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Child and caregiver language in two different play contexts

Emily Brady & Sudha Arunachalam*

Abstract. This study examined the types of utterances that parents use when speaking to their 36-month-old children (US-based, English-speaking, $N = 18$) in two tasks: a semi-naturalistic free-play task and a highly structured goal-oriented task, and if utterance type was associated with child talkativeness. Transcripts of parent-child interactions in the two tasks were coded for pragmatic function. Results revealed that parents produced more directives in the structured task compared to the semi-naturalistic task. Within directives, parents produced proportionally more supportive directives that followed their child's focus of attention in the structured task, and proportionally more intrusive directives intended to shift the child's focus of attention in the semi-naturalistic task. The more directives parents produced, the fewer conversational turns the child took per second, although this was primarily driven by performance in the structured task. These findings highlight the importance of considering context when studying caregiver language input in interactions.

Keywords. child language; pragmatics; child-directed speech

1. Introduction. A central method in language acquisition research involves making inferences about children's language learning by investigating the language input to which they are exposed by their primary caregiver(s). This method—corpus analysis or language sample analysis—allows researchers to understand the characteristics of caregiver language (e.g., how much caregivers talk to the child, about what content, using what forms, for what pragmatic functions) by transcribing and analyzing caregiver speech during caregiver-child interactions. Researchers also often analyze the child's productions during these interactions and draw inferences about how the caregiver's language might influence the child's language. This line of work has shown that characteristics of caregiver language—such as question-asking (e.g., Goodwin, Fein, & Naigles 2015; Luyster, Leiwant, & Arunachalam 2022; Zambrana, Hermansen, & Rowe 2020) or use of directive language (e.g., Flynn & Masur 2007; Tulviste & Tamm 2023)—predict aspects of children's language development (e.g., Hoff 2003; Huttenlocher et al. 1991; Rowe 2012).

However, in this line of research is it also critical to consider that caregiver language input is not a fixed characteristic of the caregiver, but rather, its properties vary across contexts (e.g., Bornstein et al. 1999; Hoff 2010; Kwon et al. 2013; Nandy et al. 2021; Tamis-LeMonda et al. 2017; Tamis-Lemonda et al. 2004). Corpora listed in the CHILDES database (MacWhinney 2000) often use only free play with toys as the interaction context for assessing caregiver and child language, although other daily contexts such as mealtimes are also represented. Expanding the range of contexts that are studied for any given research question (e.g., how often and what types of directives parents use) will provide a more robust picture of the language that children

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are exposed to throughout their varied experiences.

One recent alternative to selecting a specific context is to collect day-long recordings of the child's home environment (e.g., VanDam et al. 2016). This is a wonderful approach ensuring that a full variety of contexts is captured, but these studies are complicated in many ways. Logistically, they require a large commitment from the caregiver and result in a large quantity of data to be transcribed and coded. Thus far, most of these studies have focused on infants; with older children, privacy concerns grow in importance as the children spend more time with individuals outside the household. For the same privacy reasons, these datasets often involve only audio, which limits our ability to understand the extralinguistic contexts or pragmatic functions of caregiver speech. There is also quite a bit of variability in the naturalistic contexts to which children are exposed, which is a welcome aspect of these studies, but again, complicated in adding variability; researchers are unlikely to find a large group of families in which the exact same objects with the same affordances are present outside of the infant years (e.g., bottles and diapers). There is, then, still a valuable role for cross-sectional or longitudinal studies that capture a small slice of less naturalistic activities with minimal variability in the instructions and environments that are present across dyads.

Within the literature examining specific contexts, some types of contexts are better represented than others. In a recent scoping review of 59 studies, Holme et al. (2022) categorized studies of caregiver-child interaction into naturalistic contexts (i.e., dyads are in their own environment with no constraints on activity), semi-naturalistic contexts (i.e., specific activities are provided but without rules on how to engage with them), and structured contexts (i.e., specific tasks are provided with specific instructions). The most studied context was semi-naturalistic: free play with toys and/or books; this was followed by naturalistic contexts, including bathtime or mealtime routines. The least studied type of context was structured play.

In the current study, we compare a semi-naturalistic free play context with a structured task. Free play has been shown to have similar kinds of parent language to that found in day-long recordings (e.g., Tamis-LeMonda et al. 2017). However, structured tasks are also important to study because, although they may be less frequent than naturalistic or semi-naturalistic situations, they may be the loci of particularly dense language input of particular types. In one study involving a structured task, Kwon et al. (2013) engaged parents and their children ages 16 to 37 months in both free play with toys and a structured task in which children attempted to put together a jigsaw puzzle/shape sorter and parents were instructed only to intervene when they felt help was necessary. This task was structured to be challenging for the child; therefore, parent intervention was inevitable. Their results demonstrated that during free play, both parents and children used more complex language as compared to the structured task. Free play was also associated with parents providing more cognitive scaffolding and less negativity, and children engaging more with their parents and showing more explorative and creative manipulation of objects.

Taken together, these studies show that parent language varies across tasks. Naturalistic and semi-naturalistic play yields similarities in parent language, but as the task becomes more structured, results from the studies become less similar. Missing from the research are structured collaborative tasks where parent and child must work together towards a common goal. While still employing a structured design (i.e., specific tasks with instructions), a collaborative task allows dyads to play together and is in that sense more similar to the semi-naturalistic design.

1.1. Types of caregiver utterances.

Within parent-child interactions, two dimensions of parent language allow researchers to qualify parent utterances: pragmatic intent, or the communicative goal of the utterance, and parental sensitivity, or how the utterance relates to the activity in which the child is engaged (Akhtar et al. 1991; Flynn & Masur 2007; Masur et al. 2013; Pine 1992; Rantalainen et al. 2022).

To assess pragmatic intent, Pine (1992) developed a classification system of 7 mutually functional categories into which parental utterances could be coded: behavioural directives (i.e., attempts to control physical behaviour), tutorial prompts (i.e., questions/statements to which both parent and child know the answer), requests for information (i.e., that the parent does not currently know), attentional directives (i.e., attempts to redirect attention), descriptions of the immediate environment, feedback, and other (uncategorizable utterances). Some subsequent studies have combined some of these categories; for example, Flynn and Masur (2007) used only descriptions of the immediate environment, behavioural directive, attentional directive, and other when examining types of parent utterances in two naturalistic contexts.

Parental sensitivity is an orthogonal dimension. Utterances that follow the child's current focus of attention are considered to be sensitive, and utterances that are not related to the child's focus are considered to be intrusive (Akhtar et al. 1991; Flynn & Masur 2007; Masur et al. 2013; Rantalainen et al. 2022). Some of Pine's (1992) categories can be divided into sensitive or intrusive utterances. For example, behavioural directives that are sensitive are supportive behavioural directives (i.e., attempt to support the child's behaviour) whereas behavioural directives that are intrusive are intrusive behavioural directives (i.e., attempt to redirect the child's behaviour; Flynn & Masur 2007). Not all categories of pragmatic intent can be divided into utterances that are sensitive or intrusive. For example, attentional directives can only be intrusive because the parent is attempting to redirect the child's focus to something else, whereas descriptions can only be sensitive as it is a comment on the current activity the child is engaged in (Pine 1992).

Taken together, these two dimensions of parent language allow researchers to form broad categories of parental utterances to be observed and analyzed in parent-child interactions. The specific focus of the present study is on directive utterances: those which aim to control the child's physical behaviour or attention. Results from previous studies analyzing behavioural directive utterances have been mixed due to difficulty in defining the term. Early research associated directive utterances with commands aimed to control child behaviour. Directive utterances were viewed as being intrusive to the child's current attention or behaviour and have been associated with differences in children's later language (Akhtar et al. 1991; Masur et al. 2005; Pine 1992; Tomasello & Farrar 1986). One possibility is that parental directives shift children away from what they are interested in and thereby discourage them from engaging in conversation. However, Pine's (1992) categorization reflects the fact that directives can be sensitive when they are consistent with the child's current focus of attention. Behavioural directives that are sensitive to the child's focus, also known as supportive directives, aim to control the child's behaviour in relation to their current activity (i.e., *put the doll in the house*, while the child is playing with the dollhouse). Intrusive behavioural directives aim to control the child's behaviour while redirecting their focus of attention onto a new activity (i.e., *put the blocks in the bag*, while the child is playing with the dollhouse). Attentional directives, on the other hand, are inherently intrusive as these utterances always have the goal of redirecting the child's focus of attention (i.e., *look at the blocks*, while the child is playing with the dollhouse) (Pine 1992). In the current study, we focused on two types of directive utterances varying in parental sensitivity (that could be either behavioural or attentional): supportive directives and intrusive directives.

1.2. The current study.

In the current study, we aimed to address two research questions: (1) how does parent directiveness vary across a semi-naturalistic free-play task and a structured task? and (2) does the number of parent directives influence how much the child talks—more specifically, the number of conversational turns the child takes per second (e.g., Dethorne et al. 2011)? Like previous research, we categorized parent directives as either supportive or intrusive. Also, like previous research, we compared the same dyads across two tasks. Our research contributes to the literature in two ways. First, we compared semi-naturalistic free play with a highly structured collaborative task in which the parent and child share a common goal and must play together. This latter task, widely used in child development studies, involved having the parent and child create drawings together on an Etch-A-Sketch toy (Deater-Deckard, Pylas, & Petrill 1997). In this task, the parent and child are each only allowed to use one of the two knobs, requiring them to cooperate to construct the drawing. The task is quite challenging for young children and requires substantial support from parents. This study made use of videos collected as part of the Boston University Twin Project (Saudino & Ganiban 2019).

Second, many studies observing directive parental utterances involve children in the first 2-3 years of life. In the current study, we focus on slightly older children, age 3;0. This is an important period for examining the effects of directives in part because children are more verbal and more competent at directing conversations themselves.

2. Methods.

2.1. PARTICIPANTS. The dataset consisted of transcribed audio-video recordings of parent-child interactions that were previously collected as part of the Boston University Twin Project (Saudino & Ganiban 2019). Caregivers and their twins had visited the lab within two weeks of the twins' third birthday. From the original sample, 18 children with usable transcripts were randomly selected (10 female, 8 male). One child's data was excluded from the structured task because the none of the child's utterances were intelligible. Caregivers in the sample were all mothers and only one child from each pair of twins was chosen.

2.2. TASKS. Children participated in two tasks with their caregiver: a semi-naturalistic free-play task and a structured task. In the semi-naturalistic free-play task, dyads sat on the floor in a room with a bag of age-appropriate toys that were standard across all participants. Toys included a puzzle, a doctor's kit, Lincoln Logs, a puppet, and a small book. Caregivers were instructed to "play as they normally would at home" and to face the camera. The free-play task lasted an average of 7:23 minutes, including a one-minute clean-up time at the end. In the structured task, the mother and child sat together at a table with an Etch-A-Sketch. The investigator explained to the dyad that they were each responsible for one of the Etch-A-Sketch knobs; the mother could only move up and down, and the child could only move left and right. The dyads had to copy a line drawing of rectangles and then a house. Drawing completion was subjectively judged by the dyads. The structured task had an average duration of 5 minutes.

2.3. PROCEDURE. The audio-video parent-child interactions were transcribed verbatim using the method Codes for the Human Analysis of Transcripts (CHAT; MacWhinney 2000). The transcripts were analyzed for number of child conversational turns (e.g., DeThorne et al. 2011) using Computerized Language Analysis (CLAN) software. Each caregiver utterance was coded into one of five mutually exclusive categories as seen in Table 1. The coding scheme was adapted from Rantalainen et al. (2022). Utterances that were unintelligible or ambiguous were excluded.

Utterance coding was done by the first author and a secondary coder, who coded a random selection of 20% of the transcripts. The percentage of agreement on the coding of the 20% of transcripts that were coded by two coders was 70%.

Utterance Type	**Example**
(1) Supportive directive: behavioural controls that follow the child's attention, including encouragement and test questions	*What is that?* While the child is playing with the stethoscope *Keep going*, while the child is building a block tower
(2) Intrusive directive: attentional or behavioural controls that aim to redirect the child's attention	*See the puzzle?* while the child is playing with the doll
(3) Other: filler utterances, vocalizations, descriptions, comments regarding the immediate environment, responses to direct questions	*Okay*, laughing *That is a black and white dog*, while the child is playing with the stuffed dog

Table 1. Utterance coding with examples

2.4. RESULTS. The lme4 package (Bates, Mächler, Bolker, & Walker 2015) in R version 4.2.3 (The R Foundation for Statistical Computing 2023) was used to conduct regression analyses, and the lmerTest package (Kuznetsova, Brockhoff, & Christensen 2017) provided *p*-values.

To answer the first research question (how does maternal directiveness vary across semi-naturalistic free-play and a structured task?), a regression analysis was used to compare the total proportion of maternal utterances that were directives (i.e., categories (1) and (2) out of all utterances) in the structured task and the semi-naturalistic free-play task. The dependent variable was the proportion of maternal utterances that were directives, the independent variable was task (with structured task coded as -0.5 and semi-naturalistic free-play coded as +0.5), and dyad was included as a random factor. This analysis yielded a significant intercept (intercept $\beta = 0.48$, $t = 19.88$, $p < .001$) and a significant effect of task ($\beta = -0.14$, $t = -3.90$, $p = 0.001$), indicating that mothers used significantly more directives in the structured task (proportion = 0.56) than in the semi-naturalistic free-play task (proportion = 0.41). See Figure 1.

A second regression analysis within the utterances that were directives compared the proportion of directives that were intrusive as compared to supportive (i.e., category (2) divided by the sum of categories (1) and (2)). The dependent variable was the proportion of maternal utterances that were intrusive directives, the independent variable was task (with structured task coded as -0.5 and semi-naturalistic free-play coded as +0.5), and dyad was included as a random factor. This analysis yielded a significant intercept (intercept $\beta = 0.16$, $p < .001$) and a significant effect of task ($\beta = 0.15$, $t = 2.83$, $p = 0.0078$), indicating that mothers used significantly fewer intrusive directives out of all directives in the structured task (proportion intrusive = 0.087) than in the semi-naturalistic free-play task (proportion intrusive = 0.23).

To answer the second research question, (does the number of parent directives influence how much the child talks?) a regression analysis was performed to determine if the number of parent utterances that were directives (i.e., categories (1) and (2)) predicted the number of child turns per second; DeThorne et al. 2011). The dependent variable was the number of child turns per second, the independent variable was the proportion of parent utterances that were directives, and the child was included as a random factor. This analysis yielded a significant effect of the proportion of directives ($\beta = -0.15$, $t = -2.21$, $p = 0.035$). Mothers who used a higher proportion

of directive utterances had children who took fewer turns per second. However, as is evident in Figure 2, this effect is driven by supportive directives, particularly in the structured task, given that this is where the largest number of directives occurred. Intrusive directives in the structured task were infrequent but actually associated with a greater number of child turns. Correlation coefficients showing the associations between directive type and number of child turns are shown in Table 2.

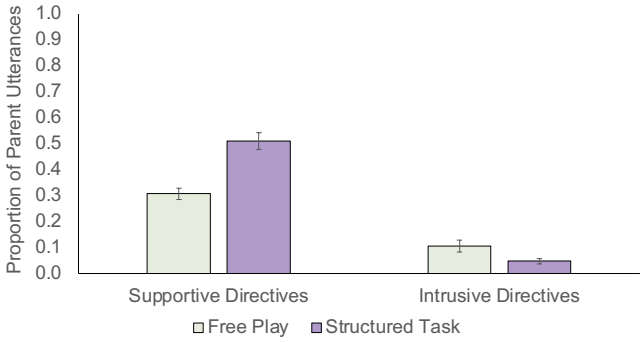

Figure 1. Proportion of caregiver utterances that are directives as a function of type and task

A. Semi naturalistic free-play task

B. Structured task

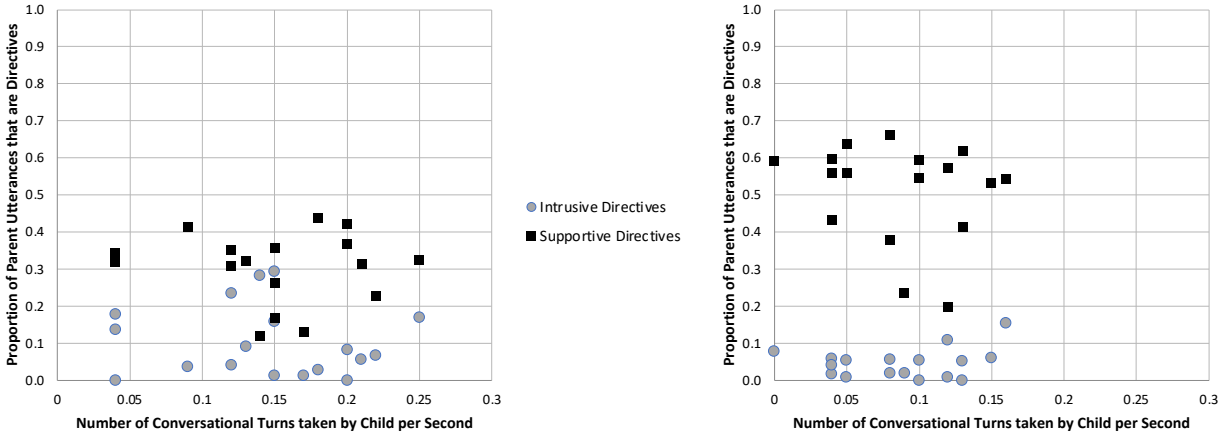

Figure 2. Relation between the proportion of caregiver directive utterances and child conversational turns in the semi-naturalistic free-play task (Panel A) and the structured task (Panel B)

	Supportive directive	**Intrusive directive**
Semi-naturalistic free-play task	-0.083	-0.088
Structured task	-0.20	0.24

Table 2. Correlation coefficients (R) of the associations between directive type and number of child turns

3. Discussion.

The goal of this study was to explore the influence of the context of parent-child interactions on parents' use of directive language and, in turn, on their 3-year-old children's talkativeness. The results showed that parents used significantly more directives in the structured task compared to the semi-naturalistic free-play task and that within the category of directives, parents

used significantly more intrusive directives in the semi-naturalistic free-play task compared to the structured task. As well, parents who used more directive utterances had children who took fewer turns per second.

These results build on existing literature showing that the context of parent-child interaction influences the type of speech used by caregivers and thus the amount of talk from their children. Overall, our findings are in line with previous research showing that different tasks result in different kinds of language from parents. While much of previous research had focused on structured tasks with passive parental involvement (Baek & Touati 2020), the present study employed a structured task that was collaborative in nature allowing for increased levels of active caregiver participation. Moreover, most of this research is with children ages 2 and under, and our findings with children aged 3;0 suggest that contextual effects of parent language are similar throughout the preschool years.

Given the difficulty of the structured Etch-A-Sketch task, it is perhaps not surprising that this task resulted in more parental directives overall. However, it is interesting that these directives were primarily supportive directives, and that parents used intrusive directives more in the free-play task; for the latter task, we might have expected few intrusive directives, as there was no goal to the play and parents could easily follow their child's lead. However, we believe that this difference between tasks results from the affordances of the situation as well as our own coding approach. In the Etch-A-Sketch task, there was only one activity at hand, and it was sufficiently engaging that most dyads stayed with it for the duration of the task session, while with free play there were many toys to choose from and it was easy for the child to attend to one while the parent was attending to another. Moreover, we coded for intrusive vs. supportive directives relatively broadly—if the child was attending to the Etch-A-Sketch and the parent provided a directive related to the Etch-A-Sketch, we coded that as supportive, even if the child was attending to the wrong part of the toy. Nevertheless, our impressionistic observations of the sessions are in line with the findings; parents were generally directing children to turn their knob while the child was attending to that knob.

Our findings for child volubility are also somewhat surprising. While prior research suggests that greater parental use of intrusive directives is associated with children's decreased participation in conversation or language skill (e.g., Akhtar, Dunham, & Dunham 1991; Rowe 2008), our results only found such a negative correlation for supportive directives in the structured Etch-A-Sketch task. Intrusive directives in this task were in fact associated with more child turns. We suspect this is because parents often produced intrusive directives in this task when the child was unhappy with the task and wanted to choose a different activity; these conversations were often child-initiated, with the child proposing to do something else, and the parent providing an intrusive directive to orient them back to the task. By contrast, when parents produced supportive directives, children were following along with the task, which was sufficiently challenging that most of them simply listened to and attempted to follow their parent's instructions. These results highlight the role of the child in directing the kind of language input they receive.

The strength of these conclusions is impacted by several factors. First, we initially aimed to achieve intercoder reliability of at least 80%, but this was not achieved, suggesting that the coding scheme may be too subjective. Second, we lacked longitudinal analyses that would reveal how these interactional styles affect children's later language outcomes. Third, although our within-subject design is a strength, the number of participants is still quite small. Fourth, this is a particularly homogenous sample of primarily monolingual English-speaking, well educated, urban or suburban US families with a set of twins. Because both language input and the contexts in

which children engage differ widely across cultures and social groups, it is critical for researchers to study a wide range of populations and to identify similarities and differences across them.

It has long been proposed that the language produced by caregivers in conversation with their child drives children's language development by virtue of being "tuned" to support children's comprehension and learning (e.g., Snow 1972). Structured tasks, in particular, offer a valuable context for testing and refining this hypothesis, as they allow both for naturalistic, unscripted caregiver speech, while still offering some control over the environment—what caregivers are likely to be speaking about (e.g., Arunachalam 2016; Leung et al. 2021). Therefore, we hope that researchers will continue to investigate caregiver-child interactions across a variety of tasks, including more and less structured ones.

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