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# Exploring the Interactive, Linguistic, and Conceptual Dimensions of Parent Input and Their Role in Children's Pragmatic Development

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# **EXPLORING THE INTERACTIVE, LINGUISTIC, AND CONCEPTUAL DIMENSIONS OF PARENT INPUT AND THEIR ROLE IN CHILDREN'S PRAGMATIC DEVELOPMENT**

A Thesis

Submitted to the Graduate Faculty of the  
Louisiana State University and  
Agricultural and Mechanical College  
in partial fulfillment of the  
requirements for the degree of  
Master of Arts

in

The Department of Communication Sciences and Disorders

by  
Nickolas Tanner Day  
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## **Abstract**

The development of children's pragmatic language, which can be defined as conversational competence in social contexts, has been attributed to variation in the language they hear in their environment. When studying the impact language input has on pragmatic development, it is important for clinicians and linguists to measure both the quantity and quality of this language input. Measures of quality, however, are much more relevant when studying the development of pragmatic language, as discussed in Zhang (2020) and Hirsh-Pasek et al. (2015). Rowe and Snow (2016) discussed three dimensions of language quality: interactive, linguistic and conceptual. There is a current gap in the literature of analyzing these language dimensions in relation to child pragmatic language use, and the current study seeks to determine which language dimension appears most frequently in parental speech, as well as which dimension or dimensions exert the most influence on child pragmatic language use. We analyzed 12 parent-child dyads, with a range of language abilities, focusing on the interactive and conceptual language dimensions. The findings of the current study have found the interactive dimension to be the more prevalent language dimension between the two dimensions in parental speech. Additionally, we found that, at school entry, parental interactive language, especially utterances that are well-timed, are associated with child pragmatic language use. Thus, parents and clinicians alike should focus on utterances that are well-timed compared to their children's previous utterances to aid in use of pragmatic language.

## 1. Introduction

The type of language children hear from their parents, defined here as parental language input, is vital to children's subsequent pragmatic language development. Pragmatic language focuses on how verbal and nonverbal language is used in different social situations. Hart and Risley's (1995) landmark study determined that the amount of parent language input experienced by children had positive impacts on children's later language abilities, specifically, their vocabulary development. This study has influenced clinical and researcher practices by illuminating how important consistent parental linguistic input is for child language development, but these practices have primarily focused on quantitative measures of language. There has been a recent call for a shift to use more qualitative measures that analyze *how* caregivers convey messages to children (Rowe & Snow, 2020). This call to action, though, has suffered due to an overall lack of uniformity in administering these qualitative measures. While vital qualitative measures can be organized into interactive, linguistic, and conceptual dimensions of quality, more than a single dimension is rarely examined in the current literature. To address this gap in the literature, the current study proposes to examine the association the conceptual and interactive dimensions of language input have upon concurrent pragmatic language skills in children between the ages of 5 and 7 years. This study will also serve to determine which of these dimensions exerts a greater influence over the other. Studying how these dimensions of quality contribute to pragmatic development in children at school entry has important practical implications for Speech-Language Pathologists (SLPs), by distinguishing which aspects of caregiver input should be strategically targeted to promote child pragmatic language development.

For many years, measuring the quantity of input was the standard for determining individual variability in typical language development in children. This procedure could be

attributed to the work done by Hart and Risley (1995) which suggested that individual differences in vocabulary knowledge in pre-school aged children was due to differences in the sheer number of words that the child heard (or did not hear) from their caregiver. However, simply measuring the quantity of language input does not account for the variety and complexity of parental language that could also contribute to a child's language development. Thus, measures of quality should be used in tandem to provide a more holistic understanding of how parental input relates to a child's pragmatic language development. Using these measures of quality allows researchers to determine if input is interactionally supportive, linguistically adaptive, and conceptually challenging for the child (Rowe & Snow, 2020). These criteria have been recently used to determine whether or not the input children hear is high-quality language input. In a review of the present literature, language quality is most often measured through number of adult and child conversational turns, as well as through number of utterances from both members of the dyad. These measures fall short, however, because they still fail to capture *what* the caregiver is communicating to the child and *how* they are communicating the information.

Rowe and Snow (2020) proposed a framework for identifying what and how caregivers are communicating to their children by examining the quality of input along three dimensions: interactive, linguistic and conceptual. Researchers analyze interactive input through measures that study the complexity of the language and conversation between the parent and child (e.g., number of conversational turns, number of wh- questions asked, mean turn length, responsiveness, shared attention). Measures that are in the realm of linguistic input are ones focused on word level analysis (e.g., mean length of utterance, number of different words, constituent diversity). Conceptual input is classified as language that was not focused on the here



and now (e.g., decontextualized language). Each individual dimension has been shown to positively relate to children's subsequent language development, but parent use of these aspects have rarely been studied together. While the linguistic dimension is of high importance for scaffolding the language development of young children, this dimension becomes decreasingly important with age. Comparatively, the conceptual and interactive dimensions become increasingly relevant for supporting children's language development with age. Given this development shift, and the focus of ages 5-7 in the current study, we focus solely on the conceptual and interactive dimensions.

### **Interactive Dimension**

Measures in the interactive dimension relate to how parents and caregivers respond to a child's utterances. Children who have caregivers who respond contingently to their utterances are more likely to develop stronger vocabularies (Rowe & Snow, 2020). This contingent responsiveness has important implications for the development of pragmatic language: the production of early pre-intentional and pre-verbal utterances, such as babbling, are treated as communicative acts and warrant a response from the caregiver. This parent responsivity leads to greater development of communicative turn-taking and global language growth in infants. Having this understanding of the overall flow of conversational turns scaffolds pragmatically appropriate participation in conversations as the child ages. Ramirez et al. (2020) found that "parentese", which is characterized by exaggerated facial movements and higher pitch, led to increased social interaction and overall social development in infants ages 6-18 months. This could be due to the exaggerated nature of the speech, which made it more likely that the child would stay engaged with what the parent was saying. These early interactions promote later pragmatic development

because the child is learning to maintain communicative engagement (e.g., eye contact and spoken turns) with a conversational partner.

Studies have reported that conversational turns between a parent and child contribute to variability in children's brain and language development above and beyond the influence of SES (Romeo et al., 2018; Rowe et al., 2005, Zhang, 2020). These findings demonstrate that language input is a more proximal measure of a child's environment than their SES, and thus should be the target of interventions. An unresolved issue, though, relates to the age at which these interventions have the largest impact. Research conducted by Romeo et al. (2018), found that interactive quality, measures such as temporal connectedness of utterances to child-directed speech and contextual relevancy, was a far stronger predictor of language development than adult word count alone. However, the research also determined that number of conversational turns plays an important role in pragmatic and social language development at the age of 6 years. These findings suggests that it is crucial for caregivers to not just speak to their children more, but for each utterance to be purposeful and connected to what the child is saying, rather than just talking to the child for the sake of increasing the overall word/utterance count of the conversation. Although it is still important for caregivers to communicate with their children regularly, the priority of conversation shifts from talking more to them for the sake of language input to having higher-quality conversations about the child's overall environment (Zhang, 2020). In addition, having interactive encounters that showed support towards the child, and thus being perceived as higher-quality conversations, is correlated with higher academic achievement (Zhang, 2020). This is an important correlation, as high-quality interaction with the child could help develop further pragmatic language skills. Taken together, high-quality interactions are intertwined with pragmatic language skills.

## **Conceptual Dimension**

Conceptual measures are used to analyze language that is not based around the present environment and circumstances. This dimension of quality is vital to the development of pragmatic language because being able to discuss past and future events based on the current situational context is a key component of appropriate pragmatic language use. Bernicot et al. (2007), found that metapragmatic language production (idioms, indirect requests, and conversational implicatures) developed later than comprehension of those metapragmatic language forms (traditional pragmatic language). This research aligns with the belief that the conceptual dimension of language becomes more important as children age, especially since more abstract uses of language are developed later as compared to more literal, concrete uses of language. Although these findings could suggest that conceptual language is exclusively pertinent to older children, research from Rozendaal et al. (2010) determined that children begin to develop comprehension and primitive use of decontextualized language even from as young as 2;9. Parents certainly play a crucial role in the development of conceptual language; Leech et al. (2018) found that parents who received training on how to use decontextualized language with 4-year-old children were more likely to consistently use more decontextualized language in conversational dyads with their children. The decontextualized language use from both partners of the parent-child dyad continued a month after implementation of the training, which demonstrates that parent education could be a useful tool to help aid children's overall pragmatic language development.

## **Child Pragmatic Assessment and Classification**

A sizable amount of measurement of child pragmatic development utilizes standardized measures, including the Children's Communication Checklist – 2 (CCC – 2), the Pragmatics Profile in the Clinical Evaluation of Language Fundamentals – 5<sup>th</sup> edition (CELF – 5), and the pragmatics subtest in the Comprehensive Assessment of Spoken Language – 2 (CASL – 2). A more accurate depiction of a child's pragmatic language development, however, comes from measuring actual language use.

In Marc Fey's book *Language Intervention with Young Children* (1986), Fey created a classification scheme that profiles children according to their levels of social-conversational participation. Using this scheme, children could be classified as one of four types of communicators: assertive and responsive conversationalists (active conversationalists), responsive but non-assertive conversationalists (passive conversationalists), children who are neither responsive nor assertive in conversations (inactive communicators), or children who are verbally active but unresponsive to the conversational needs of their partners (verbal non-communicators). When viewing this classification scheme from a pragmatic language standpoint, children who are classified as active conversationalists are most likely to be considered pragmatically appropriate communicators, since they are able to reply appropriately to a conversational partner, as well as initiating and extending conversational topics. Children who are passive conversationalists could be viewed as marginally pragmatically appropriate, since they are interacting with their conversational partner, but only to maintain the conversation. Children who are classified as inactive communicators or verbal non-communicators, however, exhibit at least one characteristic that would qualify their conversational participation as pragmatically inappropriate. Children who are inactive communicators are not involved in

conversations and do not acknowledge the speaker, and children who are verbal non-communicators do not properly attend to the conversational topic and might only be verbalizing about a tangential topic.

## **Current Study**

Understanding how the quality of language input relates to child pragmatic language development is of practical importance to the field of speech-language pathology. Given a great deal of attention is dedicated to modifying the quantity and quality of maternal language input, research should establish which dimensions are of the upmost importance to children at different developmental time points (Rowe & Snow, 2020). By examining children ages 5-7 years, the current study will:

1. Characterize the frequency of parental language input within and across the conceptual and interactive dimensions.
2. Determine the contribution of each dimension of parental language input on children's concurrent pragmatic language skills.

In the current study we focus on pragmatic language development in children ages 5-7 years old. This age is important as it marks a period at which children are first starting to begin school, and thus pragmatic and social use of language, especially with same-age peers, becomes increasingly important, yet remains relatively understudied. To identify which dimensions of maternal language input are most predictive of concurrent child pragmatic skills, we collected language samples from parent-child dyads from a range of socioeconomic backgrounds. These dyads participated in a play session adhering to the three-box task (Hirsh-Pasek et al., 2015), where parents and children were recorded as they explored and played with toys hidden in three

different containers. The transcribed play sessions were analyzed using the Systematic Analysis of Language Transcripts (SALT) across both dimensions of quality. From this analysis we predict that elements of interactive language will appear the most in language samples between parent-child dyads and in children ages 5-7 years. Also, we predict that the interactive dimension will contribute more to a child's pragmatic language use, based on the nature of the dimension itself. The more opportunities that the child has to interact with the parent, the more likely they are to be able to practice using appropriate pragmatic language.

## 2. Methods

### Participants

The current dataset consisted of 12 archival language samples ( $M_{\text{age}} = 6.10$  years;  $SD_{\text{age}} = 0.87$  years; Number of females = 7) collected from parent-child dyad play sessions as part of a larger study. All children were Native English speakers with no history of developmental or language delay, as determined by parent-report. All adult participants gave written consent to participate, and all children provided written assent. All procedures were in accordance with the Institutional Review Board at the University of Delaware. All participants were compensated for their participation. Children came from diverse socioeconomic backgrounds, as determined by maternal education level. Mother's self-reported their level of education as one of the following categories: less than 9th grade ( $n = 1$ ), did not complete high school ( $n = 6$ ), Associate's degree ( $n = 1$ ), Bachelor's degree ( $n = 2$ ), and Graduate degree ( $n = 2$ ). Parents also reported the race and ethnicity of their child. Mothers identified their children in the following racial categories: Black ( $n = 5$ ), White ( $n = 7$ ), with one mother stating their child's ethnicity as Hispanic/Latinx.

### Language Assessment

Three assessments were administered to child participants to confirm language status: The DELV – NR ( $N = 10$ ), the CTOPP – 2 ( $N = 10$ ), and the PVT ( $N = 12$ ). Due to health regulations imposed by the COVID-19 pandemic not all 12 dyads had complete data across all three assessments. The Diagnostic Evaluation of Language Variation – Norm Referenced (DELV–NR; Seymour et al., 2005) was designed to allow for cultural and dialectal variations of speech when assessing the language skills of children ages 4;0 to 9;11 by not targeting dialect-specific content, which is supposed to limit assessment bias for speakers of non-Mainstream varieties of

English (Seymour et al., 2005). The DELV uses a scaled score, with a mean of 10 and a standard deviation of 3. The mean adjusted score for the DELV among participants was 9.70, with a standard deviation of 4.00. The range of adjusted scores was 5-17, which does indicate that some participants scored at a level in which further evaluation may be warranted.

Child participants were also administered the Comprehensive Test of Phonological Processing – 2<sup>nd</sup> edition (CTOPP – 2; Wagner et al., 2013). This assessment measures phonological awareness, phonological memory, and naming and was designed to be administered to subjects ages 4;0 to 24;11 (Wagner et al., 2013). The normative mean of the CTOPP – 2 is 10 with a standard deviation of 3. The mean score of the participants was 7.50 with a standard deviation of 3.60 and range from 1-13. This range of scores indicate that some participants may need further evaluation of speech and language to determine if language therapy is appropriate.

Both parents and children were administered the Picture Vocabulary Test (PVT) from the NIH Toolbox. This test measures receptive vocabulary knowledge through a series of multiple-choice questions in which a stimulus word is provided, and the examinee must select the image that best corresponds to the stimulus. The normative mean score is 100 with a standard deviation of 15. The mean child score on this test was 102.25 with a standard deviation of 16.36. The mean parent score was 102.91 with a standard deviation of 21.85. The range of scaled scores was 73-125. This range of scores indicate that some children may benefit from further evaluation of their language abilities.



## **Parent-Child Play Session**

Parents and children participated in a 20-minute play session as their audio and video were recorded ( $M_{\text{time}} = 16.45$  min.;  $SD_{\text{time}} = 4.61$  min). During this play session, participating dyads were presented with three boxes (numbered 1, 2, and 3) containing toys and were instructed to go through the boxes numerically (similar to Hirsh-Pasek et al., 2015). Three toys were pseudo-randomly assigned to each box: dinosaur puppets, a fishing game, and number tiles. These toys were specifically chosen to elicit language in different forms. For example, the fishing game could be used to elicit interactive language, as it is a toy that would require participation from both mother and child. Dyads were aware that their audio and video were being recorded during their session.

## **Coding of Parent-Child Play Sessions**

All play sessions were transcribed and analyzed using the Systematic Analysis of Language Transcripts (SALT; Miller & Iglesias, 2008). Two dimensions of input provided by parents were targeted: interactive and conceptual.

Pragmatic indicators for the interactive and conceptual dimensions were adapted from Preza et al. (2020) and were manually entered into SALT. Frequencies for each word code were extracted using the Word Code Table function of SALT. The interactive dimension relates to how parents and children respond to a child's utterances. Thus, pragmatic indicators in this dimension were used to analyze how frequently parents responded to the child, whether or not the parent gave appropriate chances for the child to respond, and if the parent responded to the child's utterances in an appropriate time frame. These indicators were used to determine if there was equity in turn-taking between parent and child, or if one partner was taking on more of the

conversational load. Table 2.1 lists the interactive pragmatic indicators used, along with explanations and illustrative examples of how those indicators were employed in SALT.

Table 2.1. Interactive Pragmatic Indicators and Definitions

<b>Pragmatic Indicator [in SALT]</b>	<b>Definition/Clarification</b>	<b>Illustrative Examples</b>
Well-Timed [WT]	This code is used when the adult takes a turn that is either: 1. Within 3 seconds of the child's previous turn 2. After waiting at least 3 seconds between their previous turn as does not meet any of the exceptions outlined in [BB].	C xxx. M you want the ball [WT]. M that looks fun. ; :04 M you want the train [WT]?
Unrelated [UR]	This code is used for an adult turn that does not relate to the child's focus of attention. This would include the parent discussing a play set in the room that the child's attention is not focused on. Do NOT use this code if the parent introduces a new toy into the play, such as putting a new animal in the farm, or giving baby a new bottle. Also, this code is for broad shifts in attention. This means that the parent should not be penalized if their utterance is related to the play, but the child's eye gaze is elsewhere, or if the child's attention briefly shifts away, but they come right back to the play.	C {points to tower}. M this kitchen is cool [UR]. C Horsie is eating. M look. M the cow is eating, too

(Table cont'd)

<b>Pragmatic Indicator [in SALT]</b>	<b>Definition/Clarification</b>	<b>Illustrative Examples</b>
Back-to-Back [BB]	<p>This code is used for a consecutive adult turn without providing the child a chance to respond. This is operationalized as less than or equal to 3 seconds. There are 4 exceptions. [BB] is not coded when:</p> <ol style="list-style-type: none"> <li>1. The adult imitates a single word or phrase the child says, and then puts that word or phrase into a sentence</li> <li>2. The adult uses a single word, phrase, or sentence in Utterance 1, followed by specific use of one of puts the word or phrase into a sentence (i.e., sentence expansion)</li> <li>3. The adult uses Utterance 1 and 2 to illustrate a contrasting syntactic structure such as: <ol style="list-style-type: none"> <li>a. contrasts the subject NP or VP of Utterance 1 in Utterance 2</li> <li>b. contrasts the object NP label of Utterance 1 in Utterance 2</li> </ol> </li> <li>4. The adult utterance follows a turn for attention/ engagement. This includes: <ol style="list-style-type: none"> <li>a. A turn for attention (e.g., look, see, CName)</li> <li>b. A turn for engagement (e.g., sound effects)</li> </ol> </li> </ol>	<p>C my turn. M it's your turn to ride the train [WT]. M make sure to be careful [BB]. C ice cream. M ice cream [WT]. M you want some ice cream [WT]. M ball. M the ball is red [WT]. M this cup is wet [WT]. M this cup is dry [WT]. M Look, Cname [WT]. M that ball is red [WT].</p>
Overlap [OVERLAP]	<p>This code is defined as an adult turn that overlaps with a child utterance. This is marked in the transcript by &lt;&gt;.</p>	<p>C &lt;the cookies&gt;. M &lt;those cookies are&gt; for you [OVERLAP]. M &lt;is this&gt; a book [OVERLAP]? C &lt;no book please&gt;.</p>
Temporally Non-Contingent [TNC]	<p>This code is defined as an adult turn that comes more than 3 seconds (3.01 + seconds) after the previous child's turn that directly responds to the child's communicative turn. This could include responding late to a question, labeling an object the child pointed to late, or responding to a comment too late.</p>	<p>C what that? : :05 M that's a ball [TNC]. M this is really fun, isn't it? C {points to box}. ; :04 M that's a box.</p>

(Table cont'd)

<b>Pragmatic Indicator [in SALT]</b>	<b>Definition/Clarification</b>	<b>Illustrative Examples</b>
Missed Opportunity [MO]	This code is defined to illustrate a point where the parent did not respond to the child's communicative turn at all. It is possible that a parent could miss an opportunity to respond, wait 3+ seconds, and then say an utterance that could be well-timed.	C xxx. C {points to ball} M {} [MO]. C that. M {} [MO]. C cookie. M {} [MO] ; :03 M {oh} you found the spoon [WT]

The conceptual dimension focuses on language that is not focused on the present. Rather, it encompasses language that talks about past or future events, interactions, or people not present in the session. The conceptual pragmatic indicators were in conjunction with the interactive pragmatic indicators (i.e., they are not mutually exclusive) to provide a comprehensive analysis of parental language patterns and how much of the conversation focused on bringing in outside ideas and events to relate to the play activities. Table 2.2 lists the conceptual pragmatic indicators that were used in SALT, along with explanations and illustrative examples.

Table 2.2. Conceptual Pragmatic Indicators and Definitions.

<b>Pragmatic Indicator [in SALT]</b>	<b>Definition/Clarification</b>	<b>Illustrative Example</b>
Explanation [CEXP]	Talk that requested or made logical connection between objects, events, concepts, or conclusions.	"Because the lights have to be on for the remote to work."

(Table cont'd)

<b>Pragmatic Indicator [in SALT]</b>	<b>Definition/Clarification</b>	<b>Illustrative Example</b>
Pretend [CPRE]	Talk during pretend episodes of interaction; attributing actions, thoughts, feelings to inanimate objects.	"We have to have the police come and make an accident report now."
Narrative [CNAR]	Talk about events that happened in the past or will happen in the future.	"He is going to look in your nose and your throat and your ears."

### **Measuring Pragmatic Language Use**

Andres-Roqueta and Katsos (2017) define pragmatics by specific properties of the interaction, including lexical, syntactic, and social-interactive aspects. They also break down pragmatics into two categories: linguistic-pragmatics (being able to perform tasks appropriately just by using appropriate language structures) and social-pragmatics (using appropriate language structures as well as exercising theory of mind). The latter category is more relevant to our research; especially when related to the interactive and conceptual dimensions of language.

The child pragmatic coding scheme was based off the coding system developed by Fey (1986). Child utterances were coded based on whether a child initiated a conversational topic (assertive communication), maintained the current conversational topic (responsive communication), extended the topic (assertive and responsive communication), or responded about an unrelated topic (not appropriate). Assertive communication was characterized by the [IN] pragmatic indicator, which demonstrated initiation of a topic that was not related to the mother's previous utterance. Responsive communication was characterized by the [MAIN] pragmatic indicator, which demonstrated a response to an utterance from the mother to keep the

conversation going, although the utterance did not add any novel information to conversation. Utterances that were both assertive and responsive in nature were classified using the [EXT] pragmatic indicator, which indicates utterances from the mother in which the child both provided an appropriate response and added novel information to the conversation, thus extending the conversation. Utterances that were not relevant to the current conversational topic were classified by the [TANG] pragmatic indicator. Based on Fey's classification scheme, the ideal conversational partner is one who exhibits more use of [IN] and [EXT] utterances, comparatively fewer [MAIN] utterances, and no [TANG] utterances. This profile would reflect a conversationalist who not only starts conversational topics, but who is also able to service the conversational needs of the other member of the dyad.

Table 2.3. Child Pragmatic Indicators and Definitions

<b>Pragmatic Indicator [in SALT]</b>	<b>Explanation</b>
Initiation [IN]	The child begins communication with the mother. This could be to make a statement, request, or comment, or to ask a question. Utterances coded in this category indicate that the child is an assertive communicator.
Maintenance [MAIN]	The child is responding to a previous utterance made by the mother. The child's response is appropriate but does not add new information or continue the conversation. Utterances coded in this category indicate that the child is a responsive communicator.
Extension [EXT]	The child is responding to a parent's utterance while also adding new information to continue the conversation. This could be commenting on the previous utterance by agreeing or disagreeing or asking a follow-up question to ask for more information. Utterances coded in this category indicate that the child is both an assertive and a responsive communicator.

Pragmatic Indicator [in SALT]	Explanation
Tangent [TANG]	The child's utterances are not germane to the current topic and not considered pragmatically appropriate. Utterances coded in this category indicate that the child's communication is neither assertive nor responsive; it is considered inappropriate.

### 3. Results

Our first research question sought to classify variability in the frequency of different quality input across two dimensions: interactive and conceptual. To address this question, we analyzed the frequency of each type of pragmatic indicator within each dimension of parental language. In addition to identifying the raw frequency of each pragmatic indicator across participants, we also calculated the proportion of use of each pragmatic indicator when accounting for total parent utterances. We then calculated the proportion of each pragmatic indicator when accounting for both parent and child utterances. We completed this analysis by coding all transcripts with the pragmatic indicators discussed in Tables 2.1 and 2.2.

To investigate the frequency of maternal conceptual language use, we coded all maternal language input based on the codes in Table 2.2. On average, mothers produced a total of 146 conceptual utterances. Conceptual language accounted for 1.08% of total parental utterances and was the least prevalent language dimension across all parent-child dyads (see table 3.1 for frequency averages). Conceptual utterances primarily consisted of explanations (CEXP;  $n = 243$ ), with 1.42% of total parental utterances being explanations. Utterances related to pretend play [CPRE] accounted for 1.34% of total parent utterance ( $n = 174$ ), and narratives were least common, occurring only 0.49% of the time ( $n = 73$ ).

Table 3.1. Conceptual Pragmatic Indicator Frequency

Pragmatic indicator	Total number of utterances	Proportion of all parent utterances	Proportion of all parent and child utterances
Explanations	191	1.42	1.57
Pretend play	174	1.34	1.41
Narratives	73	0.49	0.51
Other (uncoded)	--	96.75	96.51
Average	146.00	1.08	1.16



To investigate the frequency of interactive language use by mothers, we coded all maternal language input based on the pragmatic indicators in Table 2.1. On average, mothers produced a total of 270.50 interactive utterances. Interactive language therefore accounted for 2.11% of total parental utterances. The average frequency of each individual pragmatic marker is displayed in Table 3.2. Interactive utterances were primarily well-timed [WT], which accounted for 7.13% of total parent utterances ( $n = 846$ ), followed by back-to-back utterances [BB], which accounted for 4.96% of total parent utterances ( $n = 705$ ). Unrelated utterances [UR] were only utilized 0.20% of the time ( $n = 26$ ). Missed opportunities to interact with the child [MO] occurred only 0.16% of the time ( $n = 18$ ). Non-temporally contingent utterances [TNC] and parental utterances overlapping child utterances [OVERLAP] occurred the least, with the former accounting for 0.11% of total parent utterances, and the latter accounting for 0.10% of all parent utterances ( $n = 14$  for both utterance categories).

Table 3.2. Interactive Pragmatic Indicator Frequency

Pragmatic indicator	Total number of utterances	Proportion of all parent utterances	Proportion of all parent and child utterances
Well-timed	846	7.13	7.18
Back-to-back	705	4.96	5.62
Overlap	14	0.10	0.09
Non-Temporally Contingent	14	0.11	0.11
Missed Opportunity	18	0.16	0.16
Unrelated	26	0.20	0.22
Other (uncoded)	--	87.34	86.62
Average	270.50	2.11	2.23

To investigate the frequency of pragmatic language use by children, we coded all child language input based on the pragmatic indicators in Table 2.3. On average, children produced a total of 247.50 utterances that were pragmatic in nature, accounting for 2.13% of all child

utterances. The results of each individual pragmatic indicator are displayed in Table 3.3. Child language was mainly characterized by utterances used to maintain a conversation, which accounted for 5.43% of total child utterances ( $n = 613$ ). Extensions of the conversation [EXT] occurred second most frequently, accounting for 1.60% of all child utterances ( $n = 210$ ). Utterances that involved a child initiating a conversation [IN] accounted for 1.29% of total child utterances ( $n = 143$ ). Tangential utterances not related to the conversation [TANG] occurred the least, accounting for just 0.20% of all child utterances ( $n = 24$ ).

Table 3.3. Child Pragmatic Indicator Frequency

Pragmatic indicator	Total number of utterances	Proportion of all child utterances	Proportion of all parent and child utterances
Initiation	143	1.29	1.16
Maintenance	613	5.43	5.17
Extension	210	1.60	1.63
Tangential	24	0.20	0.18
Other (uncoded)	--	91.48	91.86
Average	247.50	2.13	2.04

Our second research question was to determine which language dimension exerts the greatest influence on pragmatic language development in children ages 5-7 years. To address this question, we first computed bivariate correlations between each pragmatic indicator and child pragmatic knowledge, controlling for age, total number of parent and child utterances, and maternal education. Next, we calculated a composite proportion score for each dimension. These composite proportion scores were computed by dividing each individual pragmatic indicator by the frequency of parent utterances. Interactive pragmatic indicators (BB, MO, OVERLAP, TNC, UR, and WT) were then averaged together as a measure of proportion of interactive language. The same was done for interactive pragmatic indicators (CEXP, CNAR, and CPRE). All composite proportion scores were standardized (e.g., z-scored). We then completed a backward

selection stepwise multiple regression with child pragmatic language use as the dependent variable to identify whether one dimension was a stronger predictor of children's pragmatic language use above and beyond other dimensions.

Bivariate Pearson's correlations were run to determine the strength of the relationship between each form of parental language input and child pragmatic language, while controlling for child age, maternal education, and total number of parent and child utterances. Only one conceptual pragmatic indicator, narrative language, was associated with child pragmatic language – mothers who used more narrative language had children who produced more pragmatic forms of language ( $R = 0.35, p = 0.04$ ). One interactive pragmatic indicator, well-timed language, was positively correlated with child pragmatic language ( $R = 0.79, p < 0.001$ ). The results for all pragmatic indicators are displayed in Table 3.4.

Table 3.4. Bivariate Correlations between child pragmatic language and parental language input across dimensions when controlling for maternal education, total parent and child utterances, and child age.

Pragmatic indicator	<i>r</i>	<i>p-value</i>
Explanations	-0.02	0.93
Pretend play	0.18	0.31
Narratives	0.35	0.04*
Well-timed	0.79	<0.001***
Back-to-back	0.02	0.93
Overlap	--	--
Non-temporally contingent	-0.03	0.88
Missed opportunity	--	--
Unrelated	-0.005	0.98

\* $p < 0.05$

\*\* $p < 0.01$

\*\*\*  $p < 0.001$

-- Insufficient data recorded for OVERLAP and MO codes.

We then utilized a backward selection stepwise multiple regression with child pragmatic language use as the dependent variable. We included age, along with the composite proportion of

conceptual and interactive language in the model. This backward selection stepwise regression model is ideal for identifying which subset of variables result in the best performing model, and therefore, reduce prediction error. The best performing model included age and proportion of interactive language as predictors. Interactive language was positively associated with child pragmatic use ( $B = 1.40, p = 0.002$ ). Child age was also a significant predictor, with older children producing significantly more pragmatic language than younger children ( $B = 0.29, p = 0.03$ ).

**Table 3.5.** Backward Selection Stepwise Multiple Regression Predicting Child Pragmatic Language Use.

Note: \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Best performing model.				
	Estimate	Std. Error	t-value	p-value
(Intercept)	0.00	0.11	0.00	1.00
Age	0.29	0.13	2.57	0.03*
Interactive	1.40	0.30	4.64	0.002**

## **4. Discussion**

The current study sought to discern which dimension of language quality was most prevalent in play-based conversations of parent-child dyads, as well as to determine if use of one or more of these dimensions of language quality has significant bearing on child pragmatic language use.

The results of our study show that interactive language is a positive predictor of pragmatic language use, especially well-timed utterances. These findings may have further clinical implications on how parents can shape their language input to increase pragmatic language use in children ages 5-7.

### **Prevalence of Dimensions of Quality**

Our first research question asked which dimension of language quality (interactive or conceptual) was most prevalent in conversations between parent-child dyads. We hypothesized that interactive utterances would occur most frequently, due to the very nature of the dimension itself. If children are provided with more input that encourages interaction, then it could be assumed that the child would have more chances to interact back with the parent, increasing the number of chances that the child would have to practice using pragmatically appropriate language. Our hypothesis was supported, as interactive conceptual indicators were noted in 2.11% of all parental utterances, whereas conceptual pragmatic indicators were only noted in 1.08% when accounting for all parental utterances.

When comparing interactive and conceptual dimensions, which had similar coding schemes, the results supported our hypothesis that interactive language would occur more frequently in language input from parents. Well-timed utterances, an interactive pragmatic indicator, was the single most frequently occurring pragmatic indicator, occurring in 7.13% of all

utterances when controlling for parental utterances, and 7.18% of all parent and child utterances. These results indicate that parents are likely to respond appropriately, in both content and time, to a child's utterance during play. If children are provided with more interactive input, the more chances they have to interact with a conversational partner, and in turn, more opportunities to practice pragmatic language use. In regards to conceptual language, our hypothesis was that language that was not as focused on the "here and now", but focused more on language that was related to past and future events, would inspire more pragmatic language use. Conversely, narrative language, a conceptual pragmatic indicator, occurred least frequently in parent-child conversations. Thus, in a play-based environment, parents are less likely to use language that is focused on past and future events. If parents did use conceptual language, it would be more likely to be focused on taking on the role of a pretend persona, or by explaining cause and effect of different toys and the processes of playing with those toys. There may have been more pretend play in these sessions, as the toys selected encourage parents and children to put on a different identity (e.g., playing with dinosaur puppets). Unless the toy was one in which the child had engaged with prior to the play session, there were relatively fewer opportunities to talk about past and future events.

### **Influence of Each Language Quality Dimension on Pragmatic Language Use**

My second research question asked which dimension of language quality exerted the greatest influence on pragmatic language use in children. Our hypothesis was that the interactive dimension would have greater predictive influence on child pragmatic language use. This hypothesis is based on the nature of the dimension itself. The more opportunities that the child

has to interact with the parent, the more likely they are to be able to practice using appropriate pragmatic language.

We computed a bivariate correlation for each pragmatic indicator to determine the strength of the relationship between the type of parental language input and the use of child pragmatic language input. Well-timed utterances by parents, an interactive pragmatic indicator, were positively correlated with child pragmatic language use. Therefore, not only are well-timed utterances highly frequent in the language input, but this responsive feedback is a catalyst for more pragmatic language use in children. The interactive dimension as a whole was positively related to child pragmatic language use. While this may have been driven by well-timed utterances, the importance of highly engaging interactions between parents and children should not be overlooked. Numerous studies have advocated for increased turn-taking between parents and children (Donnelly & Kidd, 2021; Ramírez-Esparza, García-Sierra & Kuhl, 2014; Veneziano, 2005). We add to these studies by demonstrating that turn-taking that is highly responsive and well-timed is key to promoting child pragmatic language use.

Although the conceptual dimension was utilized less by parents, narrative language use was found to be positively correlated with child pragmatic language. This relationship could indicate that although narrative language may not be used as frequently in a play-based context, relating concepts to past or future events is still a viable way to spur pragmatic language usage. Rowe (2013) found that parents who provided more narrative and decontextualized language had children who possessed larger vocabularies one year later. This could be due to children learning how to talk about events that are not just focused on their present circumstance, which would lead to the child having a richer lexical pool of knowledge to draw from. In turn, the child would have the vocabulary to participate in a wider range of communicative contexts, potentially

increasing the likelihood of use of pragmatic language. Child age was also a significant predictor of child pragmatic language use: older children produced more pragmatic language than their younger peers. This finding is not surprising, since older children have been exposed to more language and have had more conversational opportunities than younger children. Thus, these children are more likely to have stronger conversational competence and are more likely to use pragmatic language.

### **Clinical Implications**

The results from the current study have important implications for Speech-Language Pathologists (SLPs) when counseling parents on how to promote pragmatic language use in their children. It is important for parents to promote pragmatic language use because they are their child's first teacher of language, and they are the most likely adult to respond to the child's utterances to model appropriate pragmatic language use (Meadan et al., 2014). Additionally, caregivers and clinicians alike should focus on providing utterances that are interactive in nature, with emphasis being placed on utterances that are well-timed compared to the child's previous utterance to model appropriate turn-taking behavior and overall extension of the conversation. Fortunately, research has advocated for these types of interventions, demonstrating that interventions which seek to increase parental responsiveness strengthens communication with their children (Brassart & Schelstraete, 2015) and promotes connectivity in language-specific brain regions (Romeo et al., 2021).

### **Limitations and Future Research**

A limitation of this study is that the coding schemes are experimental in nature. Although these coding schemes are modeled from previous research, this is the first study to utilize them to



analyze pragmatic language. The inter-rater reliability (IRR) for interactive language use was 99.6%, however, the conceptual dimension inter-rater reliability was 67.5%. These IRRs indicate our interactive coding scheme were highly consistent across raters, however, our conceptual coding scheme requires additional fine tuning to ensure reliability. Further, we cannot discount that the lack of significant findings in the conceptual dimension may be attributed to difficulties arising from the coding conventions themselves. A null result should not be taken as a definitive sign of non-importance in regard to this dimension. Nevertheless, more consensus on how to quantify each conceptual pragmatic indicator is needed for future research. Another limitation of the study is that no IRR was achieved for the analysis of child pragmatic indicators, since there was only one coder. Future studies could ameliorate this limitation by ensuring that each dimension (including child language) is being coded by at least two people to calculate IRR. Although the length of play sessions were controlled for in the analysis in the current study by covarying total number of parent and child utterances, a particular area of interest for future research is the temporal aspect of the play sessions. More specifically, future research questions could include how much time spent on a specific toy or game could affect pragmatic language, and if a longer or shorter time span on any of those activities could affect use of one or more of the language dimensions. Finally, although the patterns reported here are representative of a population that do not have any diagnosed speech or language delays, these patterns may differ for other groups, and may provide further insight into how children with language disorders may use pragmatic language differently.

## **Conclusion**

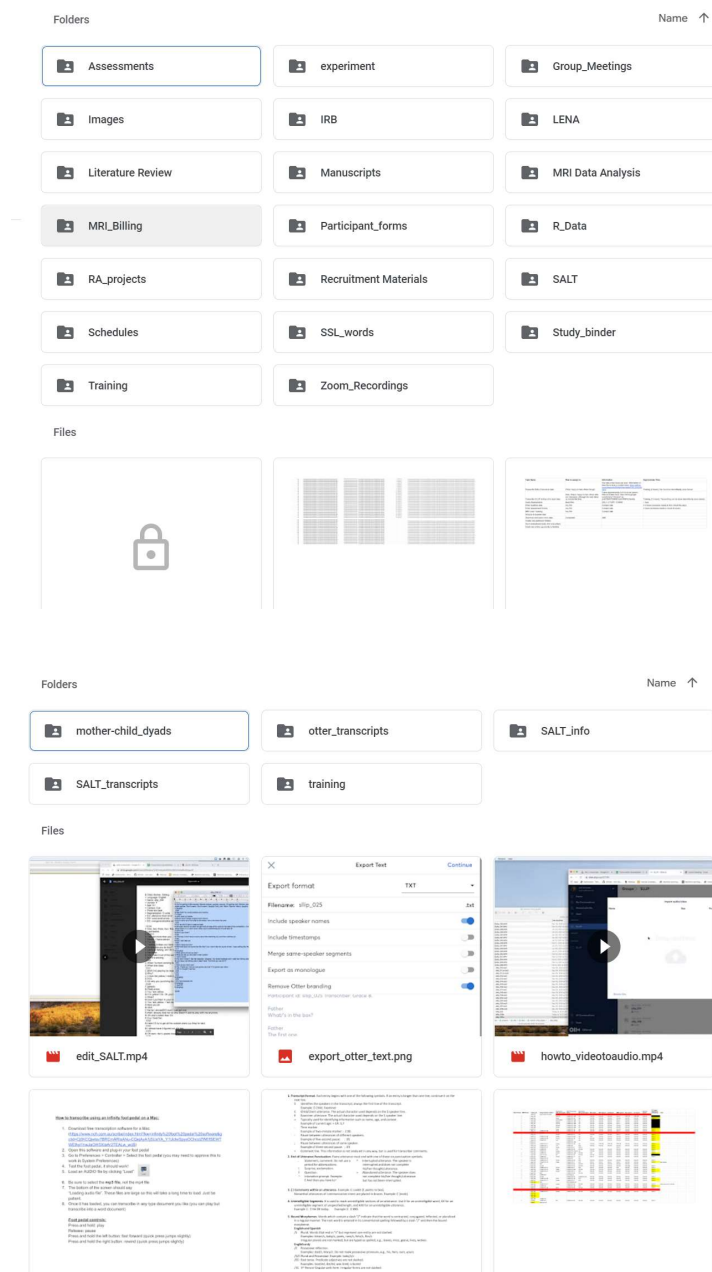
The current study analyzed two language dimensions of quality: interactive and conceptual, and how they play a role in the development of pragmatic language use in children ages 5-7 years.

Parents tended to use more interactive measures of language quality, than compared to the conceptual dimension of quality. Analyses revealed that there is a positive correlation between child age and pragmatic language use. We also found a positive correlation between interactive pragmatic indicators and pragmatic language use. These findings suggest that as children age, more opportunities for responses through interactive, well-timed utterances, are more beneficial in developing child pragmatic language use.

# Appendix

## Coding Guidelines

**Step 1.** To access the .SLT files, go to the SLLIP Google Drive. Once there, click on the folder labeled “SALT”, then click on the sub-folder labeled “SALT\_transcripts”. All of the SALT files are located in this folder. When coding, use the file named “Copy of sllip\_XXX”.



**Step 2.** Before coding a transcript, identify which subject requires coding by looking at the Transcription Spreadsheet in the “Nick\_quality\_transcripts” folder.

**Step 3.** To open up the file in SALT, download the file from the Google Drive. Double click the .SLT downloaded file and it should open automatically in SALT.

**Step 4.** Once it is open in SALT, code the document based on the coding scheme you are assigned to. If you have been assigned to code interactive codes, use Table 1 of this appendix. If you are assigned to the conceptual dimension, use the coding scheme found in Table 2 of this appendix. If you are coding child utterances, refer to Table 3 of this appendix.

**\*NOTE:** When coding SALT transcripts, coders should view the video recording of the play session along with the transcript. These video files can be accessed via the “SALT” folder and then clicking on the “mother-child\_dyads” folder. These videos should be used to determine context that may not be apparent in the transcript. For example, if the mother is listed as having multiple utterances in a row, but there is enough time between each of these utterances (3 seconds) to allow the child to respond (but the child does not), then both utterances should be coded as [WT]. If it is determined that the mother’s statements do not provide enough time for the child to respond adequately, then the first utterance should be coded as [WT], and all subsequent parental utterances should be coded as [BB].

**Step 4.** Once a file has been analyzed in one dimension, the file should be uploaded to the “in progress” folder within the Nick\_quality\_transcripts folder. Once both dimensions have been analyzed, upload the file to the “complete” folder. Save the coded transcript in the format of “slip\_###\_recoded”.

**Step 5.** Upload the file to the “Nick\_quality\_transcripts” folder and mark your initials in the “Interactive Codes”, “Conceptual Codes”, or “Child Codes” rows of the Transcription Spreadsheet, as appropriate, to ensure that more than one person has not coded the same transcript.

## Bibliography

- Adams, C. (2002). Practitioner review: The assessment of language pragmatics. *The Journal of Child Psychology and Psychiatry*, 43(8), 973-987.
- Anderson, N. J., Graham, S. A., Prime, H., Jenkins, J. M., & Madigan, S. (2021). Linking quality and quantity of parental linguistic input to child language skills: A meta-analysis. *Child Development*, 92(2), 484-501.
- Andres-Roqueta, C., & Katsos, N. (2017). The contribution of grammar, vocabulary, and theory of mind in pragmatic language competence in children with autistic spectrum disorders. *Frontiers in Psychology*, 8, 996.
- Bernicot, J., Laval, V., & Chaminaud, S. (2007). Nonliteral language forms in children: In what order are they acquired in pragmatics and metapragmatics? *Journal of Pragmatics*, 39(12), 2115–2132. <https://doi.org/10.1016/j.pragma.2007.05.009>
- Bishop, D. (2006). *Children's Communication Checklist – 2*. Pearson.
- Brassart, E., & Schelstraete, M-A. Simplifying parental language or increasing verbal responsiveness, what is the most efficient way to enhance pre-schoolers' verbal interactions? *Journal of Education and Training Studies*, 3(3), 133-145.
- Carrow-Woolfolk, E. (2017). *Comprehensive Assessment of Spoken Language – 2<sup>nd</sup> edition*. Pearson.
- Donnelly, S. & Kidd, E. (2021). The longitudinal relationship between conversational turn-taking and vocabulary growth in early language development. *Child Development*, 92(2), 609-625.
- Ferjan Ramírez, N., Lytle, S. R., & Kuhl, P. K. (2020). Parent coaching increases conversational turns and advances infant language development. *Proceedings of the National Academy of Sciences of the United States of America*, 117(7), 3484–3491. <https://doi.org/10.1073/pnas.1921653117>

- Fey, M.E. (1986). *Language intervention with young children*. College-Hill Press.
- Hart, B., Risley, T. (1995). Meaningful differences in the everyday experience of young American children. Baltimore, MD: Paul H. Brookes.
- Hirsh-Pasek, K., Adamson, L.B., Bakeman, R., Owen, M.T., Golinkoff, R.M., Pace, A., Yust, P.K.S., & Suma, K. (2015). The contribution of early communication quality to low-income children's language success. *Psychological Science*, (26)7, 1071-1083.
- Leech, K., Wei, R., Harring, J. R., & Rowe, M. L. (2018). A brief parent-focused intervention to improve preschoolers' conversational skills and school readiness. *Developmental Psychology*, 54(1), 15.
- Meadan, H., Angell, M. E., Stoner, J. B., & Daczewitz, M. E. (2014). Parent-Implemented Social-Pragmatic Communication Intervention: A Pilot Study. Focus on Autism and Other Developmental Disabilities, 29(2), 95–110.  
<https://doi.org/10.1177/1088357613517504>
- Miller, J. & Iglesias, A. (2008). Systematic Analysis of Language Transcripts (SALT), Research Version 2008 [Computer Software]. Middleton, WI: SALT Software, LLC.
- Newman, R. S., Rowe, M. L., & Bernstein Ratner, N. (2016). Input and uptake at 7 months predicts toddler vocabulary: the role of child-directed speech and infant processing skills in language development. *Journal of child language*, 43(5), 1158–1173.  
<https://doi.org/10.1017/S0305000915000446>
- Preza, T., Channell, M., & Hahn, L. Exploring the interactive and linguistic dimensions of parent input and their role in the development of children's simple sentences (Publication No. 334979803) [Master's thesis, University of Illinois at Urbana-Champaign].
- Ramirez-Esparza, N., Garcia-Sierra, A., & Kuhl, P.K. (2014). Look who's talking: Speech style and social context in language input to infants are linked to concurrent and future speech development. *Developmental science*, 17(6), 880-891.
- Romeo, R. R., Leonard, J. A., Robinson, S. T., West, M. R., Mackey, A. P., Rowe, M. L., & Gabrieli, J. D. (2018). Beyond the 30-million-word gap: Children's conversational

- exposure is associated with language-related brain function. *Psychological Science*, 29(5), 700-710.
- Romeo, R.R., Leonard, J.A., Grotzinger, H.M., Robinson, S.T., Takada, M.E., Mackey, A.P., ... & Gabrieli, J.D. (2021). Neuroplasticity associated with changes in conversational turn-taking following a family-based intervention. *Developmental cognitive neuroscience*, 49, 100967.
- Rowe, M., & Snow, C. (2020). Analyzing input quality along three dimensions: Interactive, linguistic, and conceptual. *Journal of Child Language*, 47(1), 5-21.  
doi:10.1017/S0305000919000655
- Rozendaal, M., & Baker, A. (2010). The acquisition of reference: Pragmatic aspects and the influence of language input. *Journal of Pragmatics*, 42(7), 1866–1879.  
<https://doi.org/10.1016/j.pragma.2009.05.013>
- Seymour, H.N., Roeper, T.W., & de Villiers, J. (2005). *Diagnostic Evaluation of Language Variation – Norm-Referenced*. Ventris Learning.
- Veneziano, E.. (2005). Effects of conversational functioning on early language acquisition: When both caregivers and children matter.
- Wagner, R., Torgesen, J., Rashotte, C., & Pearson. (2013). *Comprehensive Test of Phonological Processing – Second Edition*. Pearson.
- Wiig, E.H., Semel, E., & Secord W.A. (2013). *Clinical Evaluation of Language Fundamentals – 5<sup>th</sup> edition*. Pearson.
- Zhang, Y. (2020). Quality matters more than quantity: Parent–child communication and adolescents’ academic performance. *Frontiers in Psychology*, 11.



## **VITA**

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