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The breadth and specificity of 18-month-old's infant-initiated interactions in naturalistic home settings☆

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ABSTRACT

Infants actively initiate social interactions aiming to elicit different types of responses from other people. This study aimed to document a variety of communicative interactions initiated by 18-month-old Turkish infants from diverse SES (N = 43) with their caregivers in their natural home settings. The infant-initiated interactions such as use of deictic gestures (e.g., pointing, holdouts), action demonstrations, vocalizations, and non-specific play actions were coded from video recordings and classified into two categories as need-based and non-need-based. Need-based interactions were further classified as a) biological (e.g., feeding); b) socio-emotional (e.g., cuddling), and non-need-based interactions (i.e., communicative intentions) were coded as a) expressive, b) requestive; c) information/help-seeking; d) information-giving. Infant-initiated non-need-based (88%) interactions were more prevalent compared to need-based interactions (12%). Among the non-need-based interactions, 50% aimed at expressing or sharing attention or emotion, 26% aimed at requesting an object or an action, and 12% aimed at seeking information or help. Infant-initiated information-giving events were rare. We further investigated the effects of familial SES and infant sex, finding no effect of either on the number of infant-initiated interactions. These findings suggest that at 18 months, infants actively communicate with their social partners to fulfil their need-based and non-need-based motivations using a wide range of verbal and nonverbal behaviors, regardless of their sex and socio-economic background. This study thoroughly characterizes a wide and detailed range of infant-initiated spontaneous communicative bids in hard-to-access contexts (infants' daily lives at home) and with a traditionally underrepresented non-WEIRD population.

1. Introduction

From the first months of life, infants actively shape their physical and social interactions with the world. As they accomplish their learning goals, they predominantly rely on two streams of information – first-hand exploration and socially acquired knowledge. As an active learner, the child acts as both a "little scientist" eager to explore and put to test what they encounter and, crucially, as a 'little anthropologist' – being receptive to and seeking out knowledge from others (Harris, 2012; Legare & Harris, 2016; Vygotsky, 1987).

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Through this active social learning, infants initiate a range of interactions aiming to engage their social partners and to probe their own knowledge about the world (Baldwin & Moses, 1996; Bazhydai & Harris, 2021; Begus & Southgate, 2018; Butler, 2020; Saylor & Ganea, 2018). The emergence of their own active communication is inevitably shaped by how caregivers interact with them. Studies highlight the importance of caregiver sensitivity, responsiveness, gestural and linguistic input, and contingency in social interactions on infant communication patterns (Bornstein & Tamis-LeMonda, 1989; Kuhl, 2007). For example, early maternal responsivity to infant vocalizations predicted mother-directed vocalizations and was associated with an increase in infant-initiated communication (Gros-Louis et al., 2014), and the quality of social interactions predicted children's expressive language 1 year later (Hirsh-Pasek et al., 2015). In similar vein, dual neuroimaging studies show that caregivers' brains (i. e., theta power in the EEG) influence infants' during social interaction such as impacting infants' longer sustained attention during object play (Wass et al., 2018). Thus, in addition to benefiting from social communication as recipients, children use this experience to develop the skillset allowing them to initiate social interactions themselves.

The communicative tools that young children use to initiate social interactions are varied and undergo a developmental change. Among the early behaviors used to communicate with others are reaching, hold-outs, gives, pointing, and vocalizations. At around 6 months, infants are able to reach toward a toy that is not within their immediate proximity (Bates et al., 1975), which by 8 months occurs in the presence of others rather than when alone, underscoring its increasingly social nature (Ramenzoni and Liszkowski, 2016). Another set of behaviors available to infants from about 9–10 months is shows-and-gives and hold-outs, which may be indicative of the early emergence of declarative intentions (Boundy et al., 2016, 2019). Reaches, shows-and-gives and hold-outs are viewed as precursors to pointing, distinct with an index finger extension (Aureli et al., 2013; Blake et al., 1994; Carpenter et al., 1998). In addition to gestural communication, infants use their prelinguistic skills to produce babbling and other vocalizations, linked to their readiness to learn and coordinate their communication with others (Goldstein et al., 2010; Northrup & Iverson, 2020). In particular, infants' active use of vocalizations and pointing in combination impacted later language abilities (Wu & Gros-Louis, 2014), and caregivers were most likely to respond to infant-initiated communicative bids that comprised of a combination of social gaze, gestures and vocalizations (Donnellan et al., 2020). In their second year, infants can also initiate social interactions by engaging others in play activities and demonstrating actions in object play, for example how to retrieve a hidden reward such as a sticker or a button making an exciting sound from the novel toy (Ashley & Tomasello, 1998; Bazhydai, Silverstein, et al., 2020). In sum, early infant-initiated communication is described by variability in behaviors, multi-modal coordination and complexity of communicative acts (Salley et al., 2020).

Infants' communicative bids in the second year of life carry different intentions. These can stem from infants' desire to fulfil basic biological needs, such as being fed or picked up (Lilley et al., 1997; Liszkowski, 2008). Caregivers are attuned to recognize such motivations, for instance, they discriminate infant cries associated with hunger vs. pain (Gustafson & Harris, 1990). In addition to such need-based intentions, infants use their communicative tools described above for non-need-based purposes such as requesting a toy to play with, seeking emotional guidance when uncertain, or asking for help. With heavy focus on pointing gesture in particular, two primary communicative functions have been proposed: imperative (e.g., to obtain a desired object out of reach) and declarative (to attract attention of a social partner to share interest in an object) (Bates et al., 1975; Camaioni, 1997; Cameron-Faulkner, 2020). These have been shown to frame overall pointing development and its relationship to concurrent vocalizations and parental influence (Aureli et al., 2017; Carpenter et al., 1998; Cochet et al., 2011; Salo et al., 2019). In recent decades, the range of intentions that can be derived from infant-initiated communications, specifically gestures, has been expanded to include informative and interrogative (or information-seeking) intentions (Southgate et al., 2007; Tomasello et al., 2007). According to Tomasello et al. (2007), declarative motives can be further divided into expressive and informative ones, with the former referring to sharing attention or interest and the latter referring to providing information to another person. Demonstrating the informative communicative function of pointing, infants directed a naïve adult's attention towards an object they were looking for when the infant was in the know (Liszkowski et al., 2006, 2008). It has been similarly observed that preverbal infants possess an ability to produce question-like acts of communication, to which caregivers respond with provision of information (for reviews see Begus & Southgate, 2018; Butler, 2020; Harris & Lane, 2014; Lucca, 2020; Ronfard et al., 2018). Demonstrating interrogative intentions, infants initiate babbling (Goldstein et al., 2010), hold-outs and gives of objects of their interest to other people (Boundy et al., 2016), engage in social referencing both to seek social input (Striano et al., 2006) and to seek information to resolve referential uncertainty (Bazhydai et al., 2020; Goupil et al., 2016), and point to ask about objects of their interest (Begus & Southgate, 2012; Begus et al., 2014; Lucca & Wilbourn, 2018, 2019). These preverbal behaviors serve as early precursors to fully developed social information-seeking through asking questions.

The range of communicative intentions available to infants extends beyond pointing gestures and encompasses various preverbal behaviors (Boundy et al., 2019; Donnellan et al., 2020; Guevara & Rodríguez, 2023; Moreno-Núñez et al., 2020; Rodríguez et al., 2015). Despite this recent recognition of other early communicative tools, pointing has been dominating the literature in particular in terms of exploring infant intentionality. This exclusive focus has led to an abundance of research demonstrating that reaching the pointing milestone is linked to a range of socio-cognitive and linguistic outcomes, with their early language abilities in turn positively correlating with later life academic, financial, and health outcomes (Carpendale & Lewis, 2006; Kuhn et al., 2014; LeBarton et al., 2015; Lucca, 2020; Southgate et al., 2007; Tomasello et al., 2007). Pointing has been considered the first intentional gesture (Bates et al., 1975) enabling the "9-month revolution" (Tomasello, 2004) when a child achieves triadic, rather than dyadic interactions. Nevertheless, recent research suggests progressive continuity in infant gesturing and a greater role of pre-pointing behavior, including demonstrating that precursors to pointing, such as shows and gives, are predictive of expressive vocabulary independently of pointing (Choi et al., 2021).

While communicative intentions have been a topic of investigation for many decades, our knowledge about them is mixed. Some studies have embarked on investigating a variety of communicative functions, introducing extensive and complex classifications often stemming from different theoretical traditions (see Guevara & Rodríguez, 2023 for a recent review). On the other hand, for some

intentions, our knowledge stems exclusively from lab-based studies focusing on a single target intention; as such, informative pointing (Liszkowski et al., 2006), interrogative social referencing (Bazhydai et al., 2020) and interrogative pointing (Begus & Southgate, 2012) have thus far only been demonstrated in experimental settings. Some intentions have only been investigated with pointing gestures but not its precursors. Furthermore, some research findings have been inconsistent between studies using experimental longitudinal design to investigate pointing intentions by eliciting the behaviors (Aureli et al., 2013, 2017; Camaioni et al., 2004; Carpenter et al., 1998; Perucchini et al., 2020) as compared to studies in more naturalistic settings where spontaneously generated behaviors can be observed (Cochet and Vauclair, 2010a). Capturing the variety of intentions in more naturalistic settings, without the demands of the lab setting and thus reducing the impact of environmental novelty, is a necessary challenge in this line of research. In other domains, such settings have been shown to be conducive to capturing rich and diverse child-parent interactions (Bohn et al., 2022; Köster et al., 2022).

The focus in infancy research has recently increasingly turned to naturalistic settings with researchers focusing on producing and analyzing rich and ecologically valid datasets (Herzberg et al., 2022; Suarez-Rivera et al., 2019, 2022; Swirbul et al., 2022). By embracing discovery-focused science (Tamis-LeMonda, 2023), examination of datasets collected in home environment enables rich description of contextualized behaviors. For example, using infant head camera recordings during mealtimes at home, it was found that infants in their first year were more likely to learn the name of the most frequently viewed objects (Clerkin et al., 2017). The use of wearable sensors collecting data from children's motion, autonomic activity, as well as audio and video recordings, often synchronized with the data from their caregivers, and analyzed with machine learning algorithms has opened a new era in developmental research (de Barbaro, 2019). Sampling broadly from children's everyday environments, combined with conducting research with diverse samples, is the ultimate approach to improve generalizability of developmental science (West et al., 2022).

In research on infant communication, prior decades' overreliance on laboratory-based, rigorously controlled studies has led to making inferences based on behaviors observed during relatively short time frames, e.g., 5- or 10-minute study slots. While providing valuable insights into infants' communicative intentions, this methodology may not be fully representative of real-life infant-caregiver social interactions. Embracing rich video data obtained in naturalistic settings, studies looked at infants' spontaneous initiation of pointing, hold-outs, giving and reaching behaviors (Boundy et al., 2016; Carpenter et al., 1998; Cochet and Vauclair, 2010b; Perucchini et al., 2020). With access to longer periods of time as infants go about their day, we increase our chance to capture their self-driven behaviors with higher accuracy, otherwise key behaviors might be missed as children tend to react to various objects in short bursts (Herzberg et al., 2022; Slone et al., 2019). Thus, a systematic study of infant-initiated social interactions would uniquely benefit from extensive data from naturalistic environments.

The majority of studies on infant-initiated social interactions mainly focus on European-American, middle-class families, overlooking unique cultural emphasis that may shape children's communication practices, mirroring the situation in infancy research overall (Singh et al., 2023). It is reasonable to expect variations depending on the cultural context because children are exposed to differing amounts of deictic gestures with different forms (i.e., offering, showing, pointing, placing) from very early on (Salomo & Liszkowski, 2013), and also learn how to regulate their attention (Vigil, 2002), as well as when and how to ask questions or seek for information within a socio-cultural context (Callanan et al., 2020; Greenfield et al., 2003; Rogoff, 2003; Vygotsky, 1987). For example, joint attentional bids at 9- and 12-month-olds were led more by infants in British families, but more by parents in Chinese families (Vigil, 2002). When attracting their parents' attention, Mayan infants used a lower number of deictic gestures of pointing and showing compared to Dutch and Chinese infants (Salomo & Liszkowski, 2013). When seeking information from others in everyday life situations, 3- and 5-year-old children from Western (United States) and non-Western (Garifuna in Belize, Logoli in Kenya, Newars in Nepal, and Samoans in America Samoa) cultures ask similar amounts of questions; however, children from non-Western cultures ask a smaller number of explanation-seeking questions (why-questions) compared to children in the US (Gauvain et al., 2013). Taken together, these findings indicate that adults and children from all cultures structure their interaction, but sociocultural factors contribute to how these interactions are formed (Rogoff, 1990), calling for further studies with naturalistic paradigms to investigate children's communicative interactions in other cultures.

Turkey is a unique sociocultural context by being an industrialized non-Western country and comprising both collectivistic and individualistic characteristics (Şen et al., 2014). Recent developments in urbanization, economy, and formal education led to transitions in child-rearing practices which can be reflected in children's communicative interactions as well (Kagitcibasi, 1990, 2005). Limited research demonstrated that preschool children in Turkey asked more fact-seeking questions (e.g., "What is this?") than explanation-seeking questions (e.g., "How does it work?") when presented pictures of unfamiliar objects and animals (Ünlütabak et al., 2019). Moreover, explanation-seeking questions constituted a lower percentage of Turkish children's information-seeking questions when compared to their US counterparts (Chouinard et al., 2007). However, this pattern varied as a function of children's socio-economic status (SES) in Turkey. In the same study (Ünlütabak et al., 2019), Turkish preschoolers growing up in middle-SES families asked more information-seeking questions than children growing up in low-SES families. Furthermore, a recent study in a Turkish sample demonstrated that infants from high-SES families pointed more frequently and showed a larger growth in their pointing abilities from 8 to 12 months compared to infants from low-SES families (Ger et al., in press). A possible reason for this disparity may stem from the attitudes of the parents towards children's communication styles. Previous work showed that caregivers from mid-SES families provide more explanatory responses to child questions compared to low-SES parents in the US (Kurkul & Corriveau, 2018). In line with this finding, converging evidence suggests that high-SES parents in Turkey value autonomy of the children, so they display more autonomy support and less controlling behaviors for their children than low-SES parents (Kagitcibasi & Ataca, 2005; Şen et al., 2014). Low-SES parents, on the other hand, value conformity and display controlling behaviors to a greater extent than high-SES families (Koşkulu et al., 2021; Yagmurlu et al., 2009). Attitudes of families across different SES levels may also be reflected in infants' communicative intentions such that infants from higher-SES families may be more autonomous and initiate interactions to a greater extend compared to infants from low-SES families.

Furthermore, previous research indicated variations in the extent to which girls and boys engage in communicative interaction, with girls producing slightly more gestures (Berglund et al., 2005; Eriksson & Berglund, 1999; Özçalışkan & Goldin-Meadow, 2010) and initiating more joint attentional bids with their parents (Saxon & Reilly, 1999) compared to boys in infancy. Parents of female children also seem to socialize their daughters differently than their sons by talking more and using more supportive speech (e.g., positively responsive language such as praise, approval, agreement; Leaper et al., 1998), asking more questions and using longer utterances (Cherry & Lewis, 1976), especially at later ages. Research on sex differences in communicative interactions in infants from Turkey remains non-existent; however, considering differences in parents' and children's communication styles, we explored whether the slight advantage observed in girls' overall social communication skills extends to their naturalistic communicative interactions during infancy.

1.1. Present study

In this study, our primary goal was to characterize the breadth and specificity of infant-initiated behaviors by exploring naturally occurring interactions between infants and their immediate family members. To achieve this, we employed a novel behavioral coding scheme to analyze a substantial video dataset collected in Turkey. Our study focused on a particularly challenging-to-reach population: 18-month-old infants from diverse SES backgrounds, observed in their home environments.

We coded infants' active bids for social interaction, with a particular focus on the various intentions behind these behaviors, such as expressing a need, sharing attention, or requesting help. Our first objective was to determine if our coding system effectively captured a wide array of infant behaviors and organized them into theoretically meaningful categories. We accomplished this by examining the characteristics of infant-initiated communicative interactions in home settings (e.g., total number of communicative bids, total number of people around, or type of behaviors) and the nature of interactions initiated by the infants (differentiating between need-based vs. non-need-based bids).

Our second aim was to investigate whether familial SES and the sex of the infant played a role in the following aspects: (a) total number of infant-initiated communicative bids, (b) total number of need-based bids, and (c) total number of non-need-based bids. Considering the fundamental nature of need-based interactions (e.g., feeding) in parent-child relationships, which are universally observed across families from diverse backgrounds (Schön & Silvén, 2007), we hypothesized that neither SES nor the sex of the infant would be significantly related to the total number of infant-initiated need-based bids. However, we expected that SES would be positively correlated with the number of overall communicative bids and non-need-based bids, as earlier studies indicated increased gestural and explanation-seeking question behaviors among children from high-SES compared to those from lower SES backgrounds (Ger et al., in press; Ünlütabak et al., 2019). Additionally, we expected that girls would initiate more communicative bids and non-need-based interactions compared to boys, considering the advantage observed in girls' overall social communication skills (e.g., Özçalışkan & Goldin-Meadow, 2010; Saxon & Reilly, 1999).

To the best of our knowledge, this is the first study to thoroughly characterize a wide and detailed range of infant-initiated communicative bids in a natural home environment, thus bridging the distinct lines of work in developmental research.

2. Method

2.1. Dataset

The dataset came from home video observations of infant-caregiver interactions, collected as part of a longitudinal project conducted at Koç University, Turkey, entitled: *Influence of socioeconomic and immigration status on the cognitive origins of cultural learning* (Project No: 113K006) between 2015 and 2019. This study was approved by ethics board in Turkey (Protocol number: 2012.048. IRB3.18).

In the original project, 56 infants were followed at 8 time points (monthly between 8–14 months and when they were 18-month-old). The dataset comprised of several measures across the cognitive, socio-emotional and language domains, including behavioral, eye-tracking and observation measures at the lab and natural observations at home. For the purposes of the current secondary data analysis, we used video recordings of child-caregiver home observation at 18-month visits.

2.2. Participants

We coded data from 43 18-month-old infants (M_{age} = 18.69 months, SD_{age} = 0.42, *Range* = 18.13 −19.96 months, 23 females). The data acquisition process did not allow us to conduct a priori power analysis. Instead, we included all infants that had home recordings from their 18-month visit in the current study. The ethics approval was sought from the Faculty of Science and Technology Research Ethics Committee at Lancaster University for the behavioral coding and re-analysis of the original dataset (Protocol Number: FST20092).

Mothers completed a set of questionnaires to measure their familial and demographic background. During 18-month visits, the mean years of maternal age was 33.26 (*SD* = 5.01, *Range* = 22.4–44.5). All mothers were married, and the average years of marriage was 6.74 *(SD* = 5.14*, Range* = 1–22, *n* = 35*)*. The majority of the mothers were university graduates (40.5%), while the rest were graduates of primary school (19%), secondary school (7.1%), high school (19%), and graduate school (14.3%). Most of the mothers were unemployed (71.4%).

Socio-economic Status (SES): To assess the SES of each participant, we adopted two approaches (see Singh et al., 2022, for

justification and considerations for measuring SES). First, we used individual indicators of SES including the standardized summary metrics of monthly household expenditure, maternal education and occupation status. Maternal education was rated on a 6-point scale (*0 = illiterate, 1 = primary school, 2 = secondary school, 3 = high school degree, 4 = college/university degree, 5 = Master's or Doctorate's degree)*. Mother's occupation status was categorized as either unemployed (0) or employed (1). Monthly household expenditure was rated on a 5-point scale (*1 = less than 650 TL, 2 = 651–1200 TL, 3 = 1201- 3000 TL, 4 = 3001–5000 TL, 5 = more than 5000 TL*). Second, we created a composite score utilizing each of the individual SES measurements by summing the z-scores from each parameter to have a continuous measurement of SES ($M = 0.00$, $SD = 0.82$, *Range* $= -1.15 - 1.35$, $n = 37$[1]). It should be noted that the data for monthly household expenditure was collected before the hyperinflation period that Turkey went through between 2018–2023, thus the expenditure categorization does not reflect the current situation ((Ipsos, 2022; Stoupos et al., 2023).

2.3. Procedure

Each parent-infant dyad was visited at a time convenient for the parents. Before these visits, parents were called and instructed to maintain their usual daily routines and avoid interacting with the observer. The observation session lasted about an hour.

During the visits, an observer engaged in conversations with the parents, addressed their questions, welcomed the infant, and introduced the necessary equipment including tripod, camera, and head-mounted camera, to ensure a smooth transition into the observation phase.

Observers utilized a head-mounted camera to closely follow the infants throughout the visit. They made efforts to minimize responsiveness to the infant's communicative attempts as much as possible during the observation, thus avoiding any interference with the natural behavior of the parent-infant dyads. The home observations captured the dyads engaging in wide-ranging activities, encompassing playtime (e.g., playing with toys, engaging in pretend play, listening to music, and dancing), mealtime, screentime (involving the use of tablets or watching television by the infant and other individuals), and household chores (such as cooking or doing laundry while the infant was present, and occasionally involving the infant in these activities). Each house observation was conducted by a single observer.

Coding: We developed a novel coding scheme that aims to document a range of verbal and non-verbal infant-initiated behaviors in home settings. Infant behaviors observed in this study were coded by using an event-based approach (e.g., Bornstein et al., 2020). An event was considered as a snapshot of a particular interaction at a particular moment with an identifiable beginning and end, and constituted a meaningful whole. We defined an *event* as an infant-initiated interaction that starts with a specific trigger behavior such as pointing to an object and ends when the query associated with the trigger behavior was resolved or when either the parent or the infant disengaged from the ongoing communication. Further, a trigger behavior by the infant was coded as marking an infant-initiated interaction: 1) if the infant response did not occur within three seconds of the last context-relevant adult-initiated behavior (e.g., the mother asks the infant to look at something, the infant points after eight seconds), 2) if the infant disengaged from the previous interaction with a new trigger behavior (e.g., the mother asks the infant to look at the window and the infant gives an object to the mother). All behaviors that were initiated within 3 s following the trigger behavior by the infant were coded. This time frame was chosen based on the previous literature on contingency in mother-infant interactions (e.g., Kuchirko et al., 2018; Tamis-LeMonda et al., 1998, 2013).

Within this scheme, several behavioral and interactional components were coded: the identity of the interactants in the events (interactants), whether the bid that initiated the event was resolved by the same person that it was directed to (bid resolution), the number of people present in the immediate environment when the event took place (number of people), the specific trigger behaviors used to initiate the events (trigger behavior), and the perceived aim of the events (interaction type). Below, we explain these components in detail.

Interactants: In all events, the initiator of the event was the infant. We coded the interlocutor of the infant as mother, father, nanny, or other (e.g., grandparents, family friends, or other siblings).

Bid resolution: We coded whether the infants' bids were resolved by the same person to whom they made the bid or by another person in the environment. For instance, infants could make an interactive bid to their father; however, the bid could be resolved by their mother before the father was able to respond. Bid resolution code had two categorical responses: *same* (i.e., when the bid was resolved by the same person), and *different* (i.e., when the bid was resolved by another person in the environment).

Number of people: This code represents the number of people visible to the camera for each event including the infant.

Trigger behaviors: We coded a range of verbal and non-verbal behaviors used by infants to initiate interactions with the others around them. The verbal code included all language and vocalizations used (such as using words like "mom", or babbling, giggling, fussy vocalizations), another code *ask* specifically included question words as well as interrogative interjections such as "huh?". Non-verbal codes covered a range of *deictic* (i.e., pointing, hold-out, giving, reaching) and *non-specific gestures* (i.e., waving hands, "pick me up" gesture, iconic gestures, etc.), *action demonstrations* (e.g., showing how to play with a toy, or press a button), *gazing towards a social other*, *grabbing directed at objects and others*, as well as *non-specific play acts* (e.g., approaching the mother, holding their hands and rocking side by side while smiling).

Interaction type: The interactions that infants initiated through specific trigger behaviors were classified into two categories as *need-based* and *non-need-based*. Need-based interactions were initiated by the infants to express or fulfil a need they were experiencing

[1] The composite score was based on full data without any missing values. Thus, sample size was reduced to 37.

then. We further categorized this into *biological need* and *socio-emotional need.* Biological need included the cases that involved feeding, cleaning, diaper change/toilet need, or sleep. Socio-emotional need included events with a request to be held, cuddled, kissed and events where infants interacted with parents with no perceived aim (e.g., making continuous eye contact with the parents without doing anything else). Non-need-based interactions were further categorized into *requestive, expressive, information/help-seeking* and *information-giving* interactions. The categorization was made based on the perceived intention of the interactions by looking at the preceding and following context where the event occurred and the ongoing communication between the interactants in the event (e.g., Choi et al., 2021; Choi & Rowe, 2021; Salo et al., 2019). In *requestive events*, the perceived aim of infants' behavior was to request an object or an action from the social partner (e.g., giving a no-longer wanted object to the parent, or reaching to get an object from them), in *expressive events* to either share emotion about an object or an action, or attract, share or sustain attention of a social partner (e.g., holding out an object toward the parent), in *information-/ help-seeking events* to seek information or help from the social partner (e.g., pointing to an object to elicit labels, or explicitly seeking help either verbally or after trying and failing), and in *information-giving* events to transmit information to the social partner that may not be immediately apparent to them (e.g., such as directing others' attention to the location of an object that is not in their visual field, or "informing" them about something happened in their absence) (see Fig. 1).

It should be noted that the events that were coded here were all "successful events" in the sense of attracting a relevant response from the caregiver rather than achieving the goal of the trigger behavior. For instance, if an infant initiated an event by pointing to an object to request it, we coded it if the caregiver responded appropriately by either looking towards the referent of the pointing gesture, or responded verbally but not gave the requested object to the infant. Given that in natural communication, not all interactions end up achieving what the interlocutors originally intended, nonetheless, they form successful interactions (Clark, 1996; Grice, 1975).

2.4. Training Coders and Interrater Reliability

We extensively trained two coders to apply the coding scheme to the video data. The videos were coded by using INTERACT (Mangold, 2018). The coding training took place in two steps. In the first step, the coders independently watched an hour long free-flowing video second-by-second and identified the cases that would constitute an event based on our event definition. The coders focused on the specific trigger behaviors that the infant displayed to initiate the interactions. After the events were identified, the coders moved onto the second step, and they coded each event for the following categories: interactants, bid resolution, number of people, the trigger behavior that was used to initiate the interaction (e.g., via hold-out), and the type of interactions (i.e., perceived intentions of the event).

For the interrater reliability, we randomly selected and coded approximately 12% of the videos which was in line with the earlier studies with intense coding protocols (e.g., Cote et al., 2023; Fusaro et al., 2014; Harel-Gadassi et al., 2020). Interrater reliability was also conducted in two steps. The first step focused on detecting events in free-flowing videos. Two coders coded one-hour long videos for the reliability subset of the data. Then, the first author of this study acted as a third coder, reviewing all events that were not coded by both of the coders. In this final list of eligible events, 79% of all events were coded by the same coders.[2] For the categorical variables coded in the second step, all kappas' ranged between .80 - 1.00, and for continuous variables, ICC Cronbach's alphas ranged between .84 − .99, showing strong to perfect reliability. Once the reliability was reached, the coders proceeded with coding the rest of the data.

3. Results

We investigated the characteristics of infant-initiated communicative interactions in home settings, the nature of interactions initiated by the infants, and the role of familial SES and infant sex on these interactions. Since the observation duration was not exactly 60 min for each infant *(M* = 58.43 min, *SD* = 5.05, *Range* = 39.43–64.22 min*),* we standardized infants' communicative bids (including total number of communicative bids, need-based bids, and non-need-based bids) by dividing them by the total duration of observation. We present the results in different subsections with these standardized scores.

3.1. The characteristics of events initiated by infants

Infants initiated a total of 2049 *successful* events. Each infant initiated at least one event during an average of one-hour episode, with a large variability (*M* =.81, *SD* =.59, *Range* =.09 – 3.58). Events lasted 3.20 s on average (*SD* = 1.11, *Range* = 0.9 - 8.7 s). The median number of people present in the environment when the event took place differed across infants, while most infants ($n = 31$) had a median of 2 people including themselves and the other interactant during the events that they initiated, some infants ($n = 11$) had a median of 3 people, and 1 infant had a median of 4 people. There were no associations between the median number of people present and the number of events initiated by the infants ($r(43) = -.285$, $p = .063$). In most of the infant-initiated events, the interactant was the mother (77.4%), and the rest was other people such as grandparents, siblings and relatives (15.95%), father (6%), and nannies (0.7%). Almost in all events (around 99%), infants' bids received a successful response from the same person that the bid was intended to.

Next, we analyzed the trigger behaviors used to initiate events (see Fig. 2 for the distribution of the trigger behaviors). In 71.6% of

[2] Given the nature of the data where it is not possible to record the cases which were missed by both coders in a free-flowing video, we were not able to calculate a Kappa value for the event detection.

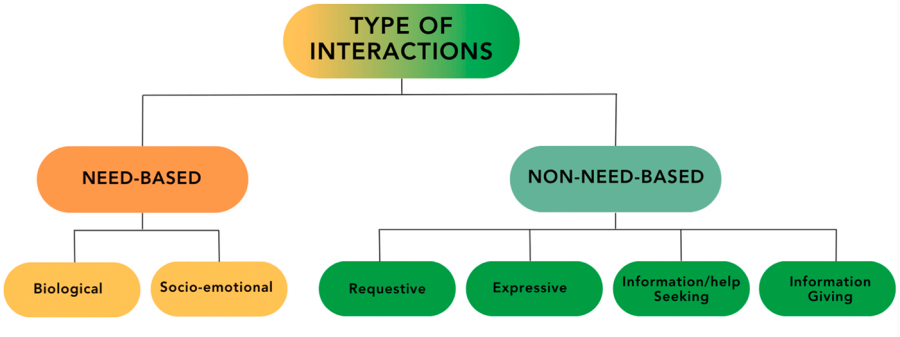

Fig. 1. Type of interactions coded to categorize infants' behavior.

the events, there were two overlapping trigger behaviors used to initiate interactions such as using pointing and a verbal expression simultaneously, in the remaining events (28.45%) infants used one trigger behavior to initiate events.

3.2. The nature of interactions

As previously mentioned, we coded the type of interactions initiated to fulfill different communicative needs based on their perceived intentions. Infants initiated both need-based and non-need-based interactions; however, non-need-based were more prevalent (88.4%). Infants initiated non-need-based events such as requesting an object or seeking information significantly more than need-based events such as being fed ($M_{non\text{-}need}$ =.72, SD =.59 and M_{need} =.09, SD =.09), $t(42) = -6.843$, $p < .001$. In non-need-based interactions, infants mostly initiated events with an expressive intention where they aimed to share emotion about an object or an action, or attract, share or sustain attention of a social partner (expressive), followed by events initiated with the intention to request an object or an action from the social partner (requestive). Infants also initiated events with the intention to seek information or help from the social partner (information/help seeking), and finally, although it was rare, some infants also initiated events to share information with their social partner (see Table 1).

3.3. SES and sex differences in the events initiated by infants

We investigated the potential relationship between SES and infants' sex with the total number of events initiated by infants during interactions with their caregivers at home, distinguishing between need-based and non-need-based interactions. When we compared groups in need-based and non-need-based interactions, we applied the Bonferroni correction to adjust the critical p-value (.0167). We also reported equal variances not assumed, when the assumption of equal variances was violated.

Following Singh et al. (2022), we employed two distinct approaches to measure SES. Our analysis included a composite SES score and individual parameters such as maternal education, mother employment status, and monthly expenditure. However, we did not find significant correlations between SES and the total number of events, nor with the total number of need-based and non-need-based interactions (all *ps* >.05, see Table 2). Subsequently, we examined the individual components of SES. Maternal education and monthly

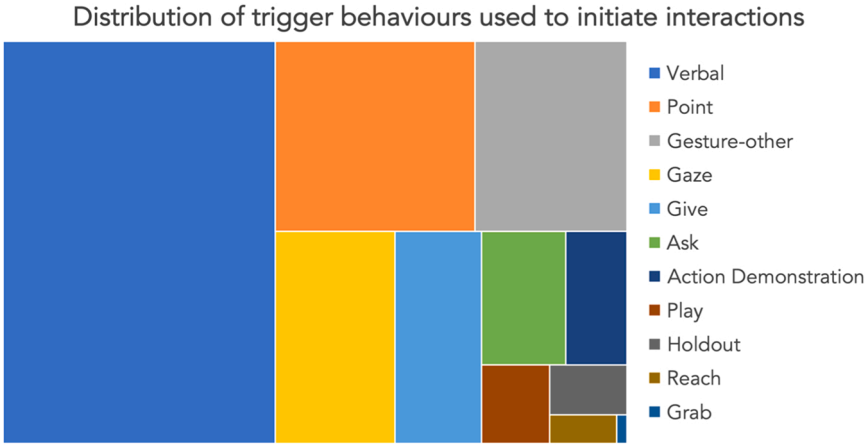

Fig. 2. The tree map chart shows the distribution of trigger behaviors used to initiate events for all events, including overlapping cases where two trigger behaviors were used. The trigger behaviors are presented in descending order based on the number of occurrences.

Table 1
Distribution of the types of interactions initiated by the infants.

Type of Interactions	Distribution of the Interactions (%)	
Need-based Interactions		11.6%
Biological Need	3.02%	
Socio-emotional Need	8.58%	
Non-need-based Interactions		88.4%
Requestive	25.96%	
Expressive	49.97%	
Information/help seeking	12.15%	
Information giving	0.29%	

expenditure did not have significant associations with the total number of events initiated by infants nor with the total number of need-based and non-need-based interactions (*ps* > .05, see Table 2). Similarly, there were no significant differences between the number of events initiated by infants ($t(12.70) = -1.045$, $p = .315$), as well as need-based ($t(40) = 1.466$, $p = .151$) and non-need-based ($t(12.45) = -1.198$, $p = .253$) interactions, for mothers who were employed or not (observed power =.164, .456, and .206, respectively) (see Table 3).

Next, we investigated whether there were sex differences in the number of infant-initiated events. Our analysis revealed no significant differences between the number of events initiated by girls and boys ($t(41) = .009$, $p = .993$). Similarly, there were no differences in the total number of need-based ($t(41) = -.929$, $p = .358$) and non-need-based ($t(41) = .145$, $p = .885$) interactions initiated by girls compared to boys (observed power =.050, .109, and .053, respectively) (see Table 3).

Taken together, these findings partially supported our hypotheses such that SES and infant's sex were not related to need-based communicative bids. However, there were no significant differences in the total number of events initiated by the infants and non-need-based interactions.

4. Discussion

In this study, we aimed to investigate 18-month-old infants' active socio-communicative behaviors in their natural environment. We developed and applied a novel coding scheme to quantify the wide range of behaviors that infants use to elicit responses from their social partners. By using one hour-long home recordings, we identified the interactions that were initiated by infants to express different communicative intentions. The current study expanded previous research (e.g., Guevara & Rodríguez, 2023; Salo et al., 2019) by comprehensively covering an extensive range of infant-initiated social interactions.

Infants in our sample truly exemplified their status of active communicators, generating nearly 50 unique events per hour. Infants initiated need-based and non-need-based interactions; however, the non-need-based interactions were more prevalent compared to need-based interactions. Among the non-need-based interactions, the vast majority aimed at expressing or sharing attention or emotion, followed by those aimed at requesting an object or an action. Only a fraction aimed at seeking information or help and infant-initiated information-giving events were rare. Further, we investigated the role of individual factors such as infant sex and familial SES on infants' tendency to initiate interactions with others. However, we found that neither had any influence on the frequency of infant-initiated interactions.

Infants used a wide range of verbal and nonverbal behaviors; verbal expressions and vocalizations played a key role in infants' different interactions with others, also accompanied by other nonverbal gestures such as points, holdouts, and action demonstrations. We found that infants were more likely to initiate interactions that did not revolve around a biological or socio-emotional need they were experiencing in the moment; but rather their interactions were more focused on meeting different communicative needs such as sharing interest or seeking help or information from their caregivers. While our data do not provide an explanation for this, one could argue that caregivers might be more attuned to their children's both biological and socio-emotional needs such as noticing when they are hungry or unwell, or feeling distressed, and thus proactively respond to these perceived needs almost immediately (e.g., Bornstein et al., 1992; Gustafson & Harris, 1990; Stallings et al., 2001; Thompson-Booth et al., 2014; van Bakel & Riksen-Walraven, 2008). Thus, when such needs of the infants are concerned, the caregivers might become the active parties in these interactions rather than the infants. On the other hand, in a play context where the focus is not on the biological or emotional needs of the infants but on the interaction itself, infants' own actions are likely to elicit and guide maternal responsiveness and input (e.g., Suarez-Rivera et al., 2022;

Table 2
Descriptive statistics and correlation coefficients for SES measures and type of interactions initiated by the infants.

Variable	*n*	M	SD	1.	2.	3.	4.	5.
1. Composite SES	37	.00	.82	-				
2. Maternal Education	42	3.24	1.34	.878**	-			
3. Expenditure	39	4.00	.86	.785**	.609**	-		
4. Total number of interactions	43	.81	.59	.137	.088	.024	-	
5. Need-based interactions	43	.09	.09	-.187	-.232	.008	.121	-
6. Non-need-based interactions	43	.72	.59	.164	.123	.023	.989**	-.026

** $p < .01$

Table 3
Descriptive statistics for Sex, Maternal Employment and Type of Interactions Initiated by the Infants.

	Total number of interactions *M (SD)*	Need-based *M (SD)*	Non-need-based *M (SD)*
Infant Sex			
Girl (n = 23)	.81 (.39)	.10 (.09)	.70 (.40)
Boy (n = 20)	.81 (.77)	.08 (.09)	.73 (.76)
SES Index: Maternal Employment			
Employed (n = 12)	1.01 (.92)	.06 (.07)	.94 (.93)
Unemployed (n = 30)	.72 (.40)	.11 (.09)	.61 (.37)

Tamis-LeMonda et al., 2013; Yu & Smith, 2013, 2017), and contribute to their learning (e.g., Begus et al., 2014; Lucca & Wilbourn, 2018). These findings provide some support that infants are more likely to seek non-need-based interactions with their caregivers.

Among the non-need-based communicative intentions, the most prevalent was expressive, which we defined as attracting, sharing or sustaining attention of a social partner, for instance, manifesting in their pointing at different parts of a toy while exchanging looks with their parent. This was followed in prevalence by the requestive intention, such as infants asking for a toy out of reach or to open the door. These two main intentions being at the forefront of infant-initiated communicative bids are in line with prior literature (see Tomasello et al., 2007 for a review). The other two intentions (information/help seeking and information giving) were substantially less frequent. Information/help-seeking was nevertheless more pronounced than both types of need-based communicative bids (biological and socio-emotional), and included behaviors like infants pointing to objects while playing or at images during book reading to ask for labels, using information-seeking vocalizations, exchanging gaze with the caregiver to inquire about locations of objects or people, and asking for help by giving or holding-out objects to their caregivers to achieve a goal they have failed to do so independently. The information-seeking intention has been identified as increasingly present in the second year of infants' life and a precursor to curiosity-driven questioning and investigation (Harris & Lane, 2014; Harris et al., 2017; Ronfard et al., 2018). The majority of studies explored its early manifestations in the lab-controlled environments (e.g., Begus & Southgate, 2012; Begus et al., 2014; Goupil et al., 2016; Lucca & Wilbourn, 2018) as well as few studies from more naturalistic environments (e.g., Chouinard et al., 2007; Olson & Masur, 2013. For instance, Begus and Southgate (2012) found that 16-month-olds were more likely to point out objects to an adult who is more likely to provide accurate information than to an adult who has been previously unreliable. Choinard et al. (2007) showed that by using interrogative vocalizations (e.g., "uh?") and gestures, 12–14-month-old infants elicited information from adults. We also contribute to this growing body of research by capturing the spontaneously occurring information seeking interactions in naturalistic settings.

Finally, information-giving interactions were the least prevalent in our sample. Even though lab-based studies have shown that children do share information with other people around them through responding to others' information-seeking questions and gaps in others' episodic knowledge (e.g., Behne et al., 2014; Liszkowski et al., 2008), we found that infant-initiated, unprompted information sharing was quite rare. This might be due to several reasons: First, distinguishing informative intentions from other intentions can sometimes be challenging because defining what counts as information-giving without making rich interpretations is difficult. For instance, if an infant pointed to the door and said "Papa"; this might be for different reasons, they might be enquiring about when their father is coming back (information seeking), they might be sharing their excitement because it is time for their father to come back (expressive), or they might want to inform that it is time for their father to come back (informative). As a result, we only considered cases as information-giving interactions when the information shared with the other person was not immediately apparent to them (e.g., if the other party does not have visual access, or events happened in their absence). Additionally, given that information-giving tends to occur upon information-seeking request of others, we might have been unable to capture these interactions because we only coded events that were initiated by the infants. Despite the limited explanatory power that our design affords, covering the full range of communicative intentions is a notable strength of this investigation, paving the way for more fine-grained research questions to be asked.

In our study, most of the interactions were initiated between infants and mothers; interactions with fathers remained limited compared to interactions with mothers and other people such as grandparents. This echoes infants' overall experiences in the Turkish context specifically with respect to their fathers' low frequency involvement in child-rearing activities both in terms of providing physical care (such as feeding and changing them) and supporting socio-cognitive development (such as chatting with their children, reading books to them, talking about emotions, etc.) (Akçınar, 2017). This finding suggests that childcare responsibilities might be structured around traditional gender roles putting mothers and other females in the family to the prominent position; however, the lower frequency of interactions with fathers might have socio-cognitive and emotional implications for the infant's development (e.g., Cabrera et al., 2004, 2007; Tamis-LeMonda et al., 2004).

Given the extant literature on the role of familial SES on early socio-cognitive development, we expected a difference in favor of children of high-SES families. However, we did not see such differences. This might be because different components of SES are differentially related to child development in different countries. Specifically, household income might be more influential in developing countries; while parental education might be more influential in industrialized countries (O'Connell, 2019). Here, we did not collect household income information because Turkish families were hesitant to share their income as it is often perceived as a private matter (see Singh et al., 2022 for an all-rounded discussion of this matter). Thus, our measures for the familial SES based on maternal education, maternal employment status and the monthly expenditure might be unable to capture these differences in Turkey context as a developing nation. It is also possible that other context-specific socio-economic characteristics of children's immediate

environment might alleviate the potential negative effects of being raised in low-SES backgrounds. For instance, Turkey has the lowest rate of female labor force among OECD countries (OECD, 2023; Tunalı et al., 2019), leading many females including mothers to stay at home. Indeed, a recent study shows that 77% of the mothers with children aged 0–5 are unemployed in Turkey (Ugur et al., 2023), and the maternal employment rate in our sample was also similar (71.4%). As a result of this, the unemployed mothers spend their time caring for their children at home, while, the employed mothers carry out childcare as a collective activity in which extended family members such as grandparents and aunts take active part in, with only 12% of mothers being able to afford or preferring to send their young children to a daycare (Madra, 2017). Hence, the continued caregiver presence around infants (Hsin & Felfe, 2014) in our sample might have had a positive effect on infants' communicative interactions regardless of their familial SES. Alternatively, the effect of SES may also exert its effect on active communicative behaviors of children at ages older than 18-month-old. This is supported, for example, by an increase in children's question-asking and asking more explanation-seeking questions in high-SES preschoolers compared to their low SES peers (e.g., Ünlütabak et al., 2019). We therefore conclude that, while still important, the similarities between the infants of low- and high-SES families in terms of initiating different types of interactions with their caregivers suggest that factors other than familial SES such as the structure of the home context, the continued presence of caregivers might have a compensating influence in shaping children's communicative bids in this specific context.

Finally, we explored whether infants in Turkey would differ in the frequency and the type of interactions they initiated with their caregivers based on their biological sex – an exploratory question stemming from prior literature demonstrating sex differences in terms of social communication skills with girls having a slight advantage over boys in areas such as using gestures (e.g., Eriksson & Berglund, 1999; Özçalışkan & Goldin-Meadow, 2010), and joint attention (e.g., Saxon & Reilly, 1999). However, we did not demonstrate any differences between girls and boys. One could argue that infants' interactions with caregivers might be influenced by other factors such as how responsive and sensitive caregivers are to infants' communicative bids displayed through wide-ranging behaviors from the use of gaze to language (e.g., Bornstein & Tamis-LeMonda, 1989; Gros-Louis et al., 2014). Thus, even if girls might be slightly advantaged in overall early communication skills, parental sensitivity to infant cues might encourage infants to initiate more interactions regardless of the infants' sex, or alleviate sex effects. It remains to be further explored which factors might impact sex differences in infant-generated interactions.

4.1. Limitations and future directions

The current study goes beyond previous research by revealing the active initiation of communication by infants in both need-based and non-need-based domains. Future studies may take our findings further. First, it is important to note that the data was originally collected for a larger project, limiting our control over the sample size, the sample characteristics, or the availability of SES measures. Additionally, the data collection method employed non-participant observation, where the observers refrained from responding to the infants' communication attempts as much as possible. This approach is commonly used in home observations to minimize interference (e.g., Tamis-LeMonda et al., 2017), and parents were encouraged to disregard the presence of the observers during these sessions (e.g., Bornstein et al., 2023; Tamis-LeMonda & Bornstein, 1994). In previous studies, parents, when asked, reported only minor influence on their children's behavior due to the observer's presence (e.g., Karasik et al., 2011). Nevertheless, it is worth considering the possibility that this observer non-responsiveness during home observations may affect the natural flow of the interaction. To gain a more comprehensive understanding of how infant-initiated communicative intentions vary across socioeconomic diversity, future research could address these considerations by increasing sample size, incorporating other SES indicators such as household income or home quality, and exploring alternative methods such as including observer as an interactant or using advanced equipment that does not require the physical presence of observers.

Second, the accurate identification of purely infant-initiated events was challenging due to the contingent and occasionally overlapping nature of interactions between infants and caregivers. To address this concern, we adopted a conservative approach, implementing a 3-second time frame to decide what counts as an infant-initiated event such that if the 3-second time frame before the trigger behavior was not helpful for determining the initiator of the event, these cases were not included. Even though we did not quantify the number of events that were not included, this approach, nonetheless, might have led to an underestimation of infant-initiated events. Similarly, the categorization of interaction types initiated by the infants relied on the coders' interpretation of the intended communicative goals (e.g., Salo et al., 2019). Given the idiosyncratic nature of each infant's unique social (e.g., number of people, the identity of the people such as adults, children, parents' communication styles) and non-social (e.g., the size of the house, number and quality of the toys/objects around) context, it was challenging to apply strict definition of intentions that would apply to all infants. Consequently, our aim was to capture a broad range of intentions while avoiding over-interpreting observed behaviors. For instance, if the child was pointing to an image during book-reading, it might be to attract their caregiver's attention or it might be to ask for the label of that image. In this situation, unless it was clear that the child was asking for the label (e.g., pointing repeatedly until the caregiver provides a label), we did not code this type of interaction as information/help seeking. As a result, this relatively conservative approach might have inflated the presence of some intentions (e.g., expressive) while limiting the presence of others (e.g., information-help seeking). To provide a more comprehensive portrayal of all types of interactions in naturalistic settings, future studies could consider incorporating additional categories that would allow for a more fine-grained distinction. Alternatively, implementing a wider time frame or using a more holistic interactional approach rather than a time-based approach (e.g., by extensively examining the wider interactional context when the trigger behavior occurred without a set time frame) might capture these issues.

4.2. Conclusion

Infants are active learners. Here, we provide additional support by showing 18-month-old infants actively communicate with their social partners to fulfil their need-based and non-need-based motives using a wide range of verbal and nonverbal behaviors, regardless of their sex and socio-economic background. This study is an important step in the way of quantifying infants' own role in shaping their social and communicative landscape by thoroughly investigating their spontaneous behaviors in their natural settings.

CRediT authorship contribution statement

Didar Karadağ: Conceptualization, Methodology, Data curation, Formal analysis, Visualization, Supervision, Writing – original draft, Writing – review & editing. **Marina Bazhydai:** Conceptualization, Methodology, Writing – original draft, Writing – review & editing. **Sümeyye Koşkulu-Sancar:** Investigation, Data collection, Writing – original draft, Writing – review & editing. **Hilal H. Şen:** Investigation, Data collection, Resources, Funding acquisition, Writing – original draft, Writing – review & editing, supervision.

Declaration of Competing Interest

The authors have no conflicting interest to declare.

Data availability

Data is publicly available on the project page on Open Science Framework (OSF) and can be accessed using this link: https://osf.io/5ctmv/.

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References

Akçınar, B. (2017). *Türkiye'de ilgili babalık ve belirleyicileri: Ana rapor.* [Involved Fatherhood and Its Determinants in Turkey]. *İstanbul: Anne Çocuk Eğitim Vakfı [Mother Child Education Foundation]*.

Ashley, J., & Tomasello, M. (1998). Cooperative problem-solving and teaching in preschoolers. *Social Development, 7*(2), 143–163. https://doi.org/10.1111/1467-9507.00059

Aureli, T., Perucchini, P., & Iverson, J.M. (2013). Motor acts and communicative gestures from 9 to 18 months of age in imperative and declarative context: Tracing the origin and development of pointing. http://digital.casalini.it/10.1400/214817.

Aureli, T., Spinelli, M., Fasolo, M., Garito, M. C., Perucchini, P., & D'Odorico, L. (2017). The pointing– vocal coupling progression in the first half of the second year of life. *Infancy, 22*(6), 801–818. https://doi.org/10.1111/infa.12181

Baldwin, D. A., & Moses, L. J. (1996). The ontogeny of social information gathering. *Child Development, 67*(5), 1915–1939. https://doi.org/10.1111/j.1467-8624.1996.tb01835.x

Bates, E., Camaioni, L., & Volterra, V. (1975). The acquisition of performatives prior to speech. *Merrill-Palmer Quarterly of Behaviour and Development, 21*(3), 205–226. https://www.jstor.org/stable/23084619.

Bazhydai, M., & Harris, P. L. (2021). Infants actively seek and transmit knowledge via communication. *Behavioral and Brain Sciences, 44*. https://doi.org/10.1017/S0140525X20001405

Bazhydai, M., Silverstein, P., Parise, E., & Westermann, G. (2020). Two-year-old children preferentially transmit simple actions but not pedagogically demonstrated actions. *Developmental Science, 23*(5), Article e12941. https://doi.org/10.1111/desc.12941

Bazhydai, M., Westermann, G., & Parise, E. (2020). I don't know but I know who to ask": 12-month-olds actively seek information from knowledgeable adults. *Developmental Science, 23*(5), Article e12938. https://doi.org/10.1111/desc.12938

Begus, K., & Southgate, V. (2012). Infant pointing serves an interrogative function. *Developmental Science, 15*(5), 611–617. https://doi.org/10.1111/j.1467-7687.2012.01160.x

Begus, K., & Southgate, V. (2018). Curious learners: How infants' motivation to learn shapes and is shaped by infants' interactions with the social world. *Active Learning from Infancy to childhood: Social Motivation, cognition, and linguistic mechanisms*, 13–37. https://doi.org/10.1007/978-3-319-77182-3_2

Begus, K., Gliga, T., & Southgate, V. (2014). Infants learn what they want to learn: Responding to infant pointing leads to superior learning. *PloS One, 9*(10), Article e108817. https://doi.org/10.1371/journal.pone.0108817

Behne, T., Carpenter, M., & Tomasello, M. (2014). Young children create iconic gestures to inform others. *Developmental Psychology, 50*(8), 2049. https://doi.org/10.1037/a0037224

Berglund, E. V. A., Eriksson, M., & Westerlund, M. (2005). Communicative skills in relation to gender, birth order, childcare and socioeconomic status in 18-month-old children. *Scandinavian Journal of Psychology, 46*(6), 485–491. https://doi.org/10.1111/j.1467-9450.2005.00480.x

Blake, J., O'Rourke, P., & Borzellino, G. (1994). Form and function in the development of pointing and reaching gestures. *Infant Behavior and Development, 17*(2), 195–203. https://doi.org/10.1016/0163-6383(94)90055-8

Bohn, M., Vieira, W. F. D. S., Giner Torréns, M., Kärtner, J., Itakura, S., Cavalcante, L., & Kanngiesser, P. (2022). *Mealtime conversations between parents and their 2-year-old Children in five cultural contexts*. https://doi.org/10.31234/osf.io/amfj9

Bornstein, M. H., Putnick, D. L., Esposito, G., & Pearson, R. M. (2023). The nature and structure of maternal parenting practices and infant behaviors in US national and international samples. *Frontiers in Child and Adolescent Psychiatry, 2*, Article 1124037.

Bornstein, M. H., Putnick, D. L., Hahn, C. S., Tamis-LeMonda, C. S., & Esposito, G. (2020). Stabilities of infant behaviors and maternal responses to them. *Infancy, 25*(3), 226–245. https://doi.org/10.1111/infa.12326

Bornstein, M. H., & Tamis-LeMonda, C. S. (1989). Maternal responsiveness and cognitive development in children. *New Directions for Child and Adolescent Development, 1989*(43), 49–61. https://doi.org/10.1002/cd.23219894306

Bornstein, M. H., Tamis-LeMonda, C. S., Tal, J., Ludemann, P., Toda, S., Rahn, C. W., … Vardi, D. (1992). Maternal responsiveness to infants in three societies: The United States, France, and Japan. *Child Development, 63*(4), 808–821. https://doi.org/10.1111/j.1467-8624.1992.tb01663.x
Boundy, L., Cameron-Faulkner, T., & Theakston, A. (2016). Exploring early communicative behaviours: A fine-grained analysis of infant shows and gives. *Infant Behavior and Development, 44*, 86–97. https://doi.org/10.1016/j.infbeh.2016.06.005
Boundy, L., Cameron-Faulkner, T., & Theakston, A. (2019). Intention or attention before pointing: Do infants' early holdout gestures reflect evidence of a declarative motive? *Infancy, 24*(2), 228–248. https://doi.org/10.1111/infa.12267
Butler, L. P. (2020). The empirical child? A framework for investigating the development of scientific habits of mind. *Child Development Perspectives, 14*(1), 34–40. https://doi.org/10.1111/cdep.12354
Cabrera, N. J., Ryan, R., Shannon, J. D., Brooks-Gunn, J., Vogel, C., Raikes, H., & Cohen, R. (2004). Fathers in the Early Head Start National Research and Evaluation Study: How are they involved with their children. *Fathering: A Journal of Theory. Research, and Practice About Men as Fathers, 2*, 5–30.
Cabrera, N. J., Shannon, J. D., & Tamis-LeMonda, C. (2007). Fathers' influence on their children's cognitive and emotional development: From toddlers to pre-K. *Applied Development Science, 11*(4), 208–213. https://doi.org/10.1080/10888690701762100
Callanan, M. A., Legare, C. H., Sobel, D. M., Jaeger, G. J., Letourneau, S., McHugh, S. R., & Watson, J. (2020). Exploration, explanation, and parent–child interaction in museums. *Monographs of the Society for Research in Child Development, 85*(1), 7–137. https://doi.org/10.1111/mono.12412
Camaioni, L. (1997). The emergence of intentional communication in ontogeny, phylogeny, and pathology. *European Psychologist, 2*(3), 216–225. https://doi.org/10.1027/1016- 9040.2.3.216.
Camaioni, L., Perucchini, P., Bellagamba, F., & Colonnesi, C. (2004). The role of declarative pointing in developing a theory of mind. *Infancy, 5*(3), 291–308. https://doi.org/10.1207/s15327078in0503_3
Cameron-Faulkner, T. (2020). The emergence of gesture during prelinguistic interaction. *Current Perspectives on Child Language Acquisition: How children use their environment to learn* (pp. 173–188). John Benjamins Publishing Company,.
Carpendale, J., & Lewis, C. (2006). *How Children Develop Social Understanding*. Blackwell Publishing,.
Carpenter, M., Nagell, K., Tomasello, M., Butterworth, G., & Moore, C. (1998). Social cognition, joint attention, and communicative competence from 9 to 15 months of age. *Monographs of the Society for Research in Child Development*, (pp.1-174)https://doi.org/10.2307/1166214
Cherry, L., & Lewis, M. (1976). Mothers and two-year-olds: a study of sex-differentiated aspects of verbal interaction. *Developmental Psychology, 12*(4), 278. https://doi.org/10.1037/0012-1649.12.4.278
Choi, B., & Rowe, M. L. (2021). A parent gesture intervention as a means to increase parent declarative pointing and child vocabulary. *Infancy, 26*(5), 735–744. https://doi.org/10.1111/infa.12418
Choi, B., Wei, R., & Rowe, M. L. (2021). Show, give, and point gestures across infancy differentially predict language development. *Developmental Psychology, 57*(6), 851–862. https://doi.org/10.1037/dev0001195
Chouinard, M. M., Harris, P. L., & Maratsos, M. P. (2007). Children's Questions: A Mechanism for Cognitive Development. *Monographs of the Society for Research in Child Development, 72*(1). i–129. http://www.jstor.org/stable/30163594.
Clark, H. H. (1996). *Using Language*. Cambridge University Press,.
Clerkin, E. M., Hart, E., Rehg, J. M., Yu, C., & Smith, L. B. (2017). Real-world visual statistics and infants' first-learned object names. *Philosophical Transactions of the Royal Society B: Biological Sciences, 372*(1711), Article 20160055. https://doi.org/10.1098/rstb.2016.0055
Cochet, H., & Vauclair, J. (2010a). Features of spontaneous pointing gestures in toddlers. *Gesture, 10*(1), 86–107. https://doi.org/10.1075/gest.10.1.05coc
Cochet, H., & Vauclair, J. (2010b). Pointing gestures produced by toddlers from 15 to 30 months: Different functions, hand shapes and laterality patterns. *Infant Behaviour and Development, 33*(4), 431–441. https://doi.org/10.1016/j.infbeh.2010.04.009
Cochet, H., Jover, M., & Vauclair, J. (2011). Hand preference for pointing gestures and bimanual manipulation around the vocabulary spurt period. *Journal of Experimental Child Psychology, 110*(3), 393–407. https://doi.org/10.1016/j.jecp.2011.04.009
Cote, L. R., Carey, D. C., & Bornstein, M. H. (2023). Responsiveness in mother-infant social interactions among immigrant and nonmigrant families: Japanese, South Korean, South American, and European American. *Infant Behavior and Development, 71*, Article 101832.
de Barbaro, K. (2019). Automated sensing of daily activity: A new lens into development. *Developmental Psychobiology, 61*(3), 444–464. https://doi.org/10.1002/dev.21831
Donnellan, E., Bannard, C., McGillion, M. L., Slocombe, K. E., & Matthews, D. (2020). Infants' intentionally communicative vocalizations elicit responses from caregivers and are the best predictors of the transition to language: A longitudinal investigation of infants' vocalizations, gestures and word production. *Developmental Science, 23*(1), Article e12843. https://doi.org/10.1111/desc.12843
Eriksson, M., & Berglund, E. (1999). Swedish early communicative development inventories: Words and gestures. *First Language, 19*(55), 55–90.
Fusaro, M., Vallotton, C. D., & Harris, P. L. (2014). Beside the point: Mothers' head nodding and shaking gestures during parent–child play. *Infant Behavior and Development, 37*(2), 235–247.
Gauvain, M., Munroe, R. L., & Beebe, H. (2013). Children's questions in cross-cultural perspective: A four-culture study. *Journal of Cross-Cultural Psychology, 44*(7), 1148–1165. https://doi.org/10.1177/0022022113485430
Ger, E., Ertaş, S., Koşkulu-Sancar, S., Liszkowski, U., & Küntay, A.C. (in press). Correlates of Infant Pointing Frequency in the First Year. *Infancy*.
Grice, H. P. (1975). Logic and conversation. *Speech Acts* (pp. 41–58). Brill,.
Goldstein, M. H., Schwade, J., Briesch, J., & Syal, S. (2010). Learning while babbling: Prelinguistic object-directed vocalizations indicate a readiness to learn. *Infancy, 15*(4), 362–391. https://doi.org/10.1111/j.1532-7078.2009.00020.x
Goupil, L., Romand-Monnier, M., & Kouider, S. (2016). Infants ask for help when they know they don't know. *Proceedings of the National Academy of Sciences, 113*(13), 3492–3496. https://doi.org/10.1073/pnas.1515129113
Greenfield, P. M., Keller, H., Fuligni, A., & Maynard, A. (2003). Cultural pathways through universal development. *Annual Review of Psychology, 54*(1), 461–490. https://doi.org/10.1146/annurev.psych.54.101601.145221
Gros-Louis, J., West, M. J., & King, A. P. (2014). Maternal responsiveness and the development of directed vocalizing in social interactions. *Infancy, 19*(4), 385–408. https://doi.org/10.1111/infa.12054
Guevara, I., & Rodríguez, C. (2023). Developing communication through objects: Ostensive gestures as the first gestures in children's development. *Developmental Review, 68*, Article 101076. https://doi.org/10.1016/j.dr.2023.101076
Gustafson, G. E., & Harris, K. L. (1990). Women's responses to young infants' cries. *Developmental Psychology, 26*(1), 144. https://doi.org/10.1037/0012-1649.26.1.144
Harel-Gadassi, A., Friedlander, E., Yaari, M., Bar-Oz, B., Eventov-Friedman, S., Mankuta, D., & Yirmiya, N. (2020). Do developmental and temperamental characteristics mediate the association between preterm birth and the quality of mother-child interaction? *Infant Behavior and Development, 58*, Article 101421.
Harris, P. L. (2012). *Trusting what you're told: How children learn from others*. Harvard University Press,.
Harris, P. L., & Lane, J. D. (2014). Infants understand how testimony works. *Topoi, 33*, 443–458. https://doi.org/10.1007/s11245-013-9180-0
Harris, P. L., Ronfard, S., & Bartz, D. (2017). Young children's developing conception of knowledge and ignorance: Work in progress. *European Journal of Developmental Psychology, 14*(2), 221–232. https://doi.org/10.1080/17405629.2016.1190267
Herzberg, O., Fletcher, K. K., Schatz, J. L., Adolph, K. E., & Tamis-LeMonda, C. S. (2022). Infant exuberant object play at home: Immense amounts of time-distributed, variable practice. *Child Development, 93*(1), 150–164. https://doi.org/10.1111/cdev.13669
Hirsh-Pasek, K., Adamson, L. B., Bakeman, R., Owen, M. T., Golinkoff, R. M., Pace, A., … Suma, K. (2015). The contribution of early communication quality to low-income children's language success. *Psychological Science, 26*(7), 1071–1083. https://doi.org/10.1177/0956797615581493
Hsin, A., & Felfe, C. (2014). When does time matter? Maternal employment, children's time with parents, and child development. *Demography, 51*(5), 1867–1894. https://doi.org/10.1007/s13524-014-0334-5
Ipsos (2022, November 29). Turkey: Re-designing adaptation in the shadow of hyperinflation. https://www.ipsos.com/en/inflation/feeling-pressure-turkey.

Kagitcibasi, C. (1990). Family and socialization in cross-cultural perspective: A model of change. Cross-cultural perspectives. *Current Theory and Research in Motivation, 37*, 135–200.
Kagitcibasi, C. (2005). Autonomy and relatedness in cultural context: Implications for self and family. *Journal of Cross-Cultural Psychology, 36*(4), 403–422.
Kagitcibasi, C., & Ataca, B. (2005). Value of children and family change: A three-decade portrait from Turkey. *Applied Psychology, 54*(3), 317–337. https://doi.org/10.1111/j.1464-0597.2005.00213.x
Karasik, L. B., Tamis-LeMonda, C. S., & Adolph, K. E. (2011). Transition from crawling to walking and infants' actions with objects and people. *Child Development, 82*(4), 1199–1209.
Koşkulu, S., Küntay, A. C., & Uzundag, B. A. (2021). Maternal behaviors mediate the relationship between socioeconomic status and joint attention. *Journal of Applied Developmental Psychology, 75*, Article 101291. https://doi.org/10.1016/j.appdev.2021.101291
Kuchirko, Y., Tafuro, L., & Tamis LeMonda, C. S. (2018). Becoming a communicative partner: Infant contingent responsiveness to maternal language and gestures. *Infancy, 23*(4), 558–576. https://doi.org/10.1111/infa.12222
Kuhl, P. K. (2007). Is speech learning 'gated'by the social brain? *Developmental Science, 10*(1), 110–120. https://doi.org/10.1111/j.1467-7687.2007.00572.x
Kuhn, L. J., Willoughby, M. T., Wilbourn, M. P., Vernon-Feagans, L., Blair, C. B., & Family Life Project Key Investigators. (2014). Early communicative gestures prospectively predict language development and executive function in early childhood. *Child Development, 85*(5), 1898–1914. https://doi.org/10.1111/cdev.12249
Kurkul, K. E., & Corriveau, K. H. (2018). Question, explanation, follow-up: A mechanism for learning from others? *Child Development, 89*(1), 280–294.
Leaper, C., Anderson, K. J., & Sanders, P. (1998). Moderators of gender effects on parents' talk to their children: a meta-analysis. *Developmental Psychology, 34*(1), 3. https://doi.org/10.1037/0012-1649.34.1.3
LeBarton, E. S., Goldin-Meadow, S., & Raudenbush, S. (2015). Experimentally induced increases in early gesture lead to increases in spoken vocabulary. *Journal of Cognition and Development, 16*(2), 199–220. https://doi.org/10.1080/15248372.2013.858041
Legare, C. H., & Harris, P. L. (2016). The ontogeny of cultural learning. *Child Development, 87*(3), 633–642. https://doi.org/10.1111/cdev.12542
Lilley, C. M., Craig, K. D., & Grunau, R. E. (1997). The expression of pain in infants and toddlers: Developmental changes in facial action. *Pain, 72*(1-2), 161–170. https://doi.org/10.1016/S0304-3959(97)00034-1
Liszkowski, U. (2008). Before L1: A differentiated perspective on infant gestures. *Gesture, 8*(2), 180–196. https://doi.org/10.1075/gest.8.2.04lis
Liszkowski, U., Carpenter, M., & Tomasello, M. (2008). Twelve-month-olds communicate helpfully and appropriately for knowledgeable and ignorant partners. *Cognition, 108*(3), 732–739. https://doi.org/10.1016/j.cognition.2008.06.013
Liszkowski, U., Carpenter, M., Striano, T., & Tomasello, M. (2006). 12-and 18-month-olds point to provide information for others. *Journal of Cognition and Development, 7*(2), 173–187. https://doi.org/10.1207/s15327647jcd0702_2
Lucca, K. (2020). The development of information-requesting gestures in infancy and their role in shaping learning outcomes. In L. P. Butler, S. Ronfard, & K. H. Corriveau (Eds.), *The questioning child: Insights from psychology and education (pp* (pp. 89–117). Cambridge University Press. https://doi.org/10.1017/9781108553803.006.
Lucca, K., & Wilbourn, M. P. (2018). Communicating to learn: Infants' pointing gestures result in optimal learning. *Child Development, 89*(3), 941–960. https://doi.org/10.1111/cdev.12707
Lucca, K., & Wilbourn, M. P. (2019). The what and the how: Information-seeking pointing gestures facilitate learning labels and functions. *Journal of Experimental Child Psychology, 178*, 417–436. https://doi.org/10.1016/j.jecp.2018.08.003
Köster, M., Torréns, M. G., Kärtner, J., Itakura, S., Cavalcante, L., & Kanngiesser, P. (2022). Parental teaching behavior in diverse cultural contexts. *Evolution and Human Behavior, 43*(5), 432–441. https://doi.org/10.1016/j.evolhumbehav.2022.07.002
Madra, A. (2017). Türkiye'de Erken Çocukluk Bakımı ve Okul Öncesi Eğitime Katılım: Bilgi Notu. İstanbul: Anne Çocuk Eğitim Vakfı.
Mangold, P. (2018). Discover the Invisible Through Tool-Supported Scientific Observation. (Translation of: Das Unsichtbare entdecken durch werkzeuggestützte wissenschaftliche Beobachtung). In H. Böttger, K. Jensen, T.- Jensen, & Mindful Evolution. (Eds.), *Conference Proceedings*. Bad Heilbrunn: Klinkhardt. ISBN 978-3-7815-2218-3.
Moreno-Núñez, A., Rodríguez, C., & Miranda-Zapata, E. (2020). Getting away from the point: the emergence of ostensive gestures and their functions. *Journal of Child Language, 47*(3), 556–578. https://doi.org/10.1017/S0305000919000606
Northrup, J. B., & Iverson, J. M. (2020). The development of mother–infant coordination across the first year of life. *Developmental Psychology, 56*(2), 221. https://doi.org/10.1037/dev0000867
OECD (2023), Labour force (indicator). doi: 10.1787/ef2e7159-e.
Olson, J., & Masur, E. F. (2013). Mothers respond differently to infants' gestural versus nongestural communicative bids. *First Language, 33*(4), 372–387. https://doi.org/10.1177/0142723713493346
Özçalışkan, Ş., & Goldin-Meadow, S. (2010). Sex differences in language first appear in gesture. *Developmental Science, 13*(5), 752–760. https://doi.org/10.1111/j.1467-7687.2009.00933.x
Perucchini, P., Bello, A., Presaghi, F., & Aureli, T. (2020). Developmental trajectories in infant pointing: The effects of vocalisation and communicative intention. *First Language, 41*(3), 314–335. https://doi.org/10.1177/0142723720980196
Ramenzoni, V. C., & Liszkowski, U. (2016). The social reach: 8-month-olds reach for unobtainable objects in the presence of another person. *Psychological Science, 27*(9), 1278–1285. https://doi.org/10.1177/0956797617718816
Rogoff, B. (2003). *The Cultural Nature of Human Development*. Oxford University Press,.
Rogoff, B. (1990). *Apprenticeship in Thinking: Cognitive Development in Social Context*. Oxford University Press,.
Rodríguez, C., Moreno-Núñez, A., Basilio, M., & Sosa, N. (2015). Ostensive gestures come first: their role in the beginning of shared reference. *Cognitive Development, 36*, 142–149. https://doi.org/10.1016/j.cogdev.2015.09.005
Ronfard, S., Bartz, D. T., Cheng, L., Chen, X., & Harris, P. L. (2018). Children's developing ideas about knowledge and its acquisition. *Advances in Child Development and Behavior, 54*, 123–151. https://doi.org/10.1016/bs.acdb.2017.10.005
Salley, B., Brady, N. C., Hoffman, L., & Fleming, K. (2020). Preverbal communication complexity in infants. *Infancy, 25*(1), 4–21. https://doi.org/10.1111/infa.12318
Salo, V. C., Reeb-Sutherland, B., Frenkel, T. I., Bowman, L. C., & Rowe, M. L. (2019). Does intention matter? Relations between parent pointing, infant pointing, and developing language ability. *Journal of Cognition and Development, 20*(5), 635–655. https://doi.org/10.1080/15248372.2019.1648266
Salomo, D., & Liszkowski, U. (2013). Sociocultural settings influence the emergence of prelinguistic deictic gestures. *Child Development, 84*(4), 1296–1307. https://doi.org/10.1111/cdev.12026
Saxon, T. F., & Reilly, J. T. (1999). Joint attention and toddler characteristics: race, sex and socioeconomic status. *Early Child Development and Care, 149*(1), 59–69. https://doi.org/10.1080/0300443991490105
Saylor, M., & Ganea, P. (2018). *Active Learning from Infancy to Childhood Springer International Publishing Ag*.
Schön, R. A., & Silvén, M. (2007). Natural parenting—back to basics in infant care. *Evolutionary Psychology, 5*(1), 147470490700500110.
Slone, L. K., Smith, L. B., & Yu, C. (2019). Self-generated variability in object images predicts vocabulary growth. *Developmental Science, 22*(6), Article e12816. https://doi.org/10.1111/desc.12816
Şen, H., Yavuz-Muren, H. M., & Yagmurlu, B. (2014). Parenting: the Turkish context. *Parenting Across cultures: Childrearing, Motherhood and fatherhood in Non-Western cultures*, 175–192.
Singh, L., Cristia, A., Karasik, L. B., Rajendra, S. J., & Oakes, L. M. (2023). Diversity and representation in infant research: Barriers and bridges toward a globalized science of infant development. *Infancy*. https://doi.org/10.1111/infa.12545
Singh, L., Barokova, M., Baumgartner, H., Lopera, D., Omane, P.O., Sheskin, M.,. & Frank, M.C. (2022). A unified approach to demographic data collection for research with young children across diverse cultures.
Southgate, V., Van Maanen, C., & Csibra, G. (2007). Infant pointing: Communication to cooperate or communication to learn? *Child Development, 78*(3), 735–740. https://doi.org/10.1111/j.1467-8624.2007.01028.x

Stallings, J., Fleming, A. S., Corter, C., Worthman, C., & Steiner, M. (2001). The effects of infant cries and odors on sympathy, cortisol, and autonomic responses in new mothers and nonpostpartum women. *Parenting, 1*(1-2), 71–100. https://doi.org/10.1080/15295192.2001.9681212

Stoupos, N., Nikas, C., & Kiohos, A. (2023). Turkey: From a thriving economic past towards a rugged future? - An empirical analysis on the Turkish financial markets. *Emerging Markets Review, 54*, Article 100992. https://doi.org/10.1016/j.ememar.2022.100992

Striano, T., Vaish, A., & Benigno, J. P. (2006). The meaning of infants' looks: Information seeking and comfort seeking? *British Journal of Developmental Psychology, 24*(3), 615–630. https://doi.org/10.1348/026151005X67566

Suarez-Rivera, C., Smith, L. B., & Yu, C. (2019). Multimodal parent behaviors within joint attention support sustained attention in infants. *Developmental Psychology, 55*(1), 96. https://psycnet.apa.org/doi/10.1037/dev0000628.

Suarez-Rivera, C., Schatz, J. L., Herzberg, O., & Tamis-LeMonda, C. S. (2022). Joint engagement in the home environment is frequent, multimodal, timely, and structured. *Infancy, 27*(2), 232–254. https://doi.org/10.1111/infa.12446

Swirbul, M. S., Herzberg, O., & Tamis-LeMonda, C. S. (2022). Object play in the everyday home environment generates rich opportunities for infant learning. *Infant Behavior and Development, 67*, Article 101712. https://doi.org/10.1016/j.infbeh.2022.101712

Tamis-LeMonda, C. S. (2023). The mountain stream of infant development. *Infancy*. https://doi.org/10.1111/infa.12538

Tamis-LeMonda, C. S., & Bornstein, M. H. (1994). Specificity in mother-toddler language-play relations across the second year. *Developmental Psychology, 30*(2), 283.

Tamis-LeMonda, C. S., Kuchirko, Y., Luo, R., Escobar, K., & Bornstein, M. H. (2017). Power in methods: Language to infants in structured and naturalistic contexts. *Developmental Science, 20*(6), Article e12456.

Tamis-LeMonda, C. S., Bornstein, M. H., Kahana-Kalman, R., Baumwell, L., & Cyphers, L. (1998). Predicting variation in the timing of language milestones in the second year: An events history approach. *Journal of Child Language, 25*(3), 675–700. https://doi.org/10.1017/S0305000998003572

Tamis-LeMonda, C. S., Kuchirko, Y., & Tafuro, L. (2013). From action to interaction: Infant object exploration and mothers' contingent responsiveness. *IEEE Transactions on Autonomous Mental Development, 5*(3), 202–209. https://doi.org/10.1109/TAMD.2013.2269905

Tamis-LeMonda, C. S., Shannon, J. D., Cabrera, N. J., & Lamb, M. E. (2004). Fathers and mothers at play with their 2-and 3-year-olds: Contributions to language and cognitive development. *Child Development, 75*(6), 1806–1820. https://doi.org/10.1111/j.1467-8624.2004.00818.x

Thompson-Booth, C., Viding, E., Mayes, L. C., Rutherford, H. J. V., Hodsoll, S., & McCrory, E. J. (2014). Here's looking at you, kid: Attention to infant emotional faces in mothers and non-mothers. *Developmental Science, 17*(1), 35–46. https://doi.org/10.1111/desc.12090

Tomasello, M. (2004). Learning through others. *Daedalus, 133*(1), 51–58.

Tomasello, M., Carpenter, M., & Liszkowski, U. (2007). A new look at infant pointing. *Child Development, 78*(3), 705–722. https://doi.org/10.1111/j.1467-8624.2007.01025.x

Tunalı, İ., Kırdar, M. G., Dayıoğlu, M., & Tunalı, İ. (2019). Female labor force participation in Turkey: a synthetic cohort (panel) analysis, 1988-2013. *World Development, 146*, Article 105609. https://doi.org/10.1016/j.worlddev.2021.105609

O'Connell, M. (2019). Is the impact of SES on educational performance overestimated? Evidence from the PISA survey. *Intelligence, 75*, 41–47. https://doi.org/10.1016/j.intell.2019.04.005

Ugur, Z., Yıldız, E., & Dogan, R. Y. (2023). [Who is minding the young children of working women in Türkiye?] Türkiye'de çalışan kadınların küçük çocuklarına kim bakıyor? *Sosyal Politika Çalışmaları Dergisi, 23*(58), 93–128. https://doi.org/10.21560/spcd. Vi.1101779

Ünlütabak, B., Nicolopoulou, A., & Aksu-Koç, A. (2019). Questions asked by Turkish preschoolers from middle-SES and low-SES families. *Cognitive Development, 52*, Article 100802. https://doi.org/10.1016/j.cogdev.2019.100802

van Bakel, H. J., & Riksen-Walraven, J. M. (2008). Adrenocortical and behavioral attunement in parents with 1-year-old infants. *Developmental Psychobiology: The Journal of the International Society for Developmental Psychobiology, 50*(2), 196–201. https://doi.org/10.1002/dev.20281

Vigil, D. C. (2002). Cultural variations in attention regulation: A comparative analysis of British and Chinese-immigrant populations. *International Journal of Language & Communication Disorders, 37*(4), 433–458. https://doi.org/10.1080/1368282021000007749

Vygotsky, L. S. (1987). *The collected works of LS Vygotsky: Problems of the theory and history of psychology* (Vol. 3). Springer Science & Business Media,.

Yagmurlu, B., Citlak, B., Dost, A., & Leyendecker, B. (2009). Child socialization goals of Turkish mothers: An investigation of education related within-culture variation. *Turkish. Journal of Psychology, 24*, 1–15.

Yu, C., & Smith, L. B. (2013). Joint attention without gaze following: Human infants and their parents coordinate visual attention to objects through eye-hand coordination. *PloS One, 8*(11), Article e79659. https://doi.org/10.1371/journal.pone.0079659

Yu, C., & Smith, L. B. (2017). Multiple sensory-motor pathways lead to coordinated visual attention. *Cognitive Science, 41*, 5–31. https://doi.org/10.1111/cogs.12366

Wass, S. V., Noreika, V., Georgieva, S., Clackson, K., Brightman, L., Nutbrown, R., & Leong, V. (2018). Parental neural responsivity to infants' visual attention: How mature brains influence immature brains during social interaction. *PLoS Biology, 16*(12), Article e2006328. https://doi.org/10.1371/journal.pbio.2006328

West, K. L., Soska, K. C., Cole, W. G., Han, D., Hoch, J. E., Hospodar, C. M., & Kaplan, B. E. (2022). From description to generalization, or there and back again (Article) *Behavioral and Brain Sciences, 45*, Article e37. https://doi.org/10.1017/S0140525X21000522.

Wu, Z., & Gros-Louis, J. (2014). Infants' prelinguistic communicative acts and maternal responses: Relations to linguistic development. *First Language, 34*(1), 72–90. https://doi.org/10.1177/0142723714521925