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Assessing Parental Conversational Overlap in a Museum Setting and Its Correlation with Child Language Skills

Madison Gould
University of New Hampshire, Durham

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Madison Gould

Department of Communication Sciences and Disorders

Honors Thesis

Thesis Advisor: Dr. Jill Thorson

Communication, Acquisition, and Translational Studies (CAT) Lab

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Abstract

Research has identified the importance of quality interactions with parents, caregivers, and peers in the promotion of language acquisition. We question how certain aspects of parental language, primarily repetition, expansion, and extension, correlate with child language skills. There is limited research available regarding the impact of conversational overlap on a child's language development at a singular time point, with most studies being longitudinal, especially when assessing conversations between children and their caregivers in different settings, such as a museum exhibit. Our findings suggest that children need less parental recasting as they age and as their language skills are bolstered.

Keywords: conversational overlap; parental input; repetition; expansion; extension; lexical diversity

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Introduction

The acquisition of language is essential for humans to be able to communicate with one another and share their own wants and intentions. Before we are even born, we are listening and absorbing surrounding speech information to add to our understanding of speech and language. As we continue to develop, so too does our language. However, not every child develops at the same rate, as they may experience different personal and environmental factors. One of these environmental factors is a child's interactions with others. Research has identified the importance of quality interactions with parents, caregivers, and peers in the promotion of language acquisition. There are many factors that influence the quality of a verbal interaction, such as caregiver utterance length, contingently related responses, and providing the child the necessary time to respond. Another factor that aids in the growth of language skills is the use of *child-directed speech* (CDS). When analyzing the linguistic features of CDS, we notice an increase in pitch, a slower duration, and exaggerated prosody and articulations. We also see the use of *repetitions*, *expansions*, and *extensions*, which may also be referred to as conversational overlap.

Current research examining conversational overlap has mainly focused on the overlap in content specifically between a mother and their child, with CDS often being referred to as *motherese* or *parentese*. When conversing with one another, both caregiver (often the mother) and child tend to repeat back their partner's words, building on what was previously said. Different forms of overlap include 1) *repetitions*, a parent's tendency to reuse the same words repeatedly in adjacent sentences, 2) *expansions*, in which a child's utterance is both repeated and expanded upon syntactically to add missing words and correct grammar, and lastly, 3) *extensions*, where the

conversational partner takes expansions a step further to also add additional information (Schwab et al., 2016). The forms of conversational overlap provide insight on how our turn-taking skills develop, which are vital in conversations. These turn-taking skills are also impact and contribute to a child's language growth. Verbal overlaps in content are interesting since they show that the speaker is paying attention to the utterances of their conversational partner, as well as following the topic of the conversation (Casla et al., 2022). Due to this, conversational overlap plays a meaningful role in language growth over time by providing new content that has immediate relevance to the context.

Of the three measures of conversational overlap identified, expansions play a unique role in that they provide two types of input: 1) *data providing*, in which a parent's language helps map references to words, and 2) *socio-pragmatic*, in which the parent's response is both relevant and coordinated to a child's utterance. Taumoepeau (2016) examined the importance of expansions and claimed that they provide an efficient and powerful context for learning vocabulary. In this longitudinal study, 79 children were assessed using a picture-book task at four time points (15, 24, 33, and 54 months). Taumoepeau (2016) found that there was a significant effect of maternal expansions on their child's acquisition of word types and that higher rates of expansion at a young age correlated with larger child vocabularies at age 2 (Taumoepeau, 2016).

Previous studies recognizing the importance of repetitions and expansions have also looked at their effect on the language skills of children with certain disorders, like autism spectrum disorder (ASD) and children with varying degrees of hearing loss. Specifically, Smith et al. (2022) placed repetition and expansion into the overall category of *discrete maternal responsiveness*, which also includes the use of WH-questions, yes/no-questions, comments, and acknowledgements. The analyzed data from 53 dyads of parents and their preschoolers with ASD

to investigate how discrete maternal responsiveness might act as a predictor of later child language ability. The collected data suggested that parental imitations and expansions of their child's utterances were the biggest predictor of improved child language ability, as expressed through parent reports of expressive communication, spoken vocabulary, and receptive language. These findings support the hypothesis that aspects of conversational overlap will positively influence a child's language ability at a later time point (Smith et al., 2022). The question then arises if these findings might also extend to other children, whether that be children with other developmental disabilities or those who are neurotypical.

Lester et al. (2022) provided additional information on the topic by analyzing how conversational overlap occurs in a multitude of languages using child-surrounding speech (CSS) and how patterns of repetition vary across a child's development. CSS references the language that parents and caregivers use when they know a child may be in their presence. Their study began within the framework that "one of the best predictors of learning across levels of linguistic structure is pure frequency" (Lester et al., 2022, p. 2). Data were gathered from databases regarding both child-surrounded speech (CSS) and adult-directed speech (ADS) to compare the amount of variation and repetition that occur within each type. Lester et al. (2022) found evidence of repetition in both sets, and that repetition occurred unknowingly and more frequently in ADS. They found that the repetition of language stretches beyond individual words and morphemes and extends into our articulation and prosody, suggesting that its presence in child-directed speech serves as a reliable cue to word segmentation, word meaning, and learning of word class (Lester et al., 2022).

There is limited research available regarding the impact of conversational overlap expressed via repetition, expansions, and extensions on a child's language development at a

singular time point, with most studies being longitudinal. There has also been less work when assessing conversations between children and their caregivers in unique settings, such as a museum exhibit. Additionally, there is also a lack of research assessing the correlations between parental input via conversational overlap and a child's score on a standardized language assessment. Research on this topic would benefit parents in that they would learn how to strengthen their interactions with their child to facilitate optimal language development from different environments. Additionally, this research would also benefit practicing speech-language pathologists (SLPs) who are planning how to proceed in therapy sessions. Should conversational overlap and spontaneous verbal repetition be an aim of therapy sessions? Could a lack of overlap potentially explain a child's language deficits? Research in this area would provide insight regarding a child's pragmatic ability of turn-taking, which may, in turn, affect other language areas such as their lexical diversity. The goal of the current study is to investigate the potential connections between parental repetition, expansion, and extension and child language ability, which may influence how parents interact and converse with their children.

The primary aim of this study is to expand on the current knowledge regarding factors of language acquisition and to specifically investigate how the features of conversational overlap (repetition, expansion, extension) interact with language ability. I hypothesize that the amount of conversational overlap via parental repetition will positively correlate with a higher score on a language assessment for the child and will positively correlate with higher levels of lexical diversity and utterance length, measured via type-token ratio (TTR) and mean length of utterance (MLU). This hypothesis is supported by Che et al. (2018), which found that rates of maternal overlap of child utterances at earlier time points positively correlated with child scores of utterance length, sentence structure, and lexical diversity. Based on pervious research, it is predicted that

higher levels of conversational overlap (i.e., increased repetitions, expansion, and extensions) at a young age will correlate with increased language ability.

A secondary aim is to examine any correlations that may be present between the forms of conversational overlap and a given age-group, observing if there is a rise or decline in the amount of overlap as a child ages. Casla et al. (2018) hypothesized that levels of conversational overlap would decrease by the time a child reaches age 2, however, levels of overlap and repetition were found to be fairly stable across the timeframe that they examined. While discussing possible limitations of the study, the authors suggest that range of child age within the study may not have been wide enough to meet their initial hypothesis. With Project ACME and this study analyzing data from children aged 3;2 to 6;9, it is hypothesized that the levels of conversational overlap will be observed to decrease across participant age groups.

Methods

The current study analyzed data from Project ACME (Advancing Children's Museum Engagement). Project ACME audio and video recorded natural play sessions between caregiver-child dyads during museum exhibit exploration at a children's museum. For the current study, the language samples were further analyzed using Systematic Analysis of Language Transcripts (SALT) (Miller & Iglesias, 2012), which allows for the analysis of language samples using reference databases for comparison with typical peers. The program is also used to extract complex measures of child language, including quantity (via word tokens), quality (via type-token ratio, or TTR, and vocabulary diversity, or VOCD), and complexity (via mean length utterance, or MLU) of their language within interactions. This study also examines the data cross-sectionally to examine if language ability varies across development by using the Core Language Scores from the Clinical Evaluation of Language Fundamentals Preschool-2 (CELF-P2) (Secord et al., 2004).

By analyzing the data extracted from Project ACME, we hope to gain further insight on how conversational overlap measured via repetition, expansion, and extensions correlates with measures of language ability and a child's score on the CELF-P2 (Secord et al., 2004), as well as the child's scores of lexical diversity and vocabulary size.

Participants

Participants for Project ACME were recruited via the museum's website and through their social media pages, locally distributed IRB-approved flyers detailing the study, and through word of mouth. For dyads that consented to participate in the study, they received free admission to the museum for that day, as well as a $25 gift card once research tasks were completed successfully. For inclusion, the children had to be between 3;0 and 6;11, typically developing, native English speakers, have normal or corrected-to-normal vision/hearing, and be able to provide verbal assent.

Procedure and Analysis

Upon arrival, the study was explained, and consent and assent were obtained. Caregivers completed a demographic survey, and the child was administered the Clinical Evaluation of Language Fundamentals-Preschool, Second Edition (CELF-P2) (Secord et al., 2004). The CELF-P2 is an assessment designed to analyze a child's language skills between the ages of 3;0 and 6;11. In this assessment, children completed the sentence structure, word structure, and expressive vocabulary sections to yield a Core Language score. The caregiver-child dyad was then led to one and then the other of two exhibits in the museum (Castle and River). In these exhibits, natural play was observed for 15 minutes (plus 5 minutes for clean-up) between caregiver-child dyads during exhibit exploration, with novel materials provided. For this study, the Castle Exhibit was utilized and included open-ended style toys (e.g., blocks, felt boards, castle figurines). To collect the language samples, participants wore Bluetooth Samson XPD1 audio headsets that wirelessly

uploaded to GarageBand for recording. The first 15 minutes out of the 20-minute spontaneous language samples were analyzed to ensure consistency across samples. Of the 38 participant files contained within project ACME, 28 dyad play sessions were transcribed using the recommended SALT conventions and used for the analysis in this study.

Recordings were transcribed and analyzed using SALT (Miller & Iglesias, 2012) as well as the acoustic software Praat (Boersma & Weenink, 2022). The children in the study were between the ages of 3 and 6 years old, with an average age of approximately 4;10.

The first 15 minutes of each participants' session were transcribed using SALT conventions and then reviewed by another research assistant for reliability. The transcriptions were then further coded for instances of repetition, expansion, and extension using the codes indicated in Table 1. The following criteria were considered when identifying each measure:

Table 1. *Table depicting definitions and examples of the overlap measures of repetition, expansion and extension.*

Measure	Definition	Example
Repetition	The parent or guardian reuses the words of the adjacent child utterance in their following sentence	C There's four! P There's four!
Expansion	The previous child utterance is both repeated and expanded upon syntactically by their parent or guardian to add missing words and correct grammar mistakes	C Nack them back up. P Stack them back up?
Extension	The previous child utterance is both repeated and expanded upon syntactically by their parent or guardian, but also adds relevant information to the conversation	C Diamond. P Oh you're gonna add diamonds to your pattern?

The codes ([REP], [EXP], and [EXT]) were coded by hand and then inserted into the SALT software so instances of their appearance could be recognized and analyzed, with examples shown below in Table 2. From there, the percentage of each measure were calculated for every dyad by

taking the number of utterances that were repeated and dividing that by the total number of utterances within the language sample. The same process was repeated for both expansions and extensions. These percentages were then compared to the child's age, as well as the various language measures captured by SALT.
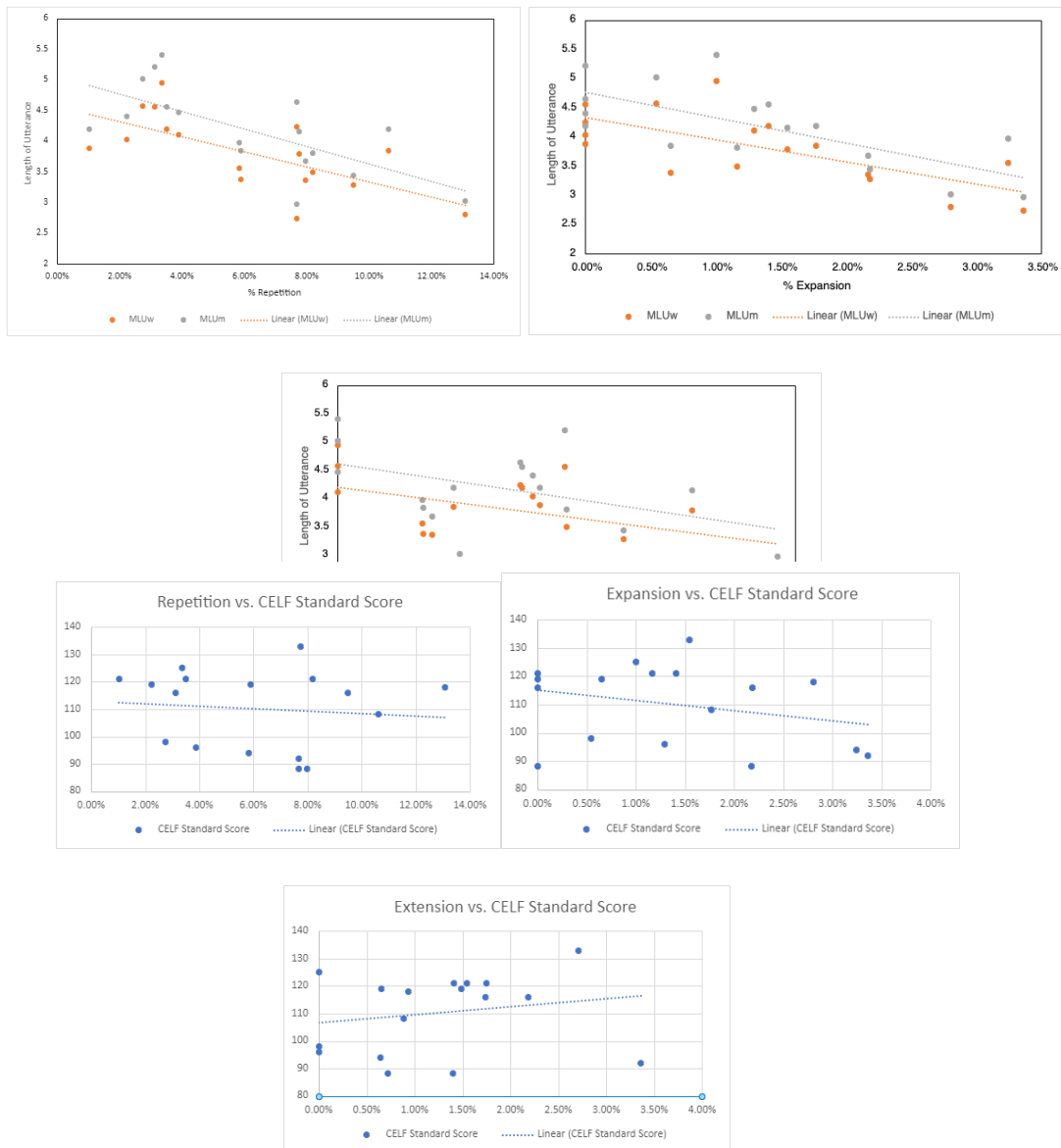
Table 2. *Table depicting the codes representing each measure and their use in examples from the collected transcripts.*

Measure	Code	Example
Repetition	[cREP] [aREP]	C There/'s four [cREP]! P There/'s four [aREP]!
Expansion	[cEXP] [aEXP]	C Nack [EW:stack] them back up [cEXP]. P Stack them back up [aEXP]?
Extension	[cEXT] [aEXT]	C Diamond [cEXT]. P Oh you/'re gonna add diamond/s to your pattern [aEXT]?

Results & Discussion

The first hypothesis investigated whether there was a correlation present between a child's score on the CELF-P2 and the amount of parental overlap present in their museum interaction(s). No significant correlation was present, as shown below in Figure 1.

With there being no significant association present between a child's standard score on the CELF-P2 and the percentages of parental overlap used within the museum setting, it is difficult to gauge whether or not the amount of overlap has an effect on the child's language score. With only the standard score being analyzed, the child's score was adjusted to

Figure 1. *Scatterplots representing correlations between standard score on the CELF-_2 and percent of repetitions (top left), expansions (top right), and extension (bottom)..*
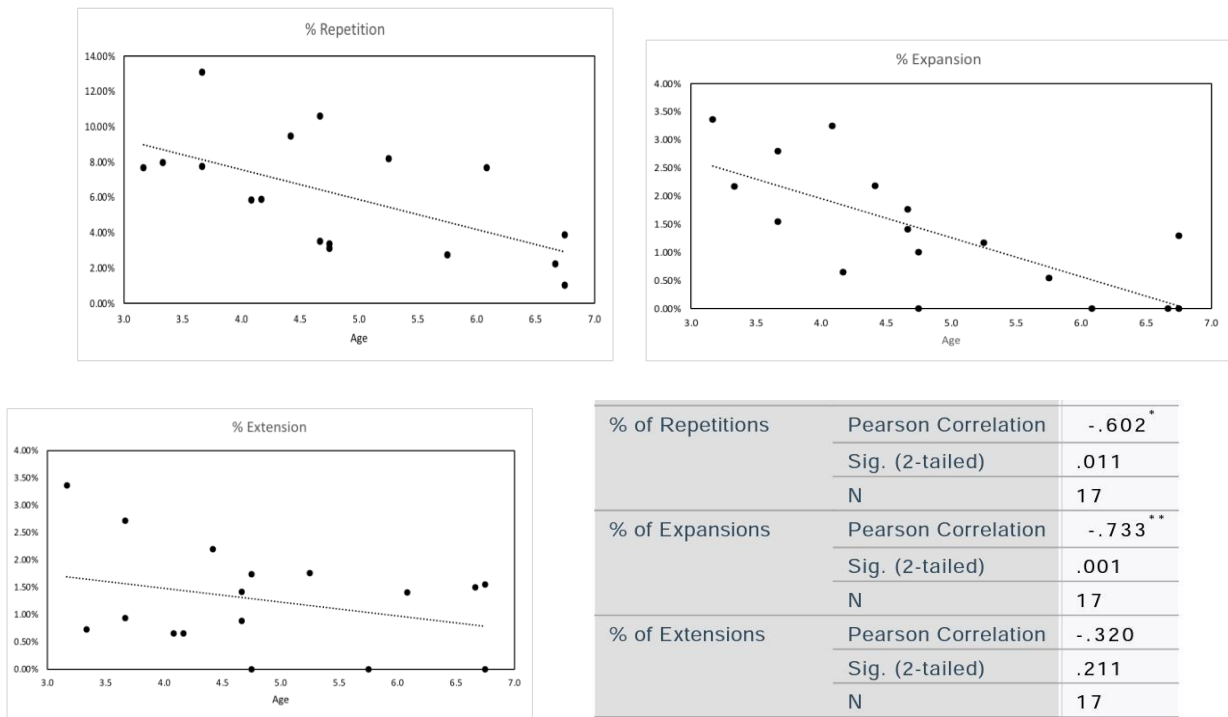
For the second hypothesis, which examined a correlation between parental overlap and measures

of lexical diversity and utterance length, a Pearson correlation found there was a moderately strong,
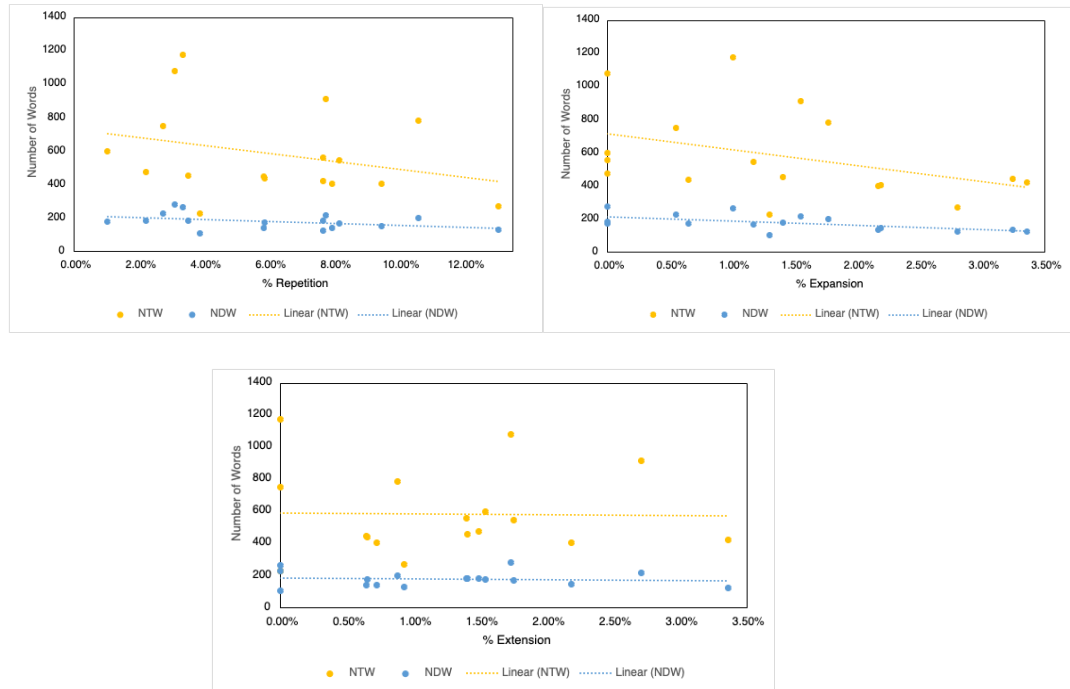
Figure 3. *Scatterplots representing correlations between number of words and percent of repetitions (top left), expansions (top right), and extension (bottom). Yellow dots show number of total words and blue dots show number of different words along with corresponding colored trendlines.*

statistically significant negative correlation between the percentage of shown in Figure _. The

child's number of total words (NTW) and number of different words (NDW) also showed a

statistically significant correlation with the percentage of repetitions (NTW: r =-.316; NDW: r =

-.425) and expansions (NTW: r = -.501 NDW: r = -.646). See Table 3 for statistical results.

A third Pearson Correlation comparing age and conversational overlap found a moderate negative correlation, with repetition at r=-.602, expansions at r=-.733, and extensions at r=-.320, shown below in Figure 3. The relationship between percentage of conversational overlap and a

% of Repetitions	Pearson Correlation	-.602[*]
	Sig. (2-tailed)	.011
	N	17
% of Expansions	Pearson Correlation	-.733[**]
	Sig. (2-tailed)	.001
	N	17
% of Extensions	Pearson Correlation	-.320
	Sig. (2-tailed)	.211
	N	17

		% of Repetitions	% of Expansions	% of Extensions
MLU (in words)	Pearson Correlation	-.582[**]	-.739[**]	-.380
	Sig. (2-tailed)	.006	.000	.090
	N	21	21	21
MLU (in morphemes)	Pearson Correlation	-.583[**]	-.738[**]	-.379
	Sig. (2-tailed)	.006	.000	.090
	N	21	21	21
NTW	Pearson Correlation	-.316	-.501[*]	-.054
	Sig. (2-tailed)	.163	.021	.817
	N	21	21	21
NDW	Pearson Correlation	-.425	-.646[**]	-.163
	Sig. (2-tailed)	.055	.002	.481
	N	21	21	21

Table 3. *Table depicting the statistical analysis for measures of conversational overlap compared to measures of lexical diversity and utterance length, done via SPSS Statistics*

child's age helps to confirm the hypothesis that children require less parental recasting as they age.

Limitations

The present study was limited by its relatively small sample size, which may have implications for the generalizability of the findings. With a sample size of only 17 parent-child dyads, the study may not have had sufficient power to detect smaller effects or the fully capture the range of individual differences within the population examined.

Additionally, another limitation of this study was the fact that it was not longitudinal. This means that the data was collected at a singular point in time, and thus, it is not possible to track changes in the child's language development skills over time. The lack of a longitudinal design makes it difficult to establish whether the observed relationships were causal or more simply, coincidental. Previous studies on the topic, as described above, collected their data longitudinally which sheds more insight on the long-term effects of the use of measures of conversational overlap.

The last limitation of the present study is that the data was analyzed by only one researcher. Efforts were made to ensure consistency within the analysis process, the sole involvement of one researcher can raise concerns regarding the reliability and validity of the results.

Despite these limitations, the present study provides valuable insights into the impact of parental conversational overlap on the acquisition of key language development milestones. This study also highlights the need for future research with a larger sample size, multiple researchers involved in data analysis, and a longitudinal design.

Conclusions

In conclusion, this study aimed to explore the relationship between conversational overlap and language ability in young children. The findings provide support for the hypothesis that children require less of these forms of parental recasting as they age and learn to structure together

language on their own. By analyzing data from children aged 3;2 to 6;9, we were able to observe a wide range of ability and parental speech styles. However, there was little support for the hypotheses that higher levels of repetition, expansion, and extension would positively correlate with the child's lexical diversity and length of utterance, or the score captured by the CELF-P2 language assessment. This could mean that parents are able to pick up on their child's language skills and adjust their own recasting accordingly. As for the CELF-P2, a standardized score, as opposed to a raw score, was utilized, possibly explaining the relatively flat association between the measures.

This study has helped to further the discussion and understanding of how measures of conversational overlap, specifically repetition, expansion, and extension, relate to the development of a child's language skills. This knowledge contributes to the well-established role of parental input, as shown in previously conducted research studies.

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