

# Chapter 3

## Understanding and Addressing Social Communication Difficulties in Children with Autism



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Atypical social communication profiles represent one of the two domains that define autism spectrum disorder (ASD). According to the DSM-5 (American Psychiatric Association, 2013; see Chap. 1), the social communication domain involves differences in three areas: (a) social–emotional reciprocity within interpersonal interactions, (b) the use and interpretation of nonverbal communication, and (c) the development and maintenance of relationships with others. This chapter will focus on the developmental trajectory of social communication milestones, and the intervention strategies used to support social communication development in children with ASD.

While all communications are inherently social, *social communication* is a term that refers to instances when communicative repertoires are deployed for the primary purpose of sharing with, and relating to, others. This is distinguished from communication for more instrumental or utilitarian purposes, such as requesting desired items or regulating others' behavior. Social–communication is separated out in nosology of ASD because this form of communication is more impaired in children with ASD as compared to other forms (Shumway & Wetherby, 2009; Wetherby, 2006), and is more difficult to influence via intervention (Yoder et al., 2015). Further, the social dimension of communication in particular is implicated in other aspects of social functioning more broadly (Bottema-Beutel, Kim, & Crowley, 2019). For example, response to joint attention in early childhood is correlated with adult social skills (Gillespie-Lynch et al., 2012). It should however be acknowledged that the line between social and instrumental communication is not always clear cut. Further,

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this distinction becomes less conceptually sound beyond the preschool period when interactions become more complex, and assigning single motives to communicative acts is not always feasible. Still, this distinction is useful for understanding early development in ASD and the features of communication that are most affected.

## Characterizing the Social–Communication Domain in ASD

Social communication—and social functioning more broadly—is highly heterogeneous in ASD. In the late 1970s, Lorna Wing described three distinct social profiles that were noted in a survey of children with ASD (Wing & Gould, 1979). She termed these *active-odd*, *aloof*, and *passive*. Active-odd children often made social overtures, but did so in a way that was atypical and did not always achieve engagement from an interaction partner (e.g., approaching another child multiple times and talking to them about cars, even after they did not express interest). Aloof children tended to avoid social interaction and seemed to have developed a preference for aloneness. Finally, passive children did not seek out interactions with others, but neither did they avoid interactions when they were approached. Since this early characterization, researchers have attempted to more precisely describe features of social communication in ASD with the goal of capturing ASD-distinctive patterns, subgroups within the ASD population, and specific intervention targets.

Social–communication comprises a complex interplay of developmental achievements. There is no universal agreement about the nature and mechanisms of social–communication, and different approaches have been used to investigate this area, with some research focusing on discrete “skills” within the social communication domain, and others using a more holistic, interactional approach (e.g., Hobson, 2007; Sterponi, de Kirby, & Shankey, 2015). Evidence suggests that both conceptualizations may be useful for characterizing social communication in ASD. For example, Bishop and colleagues (2016) used factor analysis to identify two subdomains of social communication; they termed these *basic social communication* and *interaction quality*. Basic social communication refers to more discrete, within-child behavior repertoires, including the use of eye contact, display of emotion using facial expressions, and sharing enjoyment with others. Interaction quality refers to *dyadic* characteristics of interaction, including reciprocity, conversation quality, and the development of rapport within interaction.

However, an overfocus on discrete, piecemeal behaviors can be misleading (although this approach has certainly dominated the ASD literature in the recent past). It is important to remember that, even if identifying isolated behavior is helpful for diagnosing ASD, actual human social interaction does not involve the simple expression and reception of discrete social behaviors. Rather, social interaction is multimodal, contextually situated, and sequential, and an appreciation of these aspects is critical for understanding both the nature of social communication differences in ASD and how best to support children in relation to these differences.

While many professionals who are familiar with the concept of social communication understand multimodality (i.e., the communicative relevance of bodily and gestural actions in addition to spoken language), and the contextual nature of social

meanings (i.e., that words will have different meanings in different contexts), they may be less familiar with the sequential nature of interaction. That is, communicative acts project and constrain the subsequent communicative acts of an interaction partner, and are projected and constrained by communicative acts that have come before (Schegloff, 2007). Because of this reality, it is rarely useful to consider communicative behavior as a strictly “within-child” phenomenon that is a direct manifestation of cognitive capacities (Sterponi, de Kirby, & Shankey, 2015). Instead, communicative acts should be considered interactional achievements where all social partners are at least partially implicated in their production (Schegloff, 1982; Sterponi & Fasulo, 2010). For example, echolalia, which is the repetition of the speech of others, was long considered to be nonsocial and emblematic of disengagement with others (Kanner, 1943). However, Sterponi and Shankey (2014), building on Prizant and Duchan’s (1981) work, offer a reappraisal of echolalia that illustrates how close analysis of the interactive contexts in which echolalia is produced show that these utterances are often sensitive to the social context, are projected as relevant responses by the child’s interaction partners (i.e., interaction partners design their overtures so that an echolalic response the child is known to produce is a suitable response), and responsive to prior utterances. Therefore, echolalia should be considered a communicative resource. Prior to this reconceptualization, echolalia was considered a target for remediation.

A variety of instruments are used to characterize social communication in young children with ASD. Three of the most common are the *Vineland Adaptive Communication Scales* (VABS-II; socialization and communication domains), the *Communication and Symbolic Behavior Scales*, and the *Early Social Communication Scales* (Mundy et al., 2003). During early development, it is important to use instruments that differentiate communication from language, and that differentiate social communication from communication more generally (as do the three instruments just mentioned). See Anagnostou et al., 2015 for an overview of social communication measurement systems that are relevant to the study of ASD.

## **Social Communication Development in Typical Development and ASD**

### ***Prelinguistic Development in TD Children***

Social–communication development begins shortly after birth, when infants show a propensity to orient to the social overture of others. Within the first days, infants show preferential looking to faces as compared to other aspects of their environment, and a preference for their mothers’ voice as compared to other voices (DeCasper & Fifer, 1980; Frank, Vul, & Johnson, 2009). Eventually, infants begin to respond to adult bids for interaction and develop the ability to temporally coordinate their actions with their caregivers, such as by smiling or cooing in response to caregiver’s smiles, vocalizations, and infant directed speech (Abney, Warlaumont, Oller, Wallot, & Kello, 2016). This form of dyadic engagement with a caregiver is termed *primary intersubjectivity* (Trevarthen, 1979), or what Bakeman and Adamson (1984)

refer to as *person* engagement. According to Trevarthen, this involves adapting intentional actions to incorporate the intentional actions of interaction partners. As noted by Tomasello (2019), engagement in these “protoconversations” provides a foundation for more advanced cooperative activities, including actual (verbal) conversations and joint activities (e.g., building a lego tower with a peer).

At around 6 months, infants are able to respond to bids for *joint attention* as they begin to shift their attention between a caregiver and an object or event, following a caregiver’s directive (Scaife & Bruner, 1975). At around 9 months, infants can direct their caregiver’s attention toward interesting objects and events using prelinguistic gestures, vocalizations, and eye gaze (Leekam & Moore, 2001). These joint attention processes mark a progression from *dyadic* to *triadic* interactions that incorporate aspects of the environment into interactional repertoires (Mundy, 2016). Trevarthen (1987) refers to this set of developmental achievements as *secondary intersubjectivity*. Bakeman and Adamson (1984) describe a similar phenomenon, which they term *joint engagement*. They use this term to refer to prolonged interactions between caregivers and children that involve reciprocity within play activities, and shifting attention back and forth to one another at relevant moments within the interaction. The amount of time children spend in this type of engagement with their caregivers increases in the second half of the first year, and into the second year (Bakeman & Adamson, 1984; Carpenter, Nagell, Tomasello, Butterworth, & Moore, 1998). These joint attention and engagement activities set the stage for the onset and continuing development of language, which will be discussed below.

### ***Prelinguistic Development in Children with ASD***

Because children are usually not reliably diagnosed with ASD until after their second birthday, it has been challenging for researchers to study the developmental trajectory of early social communication in this population. However, there are at least two strategies for gaining insight into the prediagnostic period in ASD (see Yirmiya & Charman, 2010 for a comprehensive review of this work). The first is to examine home video recordings produced prior to the child’s second year. This line of research has shown that a variety of social communication behaviors are reduced in frequency or absent in infants later diagnosed with ASD, joint attention, using and responding to gestures, intentional communication, expressions of emotion, and social orienting to others. These findings have been replicated across several studies using this method. It should however be noted that there are some drawbacks to using home video recordings as a data source, such as a lack of standardization of the measurement context (Yirmiya & Charman, 2010).

The second strategy to studying the early period of ASD development leverages the heritable nature of ASD. That is, 20% of infants who have an older sibling diagnosed with ASD will go on to be diagnosed themselves (Ozonoff et al., 2011). Given the relatively high probability of subsequent diagnosis for infant siblings, researchers can collect data on large groups of these infants and then retain data

on participants that do go on to develop ASD for longitudinal analyses (Zwaigenbaum et al., 2007). Given the prospective nature of this method, more sophisticated and standardized data collection techniques have been used as compared to home videos, including eye-tracking technology. Several studies using this technology have found that, prior to the first birthday, infants later diagnosed with ASD attend less to social scenes than do children who are not eventually diagnosed with ASD (Chawarska, Macari, & Shic, 2013; Falck-Ytter, et al., 2018). An early eye-tracking study has also suggested that infant siblings who go on to be diagnosed with ASD show a decline in gaze to their caregiver's eyes from the period between 3 and 6 months, while typically developing infants increase their gaze to caregivers' eyes over the same time period (Jones & Klin, 2013). Additional research has documented that at 10 months, infants later diagnosed with ASD are less likely to initiate joint attention episodes with a social partner when observing an interesting novel event (Nyström et al., 2019). This could mean that early differences in engagement with social stimuli are foundational to the developmental trajectory of ASD. Importantly, children with ASD continue to show differences in gaze patterns throughout early childhood and into adulthood. This includes differences in looking patterns in response to gestures and speech, and atypical gaze shifts to features of the environment and to people when viewing a social scene (Davis & Carter, 2014; Klin, Jones, Schultz, & Volkmar, 2003; see Hamner & Vivanti, 2019, for a review on eye-tracking studies in ASD).

Another early emerging difference in children with ASD is a decreased propensity for imitation as compared to typically developing children (see Vivanti & Hamilton, 2014 for a review). This difference is particularly noteworthy, as imitating others is a resource by which young children engage in reciprocal interactions with caregivers. Indeed, propensity for imitation in children with ASD is highly correlated with overall social functioning (Bottema-Beutel, Kim, & Crowley, 2019), as well as treatment outcomes (Vivanti et al., 2013; Smith, Klorman, & Mruzek, 2015). Children with ASD also show differences in pretend play by the second year and seem to engage in less pretense than their typically developing peers (Barbaro & Dissanayake, 2013). Hobson and colleagues found preliminary evidence that, later in childhood, pretend play is correlated with communication and social interaction (Hobson, Hobson, Malik, Bargiota, & Caló 2013).

These early social communication milestones have received much attention in early developmental research because they appear to differentiate children with ASD from typically developing and intellectually disabled children and/or because they predict later developmental achievements in children with ASD. Interestingly, there is some evidence that early joint engagement processes are even more tightly linked to later developmental milestones, such as language and social functioning, in children with ASD as compared to children who are typically developing (Bottema-Beutel, 2016; Bottema-Beutel, Woynaroski et al., 2019). This could be because children with ASD spend less time jointly engaged with caregivers, which may make each episode more crucial for development (Adamson et al., 2008). It should be noted however, that not all children who receive an ASD diagnosis in early or later childhood show these early social communication differences.

## ***Language and Conversational Development in Typically Developing Children***

Starting in the second year, typically developing children incorporate spoken language into their communicative repertoires. This begins with *holophrases*, or one word utterances that are imbued with the meaning of fully formed sentences, and can be used for a variety of interactional and pragmatic purposes. Later in the second year, children begin to combine words together, and eventually develop phrase and sentential speech. During this time, children are also increasingly able to integrate gaze, expression, and emerging vocabulary, and engage in increasingly complex interactions. By the end of the preschool period, children have acquired large vocabularies, and are able to combine words using complex syntactic structures which can be used flexibly across discourse contexts (Tager-Flusberg et al., 2009).

*Pragmatics* refers to aspects of language as it is actually used (rather than its structural properties), and foregrounds the social context in which language is produced as constitutive of meaning. Pragmatic development is the process by which children learn to formulate their own talk, and understand others' talk, according to the social context. For example, when children incorporate "slang" terms when interacting with peers, but not with their teachers, this would reflect their pragmatic development. This domain of development continues long after the onset of speech (and even into adulthood). Most typically developing children are able to adapt their talk to a variety of contexts by school entry. This includes adaptation in *suprasegmental* features, which are feature beyond simple components of words and syllables, such as speech register, intonation, volume, and tone. Children also learn the mechanics of conversation, such as turn-taking (including speaker allocation and speaker transition), presupposition (i.e., designing turns at talk so that they take into account what a conversation partner already knows), and implicature (i.e., the inferential aspects of talk that are drawn upon when principles of conversation are violated, as occurs with the use of irony). Many pragmatic regularities of talk are culturally specific, and children learn these regularities by participating in interactions with more linguistically competent others (Schieffelin & Ochs, 1986).

## ***Language and Conversational Development in Children with ASD***

Well into early childhood, children with ASD continue to display fewer initiations for and responses to joint attention, and spend less time jointly engaged with caregivers than their peers without ASD. Each of these constructs bear concurrent and longitudinal correlations with language development (Adamson et al., 2008; Toth et al., 2006; Yoder, Watson, & Lambert, 2015). The effects of these delays on speech are evident by the second year. Indeed, language delays are an early-emerging concern of caregivers who already have a child diagnosed with ASD (Talbot, Nelson, & Tager-Flusberg, 2015).

The development of spoken language is highly heterogeneous in children with ASD. Some children show no evidence of delay in speech onset while others show delays but eventually develop average or above average lexicons and language skill. Recent estimates suggest that around 25–30% of children diagnosed with ASD do not go on to develop spoken language that can be used flexibly and consistently (Tager-Flusberg, Paul, & Lord, 2005; Tager-Flusberg, 2016; Tager-Flusberg & Kasari, 2013). Some research suggests that once children with ASD do develop spoken language abilities, they use talk for more constrained purposes than children without ASD (Ziatas, Durkin, & Pratt, 2003). After speech onset, children with ASD continue to show atypicalities in nonverbal aspects of communication, including gaze, use of gestures, and facial expressions (for a summary of this research, see Davis & Carter, 2014).

All children with ASD, regardless of language development, show differences in their pragmatic use of language as compared to language–age peers. These differences may become more apparent once children enter preschool, given the increasing complexity of social contexts in early childhood as compared to infancy. Within conversation, children with ASD may show difficulty with presupposition, and appear not to take their conversation partner’s prior knowledge into account when formulating their own talk. For example, a child with ASD might begin a narrative without providing sufficient detail to understand the context of the narrative or the specific people involved. Other pragmatic differences include pronominal reversal (e.g., substituting “you” for “I”), overly formal phrasing, topic perseveration, and atypicalities in prosody as well as interpreting prosody in others’ speech (summarized in Eigsti, de Marchena, Schuh, & Kelley, 2011, and in Whyte & Nelson, 2015).

Taking an interactional approach, qualitative research in older children and youth suggests that, within conversation, individuals with ASD have difficulty with at least three aspects of talk; interactional coordination, aligning interactional priorities with their conversation partners, and enacting meaning across conversational turns in a way that is consistent with their interlocutors (reviewed in Bottema-Beutel, 2017). Interactional coordination refers to the overall “course of action” that is implemented through conversation, which requires collaboration between interaction partners (e.g., debating, storytelling, affiliating). Similarly, in order for talk to proceed without significant breakdown, interaction partners must maintain at least partially aligned interactional priorities. If, for example, one partner has prioritized listing fine-grained details of a past event during a narrative retelling, and the other partner prioritizes discerning the “moral” or “point” of the story, this may reflect misaligned interactional priorities. Finally, meaning in conversation is not localized to the utterance level; instead, meaning accrues incrementally across multiple conversational turns. If individuals with ASD are unable to track meaning across an entire stretch of talk, interaction partners may not orient to the overall meaning of the talk in similar ways.

Other research on interactions has suggested that children with ASD may have relatively more difficulty with features of talk that rely on sociocultural meanings, such as interpreting *indexicality* in talk (Ochs et al., 2004). Indexicality refers to meanings beyond semantic properties of words that are unique to social contexts



(e.g., deictic expressions such as “Here I am!”), where the referent “I” depends on the speaker). Less difficult (although still impaired as compared to children without ASD) is providing *type-fitted* responses to an interaction partner’s talk, such as responding to a question with an answer (Capps, Kehres, & Sigman, 1998).

### ***Peer Interactions and Friendships***

Most research on peer interactions and relationships in children with ASD has been conducted on children who are of late elementary school age. This research suggests that children with ASD are often isolated from their peers in school contexts, and have fewer reciprocated friendships. They also report spending less time with their friends, and rate their friendships lower in quality than typically developing children (Chamberlain, Kasari, & Rotheram-Fuller, 2007; Kasari, Locke, Gulrud, & Rotheram-Fuller, 2011; Solomon et al., 2011; also see Petrina et al., 2014 for a review). Importantly, research shows that often children with ASD do desire friendships, and many report having at least one friend (Petrina et al., 2014). Social isolation and fewer friendships may be due at least in part to typically developing peers’ perception of children with ASD, rather than conceptual misunderstanding about the nature of friendships (Bottema-Beutel et al., 2019).

### ***Heterogeneity in Social Communication Development in Children with ASD***

It is important to note that the developmental trajectories evidenced in children with ASD are far from uniform. As mentioned in Chap. 1, some children show regression in development after appearing to develop along a typical trajectory, and others do not appear to manifest the characteristics of ASD (that are noted by caregivers or professionals) until after the second year (Ozonoff et al., 2018; Yirmiya & Charman, 2010). Ozonoff et al. (2018) studied this complex phenomenon in a prospective, longitudinal study of infant siblings of children with ASD, who had a higher probability of being diagnosed with ASD. Fourteen of the children in this sample were not diagnosed with ASD at age 3 despite multiple screenings, but were eventually diagnosed with ASD in later childhood. The reasons for “missed diagnosis” seemed to vary within children, with some seeming to manifest clearer characteristics of ASD over time, and others seeming to “evolve into impairment” (Ozonoff et al., 2018, p. 856) as social demands increased in later childhood. Fountain, Winter, and Bearman (2012) documented distinct developmental trajectories of social communication with the ASD population. Some children appeared to start out with greater social and communication impairments, but then “bloom” to display relatively less impairment later in childhood. Other children displayed the



opposite profile and showed increasing levels of social communication impairment over time, while still other children maintained similar levels of impairment throughout childhood.

### ***Bilingualism and Social Communication Development***

Researchers are only beginning to explore issues related to children with ASD who are raised in environments where multiple languages are spoken. However, current research suggests that children with ASD, even those who are significantly delayed in language development, are able to acquire receptive and expressive vocabulary in multiple languages (Dai, Burke, Naigles, Eigsti, & Fein, 2018). In fact, children with ASD may experience some cognitive advantages to being bilingual (Gonzalez-Barrero & Nadig, 2017). This is important to note, because parents are often advised to avoid using their heritage language with their child with ASD, if it differs from the child's language of instruction (Hudry et al., 2018). Qualitative studies of family language practices have documented the difficulties families face when given such advice, as it often means decreasing interactions with their children with ASD (Yu, 2016). This appears to be especially important when caregivers are more fluent in their heritage language as compared to their child's language of instruction.

### **Addressing Social Communication in ASD**

Researchers have begun to identify promising avenues for supporting social communication in young children with ASD, which may be one reason why more children diagnosed with ASD now go on to develop complex language abilities than early estimates suggested (Tager-Flusberg & Kasari, 2013). One of the most promising avenues for early interventions that support social communication outcomes is the facilitation of joint engagement routines (sometimes also called "joint activity routines" or "joint action routines" Ratner & Bruner, 1978). The following paragraphs describe this concept in detail.

### ***Supporting Joint Engagement Routines***

Research on typical and atypical development has highlighted the importance of *joint engagement routines* between caregivers and children, or between interventionists and children, for social communication development (Adamson & Bakeman, 1982; Hirsh-Pasek et al., 2015; Rogers, Vivanti & Rocha, 2017). These routines involve repeated interactions between the child and communicative partner involving toys (or other salient aspects of the environment) that are predictable but flexible,

and increase in complexity over time. Adults generally follow the child's lead, incorporate play materials that are of especial interest to the child, and cooperate with the child to accomplish a shared goal that provides opportunities to do things together and learn from such experiences (e.g., building a tower with blocks). In this context, child and adult coordinate their actions and share their emotions through gestures, facial expressions, body postures, and reciprocal imitation to communicate, negotiate, and achieve their shared goal (e.g., taking turns in adding blocks to the tower, and smiling to one another to share the suspense when the last block is added to the stack).

Correlational evidence for the utility of joint engagement routines for promoting social communication and language development has been well-documented for both typically developing children and children with ASD (Adamson, Bakeman, Deckner, and Ronski 2008; Bakeman & Adamson, 1984; Bottema-Beutel et al., 2014). Further, joint engagement as a dyadic construct appears more highly correlated with later development, such as expressive language, than similar constructs that are measured to reflect discrete behaviors produced by the child (e.g., the number of gestures a child produces to initiate joint attention) (Adamson, Bakeman, Suma, and Robins 2019).

At present, researchers are attempting to maximize the effectiveness of joint engagement routines by identifying the most developmentally important forms of joint engagement, and identifying caregiver/interventionist strategies that increase the likelihood that joint engagement will occur. An especially promising joint engagement format appears to include the following three elements: (a) the child does *not* shift visual attention between the play materials and the adult, (b) it involves reciprocal interactions on toys (e.g., turn taking routines and back-and-forth imitation of actions on objects), and (c) it includes adult's talk about the child's focus of attention (Adamson et al., 2008; Bottema-Beutel et al., 2014; Crandall et al., 2019). This form of joint engagement appears to strike a balance in terms of cognitive demands, in that it does not require the child to shift visual attentional resources between play materials and an adult, but does require reciprocal interaction with the adult via actions on the play materials (Bakeman & Adamson, 1984). The scaffolding that adults provide within this form of engagement may serve as an interactional "template" that allows for reciprocal back-and-forth exchanges (Bottema-Beutel, Lloyd, Watson, and Yoder, 2018). Further, when caregivers talk about the child's focus of attention, children are not required to shift attention to something new in order to connect the talk to the objects or events being referenced. This form of talk appears to be especially facilitative of word learning (McDuffie & Yoder, 2010; Yoder, Watson, & Lambert, 2015). Recent research has also suggested that this kind of engagement may mediate the pathway between children's emerging ability to say words, and their subsequent ability to understand new words (Bottema-Beutel et al., 2018).

Correlational research suggests that adaptive interaction strategies can increase the probability that children will jointly engage with adult interaction partners. This includes providing suggestions about what children can do with the toys they are already playing with (Bottema-Beutel, Lloyd, Watson, & Yoder, 2018). Similarly,

children are also more likely to play with toys at their most advanced level when caregivers give suggestions about ways to play with toys (Bottema-Beutel, Malloy, Lloyd, Louick, Watson, & Yoder, 2018). Additionally, engagement in activities that are *emotionally* engaging increase the child's attention and facilitate the appreciation of the partner's social-communicative and emotional facial and bodily cues (e.g., smiling expectantly before blowing bubbles to communicate a feeling of "suspense"; Vivanti & Rogers, 2014). Finally, *mirrored pacing*, which involves an adult imitating children's toy play at moments when children are most likely to attend, also appears to increase the overall duration of joint engagement (Gulsrud, Hellemann, Shire, & Kasari, 2016).

Experimental studies have shown that when trained interventionists facilitate joint engagement routines in children with ASD, participants show increases in both social communication and language, and these increases continue after the intervention has stopped (Kasari, Freeman, & Paparella, 2006; Kasari, Paparella, Freeman, & Jahromi, 2008; see Chap. 6). These findings are important, as they document intervention effects that are developmentally well beyond what is directly taught within the intervention. Social communication can also be improved when caregivers are provided coaching on joint engagement routines, and then implement them within everyday interactions with their children (Green et al., 2010; Kasari, Gulsrud, Wong, Kwon, & Locke, 2010; Pickles et al., 2016; Rogers, Vismara, Wagner, McCormick, Young, & Ozonoff, 2014). Finally, there is evidence of the effectiveness of these types of interventions when they are implemented in community contexts, such as early childcare centers (e.g., Vivanti et al., 2014, 2019), and efforts to improve the accessibility and community implementation of early intervention for children with ASD, especially for families from minoritized groups or low socioeconomic backgrounds, are increasing (Chang, Shire, Shih, Gelfand & Kasari, 2016; Shire et al., 2017).

### ***Supporting Later Social Communication Development***

The early intervention period appears to be the time when children are most receptive to the benefits of social communication interventions. For example, longitudinal research has shown that improvement in verbal functioning between age 2 and 3 predicts children's later language development (Anderson et al., 2014; Pickles et al., 2014). Further, children who start intervention at younger ages appear to have better language outcomes (Smith et al., 2015; Vivanti et al., 2019). Still, even children who do participate in early intervention may need continued support in the social communication domain later in childhood and into adulthood.

While research on supporting more advanced pragmatic aspects of language in the preschool period is at its infancy, preliminary evidence suggests that pragmatic aspects of language may be influenced by lexical acquisition; that is, children with more vocabulary also have greater pragmatic skill (Whyte & Nelson, 2015). Importantly, while some pragmatic regularities can effectively be taught as hard and

fast rules (e.g., not cursing in class), other areas of pragmatics are much more complex and not entirely rule-bound. This may make direct instruction ineffective for facilitating pragmatic development. While research in this area is still in the early phases, supporting the extent to which children are able to engage in linguistic interactions with peers and adults may indirectly support both lexical acquisition and downstream pragmatic development. Supported peer engagement increases children's opportunities to learn pragmatic aspects of language, and ensures that the skills they do learn are relevant to the interactions they have with their peers (as opposed to a more idealized form of interaction that is more relevant to formal interactions with adults).

Additionally, there is evidence that in young elementary age children, teaching typically developing children to identify and approach socially isolated children improves the social connectedness of children with ASD (Kasari, Rotheram-Fuller, Locke, & Gulsrud, 2012). Facilitating play experiences between children with ASD and their typically developing peers also leads to greater social involvement with peers (Wolfberg, DeWitt, Young, & Nguyen, 2015). Importantly, this approach appears to be more effective than direct social skill instructions for improving social connectedness.

### *Supporting Children Who Are Nonverbal*

For the 25–30% of children with ASD who do not develop spoken language by the preschool period, alternative and augmentative communication (AAC) systems are a critical tool for maximizing participation in social life, and for continuing to facilitate social communication development. These systems can be low-tech, and consist of objects or laminated icons that are used as communicative symbols. They can also be high-tech, such as an iPad equipped with an app that translates icons displayed on the screen to voice output. Such AAC devices can be programmed with language capabilities that are as complex as formal languages, in terms of flexibility and generativity (i.e., infinite combinations of words can be produced). High-tech devices can be expensive and complex to learn. Therefore, the assistance of a trained speech language pathologist who is experienced in supporting families in accessing this technology is critical to ensuring that it is adequately incorporated into the child's communicative repertoire. Some caregivers may be concerned that adopting an AAC device will further delay the onset of speech. In fact, research has shown that the opposite is true; children with ASD often acquire speech as a result of using an AAC device (Kasari et al., 2014).

A popular low-tech approach is the picture exchange communication system (PECS), which involves the use of picture cards that are combined and displayed on a Velcro board, and then exchanged with a communication partner (see also Chap. 7). This intervention uses reinforcement to aid the child in connecting the icons on the cards with their referents (e.g., a card depicting a cookie can be exchanged for an actual cookie, which will reinforce the concept that the cookie icon symbolizes "cookie"). However, there is currently very little evidence to suggest that this

approach improves *social* communication in children with ASD; it appears much more useful for teaching requests (Ganz, Earles-Vollrath, Heath, Parker, Rispoli, & Duran, 2012). In contrast, there is some research to suggest that incorporating speech generating AAC devices into joint engagement interventions has measurable effects on children's social communication outcomes (Kasari et al., 2014).

### ***Interventions that Target Developmentally Distal Outcomes***

It should be noted that some of the currently available early interventions appear to be more effective in improving aspects of social communication that are proximal to the intervention (i.e., skills that are directly taught or addressed by the intervention) and context bound (i.e., skills that are only demonstrated within contexts very similar to the intervention context, for example saying "hello" in response to a specific prompt and reward system; Yoder et al., 2013). This is concerning, as the practical or developmental benefits for such outcomes are unclear. However, there are several intervention studies that have shown distal (i.e., outcomes that are developmentally beyond what is directly taught or addressed by the intervention) and generalized effects (i.e., outcomes that appear in contexts that are dissimilar to the intervention context) on social communication. These interventions share some important characteristics; they involve joint engagement routines in natural contexts (which are usually play activities), provide a balance between child-centeredness and adult support, support parent and family involvement, maintain a developmental orientation, and address the child's physiological regulation (Bottema-Beutel, Yoder, Woynoroski, & Sandbank, 2014). These types of interventions will be discussed further in subsequent chapters focusing on intervention.

### ***Future Directions for Research***

While social communication intervention research has certainly made strides in the last several decades, more well-designed intervention research is needed that can tease apart the active ingredients of early interventions designed to support social communication, and the processes by which these strategies influence broader development in children with ASD. Additional work also needs to be conducted to better understand peer relatedness in children with ASD, and how peer relationships are intertwined with other aspects of social communication development. Finally, the majority of early intervention research designed to impact social communication has been conducted on participant samples that are of European or Euro-American descent and are monolingual English speakers. Given that social communication interventions often involve influencing family interactions, more research will need to be conducted with culturally diverse families, so that intervention strategies can be adapted accordingly (see for example Guiberson & Ferris, 2019).

## Conclusion

Social communication involves communication for sharing with and relating to others, and is a core area of impairment in ASD. Differences in social communication are thought to begin early in children's development, and to impact the development of a variety of developmental achievements including language and peer relationships. For young children with ASD, supporting joint engagement routines within adult-child interactions appears to be a promising means to advance children's social communication. Intervention effects from interventions that focus on joint engagement routines are developmentally distal to the intervention procedures, and appear to influence children's generalized behavior. More research is needed on the development of pragmatic language and the formation of friendships, and interventions to support these milestones.

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