We discuss three points relevant to Kissine’s (2021) target article on autism spectrum disorder (ASD) and its implications for theories of language acquisition. First, we argue that individuals with ASD do have social communication abilities and that these are linked to their language abilities; therefore, ASD does not provide evidence that language competence and language use are dissociable. Second, we argue that typically developing children show remarkable abilities to learn new words in noninteractive situations, and thus these abilities are not unique to ASD. Third, we point out that even noninteractive situations can serve as models for, and can implicate, children’s social communication abilities. In sum, we agree with Kissine that children (with and without ASD) are skilled language learners, able to take diverse paths to learning and to benefit from many different kinds of learning situations. However, as to whether these abilities in themselves demonstrate a threat to constructionist approaches to language acquisition, we do not think that Kissine has accrued a compelling case.

**Keywords**: autism spectrum disorder, language acquisition, word learning, overhearing, speech-language pathology

1. **Introduction.** As an interdisciplinary research team of a linguist, a speech-language pathologist, and a developmental psychologist focusing on language development in young children with autism spectrum disorder (ASD), we read Kissine’s (2021) target article with interest. We agree with many aspects of Kissine’s approach, particularly the notion that there are many paths to language acquisition. Any theory that relies heavily on one ability, such as social communication, or one aspect of the learning environment, such as joint attention, will be unable to explain language acquisition in all its diversity.

However, despite this theoretical commonality with Kissine, we argue that his overarching claim about theories of language acquisition is undermined by the binary way in which he characterizes both language learners (children with ASD and typically developing children) and language-learning situations. We make three points. First, Kissine suggests that (some) children with ASD ‘have’ language but ‘do not have’ social communication skills, and that therefore it is possible to acquire language in a non-social way. We argue that this characterization of ASD is too coarse. Second, Kissine argues that data from children with ASD contributes to theoretical debates about how language is acquired because these children show different language-learning abilities from typically developing children. We argue that typically developing children also show these same language-learning abilities. Thus, children with ASD do not permit any novel theoretical conclusions. Third, Kissine suggests that these language-learning abilities evinced in ASD (and, we argue, in typically developing children as well) do not involve social communication skills. We believe that they do, that ‘noninteractive’ situations in which the child is not directly a participant in a social interaction are not ‘nonsocial’ or ‘noncommunicative’, and that children do draw on social communication abilities in order to learn in such situations. Ultimately, we believe that a more accurate characterization of the language acquisition process involves children marshalling whatever linguistic, cognitive, and socio-communicative resources they have—which vary along a
continuum, and vary widely within as well as across diagnostic groups—and applying those resources to the learning situation.

2. Characterization of ASD. The nature of ASD has been debated since its conceptual origins in the 1940s. In its relatively short history, it has been held up in contrast to typical development—as the outcome of marked deficits in early social (e.g. joint attention) and/or cognitive (e.g. theory of mind) skills. In some cases, it was even proposed that individuals with ASD exemplified a qualitatively distinct course of development, where certain skills failed to manifest. For instance, in a classic study, authors Baron-Cohen et al. suggested that ‘autistic children as a group fail to employ a theory of mind. We wish to explain this failure as an inability to represent mental states’ (Baron-Cohen et al. 1985:43). Over the years, however, these proposed dichotomies have been falsified, as research has confirmed that ASD is characterized not by the absence of any particular ability, but rather as a complex and heterogeneous range of profiles, including areas of both relative difficulty and strength—a phenomenon that is true of developmental and mental conditions more broadly. Accordingly, in recent years, the field has moved away from binary models of ‘normal’ vs. ‘disordered’ and toward understanding all human development as falling along multiple dimensions that interact with each other over time (Cuthbert & Insel 2013, Georgiades et al. 2017), and many researchers have applied this same quantitative approach to understanding ASD traits in particular (Baron-Cohen et al. 2001, Constantino et al. 2003).

Kissine’s presentation of individuals with ASD implies that he is relying on this outdated all-or-nothing approach. For instance, he focuses on a variety of higher-order language skills—the comprehension of metaphor, indirect requests, and irony—and argues that because individuals with ASD are able to perform these tasks, they must be using an approach that does not invoke social cognition. The implication here is that individuals with ASD must lack social cognitive skills (like theory of mind, understanding of intentionality, perspective taking), and indeed he comments that higher-order language comprehension is not associated with these skills. However, we disagree with his fundamental premise that individuals with ASD lack these skills entirely. Within the autism spectrum, there is in fact considerable variability in theory of mind (e.g. Scheeren et al. 2012), intentionality (see Gernsbacher et al. 2008 for a discussion), and the ability to take another’s perspective (e.g. Atherton et al. 2019). Therefore, rather than being absent, these skills are very much present in ASD (even if below age expectations) and can be harnessed for a range of language-processing tasks.

Similarly, as noted by Kissine, children diagnosed with ASD often show delays in their ability to respond to bids for joint attention. However, contrary to the author’s assertion that fundamental social communication skills (like joint attention) generally do not predict language, these abilities have been shown to predict language performance for individuals with ASD (see a recent meta-analysis by Bottema-Beutel 2016). In addition, a delay in social communication skills like joint attention does not necessarily mean that these skills are not being used for word learning or that they result in errors in word learning. One proposed example of a ‘missing link’ between early social communication (gaze following, in particular) and language learning that Kissine highlights is the ability to learn new words by following the attentional focus of the speaker. He claims that the literature suggests that children with ASD make regular errors in this

1 Our comments are not about the clinical application of categorical diagnostic labels but rather about understanding the nature of development.
context and that they ‘tend to associate the new label with the object they, and not the experimenter, are attending to’ (Kissine 2021:e144). However, his characterization of this literature is inaccurate. Although Baron-Cohen et al. (1997) and Preissler and Carey (2005) reported a tendency for children with ASD to make mapping errors (i.e. to wrongly map a novel word to the object that is the focus of their own attention rather than that of the speaker), the other, newer, studies that Kissine cites in this context do not support this claim.

In fact, Luyster & Lord 2009 stands in direct contrast: these authors found that children with ASD did not make errors—that is, they did not wrongly map novel words to objects that were in their own focus of attention rather than the speaker’s. Akechi et al. (2011) and Akechi et al. (2013) found a similar pattern; although increasing the salience of the object and adding additional cues improved performance, even in their condition which most closely resembled that of Baron-Cohen et al.’s (1997) original study, children with ASD did not erroneously associate the new label with the object of their own (vs. the experimenter’s) attention. Moreover, in most of the experimental conditions reported in these two articles, there were no statistically significant differences between typically developing children and children with ASD. Parish-Morris et al. (2007) also found that children with ASD used social cues to learn new word meanings; children’s success depended on how interesting the object was to look at, but this is a nuance, not a wholesale failure to use social cues to guide word learning.

3. Language learning in typical development and ASD. Kissine begins by highlighting the importance of social interaction in theories of how language develops. Undoubtedly, social interaction is important for healthy development, but ASD is not unique in revealing abilities to learn aspects of language in noninteractive contexts. Although language learning is generally discussed in the context of one-on-one parent-child social interaction, laboratory studies have shown that typically developing children perform well in a variety of experimental paradigms that vary widely in the social and communicative contexts they provide. We know from a range of studies that children learn a great deal simply from being a third party (i.e. observer) to the interactions of others, even if they are not a direct participant (see Akhtar & Gernsbacher 2007 for a discussion). For instance, toddlers with ASD (Luyster & Arunachalam 2020) and without ASD (e.g. Akhtar 2005, Akhtar et al. 2001, Akhtar et al. 2019, Fitch et al. 2020, Foushee et al. 2021) can learn novel nouns labeling objects by overhearing an interaction in which they are not a participant. Typically developing children can also attend to others’ conversations to extract the syntactic contexts in which novel verbs are used and in turn infer the verbs’ meanings (e.g. Arunachalam & Waxman 2010, Messenger et al. 2015, Scott & Fisher 2009, Yuan & Fisher 2009).

While these experimental paradigms presenting children with overheard speech do have many social features—children are observing a reciprocal social interaction between two individuals, for example—there are many experimental paradigms that offer even less social context, and in which both typically developing children and children with ASD succeed. For example, the classic statistical learning paradigm in which participants (from infants through adults) hear an unsegmented speech stream of meaningless syllables and are able to detect statistical regularities within it is notably nonsocial (Saffran et al. 1996). Children with and without ASD can also assign broad meanings to new verbs they hear from syntactic input that is similarly lacking in discourse or conversational context, with no relevant visual referents (Arunachalam 2013, Horvath et al. 2018, Yuan et al. 2011).
Kissine presents one well-known counterexample from Kuhl et al. 2003 in which nine-month-old infants showed sensitivity to foreign-language phonemes in a phoneme discrimination task only when they were exposed to the foreign language via direct social interaction, and not from a social interaction that took place over video. However, given the robust abilities we have noted that children with and without ASD have to attend to and learn from linguistic information presented in far less social contexts, it is likely that Kuhl et al.’s (2003) finding is limited to, perhaps, phoneme learning in infancy and is not indicative of a broad constraint on the ability to learn from noninteractive contexts.

Therefore, to the extent that evidence about learning in noninteractive contexts can be brought to bear on theories of language acquisition, children with ASD are unlikely to provide the critical test case. Instead, both typically developing children and children with ASD show abilities to learn in noninteractive contexts, making use of other available information (e.g. the linguistic and extralinguistic cues available in a third-party interaction, or the distribution of linguistic elements relative to each other in a statistical learning paradigm).

4. **Noninteractive is not nonsocial.** In addition to arguing that typically developing children, too, learn in noninteractive contexts, we suggest that the characterization of contexts as either ‘interactive’ or ‘noninteractive’ is an oversimplification, because it overlooks the importance of a range of social cognitive and linguistic capabilities of the developing child. Interactions are valuable for children partly because they may provide an opportunity to overtly practice skills but also because they provide a model. Hoff (2006) argues that these two critical ingredients—a language model and the opportunity to practice communication skills—need not be contemporaneous in order for language learning to occur, and we concur.

Therefore, even noninteractive contexts provide useful models of reciprocal engagement that can and do support language development, even if the child is not overtly participating. As such, learning in these noninteractive contexts still requires the child to engage their social communication skills—to infer the intentions of the speaker, for example. In support of this is substantial evidence that typically developing children, at least (this work has not to our knowledge yet been done with children with ASD), do not learn when they are third-party observers of situations that lack social reciprocity, such as conversations in which one conversation partner is not attending (e.g. Fitch et al. 2020, O’Doherty et al. 2011, Roseberry et al. 2014). This evidence implies that when they successfully learn in overhearing situations, children rely on their social communication skills to make sense of the interaction they observe.

Given that this comparison has not yet been conducted in children with ASD, it could still in principle be the case that children with ASD do not rely on social communication skills to learn from overheard speech and that, as Kissine (2021:e149) says, from the learner’s perspective these overheard conversations are ‘noncommunicative stimuli’. But given the evidence that social communication skill is linked to language ability in ASD (e.g. Bottema-Beutel 2016), that many individuals with ASD (including the verbal cohort studied in much of the research Kissine cites) use language for communicative purposes (e.g. Simmons et al. 2014), that individuals with ASD are socially motivated to attend to and make sense of social interactions (e.g. Jaswal & Akhtar 2019), and that individuals with ASD do show many typical communication skills even if they are below age-level expectations (e.g. Maljaars et al. 2011), we think the burden of proof for making such a claim is extraordinarily high, and certainly beyond what Kissine has presented.

Finally, there is likely a continuum of ‘interactiveness’ of word-learning situations. Some, like lab-based statistical learning paradigms, are good examples of minimally in-
teractive ones, and they are effective learning contexts for individuals with and without ASD (e.g. Obeid et al. 2016, Saffran et al. 1996). Others, like dyadic face-to-face interactions, are examples of much more interactive situations; they too can be effective learning contexts for children with and without ASD (e.g. Luyster & Lord 2009, Tomasello & Farrar 1986). Some, like watching television or other screen media, are somewhere in between—providing a model for interaction with the child as third-party witness. Children’s abilities to learn from less interactive input likely depend on their existing language skill. While infants in Kuhl et al. 2003 needed more robust social interaction in order to learn, for older children who have already made substantial headway in acquiring a first language, such as the children with ASD studied by Kissine et al. (2019) or the preschoolers with and without ASD who succeed in various noninteractive word-learning tasks discussed above, the language knowledge they already possess can serve as a strong foundation on which to build.

5. Conclusion. In conclusion, we do not dispute the broad possibility that children (with or without ASD) may use asocial pathways to language, but we dispute (i) the suggestion that language learning in ASD is independent of social cognition and social communication, (ii) the idea that children with ASD offer a different profile of language learning from typically developing individuals, and (iii) the characterization of ‘noninteractive’ language-learning contexts as being ‘nonsocial’. Instead, our understanding of language learning in ASD is one in which social communication skills are indeed impaired (but not absent), and these impairments affect language development and language skills; additionally, children with ASD and with typical development use many of the same mechanisms and learn in many of the same situations, and even noninteractive situations draw on children’s social communication skills.

ASD is complex and presents many important questions for scholars of language. Why do some children remain minimally verbal while others are virtually indistinguishable from their typically developing peers on most language measures? And although children with ASD and typically developing children do appear to use the same language-learning mechanisms for the most part (see e.g. Arunachalam & Luyster 2018 for a recent review), to what extent do they use these mechanisms to different degrees or in different contexts? However, the very complexity of ASD and the heterogeneous abilities of children with ASD, as well as the abilities of typically developing children to learn in a diverse array of situations, indicate that it is too simplistic to argue that ASD presents a tidy counterexample to existing theories. The approach that underlies Kissine’s characterization of ASD as involving language in the absence of social communication skills is reminiscent of the binary approach to categorizing aphasia types as Wernicke’s aphasia (affecting comprehension) and Broca’s aphasia (affecting production); within that literature as well, deeper understanding of patterns of acquired language impairment revealed that the deficits are too complex to be reduced to these dichotomous patterns (e.g. Tremblay & Dick 2016). We suggest that for ASD and other neurodevelopmental disorders it is also critical to move away from ‘this or that’ characterization; clinical research and practice provide substantial evidence that the autism spectrum is incredibly heterogeneous, with nuanced abilities in a variety of domains, making binaries of any kind inadequate (Jeste & Geschwind 2014, Lenroot & Yeung 2014, Kim et al. 2016, McCormick et al. 2020).

Finally, we end by emphasizing our areas of agreement with Kissine’s approach. From a theoretical perspective, we agree that children (with and without ASD or other neurodevelopmental disorders) can follow many diverse paths to acquiring language. Child-centered interactions do not deserve the primacy they have been accorded in the literature. Moreover, we agree, albeit for different reasons, that some forms of the con-
structionist approach are incompatible with the evidence about how language is acquired (e.g. Arunachalam 2015). From a clinical perspective, we agree that more interventions are needed that capitalize on the strengths of children on the autism spectrum instead of focusing only on their difficulties with social communication and joint attention in particular. Less socially demanding interventions may be helpful for aspects of language learning, at least for some individuals with ASD (e.g. Arunachalam & Luyster 2018). We appreciate the opportunity to think about these big-picture issues the author raises with our colleagues. Like Kissine, we believe that interdisciplinary research of this nature is critical for advancing our theoretical understanding both of language and of neurodevelopmental disorders, as well as for allowing us to better support children with ASD and their families.

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