (Wiesner, 1991) and *Mr. Wuffles!* (Wiesner, 2013) that were mailed to the family. The two books were counterbalanced across participants pre- and post-assessment. Both books tell a story through illustrations and have only a few words throughout the book. The content of both books is age-appropriate (three to six years of age) for the participants. In the play activity, each dyad interacted with a playdough set including 10+ small cans of playdough and a few cutting and modeling tools, which was also mailed to the family. Two participants could not locate their playdough sets during the post-assessment, so they instead used magnet tiles, which were already owned by the families and were also constructive and age-appropriate toys, to elicit parent-child verbal interactions. During snack time, each child was provided with two snacks and a drink prepared by their parent. For all three activities, the parents were instructed to interact with their child as they typically would at home, using whichever language they preferred.

All parent-child verbal interactions were transcribed by the author in utterances in Excel sheets. An utterance is defined as a main clause along with its dependent clauses. Two doctoral students from the UW College of Education together checked 20% of the parent-child interaction transcripts (24 out of 120 transcripts). The reliability checkers listened to the interaction recordings and marked discrepancies on the transcripts. The percentages of absolute agreement, calculated at the utterance level for the checked transcripts, were 88.80% on average ($SD = 8.9\%$, range = 68.75% to 99.33%). Discrepancies were discussed and resolved to generate a final set of transcripts in Excel sheets for later data annotation of conversation turns, Mandarin use, and decontextualized language use.

Conversation Turns. Conversation turns were defined as alternating utterances between parent and child speakers, with each contingent utterance following the previous one with no

more than five seconds pause between them. Table 4 includes the annotation guidelines for conversation turns and provides an example of three consecutive conversation turns. Each conversation turn was color-coded in the transcript and counted in the Excel sheet. Incomplete, interrupted, and unintelligible utterances were excluded during the annotation process.

Table 4.
Conversation Turn Annotation

Annotation Guidelines	
Turns were annotated in discrete pairs:	
Parent-Child or Child-Parent = one turn.	
Parent-Parent-Child or Child-Child-Parent = one turn.	
Parent-Child-Child or Child-Parent-Parent = one turn.	
Parent-Child-Parent or Child-Parent-Child = one turn.	
Parent-Child-Parent-Child or Child-Parent-Child-Parent = two turns.	
Example	
*CHI: It (playdough) can be rolled up inside.	Turn
*MOT: Just roll it up.	
*MOT: After rolling it up, what can you make?	Turn
*MOT: Oh, the side looks like a rose!	
*CHI: Yes, I'm making a rose.	
*CHI: Rose garden soil.	Turn
*MOT: Do you want to plant this finished one in the soil?	
*CHI: Yes.	

Mandarin Use. Due to participants' diverse language backgrounds, parent-child dyads in this study communicated in Mandarin, English, or a mixture of both languages during their interactions. To capture this linguistic diversity, the author annotated Mandarin use at the utterance level for all parent-child interaction transcripts. Two specific codes were employed: Man_MOT for "Mandarin utterance by mother" and Man_CHI for "Mandarin utterance by child". Code-switching behaviors were not annotated at this time due to the observation that there were various degrees of code-switching, and code-switching is not the focus of the current study. This annotation complemented the LEAT scores, a parental report measure, by providing

direct observational data about children’s Mandarin exposure and use across activities of reading, play, and snack time.

Decontextualized Language. At the utterance level, both child and parent speakers’ utterances were annotated if they were producing decontextualized language. A coding scheme (Table 5) was developed to capture various types of contextualized and decontextualized language that were heard and produced by preschool children based on the data of the current study as well as previous research (Demir et al., 2015; Hilvert et al., 2021; Rowe, 2012; 2013; Snow & Beals, 2006). During annotation, four codes were employed: Nar_MOT for “Narrative utterance by mother”, Nar_CHI for “Narrative utterance by child”, Exp_MOT for “Explanation utterance by mother”, and Exp_CHI for “Explanation utterance by child”. Incomplete, interrupted, and unintelligible utterances were excluded during the annotation process.

Table 5.
Decontextualized Language Coding Scheme

Categories	Definition and example
Contextualized Language	
Descriptive	Labeling or describing objects, people, or actions that are present in the context, e.g., requesting an object; describing a character’s actions in the picture book.
Procedural	Providing directions , e.g., asking the child to clean up; redirecting the child’s attention; initiating the next activity.
Facilitative	Recasting, expanding, or prompting a child’s spoken language , e.g., asking a forced-choice question.
Decontextualized Language	
Narrative	Personal narrative of past or future events , e.g., talking about a previous trip to the zoo; planning for a picnic. Fictional narrative , e.g., telling an imaginary story during mealtime. Personal knowledge , e.g., listing the names of planets. Mental state , e.g., describing feelings or emotions during book reading. Pretend talk during play , e.g., making an object represent another; attributing actions, thoughts, or feelings to toys; assuming a role to an object or a person; enacting scripts or routines in play.
Explanation	Causal or inference explanations , e.g., explaining logical connections between objects, events, actions, or concepts - using question or conjunction words “how”, “why”, “because”, “so”, “unless”, “if”.

The author conducted the annotations of conversation turns, Mandarin use, and decontextualized language for all parent-child interaction transcripts. Appendix D is a screenshot of a section of the Excel sheet showing a parent-child dyad's transcript with annotations and notes. After a training and practice session, two reliability raters independently annotated 24 of the total 120 parent-child interaction transcripts (20%) for the three behavioral measures. The two raters were blinded to both the transcripts' group assignment and the timing of the samples (per- or post-coaching). The rate (20%) of re-annotated samples meets the standard for establishing reliability for annotating narrative and discourse data (Syed & Nelson, 2015). Reliability rater #1 was a Mandarin-English speaking graduate student from the UW Speech and Hearing Sciences Department; reliability rater #2 was a Mandarin-English speaking doctoral student from the UW College of Education. Inter-rater reliability was assessed by calculating percentages of absolute agreement between the author and the reliability raters at the turn level for conversation turn annotations and at the utterance level for Mandarin use and decontextualized language annotations. The reliability score for turn annotations averaged 97.16% (SD = 3.21%, range = 91.67% to 100%); the reliability score for Mandarin use annotations averaged 99.84% (SD = 0.37%, range = 99.02% to 100%); the reliability score for decontextualized language annotations averaged 85.28% (SD = 9.63%, range = 66.67% to 96.42%). Discrepancies were discussed and resolved between the author and the two raters to establish consensus annotations for statistical analysis.

Annotation results generated multiple variables including conversation turns, Mandarin utterances by mother, Mandarin utterances by child, narrative utterances by mother, narrative utterances by child, explanation utterances by mother, explanation utterances by child, total utterances by mother, and total utterances by child, for Reading, Play, and Snack and for both

pre-assessment and post-assessment. Given the varying lengths of elicited parent-child interactions across activities and participants, the variables of interest were processed with control for time or length for statistical analysis. We calculated derived variables including: Turns-Per-Minute, %Mandarin-Mother (proportion of mother's utterances that were in Mandarin), %Mandarin-Child (proportion of child's utterances that were in Mandarin), %Narrative-Mother (proportion of mother's utterances that were narrative), %Narrative-Child (proportion of child's utterances that were narrative), %Explanation-Mother (proportion of mother's utterances that were explanation), %Explanation-Child (proportion of child's utterances that were explanation), and %Decontextualized-Mother (proportion of mother's utterances that were decontextualized language).

Parent Feedback

Towards the end of the post-coaching assessment meeting, all parent participants completed a semi-structured interview with the coach to provide feedback on the CHILD program. These interviews were video recorded via Zoom. Additionally, 19 of the 20 parent participants completed an anonymous survey using a 5-point Likert scale delivered through UW Google Forms. The survey contained 15 questions addressing three feedback areas: overall program impact, effects on language practices at home, and direct coaching impact. The primary purpose of collecting parent feedback was to understand their satisfaction with the CHILD program and gather suggestions for improvement. Appendix E contains the post-coaching interview questions, and Appendix F presents the feedback survey.

Analysis Plan

All statistical analyses were conducted in R using RStudio (RStudio Team, 2020), using an alpha level of 0.05 to determine statistical significance.

Research Question 1 - Group Differences in Language Profiles

Before testing for group differences in LEAT scores and MAIN assessment variables, variance and normality of the groups matched on age were tested. Levene's tests were conducted to assess homogeneity of variance between TD and DLD groups, and Shapiro-Wilk tests were used to examine normality within each group.

For the LEAT scores (i.e., relative exposure to Mandarin at home), Levene's test indicated equal variances could be assumed ($p = 0.071$), but the Shapiro-Wilk test showed non-normal distribution in the TD group ($p = 0.0003$) while the DLD group approached normal distribution ($p = 0.061$). Therefore, a non-parametric Mann-Whitney U test was used to compare groups.

For the MAIN assessment variables (i.e., comprehension score, number of utterances, MLU-word, NDW-per-second in both languages and participants' best performance across languages in these measures), Levene's tests revealed equal variances for most measures ($p > 0.05$), except for Best Comprehension variable ($p = 0.023$). Shapiro-Wilk tests indicated varied normality results. For Mandarin measures, number of utterances and MLU-word met both parametric assumptions (equal variances and normality in both groups). For English measures, no variables met normality assumptions in both groups ($p < 0.05$). Looking at the best scores across languages, number of utterances, MLU-word, and NDW-per-second met both parametric assumptions ($p > 0.05$).

As such, independent samples t-tests with equal variances assumed were used for variables meeting both parametric assumptions: Mandarin Number of Utterances, Mandarin MLU-Word, Best Number of Utterances, Best MLU-Word, and Best NDW-Per-Second. Welch's t-test was used for Best Comprehension due to unequal variances but normal distribution in the DLD group. Mann-Whitney U tests were conducted for all remaining variables violating normality assumptions in at least one group: LEAT Score, Mandarin Comprehension, Mandarin NDW-Per-Second, English Comprehension, English Number of Utterances, English MLU-Word, and English NDW-Per-Second.

Correlations between Mandarin Exposure and MAIN Measures. To complement the group comparison analyses in Research Question 1, correlational analyses were conducted to examine associations between children's Mandarin exposure (LEAT scores) and their MAIN assessment variables. Given that the LEAT scores showed non-normal distribution in the TD group ($p = 0.0003$), Spearman's rank correlation coefficients were calculated to examine associations between Mandarin exposure percentage and language measures (comprehension scores, number of utterances, MLU-word, and NDW-per-second) in both languages.

Research Question 2 – Outcomes of the CHILD Program

Shapiro-Wilk tests were used to assess normality and Levene's tests were used to examine homogeneity of variance for the two dependent variables within each group (TD and DLD): %Decontextualized-Mother and Turns-Per-Minute (see definitions in Table 6).

Table 6.

Dependent Variables of Research Question 2 – Outcomes of the CHILD program

Variables	Definition
%Decontextualized -Mother	<u><i>Mother freq. of narrative utt. + Mother freq. of explanation utt.</i></u> <i>Mother freq. of utt.</i>

Turns-Per-Minute

$$\frac{\text{Dyad's freq. of conversation turns}}{\text{Duration of dyad's conversation in minutes}}$$

Note: Freq. = frequency; Utt. = utterances

Assumption tests results showed that both dependent variables met the assumptions for parametric testing. Shapiro-Wilk tests for normality yielded non-significant results ($p > 0.05$) across all combinations of Group (TD, DLD), Time (Pre-Coaching, Post-Coaching), and Activity (Reading, Play, Snack) for both Turns-Per-Minute (p-values ranging from 0.12 to 0.99) and %Decontextualized-Mother (p-values ranging from 0.09 to 0.92). Levene's tests confirmed homogeneity of variance between groups across all Time and Activity combinations for both dependent variables (all p-values > 0.05). Figure 2 shows the Q-Q plots for the two dependent variables, revealing generally good adherence to normality with some minor deviations at the extremes, particularly for the Turns-Per-Minute variable in the TD group and the %Decontextualized-mother variable in the DLD group. However, these deviations were not substantial enough to violate the normality assumption for ANOVA.

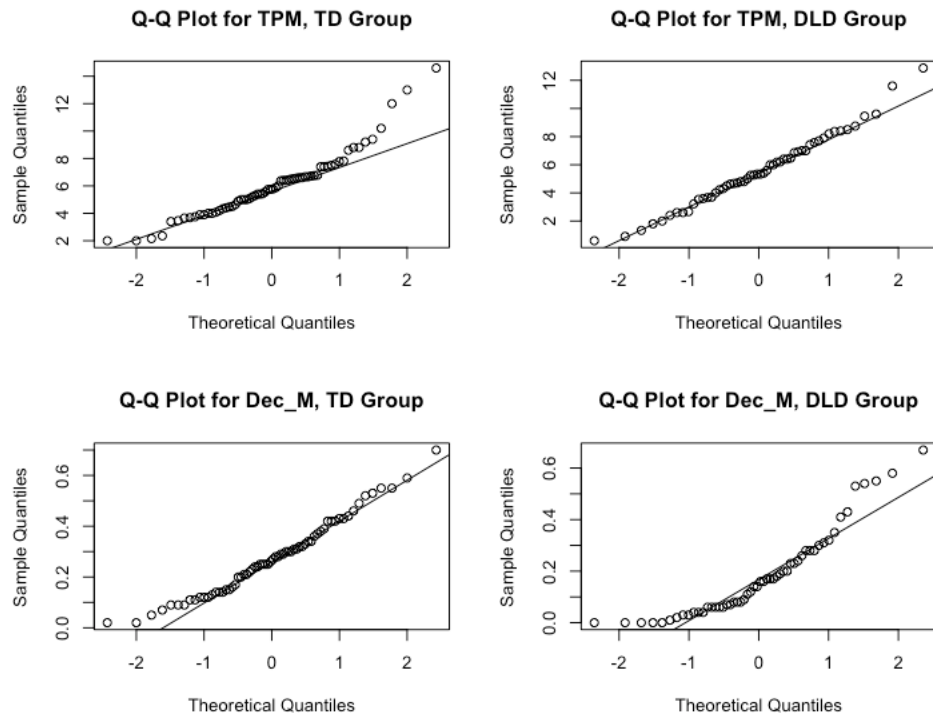


Figure 2. *Q-Q Plots for Turns-Per-Minute (TPM) and %Decontextualized-Mother (DEC_M) by Group: TD, DLD.*

As such, $\text{Group}(2) \times \text{Activity}(3) \times \text{Time}(2)$ mixed ANOVA tests were used to examine two CHILD program outcomes: %Decontextualized-Mother and Turns-Per-Minute. The mixed ANOVA models included one between-subject factor with two levels (Group: TD, DLD) and two within-subject factors (Activity: Reading, Play, Snack; Time: Pre-Coaching, Post-Coaching). Due to the small samples ($n = 20$), effect sizes (generalized eta-squared for ANOVA), in addition to p-values, were also reported. Post-hoc tests with Bonferroni corrections were conducted to examine any significant main effects of activity, which had three levels: Reading, Play, and Snack.

$$Y_{\%Decontextualized-Mother}$$

$$= b_0 + b_1 \times Group + b_2 \times Time + b_3 \times Activity + b_4 \times (Group \times Time) \\ + b_5 \times (Group \times Activity) + b_6 \times (Time \times Activity) \\ + b_7 \times (Group \times Time \times Activity) + e$$

$$Y_{Turns-Per-Minute}$$

$$= b_0 + b_1 \times Group + b_2 \times Time + b_3 \times Activity + b_4 \times (Group \times Time) \\ + b_5 \times (Group \times Activity) + b_6 \times (Time \times Activity) \\ + b_7 \times (Group \times Time \times Activity) + e$$

Parent Satisfaction

Descriptive statistics were calculated to summarize parent participants' anonymous responses to the 15-question feedback survey (see Appendix F), providing insight into their satisfaction with the CHILD program. The recordings of the post-coaching interviews will be analyzed qualitatively in the future to inform improvements to the CHILD program and guide expansion of this pilot study to a larger sample size.

Chapter 4: Results

Research Question 1 – Group Differences in Language Profiles

Descriptive results of MAIN assessment variables (Table 7) were reported to provide context for group comparison tests. TD children showed better performance in all Mandarin measures than children with DLD: number of utterances (12.73 vs 5.00), utterance length (MLU-Word: 5.65 vs 2.07), and lexical diversity (NDW-Per-Second: 0.40 vs 0.10). Children with DLD showed relatively stronger English performance than Mandarin in all measures within group, but still lower than TD children in three out of four measures. For the best performance across languages, TD children outperformed children with DLD in utterance length, lexical diversity, and comprehension score, though the total number of utterances was similar.

Table 7.
Descriptive Results of MAIN Assessment Variables

	Typical Development (n = 11)	Developmental Language Disorder (n = 9)
	Mean (SD), Range	Mean (SD), Range
Number of Utterances		
Mandarin	12.73 (4.00), 5-18	5.00 (5.61), 0-15
English	6.82 (5.17), 0-15	12.44 (8.82), 0-26
Best	13.27 (3.13), 8-18	12.78 (6.83), 5-26
MLU-Word		
Mandarin	5.65 (2.10), 1-8.50	2.07 (2.40), 0-6.82
English	4.24 (3.03), 0-8	3.21 (2.09), 0-6.26
Best	5.95 (1.72), 2.67-8.50	4.22 (1.64), 1.80-6.82
NDW-Per-Second		
Mandarin	0.40 (0.24), 0.03-0.84	0.10 (0.14), 0-0.41
English	0.27 (0.30), 0-1.05	0.18 (0.14), 0-0.47
Best	0.42 (0.22), 0.17-0.84	0.21 (0.15), 0.05-0.47
MAIN Comprehension		
Mandarin	8.18 (2.23), 4-10	3.22 (3.63), 0-10
English	6.64 (2.66), 1-10	3.78 (2.44), 0-6
Best	8.91 (1.30), 6-10	4.78 (3.11), 0-10

Note: MAIN = Multilingual Assessment Instrument for Narratives; MLU-Word = Mean Length of Utterance in words; NDW = Number of Different Words; MAIN comprehension has a max score of 10.

Group Comparisons

Statistical analyses revealed significant differences between TD and DLD groups on many MAIN assessment measures. Table 8 presents a summary of all statistical test results.

Table 8.
Group Differences in LEAT and MAIN Assessment Variables

	TD (n = 11)	DLD (n = 9)	Group Comparison
Variables	Mean	Mean	Test Result, p-value
LEAT-Mandarin	83%	62%	Mann-Whitney U: W = 35, p = 0.285
Utterances			
Mandarin	12.73**	5.00	t-test: t = -3.59, df = 18, p = 0.002
English	6.82	12.44	Mann-Whitney U: W = 71.5, p = 0.098
Best	13.27	12.78	t-test: t = -0.22, df = 18, p = 0.832
MLU-Word			
Mandarin	5.65**	2.07	t-test: t = -3.56, df = 18, p = 0.002
English	4.24	3.21	Mann-Whitney U: W = 36, p = 0.320
Best	5.95*	4.22	t-test: t = -2.28, df = 18, p = 0.035
NDW-Per-Second			
Mandarin	0.40**	0.10	Mann-Whitney U: W = 12, p = 0.005
English	0.27	0.18	Mann-Whitney U: W = 39, p = 0.444
Best	0.42*	0.21	t-test: t = -2.40, df = 18, p = 0.027
Comprehension			
Mandarin	8.18**	3.22	Mann-Whitney U: W = 14.5, p = 0.008
English	6.64*	3.78	Mann-Whitney U: W = 18.5, p = 0.019
Best	8.91**	4.78	Welch's t-test = -3.72, df = 10.28, p = 0.004

Note: LEAT = The Language Exposure Assessment Tool; * indicates $p < 0.05$, ** indicates $p < 0.01$; df = degree of freedom; MLU-Word = Mean Length of Utterance in words; NDW = Number of Different Words; MAIN = Multilingual Assessment Instrument for Narratives; MAIN comprehension has a max score of 10.

For MAIN Mandarin outcomes, significant group differences were found in all language measures except relative Mandarin exposure (LEAT score). TD children produced significantly more utterances in Mandarin ($t = -3.59, p = 0.002$) with longer Mandarin MLU ($t = -3.56, p = 0.002$) compared to children with DLD. Mann-Whitney U tests revealed that TD children also had significantly greater lexical diversity as measured by NDW-Per-Second ($W = 12, p = 0.005$, Mann-Whitney U) and higher Mandarin comprehension scores ($W = 14.5, p = 0.008$, Mann-Whitney U) than children with DLD. Despite these language differences, the groups did not

differ significantly in their relative exposure to Mandarin at home ($W = 35, p = 0.285$, Mann-Whitney U). Within group, TD children consistently performed better in Mandarin.

For MAIN English outcomes, a significant group difference was observed only in narrative comprehension ($W = 18.5, p = 0.019$, Mann-Whitney U) with the TD group outperforming the DLD group. No differences were found in English utterances, MLU-Word, or NDW-Per-Second. Within group, children with DLD consistently performed better in English.

For the best performance across languages, significant group differences were also found. TD children showed significantly better comprehension ($t = -3.72, p = 0.004$, Welch's t-test), longer utterances ($t = -2.28, p = 0.035$), and greater lexical diversity ($t = -2.40, p = 0.027$) compared to children with DLD. There was no significant difference in the number of utterances produced. Figure 3 visually presents significant group differences in MAIN measures.

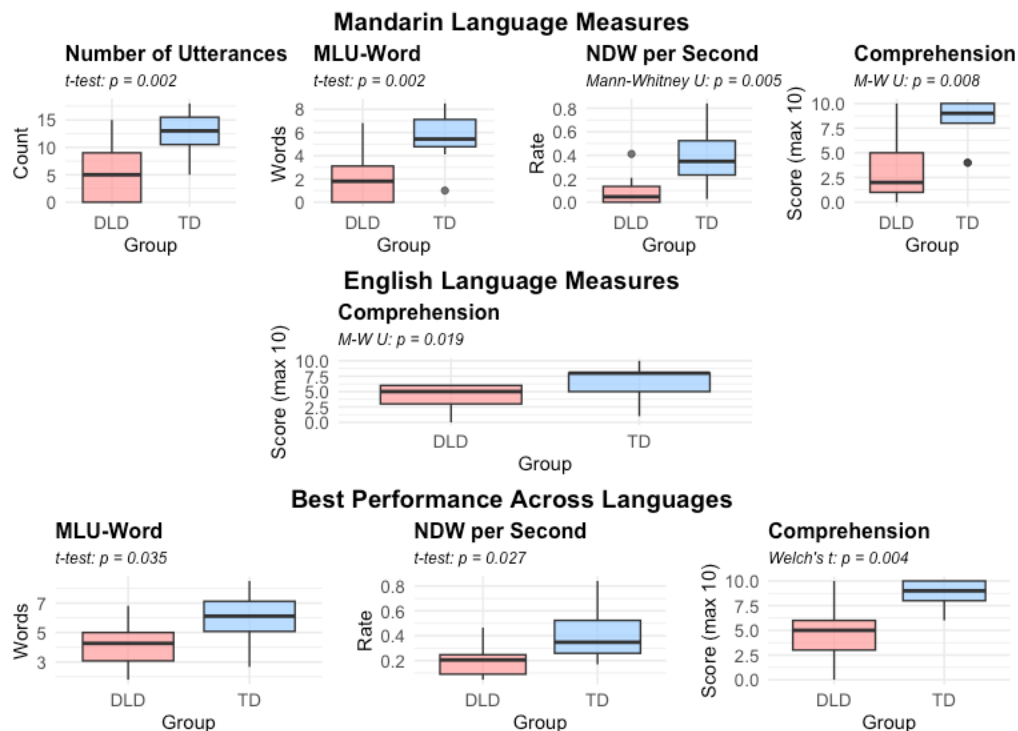


Figure 3. Significant Group Differences in MAIN Measures. MAIN = Multilingual Assessment Instrument for Narratives. MLU-Word = Mean Length of Utterance in words; NDW = Number of Different Words; M-W U = Mann-Whitney U.

Correlations between Mandarin Exposure and MAIN Measures

Spearman's rank correlations were calculated between LEAT Mandarin Exposure and MAIN assessment variables for the overall sample and separately for TD and DLD groups (Table 9 and Figure 4). In the total sample, strong positive correlations were found between Mandarin exposure and Mandarin production measures: utterances ($r_s = 0.630, p = 0.003$), MLU-Word ($r_s = 0.668, p = 0.001$), and NDW-Per-Second ($r_s = 0.640, p = 0.002$). Group-specific analysis revealed distinct patterns. In the TD group, a significant negative correlation emerged between Mandarin exposure and English comprehension ($r_s = -0.747, p = 0.008$). No other significant correlations were found in this group. For children with DLD, strong positive correlations were observed between Mandarin exposure and Mandarin production measures: utterances ($r_s = 0.777, p = 0.014$), MLU-Word ($r_s = 0.839, p = 0.005$), and NDW-Per-Second ($r_s = 0.743, p = 0.022$). Unlike the TD group, children with DLD showed no significant negative correlation between Mandarin Exposure and English comprehension.

Table 9.
Spearman's Rank Correlations Between LEAT Mandarin and MAIN Assessment Variables

Predictor: LEAT Mandarin	Overall (n = 20)	TD (n = 11)	DLD (n = 9)
Mandarin			
Comprehension	0.34	0.13	0.55
Utterances	0.63**	0.45	0.78*
MLU-Word	0.67**	0.42	0.84**
NDW-Per-Second	0.64**	0.57	0.74*
English			
Comprehension	-0.27	-0.75**	-0.15
Utterances	-0.14	-0.11	0.08
MLU-Word	-0.06	-0.00	-0.53
NDW-Per-Second	-0.04	0.21	-0.27

Note: LEAT = The Language Exposure Assessment Tool; * indicates $p < 0.05$, ** indicates $p < 0.01$. MLU-Word = Mean Length of Utterance in words; NDW = Number of Different Words; MAIN = Multilingual Assessment Instrument for Narratives; MAIN comprehension has a max score of 10.

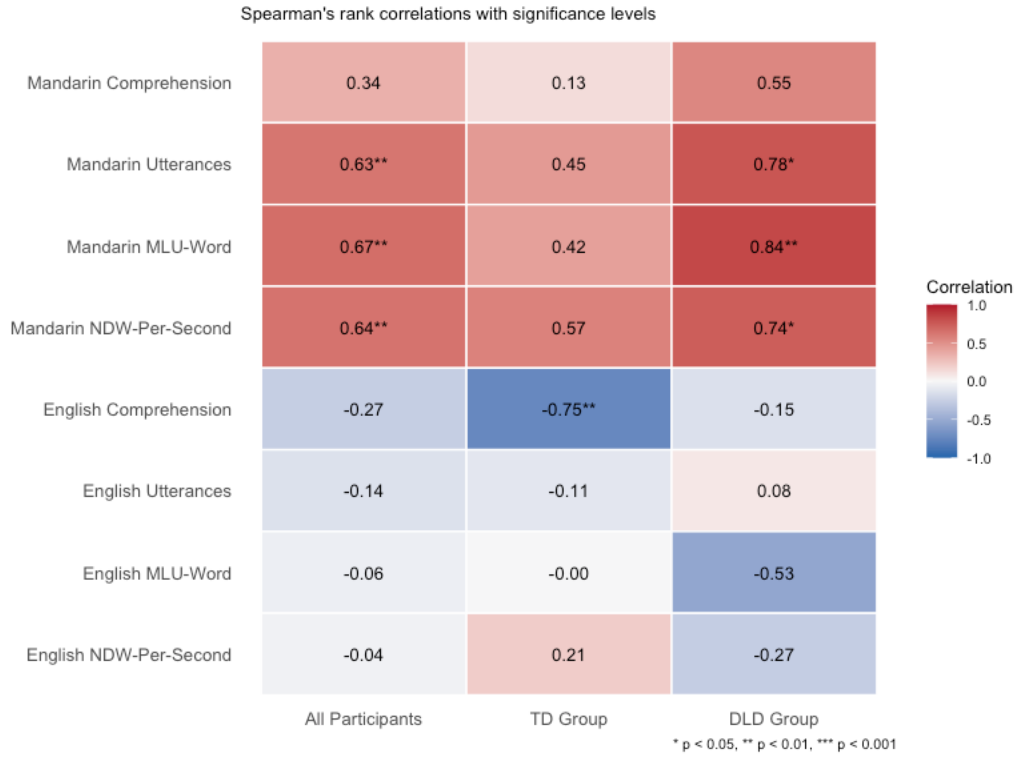


Figure 4. *Spearman's Rank Correlations Between LEAT Mandarin and MAIN Assessment Variables.* LEAT = The Language Exposure Assessment Tool; MLU-Word = Mean Length of Utterance in words; NDW = Number of Different Words.

Research Question 2 – Outcomes of the CHILD Program

Descriptive statistics of parent-child interaction variables (see Table 10) showed that mothers' decontextualized input increased post-coaching for both groups: Reading (TD: 15% to 26%; DLD: 8% to 18%), Play (TD: 24% to 38%; DLD: 12% to 31%), and Snack (TD: 26% to 36%; DLD: 17% to 24%). Turns-Per-Minute also increased post-coaching for both groups: Reading (TD: 5.7 to 7.45; DLD: 4.79 to 7.69), Play (TD: 5.13 to 7.05; DLD: 4.53 to 7.15), and Snack (TD: 4.26 to 6.66; DLD: 3.58 to 5.62). Narrative input consistently occurred at higher proportions than explanation input for both groups, particularly during play. Overall, the TD group consistently showed higher proportions of decontextualized input compared to the DLD group. Mothers' Mandarin use remained consistent throughout the study period, with the TD group maintaining higher proportions of Mandarin use (TD: 82% to 89%; DLD: 68% to 75%).

Table 10.*Descriptive Results of Parent-Child Verbal Interaction Variables*

	TD (n = 11)		DLD (n = 9)	
	Mean (SD), range		Mean (SD), range	
Reading	Pre	Post	Pre	Post
Duration (minute)	8.80 (3.69), 5-13.5	7.65 (2.25), 5-10	5.75 (1.86), 4.5-10.5	6.67 (2.41), 3-10
Turn-Per-Minute	5.7 (1.83), 2.15-9.2	7.45 (2.96), 3.9-14.6	4.79 (2.18), 1.33-7.43	7.69 (3.3), 3.54-12.88
%Mandarin-Mother	88 (18), 37-100	89 (10), 69-99	73 (32), 0-100	72 (32), 0-100
%Mandarin-Child	81 (29), 3-100	79 (27), 8-99	49 (42), 0-100	49 (35), 0-97
%Narrative-Mother	8 (7), 1-22	14 (6), 6-24	4 (4), 0-10	11 (6), 4-21
%Narrative-Child	8 (8), 0-27	13 (6), 3-21	3 (4), 0-9	9 (5), 0-18
%Explanation-Mother	7 (3), 2-13	12 (7), 3-24	4 (5), 0-14	8 (6), 0-15
%Explanation-Child	7 (5), 0-17	13 (6), 3-21	2 (3), 0-8	7 (6), 0-19
%Decontextualized-Mother	15 (7), 7-30	26 (8), 12-42	8 (6), 0-17	18 (10), 7-35
Play	Pre	Post	Pre	Post
Duration (minute)	7.85 (2.25), 5-11.5	6.9 (1.59), 5-9	7.17 (2.29), 4.5-10	6.78 (2.05), 5-10
Turn-Per-Minute	5.13 (1.3), 3.47-7.43	7.05 (2.27), 4.46-12	4.53 (1.47), 2-6.92	7.15 (1.51), 4.8-9.45
%Mandarin-Mother	88 (17), 38-100	84 (24), 26-100	71 (31), 0-98	68 (33), 0-100
%Mandarin-Child	74 (31), 3-100	70 (38), 0-100	39 (40), 0-96	41 (37), 0-99
%Narrative-Mother	21 (9), 2-30	31 (15), 10-57	9 (10), 0-26	26 (20), 2-52
%Narrative-Child	19 (13), 3-48	30 (16), 11-71	14 (13), 0-35	25 (19), 2-54
%Explanation-Mother	3 (3), 0-9	7 (3), 3-13	3 (6), 0-17	5 (4), 0-13
%Explanation-Child	5 (5), 0-16	7 (6), 0-15	1 (1), 0-4	5 (6), 0-15
%Decontextualized-Mother	24 (10), 2-36	38 (17), 13-70	12 (9), 3-28	31 (21), 2-55
Snack Time	Pre	Post	Pre	Post
Duration (minute)	6.27 (2.24), 3-9.5	4.62 (2.18), 1-9.3	4.44 (1.57), 1.5-6	3.83 (2.17), 1-8.5
Turn-Per-Minute	4.26 (1.65), 2-6.67	6.66 (2.75), 3.4-13	3.58 (2.47), 0.6-8.4	5.62 (1.82), 2.67-8.75
%Mandarin-Mother	84 (21), 30-100	82 (22), 31-100	74 (30), 0-100	75 (25), 25-100
%Mandarin-Child	74 (27), 9-100	70 (32), 3-100	54 (36), 0-100	53 (33), 7-100
%Narrative-Mother	18 (17), 0-50	25 (16), 0-52	14 (14), 0-39	12 (17), 0-50
%Narrative-Child	18 (15), 0-37	34 (26), 0-84	12 (17), 0-50	17 (20), 0-50
%Explanation-Mother	8 (5), 2-16	10 (6), 5-27	2 (3), 0-7	12 (13), 0-40
%Explanation-Child	6 (4), 0-13	15 (8), 4-31	3 (5), 0-12	9 (13), 0-40
%Decontextualized-Mother	26 (17), 2-52	36 (17), 5-59	17 (16), 0-43	24 (24), 0-67

Outcome #1: Decontextualized Input

A mixed Group(2) $\times$ Activity(3) $\times$ Time(2) ANOVA examined mothers' decontextualized input (proportion of mothers' utterances that were decontextualized language) as the first outcome measure. Significant main effects (see Table 11) were observed for Group ($F(1,18) = 6.01, p = 0.025, \eta^2 = 0.10$), Time ($F(1,18) = 16.05, p < 0.001, \eta^2 = 0.15$), and Activity ($F(2,36) = 5.38, p = 0.009, \eta^2 = 0.09$). Generalized eta-squared (η^2) effect sizes are interpreted as small = 0.01-0.05; medium = 0.06-0.14; large = 0.15 (Olejnik & Algina, 2003). No interaction effects were found. Post-hoc tests with Bonferroni corrections (see Table 12) revealed that Play ($p = 0.015$) and Snack Time ($p = 0.023$) elicited more decontextualized input than Reading. No significant differences were found between Play and Snack.

Table 11.

Mixed ANOVA Results: Group, Activity, and Time Effects on %Decontextualized-Mother

Effect	DFn	DFd	F	p-value	Effect size η^2
Group	1	18	6.01	0.025*	0.10
Time	1	18	16.05	0.001**	0.15
Activity	2	36	5.38	0.009**	0.09
Group $\times$ Time	1	18	0.01	0.930	0.00
Group $\times$ Activity	2	36	0.10	0.908	0.00
Time $\times$ Activity	2	36	2.12	0.134	0.02
Group $\times$ Time $\times$ Activity	2	36	0.37	0.690	0.00

Table 12.

Post-hoc Bonferroni Tests for the Main Effect of Activity on %Decontextualized-Mother

Contrast	estimate	SE	df	t.ratio	p-value
Play – Reading	0.09	0.03	108	2.864	0.015*
Play – Snack	0.00	0.03	108	0.147	1.000
Reading – Snack	-0.09	0.03	108	-2.717	0.023*

Note: %Decontextualized-Mother = proportion of mothers' utterances that were decontextualized language; DFn = Degrees of Freedom numerator; DFd = Degrees of Freedom denominator; df = degree of freedom; * indicates $p < 0.05$, ** indicates $p < 0.01$

Outcome #2: Conversation Turns

A mixed Group(2) $\times$ Activity(3) $\times$ Time(2) ANOVA examined dyads' conversation turn rates (Turns-Per-Minute) as the second outcome of the CHILDP program. A significant main

effect was observed for Time ($F(1,18) = 32.50, p < 0.001, \eta^2 = 0.22$), with turn rates increasing significantly from pre- to post-coaching across both groups with a large effect size. A significant main effect of Activity was also observed ($F(2,36) = 4.28, p = 0.022, \eta^2 = 0.07$), with conversation turns varying significantly across activity contexts with a medium effect size. There was no significant main effect of Group. No significant interactions were found between any factors. Post-hoc tests with Bonferroni corrections revealed that Reading elicited higher turn rates than Snack ($p = 0.020$). No significant differences in turn rates were found between Play and Reading or between Play and Snack. Tables 13 and 14 present the ANOVA and Post-hoc results. Figure 5 shows interaction plots for the two outcome variables.

Table 13.

Mixed ANOVA Results: Group, Activity, and Time Effects on Turns-Per-Minute

Effect	DFn	DFd	F	p-value	Effect size η^2
Group	1	18	0.65	0.430	0.01
Time	1	18	32.50	<0.001**	0.22
Activity	2	36	4.28	0.022*	0.07
Group $\times$ Time	1	18	0.39	0.541	0.00
Group $\times$ Activity	2	36	0.24	0.787	0.00
Time $\times$ Activity	2	36	0.01	0.989	0.00
Group $\times$ Time $\times$ Activity	2	36	0.60	0.554	0.01

Table 14.

Post-hoc Bonferroni Tests for the Main Effect of Activity on Turns-Per-Minute

Contrast	estimate	SE	df	t.ratio	p-value
Play – Reading	-0.44	0.50	108	-0.89	1.000
Play – Snack	0.94	0.50	108	1.88	0.189
Reading – Snack	1.38	0.50	108	2.77	0.020*

Note: DFn = Degrees of Freedom numerator; DFd = Degrees of Freedom denominator; df = degree of freedom; * indicates $p < 0.05$, ** indicates $p < 0.01$

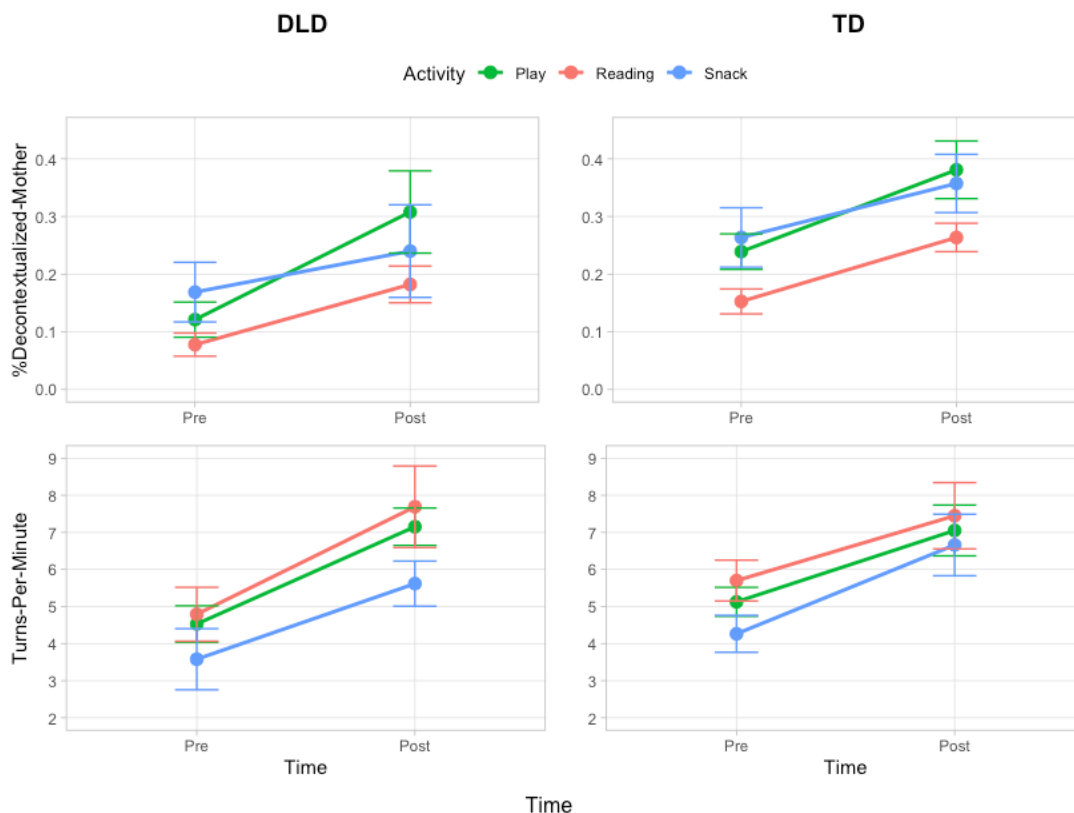


Figure 5. *Interaction Plots for Outcome Measures of the CHILD Program.* %Decontextualized-Mother = proportion of mothers' utterances that were decontextualized language; DLD = Developmental Language Disorder; TD = Typical Development.

Correlations between Child and Mother Language Use

Correlations were also conducted to explore the associations between children's and mothers' use of Mandarin, narrative, and explanation language for all conditions. Visual inspection of histograms revealed non-normal distributions, with variables showing bimodal patterns or concentration at extreme values. This was particularly evident in Mandarin use, which displayed strong clustering near 100% usage for many dyads (see Figure 6).

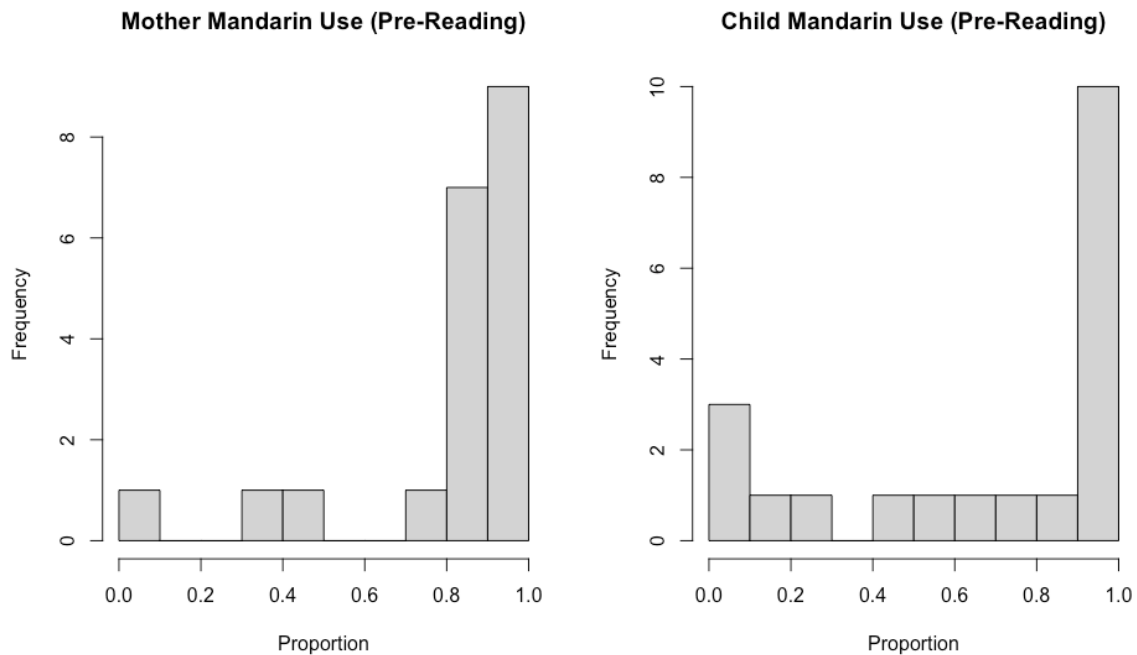


Figure 6. *Dyads' Mandarin Use (%) During Pre-Coaching Reading*

Therefore, Spearman's rank correlations were used to examine these associations due to violations of normality assumptions and the small sample sizes in each group. The non-parametric approach does not assume bivariate normality. While these distributional characteristics present analytical challenges, understanding patterns of mother-child language behaviors in social interactions remains valuable for understanding linguistic alignment within dyads. The results of Spearman's rank correlations are shown in Table 15 and Figure 7.

For Reading, the DLD group demonstrated significant correlations in Mandarin use during both pre-coaching ($r_s = 0.90, p = 0.001$) and post-coaching ($r_s = 0.77, p = 0.015$) sessions, while no significant correlations were found for the TD group. For explanation language during Reading, a significant correlation was found only in the DLD group post-coaching ($r_s = 0.74, p = 0.021$).

For Play, both TD and DLD groups showed significant correlations in Mandarin use during both pre-coaching (TD: $r_s = 0.70, p = 0.017$; DLD: $r_s = 0.86, p = 0.003$) and post-coaching (TD: $r_s = 0.73, p = 0.011$; DLD: $r_s = 0.93, p < 0.001$) sessions. Both groups also showed significant correlations in narrative language use at both time points: pre-coaching (TD: $r_s = 0.84, p = 0.001$; DLD: $r_s = 0.81, p = 0.008$) and post-coaching (TD: $r_s = 0.89, p < 0.001$; DLD: $r_s = 0.87, p = 0.002$). For explanation language, a significant correlation was found only in the TD group pre-coaching ($r_s = 0.75, p = 0.008$).

For Snack, the TD group showed significant correlations in narrative language use at both time points (pre: $r_s = 0.88, p < 0.001$; post: $r_s = 0.86, p = 0.001$) and in Mandarin use post-coaching ($r_s = 0.86, p = 0.001$). The DLD group demonstrated significant correlations in Mandarin use at both time points (pre: $r_s = 0.89, p = 0.001$; post: $r_s = 0.75, p = 0.019$) and in narrative and explanation language use post-coaching ($r_s = 0.95, p < 0.001$; $r_s = 0.96, p < 0.001$, respectively).

Table 15.
Spearman's Correlation Results for Mother-Child Interaction Variables

	TD (n = 11)		DLD (n = 9)	
Reading	Pre	Post	Pre	Post
%Mandarin	0.29	0.44	0.90**	0.77*
%Narrative	0.29	0.55	0.19	0.53
%Explanation	0.37	0.24	0.37	0.74*
Play	Pre	Post	Pre	Post
%Mandarin	0.70*	0.73*	0.86**	0.93**
%Narrative	0.84**	0.89**	0.81**	0.87**
%Explanation	0.75**	0.38	0.30	0.58
Snack Time	Pre	Post	Pre	Post
%Mandarin	0.30	0.86**	0.89**	0.75*
%Narrative	0.88**	0.86**	0.39	0.95**
%Explanation	0.48	0.50	0.35	0.96**

Note: * indicates $p < 0.05$, ** indicates $p < 0.01$

Mother-Child Language Synchrony

Spearman Correlations by Group, Language Type and Activity

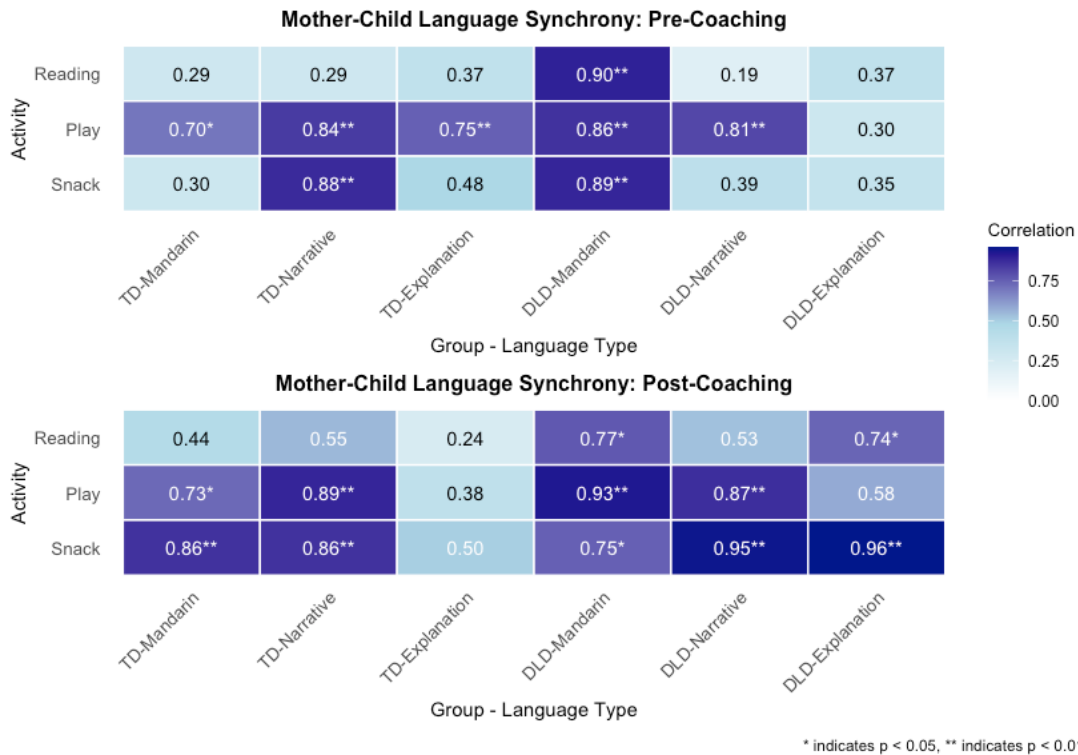


Figure 7. *Spearman's Correlation Results for Mother-Child Interaction Variables.* TD = Typical Development; DLD = Developmental Language Disorder.

Parent Satisfaction

Parents reported high levels of satisfaction with the CHILD program (Table 16). The survey was completed by 19 of 20 parents who participated in the CHILD program. All respondents (100%) agreed that the program met their expectations for supporting decontextualized language use, that they were satisfied overall with the program, and that the online format was effective. Parents also expressed high satisfaction with the coaching aspects, with 100% agreeing that coaches respected family goals, provided culturally appropriate suggestions, and answered questions professionally. Most parents reported positive outcomes regarding language practices, with 94.7% indicating they learned effective strategies for eliciting more language and now initiate more decontextualized talk with their child. The areas with lower

agreement were children initiating more decontextualized talk (78.9%) and children engaging in more conversations with family members (68.5%).

Table 16.

Descriptive Results for Parent Feedback Survey (n = 19) for the CHILD Program

Satisfaction Factors		%
Overall Program Impact		
The CHILD coaching program met my expectations for supporting decontextualized language use in my child.	Disagree/Neutral Agree	0 100
The CHILD coaching program met my expectations for supporting Mandarin and/or English language development in my child.	Disagree/Neutral Agree	10.5 89.5
I would recommend this program to other families wanting to increase decontextualized language in their 4-5 years old.	Disagree/Neutral Agree	5.3 94.7
The online format was effective for parent coaching on language interaction strategies.	Disagree/Neutral Agree	0 100
Overall, I am satisfied with the CHILD program.	Disagree/Neutral Agree	0 100
Effects on Language Practices		
I have learned effective strategies for using decontextualized talk with my child.	Disagree/Neutral Agree	0 100
I have learned effective strategies for eliciting more language from my child.	Disagree/Neutral Agree	5.3 94.7
I now initiate more decontextualized talk (such as past/future events, explanations, predictions) with my child.	Disagree/Neutral Agree	5.3 94.7
My child now initiates more decontextualized talk (such as past/future events, explanations, predictions) with me.	Disagree/Neutral Agree	21.1 78.9
My child now engages in more conversations with family members in English or Mandarin.	Disagree/Neutral Agree	31.5 68.5
Direct Coaching Impact		
The coach respected our family's goals for child language development.	Disagree/Neutral Agree	0 100
The coach provided culturally appropriate suggestions for parent-child interactions.	Disagree/Neutral Agree	0 100
The coach provided helpful feedback using our parent-child interaction recordings during reading, play, and snack time.	Disagree/Neutral Agree	10.5 89.5
The coach answered my questions professionally.	Disagree/Neutral Agree	0 100
The coach helped me develop strategies tailored to my child's specific needs	Disagree/Neutral Agree	5.3 94.7

Note. Disagree/neutral combines strongly disagree, disagree, and neutral; Agree combines agree and strongly agree.

Chapter 5: Discussion

The main purpose of this parent coaching study was to explore the association between parental input of decontextualized language and parent-child conversation turns in Mandarin-English bilingual preschoolers with DLD compared to those with typical development. This research was framed within the developmental cascades framework, which argues that changes in one system can trigger cascading effects on other systems of development. By examining both direct changes in mothers' linguistic behavior and the cascading effects on parent-child interactions, this research aims to understand how targeted language interventions can affect an untargeted area of child language development. This investigation addresses two key questions: (1) the language profiles of Mandarin-English bilingual preschoolers with TD and DLD, and (2) the effects of parent coaching, activity contexts, and group status on parental input of decontextualized language and parent-child conversation turns. The findings of the research questions are discussed below.

Language Profiles - Research Question 1

Language Use Difficulties in DLD

The examination of language profiles confirms that TD children have longer sentences, more diverse vocabulary, and better story comprehension than their age-matched DLD counterparts, as shown by the best scores across languages in narrative tasks. Looking at language-specific performance, this study finds no group differences in English measures except for story comprehension, with TD children having better comprehension scores. DLD children performed significantly worse on all Mandarin measures, despite comparable Mandarin exposure across groups. Specifically, children with DLD produced fewer sentences, shorter sentences, less

diverse vocabulary, and demonstrated weaker story comprehension in Mandarin, pointing to increased vulnerability in heritage language development in children with language disorders (Anderson, 2012; Kohnert, Ebert, et al., 2021; Kohnert, Windsor, et al., 2009; Kohnert, Yim, et al., 2005). This pattern is also consistent with the literature (Abed Ibrahim, 2025; Ebert & Reilly, 2022; Öberg & Bohnacker, 2024) that shows that bilingual children with DLD tend to perform worse on heritage language measures than their TD peers. These findings add evidence for different language profiles between TD children and children with DLD.

The vulnerability in heritage language development observed in children with DLD may be attributed to several factors beyond simple quantity of language exposure. First, the underlying difficulties in language learning may reduce children with DLD's ability to effectively extract information from their linguistic environment. Weismer and Evans (2002) suggest that toddlers with DLD demonstrate reduced linguistic processing capacity, which becomes particularly evident when processing the complex morphosyntactic features of a heritage language that is also a minority or non-dominant language in the community.

The second reason may be related to the early dominance of the community language (Giguere & Hoff, 2022). Between the TD and DLD children, no significant differences were found in any English measures, except for English story comprehension with higher scores in the TD children. In other words, both groups showed similar performance in English, despite it being the non-dominant language for TD children but the dominant language for children with DLD. Parent reports support this language dominance pattern: at the time of data collection, 66.7% of DLD children had English identified as their stronger language, compared to only 18.2% of TD children. English, as the community language, receives reinforcement from multiple sources (e.g., school, media use, books) beyond the home. For children with language

disorders, this linguistic scaffolding provided by the broader environment may compensate for or moderate underlying language learning difficulties, resulting in better language skills in the community language. This pattern suggests that the mere heritage language experience at home may be insufficient for children with DLD to develop heritage language skills comparable to their TD peers. According to the developmental cascades model, language development is not simply a function of language input but is also supported by the richness and variety of language use opportunities (e.g., language use in school, media, and community) that children experience in daily social interactions.

Exposure-Performance Associations

Although children with DLD demonstrated weaker skills in their heritage language, positive associations between Mandarin exposure and productive measures (number of utterances, MLU-word, and NDW-per-second) were only observed in the DLD group. In contrast, the TD group showed no exposure-performance association in Mandarin. This pattern differs from previous findings (e.g., Hoff, Rumiche et al., 2014; Hurtado et al., 2014; MacLeod et al., 2013; Öberg & Bohnacker, 2024) that TD children typically show exposure-performance associations in their heritage language. It is possible that the TD children in this study were already quite proficient in Mandarin (with 81.8% having Mandarin as their stronger language), potentially creating a ceiling effect where additional exposure does not produce measurable gains. Since Mandarin functions as the non-dominant language for most children with DLD, they require more consistent and substantial input to develop proficiency in their heritage language. Despite similar levels of Mandarin exposure between groups, children with DLD may process linguistic information less efficiently due to their underlying difficulties in language learning.

However, a strong negative correlation between Mandarin exposure and English comprehension was observed in the TD group, which was absent in the DLD group. First, this finding suggests that TD children experience a trade-off in bilingual development when resources are divided between languages (Hayakawa et al., 2022). Children with DLD may not demonstrate this trade-off pattern due to their overall reduced language capacity. Second, such a trade-off may be more obvious in bilingual children whose dominant language is not the community language, such as the TD children in this study. This pattern aligns with findings from Hoff et al. (2021), who also did not find evidence of trade-off in English-dominant preschoolers whose home language was Spanish.

In summary, the findings from Research Question 1 demonstrate that bilingual children with DLD show weaker language profiles, especially in their heritage language, as compared to TD counterparts. It is also important to note that bilingual children with DLD tend to show earlier dominance in the community language, which contrasts with the heritage language strength seen in most TD children. These distinct developmental patterns observed between TD and DLD children provide additional evidence for the well-established literature about difficulties in language learning and use associated with DLD, extending to Mandarin-English bilingual populations.

CHILD Program Outcomes - Research Question 2

Increased Decontextualized Input

Main Effect of Time. The mixed ANOVA analysis of mothers' decontextualized language input revealed significant main effects of time (large effect size), group (medium effect size), and activity context (medium effect size), without any interaction effects. The biggest

takeaway is that the CHILD program successfully increased mothers' decontextualized language input across both TD and DLD groups, confirming our hypothesis that parent coaching focused on decontextualized language would produce measurable changes in this direct target. This study extends the evidence from previous intervention research on decontextualized input with monolingual preschoolers with typical development (Leech & Rowe, 2021; Morgan & Goldstein, 2004; Seven et al., 2020) to include bilingual preschoolers with language disorders.

Main Effect of Group. The mixed ANOVA analysis revealed a main effect of Group on mothers' decontextualized language input with a medium effect size. Mothers from the DLD group consistently produced a lower proportion of decontextualized input than mothers from the TD group across all activities, which persisted even after intervention. This finding aligns with Hilvert et al. (2021), who found that mothers of children with Down syndrome produced less decontextualized language compared to mothers of TD children. This group difference suggests that mothers adjust their language complexity to match their child's language abilities, providing evidence for the bidirectional influence in parent-child conversations (Majorano & Lavelli, 2014). However, despite natural tendencies to simplify language based on their children's abilities, mothers of children with DLD still successfully incorporated more sophisticated language forms when given explicit coaching.

Regarding decontextualized input in the TD group, baseline measurements in this study revealed notably higher proportions of decontextualized language (averaging 21.67%, see Table 10) compared to previous research findings of 7% and 11% reported by Demir et al. (2015) and Hilvert et al. (2021), respectively. This comparison is methodologically valid as the categorization and definition of contextualized and decontextualized language are highly consistent across all three studies. The observed difference is likely due to our child participants

being older preschoolers (average age = 4;11) compared to those in the other studies (average age = 2;6 in Demir et al., 2015; average age = 3;8 in Hilvert et al., 2021). This pattern aligns with Rowe's (2012; 2013) observation that parents significantly increase their use of decontextualized language during a child's fourth year, reflecting the developmental trajectory of language input complexity.

Looking at the subcategories of decontextualized language, descriptive statistics (Table 10) showed that narrative input consistently occurred at higher proportions than explanation input for both groups across all activities, particularly during play. This finding is consistent with the developmental progression documented by Rowe (2012), Grimminger et al. (2020), and Wei et al. (2020), where explanation language requiring more advanced linguistic skills occurs less frequently and emerges later in parent-child interactions than narrative language.

Main Effect of Activity Context. The significant main effect of activity context with a medium effect size indicates that different interaction contexts distinctly influence mothers' production of decontextualized language. This finding aligns with literature showing how activity contexts shape the form and content of parental language input (Holme et al., 2022; Rowe & Weisleder, 2020). Surprisingly, post-hoc comparisons with Bonferroni corrections showed that both play and snack activities elicited significantly higher proportions of decontextualized input than shared book reading. It is possible that the wordless, picture books (*Tuesday* and *Mr. Wuffles*) used in this study prompted mothers to focus on describing the visual content, thus naturally eliciting more descriptive language (e.g., labeling aliens' actions in the book *Mr. Wuffles*) than decontextualized language.

Play, which elicited the highest proportion of decontextualized language, provided meaningful opportunities for pretend narratives and causal explanations as mothers and children

engaged with the playdough. The constructive, open-ended nature of the toy play activity invited dyads to engage in imaginary scenarios (e.g., “You can order a pizza from my shop.”) and explain processes (e.g., “If you mix these colors, you cannot unmix them.”). This finding reinforces Doering et al.’s (2020) observation that toy play can generate rich linguistic interactions.

Snack activity also generated substantial decontextualized language, comparable to play. This finding supports previous research by Leech and Rowe (2021) and Snow and Beals (2006) highlighting mealtime conversations as opportunities for abstract discussions. The relatively face-to-face, stationary nature of snack time or mealtime may have facilitated conversations about people or objects not present in the context (e.g., “Where is daddy?” “He is doing some yard work with your brother.”), past events (e.g., “Remember last year we went to Grandma’s for Christmas.”) or future events (e.g. “We’ll go skiing this afternoon. Are you excited?”). This finding suggests that this routine also remains an optimal context for language enrichment for Mandarin-speaking families.

No Interaction Effects. The absence of any interaction effects, particularly no Group $\times$ Time interaction, has meaningful clinical implications. No Group $\times$ Time interaction indicates that, while the intervention is effective in increasing decontextualized language input for both groups, it did not close the gap between TD and DLD groups in terms of mothers’ language input behaviors. The parallel improvement trajectories (TD group: 21.7% to 33.3%, an increase of 11.6 percentage points averaging across the three activities; DLD group: 12.3% to 24.3%, an increase of 12.0 percentage points averaging across the three activities) suggest the intervention works equally well for both groups despite their different starting points. This finding disproves our hypothesis that the DLD group’s gains in outcome measures would be different from those seen

in the TD group. This persistent gap likely reflects mothers' continued sensitivity to their children's language abilities, remaining adjusted to their children's abilities even as they incorporate more sophisticated language forms.

The absence of Time $\times$ Activity and Group $\times$ Time $\times$ Activity interactions also suggests that mothers in both groups showed similar patterns of improvement regardless of whether they were engaging in reading, play, or snack activities. Together, these findings support the effectiveness of the CHILD program in increasing mothers' decontextualized input for both groups across different interaction contexts.

Increased Conversation Turns

Main Effect of Time. The mixed ANOVA analysis of conversation turn rates revealed significant main effects of time (large effect size) and activity context (medium effect size), without group or interaction effects. The most important finding was that the CHILD program successfully increased conversation turns for both TD and DLD groups, confirming our hypothesis that parent coaching focused on decontextualized language input would produce measurable changes in this indirect, cascading target: conversation turns. This study extends the evidence from previous intervention research with monolingual children with typical development (e.g., Leech & Rowe, 2021) to include bilingual children with language disorders.

No Group Effect. The mixed ANOVA analysis revealed no main effect of Group on conversation turn rates. This finding indicates that despite differences in children's language abilities, as reported in the language profiles analysis (Research Question 1), the TD and DLD groups maintained comparable conversation turn rates both before and after coaching. This finding is consistent with previous research by Conti-Ramsden et al. (1995), Goldman and DeNigris (2015), and Yuill and Little (2017), none of whom found significant quantitative

differences in conversation measures between DLD and TD child-parent dyads. As discussed previously, the absence of group differences in conversation engagement may reflect the compensatory role that parents of children with DLD play in maintaining conversational flow, accommodating their children's language ability while still fostering back-and-forth exchanges.

Main Effect of Activity Context. The main effect of activity context with a medium effect size indicates that different interactive contexts influence the rate of parent-child conversation turns differently. Post-hoc tests with Bonferroni corrections revealed that reading elicited significantly higher turn rates than snack activity. This finding suggests the inherently conversational nature of shared book reading (see Read et al., 2023 for a review of parent-child shared book reading research), which tends to prompt questions (e.g., “Are they aliens?” “Yes.”), comments (e.g., “I think the cat saw them!” “Oh no.”), and elaborations (e.g., “They are not Mr. Wuffles’ toys.” “Why?” “As they don’t have a price tag on their spaceship.”). The picture books used in this study contained no text, potentially encouraging more parent-child dialogue to co-construct meaning from the visual narratives, although with a lot of contextualized, descriptive language.

No Interaction Effects. No significant interaction effects in the conversation turns analysis offer some clinical insights. No Group $\times$ Time interaction suggests that both TD children and children with DLD show similar increases in conversations following the CHILD program. No Time $\times$ Activity interaction indicates that conversation turns increased consistently across all three activity contexts, providing evidence that the benefits of the CHILD program extend to various activities, not just specific contexts. This finding reinforces the effectiveness of the routine-based approach to teaching communication strategies in parent coaching interventions, aligning with the work by Akamoglu and Meadan (2018) and Masek et al. (2024),

who have found that incorporating intervention strategies into multiple everyday family routines produces positive effects on both parent implementation and child communication outcomes. Finally, the non-significant three-way interaction further confirms the consistency of improvement across groups and activities.

Together, these findings on the outcome of conversation turns complement the findings on the outcome of decontextualized input, demonstrating that the CHILD program has successfully influenced both direct (decontextualized input) and cascading (conversation turns) targets. The consistent improvement across both TD and DLD groups indicates the value of parent coaching on interactive language as an effective intervention approach for bilingual children with language disorders.

Parent-Child Interactions

Taking a closer look at parent-child interactions across reading, play, and snack activities, this study found a high level of mother-child correlations in their use of Mandarin, narrative, and explanation language (Table 15). The correlation findings suggest that parents provide natural language models for their children in interactions across contexts.

Context-Based Differences in Dyadic Language Use. Play is the activity context showing the highest level of bidirectional influence in mother-child conversation behaviors, having significant correlations in 9 out of 12 tested variables in the total sample. All mother-child dyads demonstrated strong correlations in Mandarin use and narrative language during play. This finding is important as Jokihaka et al. (2022) found that preschoolers with DLD (ages 3 to 6 years) who experienced fluent and attuned dyadic behavior with their parents in play demonstrated better receptive language at baseline and better expressive language at follow-up (ages 6 to 7 years). The synchronized interactions during open-ended play appear to create what

Jokihaka et al. (2022) described as a “connected and mutually attuned parent-child relationship” that can serve as a protective factor for language development in preschoolers with DLD. In contrast, reading and snack activities in this study showed fewer correlations in dyadic language use. Although shared book reading has elicited more conversation turns as reported earlier, reading is a relatively more structured activity than play, which may reduce the need for spontaneous language coordination.

Group-Based Differences in Dyadic Mandarin Use. An important finding was that DLD dyads consistently showed strong correlations in Mandarin use in all conditions, while TD dyads showed more variable patterns. This observation reinforces the earlier finding that children with DLD showed strong correlations between their Mandarin exposure and performance, unlike the TD group (Table 9). This linguistic alignment in DLD dyads suggests that children with language disorders rely more on parental language models and immediate language input to promote their heritage language use.

Dyadic Use of Decontextualized Language. Consistent with the findings from previous intervention studies (Morgan & Goldstein, 2004; Seven et al., 2020), this study also found that children’s decontextualized language use mirrored their mothers’ both before and after coaching. This correlation pattern suggests the increased dyadic use of decontextualized language because of the targeted intervention. Narrative language showed more mother-child correlations (7 out of 12 tested variables) than explanation language (3 out of 12 tested variables) in the total sample. The lower dyadic alignment in explanation language use again reflects its more cognitively demanding nature. Interestingly, post-coaching correlations in parents’ and children’s explanation language use were observed predominantly in the DLD group, particularly during reading and snack activities. This suggests that the CHILD program may have helped parents of

children with DLD to scaffold this more complex form of decontextualized language in ways that enabled greater dyadic alignment, even with children who have language learning and use challenges.

Theoretical and Clinical Implications

The study provides valuable evidence supporting the developmental cascades framework to explain child development. First, we observed that modifications to one system of language development (language input) produced cascading effects on another (parent-child interactions). The significant increase in conversation turns following intervention, despite conversation turns not being directly targeted, supports the developmental cascades principle that “changes at one point in time set the stage for changes and developments at another point in time” (Oakes & Rakison, 2019, p. 104). Second, this study extends the developmental cascades theory to a new population: bilingual children with language disorders. Children with DLD demonstrate weaker language profiles overall as well as a higher risk of heritage language attrition than their TD peers. This study recognizes that the underlying difficulties in language learning and use could shape language acquisition trajectories.

This intervention study also provides many clinical implications for speech-language pathologists and other professionals working with bilingual preschoolers with DLD. First, the results from Research Question 1 indicate the importance of conducting language assessments in both languages for bilingual children whose heritage language is not the community language. Children with DLD may show different profiles of strengths and weaknesses across their languages, with notable vulnerability in their heritage language development despite similar exposure levels as their TD peers. If only one language of bilingual children has been assessed, clinicians might miss important clinical information. Aligning with American Speech-Language-

Hearing Association's guideline "*Multilingual Service Delivery in Audiology and Speech-Language Pathology*" (n.d.), the assessment of all the languages used by a child will allow clinicians to distinguish between language difference and language disorder, develop intervention goals that address the unique language needs of the child across their languages, and provide language-specific intervention strategies.

Second, the vulnerability in heritage language development as well as the strong exposure-performance associations in DLD suggest that young children with language disorders may require more consistent and substantial heritage language input to develop or maintain proficiency comparable to their TD peers. Clinicians should work with non-English speaking families to identify the goals for their child's language development. If families hope to support their child's heritage language development, clinicians may advise families of children with DLD to (1) encourage continued, consistent exposure to the heritage language from native speakers at home (often parents or grandparents), (2) reassure parents that exposure to two languages does not cause or exacerbate language disorders, but that their child may need more intentional or high-quality support in the heritage language such as reading Chinese books. This approach supports additive bilingualism (De Houwer, 2020; Moore & Pérez-Méndez, 2006) while recognizing the unique needs of children with language disorders for developing heritage language proficiency.

Third, this study demonstrates that explicitly teaching parents to increase decontextualized input is beneficial for bilingual children with DLD. Even within a short time (one month), parents successfully incorporated more sophisticated language forms, which cascaded to increased conversation turns with their children. Clinicians may consider (1) including decontextualized language input as a recommendation in parent coaching for preschool

populations, and (2) teaching parents to recognize opportunities for narrative and explanation language during daily activities. This focus on decontextualized language may help prepare children with DLD for the academic language demands they will face in educational settings in later childhood.

Finally, the differential effects of activity contexts on parent-child interactions highlight the value of a routine-based intervention approach. The findings that play elicited the highest proportion of decontextualized language, reading generated the most mother-child conversation turns, and both play and snack time showed strong parent-child language synchrony suggest that combining various activities can leverage the strengths of each context. A routine-based approach builds on existing family practices, enhancing cultural responsiveness and implementation fidelity. Therefore, clinicians should help parents identify routines where they already engage their child in verbal interactions for implementing language support strategies, with awareness that different activities may naturally elicit different forms and content of language. The goal of this approach is creating a linguistically rich environment across the child's daily experience.

Limitations and Future Directions

Several limitations should be considered when interpreting the findings of this study. First, the sample size was relatively small (TD = 11; DLD = 9), which may have limited statistical power to detect smaller effects, particularly in interaction analyses. Additionally, the sample demographics reflected high socioeconomic status (SES) families, with relatively high household incomes (no less than \$150k for 72.7% of TD and 66.7% of DLD families) and maternal education levels (all mothers had a college degree, with 63.7% of TD and 66.6% of DLD mothers holding Masters' or PhD degrees). Future studies should evaluate the CHILD

program's effectiveness across diverse SES populations to enhance the generalization of findings.

Another limitation concerns the duration of the CHILD program. The coaching consisted of reviewing coaching materials and attending two Zoom sessions with a one-month interval between pre- and post-assessments. This intensive but brief coaching protocol may be insufficient to produce more substantial changes, particularly in children's language behaviors. During post-coaching interviews, several parents expressed a desire for additional coaching sessions to further develop target skills in their children. The results of the parent feedback survey reflect a higher agreement level regarding parental behavior changes (94.7% agreed they now initiate more decontextualized talk) compared to child behavior changes (78.9% agreed their child now initiates more decontextualized talk). This feedback pattern suggests that while parents have successfully incorporated more sophisticated language forms, the one-month intervention period may be insufficient to detect the changes in children's language behaviors. For example, a follow-up assessment at 12-month post-intervention would help determine whether the immediate gains will be maintained and if additional changes in children's language behaviors will emerge over time.

For future studies, examining the effects of specific types of decontextualized language input is a promising direction. The current study observed that narrative input consistently occurred at higher frequencies than explanation input across both groups. Future research could compare focused interventions targeting either narrative or explanation language to determine which approach may produce stronger cascading effects on bilingual children with language disorders.

Finally, the generalization of these findings to bilingual populations beyond Mandarin-English speakers requires caution. Cross-linguistic research (Blom et al., 2020; Blom et al., 2021; Sussman et al., 2023) has demonstrated that linguistic distance between languages influences bilingual language acquisition patterns in young children. The specific linguistic properties of Mandarin that differ from English (such as topic-prominence rather than subject-prominence, lexical tone system, and word order reliance rather than morphological reliance) may result in language-specific manifestations of DLD, as documented in the review by Sheng et al. (2023). Future research may examine whether the effects of decontextualized language coaching extend to other language pairs with varying degrees of linguistic distance.

Conclusion

This study examined the association between parental decontextualized input and parent-child conversations in Mandarin-English bilingual preschoolers with and without DLD. The CHILD parent coaching program successfully increased mothers' decontextualized language input and dyadic conversation turns across both groups, though mothers of children with DLD produced lower proportions of decontextualized input in all conditions, suggesting sensitivity to their children's language abilities. This study challenges deficit-oriented perspectives by showing that bilingual children with DLD benefit from sophisticated language input when appropriately supported.

This research has translated the developmental cascades model into an intervention program (the CHILD program), demonstrating how modifications to parental input in daily interactive activities can produce cascading effects on parent-child conversations. The CHILD program addresses a gap in research by providing evidence for the effectiveness of decontextualized language coaching with children with language disorders, while also

establishing the feasibility of remote parent coaching mode. Additionally, the CHILD program is designed as a collaborative, family-centered, and culturally responsive approach to support bilingual families. The high parent satisfaction ratings demonstrate that this approach empowers parents, creating improvements in the language environments of bilingual children with language disorders.

Appendix A Language Development Milestones

3-4 Years Lexicon & Semantics Possessive, Negatives, location words, 1000 vocabulary words Morphology & Syntax Comparing things with words, Simple WH questions, Combine 3+ words, Produce complete sentences, Use passive “BEI”, Use active “BA” Narrative & Discourse Retell stories, narrate events, explain reasons Speech 75% intelligibility for unfamiliar listeners Early Literacy Pretend to read by turning pages, pretend to writing, Write a few English letters/Chinese Characters, Read 5 Chinese characters without using Pinyin	3-4 岁 词汇与语义 所有格、否定词、位置词、1000 个词汇量 形态学与句法 用词语比较事物（“比我大”）、理解和表达简单的特殊疑问句（“什么时候睡觉？”，“为什么没有饼干”）、组合 3 个以上的词、使用完整的句子、使用“被”字句和“把”字句 叙事与话语 复述故事、叙述事件、解释原因 语音 对于陌生人，75%的发音可以被理解 早期读写能力 假装阅读（翻页）、假装写字、能写几个英文字母或者汉字、不使用拼音时能认读 5 个汉字
4-5 Years Lexicon & Semantics Adjectives and descriptions in sentences, time words (e.g., tomorrow, yesterday) Morphology & Syntax Grammatically correct sentences, longer and more complex sentences Narrative & Discourse Telling stories related to topic, story elements of character and settings, 4+ back and forth conversation turns Speech 100% intelligibility for unfamiliar listeners, 90% of consonants in their language(s) by age 5 Early Literacy Locate the front of a book and its title, name 10 English letters or 10 Chinese characters, write own name and 10+ Chinese characters, identify rhyming words	4-5 岁 词汇与语义 在句中使用形容词和描述，理解和使用时间词（例如：明天、昨天） 形态学与句法 表达语法正确的句子，使用更长和更复杂的句子 叙事与话语 讲述与主题相关的故事，故事中包含人物和背景等元素，能进行 4 轮以上的对话交流 语音 对于陌生人，100%的发音可以被理解；到 5 岁时，90%的所学语言中的辅音发音正确 早期读写能力 能指出书的封面和标题，说出 10 个英文字母或 10 个汉字，能写出自己的名字和 10 个以上的汉字，能识别押韵的词

Adapted from [ASHA’s Developmental Milestones: Birth to 5 years](#) (ASHA, n.d.), [Bilingualistics Apples to Apples](#) (2013), [Bilingualistics Early Language Milestones](#) (2013), [CDC’s Get Free “Learn the Signs. Act Early.” Materials](#) (CDC, n.d.), and Wu (2023)

Appendix B Fidelity Checklist

Pre-Coaching Assessment	Attendees: Coach Parent Child	Y	N	N/A
Greet the child by saying something like: “Hello [child’s name]! My name is Laura. I’m excited that today you, mom/dad, and me are going to do some fun activities together. 你好！我的名字是 Laura。今天很开心我们可以一起做一些有趣的活 动。”				
After obtaining parent’s verbal approval, start the Zoom recording .				
Follow MAIN ’s protocols to conduct the retelling task in both English and Mandarin . Start with the child’s stronger language as reported by parent. Provide verbal instructions - saying something like: “We’ll listen to two stories while looking at some pictures. After each story, you get to be the storyteller and tell the story back to me in your own words. I’ll also ask you some questions about what happened in the stories. The first story is in Mandarin/English, and the second story is in English/Mandarin. 我们要听两个故事，同时看有趣的图片。听完每个故事后，你就用你的话把故事再讲给我听。我还会问你一些关于故事的问题。第一个故事我们用中文/英文讲，第二个故事用英文/中文讲。”				
Provide verbal instructions for the interactive activities to the parent, by saying something like: “First, mom/dad and [child’s name] will read the picture book together, play with the playdough set, and then [child’s name] can have some snacks with mom/dad sitting next to [child’s name]. You have 5-10 minutes for each activity. Make sure that you two stay in front of the screen so that Zoom can capture your voice and actions. I will turn off my camera and mute myself. When time is up, I will come back on. 首先，妈妈/爸爸和[儿童姓名]将一起读那本图片书，玩橡皮泥，然后[儿童姓名]可以在妈妈/爸爸陪同下吃零食。每项活动大概 5 到 10 分钟的时间。请确保你们保持在屏幕前面，这样 Zoom 才能捕捉到你们的声音和动作。在此期间，我会关闭摄像头并保持静音。等时间到了，我会重新加入。”				
Follow the LEAT ’s protocols to gather information about the child’s language exposure.				
Use the Bilingual Environments Survey to gather the child’s demographic information.				
Tell the parent to review coaching materials which will be sent to them shortly.				
Schedule the next meeting.				
Meeting Fidelity Result *Exclude N/A (# of Yes)/ (# of Yes + No) = _____				

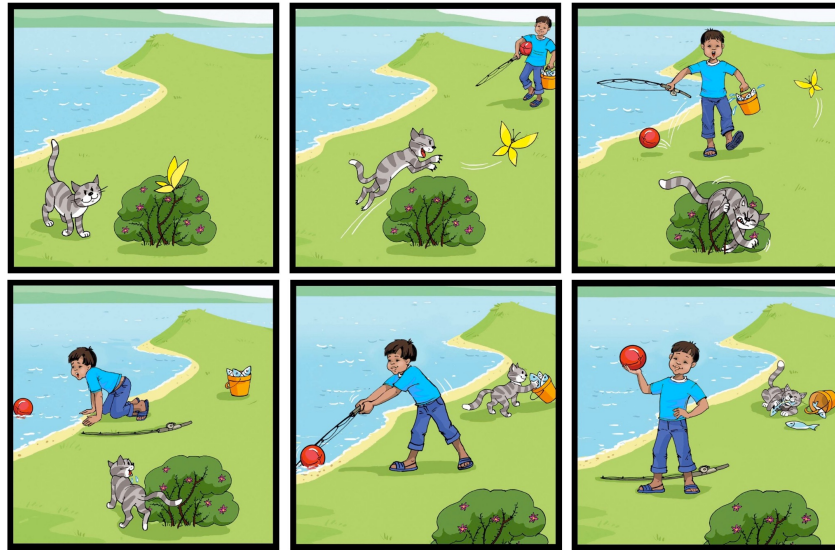
Coaching #1	Attendees: Coach Parent		Y	N	N/A	Notes
Inform that the session will be video recorded. After obtaining parent's verbal approval, start the recording.						
Introduce today's agenda.						
Using Handout #1, confirm that the parent understands and agrees with the CHILD program coaching goal.						
Use Handout #2 "Milestones" as a guideline to discuss: - Any questions that the parent has about their child's current level of Mandarin and English language skills. - The child's strengths and areas of support in communication.						
Use Handout #4 "Decontextualized Talk" to discuss: Definitions and examples of decontextualized talk.						
Use Handout #5 "Language Interaction Feedback" - Watch two pre-selected video clips of parent-child interaction. - Prompt the parent to describe where they are doing well in initiating decontextualized talk or providing contingent responses to the child's decontextualized talk, by saying something like "Did you notice the places where you used decontextualized language with your child? 您注意到在哪些地方你和你的孩子使用了脱离语境的语言了吗?" - Confirm and describe about the strengths. "You're right. I also heard something good. 我同意。我也听到了一些很棒的。" - Point out the areas where the parent can provide decontextualized input by saying something like: "I think this is a good place to initiate decontextualized talk. 我觉得这儿也适合使用脱离语境的对话。"						
Use Handout #6 "Daily Routine Application" as a guideline to: Identify three routines to increase decontextualized input: "Think about three regular routines that you and your child share. These could include indoor or outdoor play, book reading, snack and mealtime, bath time, bedtime, walks, car rides, public transit rides, or any other activities important and unique to your family. 请思考您和孩子共同进行的三个您和孩子一起参与的常规活动。可能包括：室内或室外玩耍、读书、点心和用餐时间、洗澡、睡前时间、散步、坐车、乘坐交通工具，或任何对您家庭重要且独特的活动。"						
Inform parents about their homework: increasing decontextualized input during the three identified routines.						
Schedule the next meeting.						
Meeting Fidelity Result *Exclude N/A (# of Yes)/ (# of Yes + No) = _____						

Coaching #2	Attendees: Coach Parent	Y	N	N/A	Notes
Inform that the session will be video recorded. After obtaining parent's verbal approval, start the recording.					
Ask the parent to share their experiences of increasing decontextualized input with their child for the past week. Example prompts: "How has it been going this past week as you increased using narratives and explanations with your kids in daily conversations? 在过去这一周，当你尝试增加与孩子的叙事性和解释性对话时，效果如何？” “Which daily activities have you practiced decontextualized talk? 哪些日常活动你尝试增多了脱离语境的对话？”					
Answer questions that the parent has about the coaching program.					
Encourage the parent to keep practicing decontextualized talk with their child.					
Schedule the next meeting.					
Meeting Fidelity Result *Exclude N/A (# of Yes)/ (# of Yes + No) = _____					

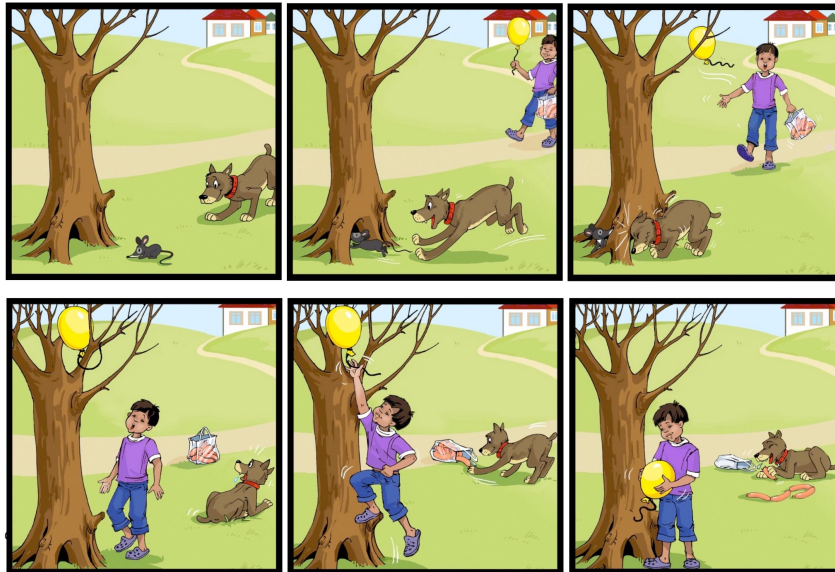
Post-coaching Assessment	Attendees: Coach	Parent	Child	Y	N	N/A	Notes
Inform that the session will be video recorded. After obtaining parent's verbal approval, start the recording.							
Introduce today's agenda.							
Provide verbal instructions for the interactive activities to the parent, by saying something like: "First, mom/dad and [child's name] will read the picture book together, play with the playdough set, and then [child's name] can have some snacks with mom/dad sitting next to [child's name]. You have 5-10 minutes for each activity. Make sure that you two stay in front of the screen so that Zoom can capture your voice and actions. I will turn off my camera and mute myself. When time is up, I will come back on. 首先, 妈妈/爸爸和[儿童姓名]将一起读那本图片书, 玩橡皮泥, 然后[儿童姓名]可以在妈妈/爸爸陪同下吃零食。每项活动大概 5 到 10 分钟的时间。请确保你们保持在屏幕前面, 这样 Zoom 才能捕捉到你们的声音和动作。在此期间, 我会关闭摄像头并保持静音。等时间到了, 我会重新加入。"							
Gather feedback on the CHILD program: Parent complete an interview with the coach and a google form survey. Interview questions: "What aspects of this coaching program did you find most valuable? 这个培训项目中哪些方面对您最有帮助? What aspects of the coaching program could be improved? 这个项目有哪些方面可以改进? Did you feel comfortable and respected during the coaching sessions? Please explain. 您在培训课程中是否感到舒适和受尊重? 请说明。 What changes have you made or plan to make in your communication with your child because of this program? 通过这个项目, 您在与孩子的沟通方面已经做出了或计划做出哪些改变? What topics or skills were you hoping to learn that weren't covered in the coaching? 在培训中有哪些您希望学习但未涉及的主题或技能? "							
Inform the parent that the program is completed and thank them for the participation.							
Meeting Fidelity Result *Exclude N/A (# of Yes)/ (# of Yes + No) = _____							

Appendix C MAIN Picture Stimuli (Bohnacker & Gagarina, 2019)

“Cat”



“Dog”



Appendix D Parent-Child Interaction Annotations Example

	A	B	C	D	E	F	G
1	Speaker: Utterance	Turn	Language	Decontextualized	Note	Duration = [01:12.040 - 14:36.220] = 13.4	13.4
2	*MOT: let's read it okay .					Turn #	68
3	*MOT: Mr Wuffles .				book title	Mandarin utterance # by mother	76
4	*MOT: 这是什么动物 ?		Man_MOT			Mandarin utterance # by child (Man_CHI)	2
5	*CHI: 猫咪 .		Man_CHI			Narrative # by mother (Nar_MOT)	44
6	*MOT: 猫咪 .		1 Man_MOT			Narrative # by child (Nar_CHI)	19
7	*MOT: oh it's bumpy .					Explanatory # by mother (Exp_MOT)	8
8	*CHI: it's one of the best books at school .		1	Nar_CHI	books at school	Explanatory # by child (Exp_CHI)	5
9	*MOT: 哦 大声音 .		Man_MOT		directive language	Utterance # by mother speaker	207
10	*MOT: 她听不见你 .		Man_MOT			Utterance # produced by child speaker	70
11	*MOT: 她想听你说话 .		Man_MOT				
12	*CHI: okay .		1				
13	*MOT: okay it's one of the best books .				repeat child's words		
14	*MOT: the best books 这个是吧 ?				repeat child's words		
15	*CHI: yeah .		1				
16	*MOT: 别的书有吗 ?		Man_MOT	Nar_MOT	ask about other books		
17	*CHI: no .			Nar_CHI	respond to a nar question		
18	*MOT: no okay .		1				
19	*CHI: at the library at school .			Nar_CHI	library at school		
20	*MOT: at library you saw it ?		1		expand		
21	*MOT: oh it's like a comic book ?				comment on the book Mr. Wuffles		
22	*MOT: look Mr Wuffles a new toy .						
23	*MOT: 一条小鱼 .		Man_MOT				
24	*MOT: oh Mr Wuffles .						
25	*MOT: 你觉得他喜欢这个小鱼吗 ?		Man_MOT	Nar_MOT	"喜欢" mental state		
26	*MOT: 为什么 ?		Man_MOT	Exp_MOT	"为什么" why		
27	*CHI: i don't know .		1		I don't know - no credit		
28	*MOT: Mr Wuffles .						
29	*MOT: 哇 它有这么多玩具 .		Man_MOT				
30	*MOT: 好多哈 .		Man_MOT				
31	*MOT: 你觉得它喜欢哪个 ?		Man_MOT				
32	*CHI: no .				no - no credit		
33	*MOT: no .		1				
34	*MOT: 比如说这个是你的玩具 你最喜欢哪个 ?		Man_MOT	Nar_MOT	pretend - if these are your toys, which one is your favorite?		
35	*CHI: 这个 .		1 Man_CHI	Nar_CHI			
36	*MOT: 你会最喜欢这个小鱼 .		Man_MOT	Nar_MOT			
37	*MOT: 我们家也有一个是吧 ?		Man_MOT	Nar_MOT			
38	*MOT: what's this look like ?						
39	*MOT: 这像什么 ?		Man_MOT	Nar_MOT			
40	*MOT: 这里面是这些 .		Man_MOT				
41	*MOT: what is it ?						
42	*CHI: aliens .						
43	*MOT: aliens wow aliens .		1				
44	*MOT: 他在说什么东西呢 .		Man_MOT				
45	*MOT: let's see .						
46	*MOT: 哇 他们说的语言我听不懂 .		Man_MOT				
47	*MOT: 你说他们在说什么 ?		Man_MOT	Nar_MOT			
48	*MOT: 这个不是English .						

Appendix E Feedback Interview Questions

1. What aspects of this coaching program did you find most valuable?

这个培训项目中哪些方面对您最有帮助？

2. What aspects of the coaching program could be improved?

这个项目有哪些方面可以改进？

3. Did you feel comfortable and respected during the coaching sessions? Please explain.

您在培训课程中是否感到舒适和受尊重？请说明。

4. What changes have you made or plan to make in your communication with your child as a result of this program?

通过这个项目，您在与孩子的沟通方面做出了或计划做出哪些改变？

5. What topics or skills were you hoping to learn that were not covered in the coaching?

在培训中，有哪些您希望学习但未涉及的主题或技能？

Appendix F Parent Feedback Survey

CHILD Program Parent Feedback Survey / CHILD 培训项目家长反馈调查

Please rate each statement on a scale of 1-5: / 请按 1-5 级评分:

1 = Strongly Disagree / 强烈不同意

2 = Disagree / 不同意

3 = Neutral / 中立

4 = Agree / 同意

5 = Strongly Agree / 强烈同意

Overall Program Impact / 整体项目影响

1. The CHILD coaching program met my expectations for supporting decontextualized language use (e.g., narratives and explanations) in my child *

CHILD培训项目满足了我对促进孩子使用脱离情境化语言（如叙事和解释）的期望

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

2. The CHILD coaching program met my expectations for supporting Mandarin and/or English language development in my child *

CHILD培训项目满足了我对促进孩子中文和/或英文语言发展的期望

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

3. I would recommend this program to other families wanting to increase decontextualized language in their 4-5 year olds *

我会推荐这个项目给其他想增加4-5岁孩子使用脱离情境化语言的家庭

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

4. The online format was effective for parent coaching on language interaction strategies *

在线形式对于指导家长学习语言互动策略是有效的

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

5. Overall, I am satisfied with the CHILD program *

总的来说，我对CHILD项目感到满意

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

Effects on Language Practices / 语言实践效果

6. I have learned effective strategies for using decontextualized talk with my child *

我学会了与孩子进行脱离情境化对话的有效策略

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

7. I have learned effective strategies for eliciting more language from my child *

我学会了引导孩子说更多话的有效策略

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

8. I now initiate more decontextualized talk (such as past/future events, explanations, predictions) with my child

*

我现在会主动与孩子进行更多脱离情境化对话（如谈论过去/未来的事件、解释和预测）

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

9. My child now initiates more decontextualized talk (such as past/future events, explanations, predictions) with me

*

我的孩子现在会主动与我进行更多脱离情境化对话（如谈论过去/未来的事件、解释和预测）

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

10. My child now engages in more conversations with family members in English or Mandarin

*

我的孩子现在用中文或英文与家人进行更多对话

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

Direct Coaching Impact / 直接培训效果

11. The coach respected our family's goals for child language development

*

培训老师尊重我们家庭对孩子语言发展的目标

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

12. The coach provided culturally appropriate suggestions for parent-child interactions *

培训老师提供了符合文化背景的家长儿童的语言互动建议

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

13. The coach provided helpful feedback using our parent-child interaction recordings during reading, play, and snack time *

培训老师利用我们在阅读、游戏和点心时间的亲子互动录像提供了有帮助的反馈

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

14. The coach answered my questions professionally *

培训老师专业地回答了我的问题

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

15. The coach helped me develop strategies tailored to my child's specific needs *

培训老师帮助我制定了适合我孩子特定需求的策略

	1	2	3	4	5	
Strongly Disagree / 强烈不同意	☐	☐	☐	☐	☐	Strongly Agree / 强烈同意

Thank you for your feedback! 谢谢您提供的反馈!

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