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## Introduction: Perspectives on Language in ASD

Diagnoses of neurodevelopmental disorders, and particularly autism spectrum disorder (ASD), have been increasing over the past 20 to 30 years (Fombonne, Quirke, & Hagen, 2011); hence, more and more children and adolescents are carrying an ASD diagnosis. Deficits in social interaction, together with excessive restricted and repetitive behaviors, are key components of ASD. Language impairment, broadly defined, has also been considered a core component of ASD (American Psychiatric Association, 2000), yet the precise nature of this impairment, and its current status within the ASD diagnosis, is unresolved (American Psychiatric Association, 2013; World Health Organization [WHO], 1992; see also Eigsti & Schuh, Chapter 9, this volume). One reason for this lack of resolution is the enormous variability that is observed when language use is assessed in individuals with ASD. In somewhat oversimplified terms, some studies report language impairments ranging from minimal to severe, and other studies report language that looks completely intact. From a person-centered standpoint, some individuals with ASD rarely speak and appear not to understand the language of their community, whereas others speak and understand at levels that appear indistinguishable from typically developing (TD) individuals—and many, many others present with language in between these two extremes. This variability has intrigued and inspired the contributors to this volume, who have brought their expertise in fields ranging from communication disorders to developmental and clinical psychology to theoretical linguistics to bear on innovative investigations concerning the nature and origins of linguistic knowledge and use in individuals, especially children, with ASD.

## Why Does Variability in Language Use Matter?

Variability in the development and use of language in children with ASD matters to clinicians, linguists, and developmental psychologists for somewhat different reasons. Clinicians, who diagnose, assess, design, and carry out interventions, are directly affected by recent changes in the core diagnostic characteristics of ASD (for an excellent historical review, see Goldstein & Ozonoff, 2009). That is, deficits and delays in language per se are no longer designated as core components of ASD in the current U.S.-based *Diagnostic and Statistical Manual of Mental Disorders* (fifth edition [DSM-5]; American Psychiatric Association, 2013); the *International Statistical Classification of Diseases* (10th revision [ICD-10] for “Childhood Autism”; WHO, 1992), which is now considered the standard for diagnosis, focuses more on deficits in the social uses of language. Both

of these sources cite *communication* as a core component of ASD or Childhood Autism, particularly with reference to nonverbal behaviors in social interaction, such as eye contact and facial expressions, body language, and gesture. Developmental disorders of speech and language (SLDs) are designated as separate from ASD, with the possibility available that a child presents with both disorders comorbidly. It is important, therefore, to clarify some distinctions between *communication* and *language*.

*Communication* may be considered the broader term because many uses of language (e.g., telling and understanding stories, metaphors, puns, and jokes; disputing, conversing about external events and internal thoughts and feelings) are communicative in that they convey intentional messages between producers and comprehenders. Additionally, there are nonlinguistic forms or media of communication, such as body language and gesture.<sup>1</sup> Language use also exists outside of interpersonal communication, as speakers may exploit their linguistic knowledge during, for example, self-reflection and examination, social and cognitive problem solving, creative engagement, and (for students of language) linguistic analysis (Altmann, 1996; Chomsky, 2006). A key point, however, is that both communicative and noncommunicative language use includes all four levels of language, including sounds and signs, words, sentences, and discourse (also termed *phonology*, *lexical semantics*, *morphology and syntax*, and *semantics/pragmatics*). Salient questions for clinicians, then, may involve the extent to which children with ASD's delays in language-related milestones (first words, first phrases) and/or difficulties with stories and metaphors reflect linguistic as well as communicative deficits. Moreover, to the extent that language is a dominant medium for interventions for children with ASD, intervention design must take account of their linguistic as well as communicative skills. Finally, it is important to point out that many of the studies described in these chapters were carried out by researchers who were studying children diagnosed as ASD under the criteria of the previous edition of the *DSM* (*DSM-IV*; American Psychiatric Association, 2000), in which language delay is a specific criterion (note that, changes in *DSM-5* notwithstanding, these individuals are still considered to carry the ASD diagnosis). An interesting question for future research concerns the extent to which findings such as those discussed in this volume are replicated with children with ASD whose diagnosis is restricted to *DSM-5/ICD-10* criteria.

Variability in the development and use of language in children with ASD raises questions for linguists that involve theory and structure. For example, when language impairment occurs, does the coherent system of highly regular relationships between linguistic forms (sounds, morphemes, words, sentences, discourse) and meanings (concepts, events, relationships, propositions, interactions) break down in ASD in similarly systematic patterns, such that only one level is impaired or all levels are impaired? Language deficits in ASD can look quite systematic, especially at the lowest and highest

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<sup>1</sup> Sign languages, by virtue of their reliance on the visual-tactile modalities, include both linguistic and nonlinguistic manifestations of these forms (Goldin-Meadow, 2015). See Shield (2014) for a recent discussion of how ASD may be manifested in American Sign Language.

verbal extremes. For example, a sizeable minority (15%–30%) of children diagnosed with ASD remain nonverbal (i.e., apparently without language) into adulthood (Pickett, Pullara, O'Grady, & Gordon, 2009); moreover, many children who acquire language nonetheless show substantial delays in their onset of speech compared with TD age mates (Tager-Flusberg, Paul, & Lord, 2005; Tek, Mesite, Fein, & Naigles, 2014). Among high-verbal children with ASD, neither speech-sound nor articulation errors are commonly reported, supporting an intact system of phonology (Tager-Flusberg et al., 2005), although recent research has begun to question this conclusion (Suh et al., Chapter 11, this volume; Tuller et al., Chapter 6, this volume). Scrutiny of the pragmatic level, in contrast, yields the most consistent evidence of difficulties, including weaknesses in story connectedness, humor and metaphor use, and adjustments of speech in line with the perspectives of the listener (for comprehensive summaries, see Naigles & Chin, 2015; Stirling, Douglas, Leekam, & Carey, 2014), supporting a pervasive deficit in the pragmatic component of language. Four chapters in the current volume further explore the origins of this deficit. For example, researchers investigate whether ASD perspective-taking difficulties might actually be rooted in challenges with complex syntax (Durrelman-Tame, Burnel, & Reboul, Chapter 8, this volume) or low-level nonsocial functions such as working memory (see in this volume Eigsti & Schuh, Chapter 9; Suh et al., Chapter 11). Researchers also deploy novel methods, such as written retelling of familiar narratives and eye tracking during tasks accessing speaker–listener common ground to illuminate unexpectedly good—and poor—pragmatic usage (see in this volume Eigsti & Schuh, Chapter 9; Stirling, Barrington, Douglas, & Delves, Chapter 10).

Studies focusing on the components of lexicon and grammar, including both morphology and syntax, have generated the most mixed findings with respect to their degree of intactness/strength versus deficit/weakness in ASD and are discussed at length in the current volume. One prominent example in the literature concerns the degree to which a subgroup of children with ASD might manifest the same language impairments as children without ASD who have specific language impairment (SLI). In brief, classic SLI can be diagnosed in preschool-aged children whose language scores are below the normal range for their age but whose nonverbal IQs are within the normal range—that is, they present without frank cognitive deficits. These children typically demonstrate significant impairments in articulation and grammatical expression, frequently omitting sounds from consonant clusters; morphemes, such as those for tense and aspect; and required elements, such as direct objects, from sentences (Leonard, 2015; Tomblin, 2015). Tager-Flusberg and colleagues (Kjelgaard & Tager-Flusberg, 2001; Roberts, Rice, & Tager-Flusberg, 2004; Tager-Flusberg, 2006; Tager-Flusberg & Joseph, 2003; see also Gernsbacher, Geye, & Ellis Weismer, 2005) have proposed that a subgroup of children with ASD also fit this profile, such that they carry both ASD and SLI (or in *DSM-5/ICD-10* terms, SLD) diagnoses. This proposal has been controversial, with other researchers arguing that the “structural language” impairments associated with ASD are different in kind from those in SLI (Riches, Loucas, Baird, Charman, & Simonoff, 2010; Taylor, Mayberry, & Whitehouse, 2014;

Williams, Botting, & Boucher, 2008); however, Tuller et al. (Chapter 6, this volume) garner some support for the proposal while recasting the grammatical deficit as one involving computational complexity rather than specific constructions. Still other researchers point out that similarities in overt grammatical use may have different underlying roots or developmental pathways (Eigsti & Bennetto, 2009; Taylor et al., 2014; Whitehouse, Barry, & Bishop, 2008; see also Norbury, Chapter 1, this volume). The existence of an ASD–SLI subgroup would provide evidence of linguistic systematicity in language breakdown (i.e., a specifically grammatical impairment; see van der Lely, 2005); however, because human language also manifests interfaces between language levels, evidence of the interdependency of, say, the lexical semantic and syntactic levels in the language of children with ASD is also highly relevant for investigations of systematicity (e.g., Naigles, Kelty, Jaffery, & Fein, 2011; see also in this volume, Janke & Perovic, Chapter 7; Nadig & Bang, Chapter 5; Naigles & Fein, Chapter 3; Norbury, Chapter 1).

Variability in the development and use of language in children with ASD raises questions for developmental psychologists that may involve the processes of change and growth. For example, when some children with ASD have difficulty developing more advanced language, is this because they are using some different processes of language acquisition or because they are using the same processes as TD children but at lower levels of efficiency? Processes exploited during the language acquisition of TD children include, but are by no means limited to, statistical learning (Höhle, 2015; Thiessen & Erickson, 2015), which enables children to discover the configural patterns of their input language; social interaction (Clark, 2015; Tomasello, 2015), which facilitates children's attention to the linguistic signal and its concomitant meanings; and working memory (Archibald & Noonan, 2015; Snedeker & Huang, 2015), which enables children to track and organize the plethora of external and internal data that goes into acquiring, producing, and understanding language. Thus, because both engagement in and inferencing from social interactions are, by definition, impaired in children with ASD, such children might illuminate how much language development and use is dependent on these interactions. Indeed, the social impairments of children with ASD have been cited as the primary cause of their language impairments (Tager-Flusberg et al., 2005): If children are not sufficiently socially engaged even to pay attention to the speech of others in their milieu, they are not going to process that speech sufficiently to determine its sound structure, syntactic patterning, and semantic–pragmatic relationships. Yet social engagement cannot be the definitive “gatekeeper” to language development because many socially impaired children with ASD nonetheless acquire functional, if not advanced, language skills (Akhtar & Gernsbacher, 2007; Naigles & Chin, 2015). Possible interpretations of these findings include postulating that (some) children with ASD acquire language by relying more on statistical learning or working memory processes than social interactional processes or that the social processes may exert their primary influence at develop-

mentally restricted time points (Gernsbacher, Stevenson, Khandakar, & Goldsmith, 2008; Naigles, 2013).

## Overarching Research Questions

From all three perspectives (linguistic, clinical, and that of developmental psychologists), two overarching questions recur: Is the variability of language development and use in children with ASD a function of the *language*, such that some linguistic domains are more vulnerable to ASD than others? Is the variability a function of the *individual*, such that some characteristics predispose those with ASD to have more versus less difficulty with language development and use? The investigations presented in this volume address both of these questions. In particular, contributors consider and assess language as a system of interdependent levels (phonology, lexical semantics, grammar—morphology, single-clause syntax, complex syntax—and semantics/pragmatics), and scrutinize the structures in these levels in sufficient detail to (a) observe pockets of strengths or weaknesses possibly unique to a specific level or (b) observe connections across levels that are linguistic-theoretic or processing based. Naigles and Fein's (Chapter 3) discovery that highly verbal children with ASD nonetheless have difficulty using a shape bias to extend word meanings is an example of (a); Janke and Perovic's (Chapter 7) demonstration of children with ASD's success in identifying referents that require tapping both syntactic and pragmatic information is an example of (b).

Contributors also target the psychological underpinnings or precursors to successful language acquisition and use, scrutinizing characteristics within the child such as processing speed, attention, and working memory. For example, Bavin and Baker (Chapter 2) demonstrate that while both TD children and children with ASD display anticipatory looking to referent objects based on prior speech, the ASD group's looking occurred significantly more slowly. Characteristics of the child in his or her milieu, such as social-interpersonal interaction and the linguistic richness of the input, are also discussed, with McDuffie, Thurman, Channell, and Abbeduto (Chapter 4) intensively exploring the role of social cues in word learning by children with ASD as well as children with fragile X syndrome. Intriguingly, the superficially similar social impairments of the two groups nonetheless seem coupled with different patterns of word learning. Nadig and Bang (Chapter 5) highlight the increasingly compelling evidence that, despite their generally poor social skills, children with ASD nonetheless are able to use their parents' linguistic or social input (or both) in the service of learning language.

Finally, conventional standardized testing lacks the methodological techniques and range of stimuli that could help reveal the origins and extent of the language variability in children with ASD. The contributors of this volume deploy new and exciting methods that allow us to observe language development and language processing in

real time, as well as both within and independently of the social milieu. For example, studies involving eye tracking during language use are covered in five chapters in this book (Norbury, Chapter 1; Bavin & Baker, Chapter 2; Naigles & Fein, Chapter 3; McDuffie et al., Chapter 4; Eigsti & Schuh, Chapter 9), with the general goal of using a task that is both less socially taxing (thereby tapping linguistic knowledge less fettered by communicative demands) and more finely tuned to the time course of speech production and comprehension (thereby illuminating when language processing might go awry). Intriguingly, researchers have revealed both typical and atypical looking patterns during language use in children and adolescents with ASD.

## Plan of the Volume

This volume will be of interest to students and researchers from all language-relevant disciplines, including linguists, psychologists, sociologists, and behavioral and cognitive neuroscientists, from the graduate student to the professional level. Although each of the three perspectives included here has its own terminology and assumptions, chapter authors have made considerable effort to present their research in ways that will be comprehensible to those outside their specific disciplines. Examples are plentiful throughout, and jargon has been kept to a minimum (see also the section on terminology at the end of this chapter). All contributors include both discussions of background literature and descriptions of their state-of-the-art empirical results, and many include suggestions of how to extend their findings for use in interventions.

The following 11 chapters are ordered somewhat in line with the levels of language they focus on, with investigations of lexical semantics and single-clause syntax presented first (Chapters 1–5), followed by investigations of computationally complex phonology and syntax (Chapter 6) and the syntax-pragmatics interface (Chapters 7 and 8), and then investigations of pragmatics (Chapters 9 and 10). The final chapter (Chapter 11) considers a wide range of language structures and processes with respect to one extremely intriguing subgroup: children originally diagnosed with ASD who no longer carry the diagnosis (i.e., “optimal outcome”; Fein et al., 2013). Additional prominent subthemes of the chapters include discussions of what eye-tracking methods, cross-disorder comparisons (Norbury, Chapter 1; McDuffie et al., Chapter 4; Nadig & Bang, Chapter 5; Tuller et al., Chapter 6; Suh et al., Chapter 11), and examinations of what the contexts of language development (Naigles & Fein, Chapter 3; McDuffie et al., Chapter 4; Nadig & Bang, Chapter 5; Suh et al., Chapter 11) have revealed about the variability and uniqueness of ASD language use.

Most of the chapters consider the language of children with ASD who are school age (6–11 years) or adolescents, although two (Chapters 3 and 5) discuss children as young as 2 years of age. The dominant language under investigation is English; however, another innovation of this volume is to reflect the increasing inclusion of additional



languages to the study of language development and representation in ASD: three of the 11 chapters (Nadig & Bang, Chapter 5; Tuller et al., Chapter 6; Durrleman-Tame et al., Chapter 8) present findings from French learners. Investigations of the language use of children and adults with ASD who are exposed to the many other languages of the world are, of course, of great need and importance (e.g., Su, Jin, Wan, Zhang, & Su, 2014).

In sum, these chapters provide a wealth of detailed information about the language development, processing, and production of children with ASD. Some authors aimed for breadth, taking readers through beautifully integrated surveys of recent research, whereas other authors chose depth, showing readers how they generated and analyzed specific linguistic findings. Variability of language use, as suspected, is accounted for in multiple ways, including language centered (e.g., some concepts and constructions are indeed more resilient than others), child centered (e.g., more efficient speech processing and social referencing enable better word learning and conversational interaction), and situation centered (e.g., parental behaviors and intensive interventions can facilitate the language development of children with ASD). Building on these findings, many of the chapters call for a fourth category of innovative investigation, involving longitudinal studies (e.g., Anderson, Liang, & Lord, 2014). For example, children should be followed over time to discover the *effects*—weeks, months, and years later—of more versus less efficient speech processing, parental responsivity, and richness of linguistic input. Moreover, concepts, constructions, and conversation topics that are challenging for children with ASD to produce or understand at one age can be reassessed at later ages to see whether and when they are mastered. The language of children with ASD is still a puzzle in need of solutions, but the chapters in this volume illuminate many of the tools needed to identify the puzzle pieces and fit them together.

## Explanation of Some Linguistic Terminology

For additional information on terminology, see Hoff (2008).

*Grammatical morphology* is the structure of words that results from combining word roots with prefixes or endings that mark grammatical relations, such as the *–s* at the end of verbs to mark agreement with a third-person subject (he runs) or the *–ed* at the end of verbs to mark the past tense.

A *mental lexicon* is the “dictionary” of words and associated knowledge that speaker–hearers have.

*Phonology* is the sound system of a language. Phonological segments include sonorants (*s*, *z*), glides (*w*, *y*), liquids (*l*), and obstruents (*p*, *b*, *d*, *t*). Phonological syllables can appear at onset (beginning), medial (middle), and coda (final) positions in words.

*Pronouns* (*she*, *they*, *his*), clitics (*le*, *la*, *les* in French), and empty categories (phonologically null) refer to full noun phrases (antecedents) in surrounding discourse; their reference is governed by syntactic and pragmatic principles.

*Syntax* is a system of rules for building phrases out of words (which belong to particular grammatical categories such as *noun* and *verb*) and for building sentences out of those constituent phrases.

*Complex sentences* are composed of a main clause plus at least one subordinate/dependent clause. Sentence complements are subordinate clauses that modify or further specify the verb phrase in the main clause. Relative clauses are subordinate clauses that modify or further specify one of the noun phrases in the main clause.

*Syntactic bootstrapping* is the process of acquiring aspects of the meanings of words based on the ways those words appear in sentences.

*Wh-questions* are questions that begin with *who*, *what*, *where*, *why*, *when*, or *how*. In “movement” languages, these *wh*-words usually appear at the beginning of the question. In “in situ” languages, the *wh*-words usually appear at the location in the sentence of the phrase, which the *wh*-word is asking about. For example, “What is she wearing?” in English is produced as “She [is] wearing what?” in Chinese.

## References

- Akhtar, N., & Gernsbacher, M. A. (2007). Joint attention and vocabulary development: A critical look. *Language and Linguistics Compass*, 1, 195–207. <http://dx.doi.org/10.1111/j.1749-818X.2007.00014.x>
- Altmann, G. (1996). *The ascent of Babel*. Oxford, England: Oxford University Press.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
- Anderson, D. K., Liang, J. W., & Lord, C. (2014). Predicting young adult outcome among more and less cognitively able individuals with autism spectrum disorders. *Journal of Child Psychology and Psychiatry*, 55, 485–494. <http://dx.doi.org/10.1111/jcpp.12178>
- Archibald, L., & Noonan, N. (2015). Processing deficits in children with language impairments. In E. L. Bavin & L. R. Naigles (Eds.), *The Cambridge handbook of child language* (2nd ed., pp. 564–584). <http://dx.doi.org/10.1017/CBO9781316095829.026>
- Chomsky, N. (2006). *Language and mind* (3rd ed.). <http://dx.doi.org/10.1017/CBO9780511791222>
- Clark, E. V. (2015). Lexical meaning. In E. L. Bavin & L. R. Naigles (Eds.), *The Cambridge handbook of child language* (2nd ed., pp. 351–368). <http://dx.doi.org/10.1017/CBO9781316095829.016>
- Eigsti, I. M., & Bennetto, L. (2009). Grammaticality judgments in autism spectrum disorders: Deviance or delay. *Journal of Child Language*, 19, 1–23.
- Fein, D., Barton, M., Eigsti, I.-M., Kelley, E., Naigles, L. R., Schultz, R. T., . . . Tyson, K. (2013). Optimal outcome in individuals with a history of autism. *Journal of Child Psychology and Psychiatry*, 54, 195–205. <http://dx.doi.org/10.1111/jcpp.12037>
- Fombonne, E., Quirke, S., & Hagen, A. (2011). Epidemiology of pervasive developmental disorders. In D. G. Amaral, D. H. Geschwind, & G. Dawson (Eds.), *Autism spectrum disorders* (pp. 90–111). <http://dx.doi.org/10.1093/med/9780195371826.003.0007>



- Gernsbacher, M. A., Geye, H. M., & Ellis Weismer, S. (2005). The role of language and communication impairments within autism. In P. Fletcher & J. Miller (Eds.), *Developmental theory and language disorders* (pp. 73–93). <http://dx.doi.org/10.1075/tilar.4.06ger>
- Gernsbacher, M. A., Stevenson, J. L., Khandakar, S., & Goldsmith, H. H. (2008). Why does joint attention look atypical in autism? *Child Development Perspectives*, 2, 38–45. <http://dx.doi.org/10.1111/j.1750-8606.2008.00039.x>
- Goldin-Meadow, S. (2015). From gesture to word. In E. L. Bavin & L. R. Naigles (Eds.), *The Cambridge handbook of child language* (2nd ed., pp. 183–204). <http://dx.doi.org/10.1017/CBO9781316095829.009>
- Goldstein, S., & Ozonoff, S. (2009). Historical perspective and overview. In S. Goldstein, J. Naglieri, & S. Ozonoff (Eds.), *Assessment of autism spectrum disorders* (pp. 1–17). New York, NY: Guilford Press.
- Hoff, E. (2008). *Language development* (4th ed.). Belmont, CA: Wadsworth/Cengage Learning.
- Höhle, B. (2015). Crosslinguistic perspectives on segmentation and categorization in early language acquisition. In E. L. Bavin & L. R. Naigles (Eds.), *The Cambridge handbook of child language* (2nd ed., pp. 159–182). <http://dx.doi.org/10.1017/CBO9781316095829.008>
- Kjelgaard, M. M., & Tager-Flusberg, H. (2001). An investigation of language impairment in autism: Implications for genetic subgroups. *Language and Cognitive Processes*, 16, 287–308. <http://dx.doi.org/10.1080/01690960042000058>
- Leonard, L. (2015). Language symptoms and their possible sources in specific language impairment. In E. L. Bavin & L. R. Naigles (Eds.), *The Cambridge handbook of child language* (2nd ed., pp. 545–563). <http://dx.doi.org/10.1017/CBO9781316095829.025>
- Naigles, L. R. (2013). Input and language development in children with autism. *Seminars in Speech and Language*, 34, 237–248. <http://dx.doi.org/10.1055/s-0033-1353446>
- Naigles, L. R., & Chin, I. (2015). Language development in children with autism. In E. L. Bavin & L. R. Naigles (Eds.), *The Cambridge handbook of child language* (2nd ed., pp. 637–658). <http://dx.doi.org/10.1017/CBO9781316095829.029>
- Naigles, L. R., Kelty, E., Jaffery, R., & Fein, D. (2011). Abstractness and continuity in the syntactic development of young children with autism. *Autism Research*, 4, 422–437. <http://dx.doi.org/10.1002/aur.223>
- Pickett, E., Pullara, O., O’Grady, J., & Gordon, B. (2009). Speech acquisition in older nonverbal individuals with autism: A review of features, methods, and prognosis. *Cognitive and Behavioral Neurology*, 22, 1–21. <http://dx.doi.org/10.1097/WNN.0b013e318190d185>
- Riches, N. G., Loucas, T., Baird, G., Charman, T., & Simonoff, E. (2010). Sentence repetition in adolescents with specific language impairments and autism: An investigation of complex syntax. *International Journal of Language & Communication Disorders*, 45, 47–60. <http://dx.doi.org/10.3109/13682820802647676>
- Roberts, J., Rice, M., & Tager-Flusberg, H. (2004). Tense marking in children with autism. *Applied Psycholinguistics*, 25, 429–448. <http://dx.doi.org/10.1017/S0142716404001201>
- Shield, A. (2014). Preliminary findings of similarities and differences in the signed and spoken language of children with autism. *Seminars in Speech and Language*, 35, 309–320. <http://dx.doi.org/10.1055/s-0034-1389103>
- Snedeker, J., & Huang, Y. T. (2015). Sentence processing. In E. L. Bavin & L. R. Naigles (Eds.), *The Cambridge handbook of child language* (2nd ed., pp. 409–437). <http://dx.doi.org/10.1017/CBO9781316095829.019>

- Stirling, L., Douglas, S., Leekam, S., & Carey, L. (2014). The use of narrative in studying communication in autism spectrum disorders: A review of methodologies and findings. In J. Arciuli & J. Brock (Eds.), *Communication in autism* (pp. 171–215). <http://dx.doi.org/10.1075/tilar.11.09sti>
- Su, Y., Jin, Y., Wan, G., Zhang, J., & Su, L. (2014). Interpretation of *wh*-words in Mandarin-speaking high-functioning children with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 8, 1364–1372. <http://dx.doi.org/10.1016/j.rasd.2014.07.008>
- Tager-Flusberg, H. (2006). Defining language phenotypes in autism. *Clinical Neuroscience Research*, 6, 219–224. <http://dx.doi.org/10.1016/j.cnr.2006.06.007>
- Tager-Flusberg, H., & Joseph, R. M. (2003). Identifying neurocognitive phenotypes in autism. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 358, 303–314. <http://dx.doi.org/10.1098/rstb.2002.1198>
- Tager-Flusberg, H., Paul, R., & Lord, C. (2005). Language and communication in autism. In F. R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders* (3rd ed., pp. 335–364). New York, NY: Wiley.
- Taylor, L., Mayberry, M., & Whitehouse, A. (2014). Do autism spectrum disorders and specific language impairment have a shared aetiology? In J. Arciuli & J. Brock (Eds.), *Communication in autism* (pp. 75–102). Amsterdam, the Netherlands: John Benjamins.
- Tek, S., Mesite, L., Fein, D., & Naigles, L. (2014). Longitudinal analyses of expressive language development reveal two distinct language profiles among young children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 44, 75–89. <http://dx.doi.org/10.1007/s10803-013-1853-4>
- Thiessen, E., & Erickson, L. (2015). Statistical learning. In E. L. Bavin & L. R. Naigles (Eds.), *The Cambridge handbook of child language* (2nd ed., pp. 37–60). <http://dx.doi.org/10.1017/CBO9781316095829.003>
- Tomasello, M. (2015). The usage-based theory of language acquisition. In E. L. Bavin & L. R. Naigles (Eds.), *The Cambridge handbook of child language* (2nd ed., pp. 89–106). <http://dx.doi.org/10.1017/CBO9781316095829.005>
- Tomblin, B. (2015). Children with SLI. In E. L. Bavin & L. R. Naigles (Eds.), *The Cambridge handbook of child language* (2nd ed., pp. 527–544). <http://dx.doi.org/10.1017/CBO9781316095829.024>
- van der Lely, H. K. (2005). Domain-specific cognitive systems: Insight from Grammatical-SLI. *Trends in Cognitive Science*, 9, 53–59. <http://dx.doi.org/10.1016/j.tics.2004.12.002>
- Whitehouse, A. J., Barry, J. G., & Bishop, D. V. (2008). Further defining the language impairment of autism: Is there a specific language impairment subtype? *Journal of Communication Disorders*, 41, 319–336. <http://dx.doi.org/10.1016/j.jcomdis.2008.01.002>
- Williams, D., Botting, N., & Boucher, J. (2008). Language in autism and specific language impairment: Where are the links? *Psychological Bulletin*, 134, 944–963. <http://dx.doi.org/10.1037/a0013743>
- World Health Organization. (1992). *The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines*. Geneva, Switzerland: Author.