PRAGMATIC SKILLS AND SOCIO-EMOTIONAL NEEDS IN CHILDREN WITH DEVELOPMENTAL LANGUAGE DISORDER

Kinder, die gravierende Probleme mit der Perzeption und/oder Produktion von Sprache während des Erstspracherwerbs haben, leiden unter einer sogenannten Sprachentwicklungsstörung. Die Sprache dieser Kinder zeichnet sich durch zahlreiche Fehler aus, die besonders auf phonologischer und morphosyntaktischer Ebene am häufigsten und schwerwiegendsten auftreten. Kürzlich zeigten Studien, dass bei betroffenen Kindern auch die Verwendung von Sprache in Interkation, d.h. der kommunikative Sprachgebrauch, Schwierigkeiten bereiten kann. Aus diesem Grund ist die Erhebung und Untersuchung von pragmatischen und sozial-emotionalen Fähigkeiten bei Kindern mit Sprachstörungen ein relativ neues und sehr spannendes Forschungsfeld, das weiterer Studien bedarf. Im vorliegenden Artikel diskutieren wir die Notwendigkeit, pragmatische und sozial-emotionale Fertigkeiten von Kindern geanuer zu untersuchen, vor allem bei Kindern mit Sprachstörungen. Außerdem sprechen wir uns für die genauere Betrachtung und Miteinbeziehung individueller Unterschiede im kommunikativen Sprachgebrauch bei betroffenen Kindern aus, und weisen darauf hin, dass vor allem jene Fertigkeiten, die sich auf die aktive Verwendung von Sprache stützen, z.B. Sprecherwechsel, Themenwahl/Themenwechsel, die größte Herausforderung darstellen. Zuguterletzt präsentieren wir Vorschläge, wie Lehrer*innen, Eltern und Mitschüler*innen zur Prävention und Bewältung sozial-emotionaler Bedürfnisse von Kindern mit Sprachstörungen beitragen können.

● Sabrina Turker | MPI, Leipzig, Dai Pu | Monash University, Kirrie Ballard | University of Sydney

Background

Learning to speak enables children to organize their perception, express their emotions, understand their experiences, and most importantly, to communicate their wishes, views and intentions (Im-Bolter & Cohen, 2007). Severe delays or problems during language acquisition will thus inevitably impact children's lives. Up to 50% of children with social-emotional problems referred to mental health clinics and special classrooms suffer from language impairments (Camarata, Hughes & Ruhl, 1988; Leonard, 1998), such as developmental language disorder (DLD; earlier 'Specific Language Impairment/SLI'; Bishop, 2017). DLD is characterized by a delay in first language acquisition and substantial, persisting weaknesses in phonological processing, morphology and syntax (Leonard, 2014). The 7-10% of school-aged children affected by DLD (Tomblin *et al.*, 1997) present a delay in first spoken words, usage of simplified grammar and limited active/passive vocabulary (Bishop, 2006).

In order to communicate successfully, however, children do not only need to learn how to speak but to successfully use social contextual cues to infer meaning and attain goals through communication (Coplan & Weeks, 2009). In other words, they need to acquire pragmatic skills. Talking about pragmatic and socio-emotional skills is challenging since the boundaries to other clinical diagnoses are not clear-cut. For instance, impairments in the communicative domain constitute a separate diagnostic entity termed 'social (pragmatic) communication disorder' (SPCD; APA, 2013; see Swineford et al., 2014), and often there is an overlap with autism spectrum disorder (ASD; APA, 2013). Conti-Ramsden, Simkin & Botting (2006) reported that 4% of adolescents with a DLD history had sufficient behavioral characteristics of autism to warrant a diagnosis. In a recent investigation, Taylor & Whitehouse (2016) even failed to reliably distinguish the three conditions due to a lack of appropriate assessment tools. Nonetheless, a significant portion of children with DLD experience broad communicative difficulties in responding

to and expressing communicative intents, not stemming from their weakness in mastering language (Bishop *et al.*, 2000). In the present paper, the focus shall not lie on the linguistic problems encountered by children with DLD, but on the (co-)occurrence of pragmatic and socio-emotional weaknesses. The present paper emphasizes the necessity of further exploring pragmatic and socio-emotional abilities in children with DLD, in particular individual differences therein. We will do so by discussing three individual profiles of children with DLD and the socio-emotional and behavioral weaknesses they encounter. Last, future avenues for research, as well as the potential of parents, teachers and peers to help children with DLD in their struggle shall be addressed.

The Necessity of Investigating Pragmatic and Socio-Emotional Skills in Children

When children struggle with language acquisition, other problems, presumably of less serious nature at first sight, may go unnoticed. However, they may later turn into further-reaching issues that seriously impact the child's life. In fact, pragmatic and social weaknesses lead to childhood peer problems, academic difficulties, peer victimization, isolation, delinquency, dropping out of school, and psychological maladjustment (Hart *et al.*, 2004; Leonard, Milich & Lorch, 2011). Although it is widely known that a subgroup of children with DLD suffers from pragmatic problems (Bruce, Thernlund & Nettelbladt, 2006), these weaknesses are not included in the concept or diagnosis of DLD (Norbury & Bishop, 2002; Rapin & Allen, 1983).

In earlier studies, children with DLD showed persisting difficulties with turn-taking, adapting to the needs of the listener, stereotypical language use, and they used fewer and shorter comments in communicative situations (Paul, 2007). Furthermore, gesture accuracy and understanding are often reported as severely impaired (Wray *et al.*, 2017, Wray, Norbury & Alcock, 2016). These pragmatic weaknesses are frequently further accompanied by deficits in social-emotional functions not primarily caused by the linguistic impairment (Bakopoulou & Dockrell, 2016). Recently, Helland & Helland (2017) compared children with

DLD to children with ASD with regard to emotional and behavioral needs, and their potential link to pragmatic skills. Children with DLD scored in the borderline/abnormal range on tests assessing emotional symptoms (30%), peer problems (60%), hyperactivity/inattention (40%), prosocial behavior (15%) and conduct problems (20%). The percentages of affected children were even higher in the ASD group. Moreover, they found that the total difficulty score was negatively correlated with children's pragmatic abilities, i.e., the lower they scored on the pragmatic test, the more frequently they had emotional and behavioral needs. These results were supported in a longitudinal study by Conti-Ramsden *et al.* (2019), who looked into emotional difficulties and peer problems in children with DLD (age range = 7-16 years). Half of their subjects showed parallel trajectories in emotional and peer domains, which were most closely associated with pragmatic language ability, prosociality and parental mental health. Overall, only 11% of all children had low levels in both domains throughout childhood and adolescence, and in another 24% the emotional problems resolved during adolescence.

Given the evidence that children with DLD also suffer from emotional, social and pragmatic weaknesses, it seems vital to investigate the nature of pragmatics in affected or even at-risk children to inform the holistic management of these children. In other words, it is not only necessary to perform research (preferably longitudinally) with children or adults with DLD, but even more in at-risk infants before the onset of language acquisition. Especially since the interconnectedness and direction of the link between linguistic, pragmatic and socio-emotional skills is not fully uncovered yet.

Individual Differences in Pragmatic and Socio-Emotional Weaknesses in Children with DLD

For research studies, children's weaknesses are usually compared to large groups of other children with completely different backgrounds (e.g., education, parental situation and engagement), personalities, deficits and needs. In the past decades, however, there has been a shift in thinking and researching individual differences in skills has gained increasing popularity, e.g., see Kidd *et al.*

Dr. Sabrina Turker is a linguist and foreign language teacher. After completing her doctoral studies at the University of Graz, Austria, she received a Humboldt fellowship for postdoctoral researchers and is now working at the Max Planck Institute for Human Cognitive and Brain Sciences in Leipzig, Germany. Her current research combines neuroimaging with non-invasive brain stimulation to explore the neurobiology of reading and dyslexia.

Dr. Dai Pu is a multilingual researcher and trained speech-language pathologist. She completed her PhD at the Faculty of Education at The University of Hong Kong and is currently focusing on research translation to healthcare and health policy at Monash University, Melbourne, Australia.

Prof. Kirrie Ballard is a trained speech-language pathologist and Australian Research Council Future Fellow (2012-16) at the University of Sydney, Australia. She specializes in the study of apraxia of speech (acquired and childhood forms). Her work also considers the interaction of apraxia of speech and aphasia in stroke and primary progressive aphasias.

(2018). Especially for language-disordered children, it seems worthwhile to more closely investigate their specific needs and behaviors, i.e., to consider individual differences in verbal and nonverbal language use to better understand their potential future implications.

For the present article, we would like to elaborate on the individual profiles of three monolingual, English-speaking children, Andy, Michael and Ines (pseudonyms), who had all been diagnosed with mixed receptive and expressive language disorder at age 6. Andy was already diagnosed with a moderate language delay at age 4 due to an overuse of gestures, impaired phonological awareness, and weak language comprehension and production. Michael was diagnosed with particular weaknesses in expression (grammatical correctness, morphology, and syntax) and sentence repetition. Ines experienced severe difficulties in kindergarten and school due to a lack of understanding of concepts like time, distance, relations between objects and generally the use of words for numbers. We assessed their pragmatic skills in the form of verbal, nonverbal, and communicative competence (Pragmatic Protocol, Prutting & Kirchner, 1987). Social and emotional skills were assessed with the Social Emotional Evaluation (SEE; Wiig, 2008).

Pragmatic communication skills

Regarding communicative and pragmatic skills, all three children had severe problems with topic maintenance (sticking to a topic that had been introduced), topic change (successfully changing to another topic or adjusting to a change) and lexical selection (choosing the right terms for expressing intents). This, in turn, impacted their turn taking skills leading to issues with response, pause time, and feedback to speakers. Frequently, they

failed to answer questions completely and appropriately, meaning they either remained completely silent without answering a question or changed topic or answered inappropriately. Andy and Ines used no fillers at all but would rather sit, gaze at some point and remain silent. However, there were distinct differences between the children's communication styles and how they engaged, e.g., Andy and Ines did not initiate speech, neither asked for clarification, and often guessed answers in response to questions; while Michael frequently ignored questions or demands and interrupted the other speaker.

Lexical selection

Lexical selection during conversation is generally known to be hard to assess in children with DLD since they tend to give either too little information (likely due to the complexity of a question or difficulty with production) or more information than asked, mostly off-topic. Andy, for instance, mixed up words denoting similar concepts, like colors (e.g., using red for orange), pointing towards major lexical problems, or guessed the answers to questions. Likewise, Michael's answers were frequently too short, often using yes/no answers for open questions. In other situations, however, he explained in too much detail and continued when the time to answer was already over. Overall, two of the three children we assessed (namely Andy and Ines) were 'poor communicators' (Fey, 1986; Rice, Sell and Hadley, 1991), displaying long pause times, a lack of fillers and a lack of initiating speech. This behavior leads to a passive role in conversation with reduced opportunities for practicing language and conversational skills (Craig & Washington, 1993; Brinton *et al.*, 1997). Some of the issues we found can be explained by poor language skills (i.e., problems with morphology, phonology and syntax) but all three children also showed difficulties in attention (e.g., constant movement, loss of interest, annoyance) and turn taking skills (vocal coordination and gaze), already establishes in young typically developing infants (Rutter & Durkin, 1987).

Nonverbal communication

Concerning gestures, Andy used a range of gestures to compensate for his limited vocabulary but constantly moved his body, arms, and/or legs, interrupting the conversation. Michael had less problems

Children with DLD need to be supported in successfully leading conversations, making friends and fostering relations to their friends and peers.

but avoided looking at the conversation partner accompanied by problems with his attention span. During the interaction he seemed to lose interest, got tired and annoyed. Ines did not use any gesture at all and remained still and focused during the whole session, not even using gestures to compensate for problems in expressive language (for example, not showing "tall" with her arms when she could not say the word). Therefore, the picture was rather mixed across the three children and the results from previous studies, in which children with DLD used gestures as a means for communication, were not in line with our observations (Iverson and Braddock, 2011; Lavelli, Barachetti and Florit, 2015; Mainela-Arnold, Alibali, Hostetter and Evans, 2014; Wray *et al.*, 2017).

Social emotional skills and peer relationships

Overall, results of the SEE for the assessment of socio-emotional skills in our three children ranged from 74-84% for the three children. While typically-developing children also still have minor problems with abstract language use (e.g., figurative language, idioms, sarcasm, jokes) at around the age of 6 because these abilities develop generally late (Demorest et al., 1983), only Andy scored within the normal range in the SEE (normal range: 80-100%; Andy's score: 87%). Doubtlessly, communicative situations are not easy, in particular if there are substantial problems with initiating speech, following a conversation, and responding appropriately (Paul, 2007). Ines' mother stated that she would hardly communicate willingly or seek friends as she felt uncomfortable in many social situations. Similarly, Andy's mother expressed her sincere worries about him not being able to make friends and being overly shy. This means that two of the three children are explicitly described as having issues finding friends and relating to peers. Moreover, all three children experienced difficulties with emotions. Ines' parents declared her as only sometimes being able to respond appropriately to emotions and said that she would only sometimes cry at appropriate times. Michael showed frustration and problems controlling his emotions, whereas Andy was also described as lacking an understanding of emotions in other people. Surely, these weaknesses make it harder for them to make friends since the ability to infer a

communication partner's emotional reactions, express emotions and deal with them is a key component of daily social discourse (Ford and Milosky, 2003).

Summary and Future Avenues for Research

The three individual pragmatic and socio-emotional profiles show that weaknesses may differ to such an extent that no single one-fit-all treatment will help each child to the same extent. We also want to emphasize that greater awareness is desperately needed among schools, teachers, and peers. Research has shown that DLD has a long-term impact on the affected children's academic success, social life and well-being. Our world is dependent on communication and children who are severely impaired in this domain must not be left alone in their struggle (Ruben, 2000). Moreover, we want to emphasize that weaknesses in first language acquisition also severely affect second/foreign language learning, and that problems concerning the use of language in context could also present in children without a DLD diagnosis. Children with multilingual or migrant backgrounds, for instance, often display specific socio-emotional needs and problems acquiring their first or second language could have a far reaching, negative impact on their integration in a new society, as well as on their mental health and well-being, which would in turn negatively influence all learning situations.

What can be done to support children with language disorders and pragmatic weaknesses? Apart from speech and language therapy for accelerating the development of the language impairment(s), parents, caregivers and teachers can also provide affected children with equipment and tools to develop the necessary communicative abilities to overcome socio-emotional needs in

The three individual pragmatic and socio-emotional profiles show that weaknesses may differ to such an extent that no single one-fit-all treatment will help each child to the same extent.

everyday life. First, since parental mental health has been shown to influence children's pragmatic and socio-emotional well-being, it is necessary for parents to consider a potential impact of their own health on their children. We thus advocate that parents are educated about this and advised and supported in seeking family counselling. Likewise, teachers and caregivers are advised to pay close attention to a child's surrounding, which should be highly beneficial and never negative or destructive. Second, supporting prosocial behavior and fostering peer relations is of great importance. Since these two are closely associated with negative mental health and behavioral outcomes, children with DLD need to be supported in successfully leading conversations, making friends and fostering relations to their friends and peers. The importance of good peer relationships is obvious, in particular as far as the child's socio-emotional well-being is concerned. Not only can parents create situations at home in which children can practice their abilities, and help them find friends, but in particular teachers play a major role therein. Last, it seems worthwhile to closely monitor the development of pragmatic abilities already from very early stages (i.e., before the onset of language acquisition) to potentially prevent deficits or difficulties with the acquisition of communicative skills later on. Specific strategies for teachers at school and parents/caregivers in the home environment can be devised in collaboration with the speech-language pathologist, and longitudinal monitoring will also aid the combined efforts of all three parties to provide timely and child-centered socio-emotional and language intervention. As such, not only intervention could

help children to improve their verbal and nonverbal pragmatic skills, but prevention could help avoid situations in which children are overstrained and deficits might arise.

Concerning future avenues for research, more studies with larger groups are needed to further clarify the nature of DLD and investigate the considerable variability in the presentation of DLD (e.g., see Lancaster & Caramata, 2018, who recently provided evidence that DLD should be treated as a continuum or spectrum instead of searching for subgroups). Moreover, research with larger groups can also help see a much broader range of skills, and with statistical modeling, one can then determine which skills have the strongest impact on or interact with core language abilities, academic success and so on. There is also a lack of studies using pragmatic or communicative interventions to improve communication-related issues in affected children. Studies focusing on individual language profiles of children, on the other hand, are also needed since they help us to (1) adapt pre- and intervention to the individual needs of each child, (2) better understand the large discrepancies in skills and abilities found in children and how other variables (e.g., educational, parenting style) exert influence thereon, and (3) help us keep in mind that every child is different, and no single approach will be successful in helping every child. Last, we suggest to extend the current emphasis on language disorders in monolingual children to children with multilingual experiences from early phases on, as it is a topic of great societal importance that has only been marginally addressed by research to date.

Specific strategies for teachers at school and parents/caregivers in the home environment can be devised in collaboration with the speech-language pathologist, and longitudinal monitoring will also aid the combined efforts of all three parties to provide timely and child-centered socio-emotional and language intervention.

References

American Psychiatric Association. (2013). Diagnostic and statistical manual of mental disorders (5th ed.). https://doi.org/10.1176/appi.books.9780890425596

Bakopoulou, I., & Dockrell, J. E. (2016). The role of social cognition and prosocial behaviour in relation to the socio-emotional functioning of primary aged children with specific language impairment. *Research in developmental disabilities 49*. https://doi.org/10.1016/j.ridd.2015.12.013

Bishop, D. V. (2006). What causes specific language impairment in children? *Current directions in psychological science 15*(5). https://doi.org/10.1111/j.1467-8721.2006.00439.x

Bishop, D. V. (2017). Why is it so hard to reach agreement on terminology? The case of developmental language disorder (DLD). *International journal of language & communication disorders 52*(6). https://doi.org/10.1111/1460-6984.12335

Bishop, D. V., Chan, J., Adams, C., Hartley, J., & Weir, F. (2000). Conversational responsiveness in specific language impairment: Evidence of disproportionate pragmatic difficulties in a subset of children. *Development and psychopathology 12*(2). https://doi.org/10.1017/s0954579400002042

Brinton, B., Fujiki, M., Spencer, J. C., & Robinson, L. A. (1997). The ability of children with specific language impairment to access and participate in an ongoing interaction. *Journal of Speech Language and Hearing Research 40*(5). https://doi.org/10.1044/jslhr.4005.1011

Bruce, B., Thernlund, G., & Nettelbladt, U. (2006). ADHD and language impairment. *European child & adolescent psychiatry 15*(1), 52-60. http://dx.doi.org/10.1007%2Fs00787-006-0508-9

Camarata, S. M., Hughes, C. A., & Ruhl, K. L. (1988). Mild/moderate behaviorally disordered students: A population at risk for language disorders. *Language, Speech, and Hearing Services in Schools 19*. https://doi.org/10.1044/0161-1461.1902.191

Conti-Ramsden, G., Mok, P., Durkin, K., Pickles, A., Toseeb, U., & Botting, N. (2018). Do emotional difficulties and peer problems occur together from childhood to adolescence? The case of children with a history of developmental language disorder (DLD). *European Child & Adolescent Psychiatry 28*. https://doi.org/10.1007/s00787-018-1261-6

Conti-Ramsden, G., Simkin, Z., & Botting, N. (2006). The prevalence of autistic spectrum disorders in adolescents with a history of specific language impairment (SLI). *Journal of Child Psychology and Psychiatry, and Allied Disciplines 47*(6). https://doi.org/10.1111/j.1469-7610.2005.01584.x

Coplan, R. J., & Weeks, M. (2009). Shy and soft-spoken: shyness, pragmatic language, and socio-emotional adjustment in early childhood. *Infant and Child Development: An International Journal of Research and Practice 18*(3). https://doi.org/10.1002/icd.622

Craig, H. K., & Washington, J. A. (1993). Access behaviors of children with specific language impairment. *Journal of Speech Language and Hearing Research 36*(2). https://doi.org/10.1044/jshr.3602.322

Demorest, A., Silberstein, L., Gardner, H., & Winner, E. (1983). Telling it as it isn't: Children's understanding of figurative language. *British Journal of Developmental Psychology 1*(2). https://doi.org/10.1111/j.2044-835X.1983.tb00550.x

Fey, M. E. (1988). Generalization issues facing language interventionists. *Language Speech and Hearing Services in Schools 19*(3). https://doi.org/10.1044/0161-1461.1903.272

Ford, J. A., & Milosky, L. M. (2003). Inferring emotional reactions in social situations: Differences in children with language impairment. *Journal of Speech, Language, and Hearing Research 46*(1). https://doi.org/10.1044/1092-4388(2003/002)

Hart, K. I., Fujiki, M., Brinton, B., & Hart, C. H. (2004). The relationship between social behavior and severity of language impairment. *Journal of Speech, Language, and Hearing Research 47*(3). https://doi.org/10.1044/1092-4388(2004/050)

Helland, W. A., & Helland, T. (2017). Emotional and behavioural needs in children with specific language impairment and in children with autism spectrum disorder: The importance of pragmatic language impairment. *Research in Developmental Disabilities 70*. https://doi.org/10.1016/j.ridd.2017.08.009

Im-Bolter, N. & Cohen, N. J. (2007). Language Impairment and Psychiatric Comorbidities. *Pediatric clinics of North America 54*(3). https://doi.org/10.1016/j.pcl.2007.02.008

Kidd, E., Donnelly, S., & Christiansen, M. H. (2018). Individual differences in language acquisition and processing. *Trends in Cognitive Sciences 22*. https://doi.org/10.1016/j.tics.2017.11.006

Lancaster, H. S., & Camarata, S. (2019). Reconceptualizing developmental language disorder as a spectrum disorder: issues and evidence. *International journal of language & communication disorders, 54*(1), 79-94.

Lavelli, M., Barachetti, C., & Florit, E. (2015). Gesture and speech during shared book reading with preschoolers with specific language impairment. *Journal of Child Language 42*. https://doi.org/10.1017/s0305000914000762

Leonard, L. B. (2014). *Children with specific language impairment*. MIT press.

Leonard, L. B. (1998). Language, speech, and communication. *Children with specific language impairment*. MIT Press.

Leonard, M. A., Milich, R., & Lorch, E. P. (2011). The role of pragmatic language use in mediating the relation between hyperactivity and inattention and social skills problems. *Journal of Speech, Language, and Hearing Research 54*(2). https://doi.org/10.1044/1092-4388(2010/10-0058)

Mainela-Arnold, E., Alibali, M. W., Hostetter, A. B., & Evans, J. L. (2014). Gesture-speech integration in children with specific language impairment. *International Journal of Language & Communication Disorders 49*(6). https://doi.org/10.1111/1460-6984.12115

Norbury, C. F., & Bishop, D. V. M. (2002). Inferential processing and story recall in children with communication problems: A comparison of specific language impairment, pragmatic language impairment and high-functioning autism. *International Journal of Language and Communication Disorders 37*(3). https://doi.org/10.1080/13682820210136269

Paul, R. (2007). *Language disorders from infancy through adolescence: Assessment & intervention* (Vol. 324). Elsevier Health Sciences.

Prutting, C. A., & Kirchner, D. M. (1987). A clinical appraisal of the pragmatic aspects of language. *Journal of Speech and Hearing Disorders 52*(2), 105-119.

Rapin, I., & Allen, D. (1983). Developmental language disorders: Nosologic considerations. In U. Kirk (Ed.). *Neuropsychology of language, reading, and spelling*, 155–184. New York: Academic Press.

Rice, M. L., Sell, M. A., & Hadley, P. A. (1991). Social interactions of speech, and language-impaired children. *Journal of Speech, Language, and Hearing Research 34*(6). https://doi.org/10.1044/jshr.3406.1299

Ruben, R. J. (2000). Redefining the survival of the fittest: communication disorders in the 21st century. *The Laryngoscope 110*(2). https://doi.org/10.1097/00005537-200002010-00010

Rutter, D. R., & Durkin, K. (1987). Turn-taking in mother–infant interaction: An examination of vocalizations and gaze. *Developmental Psychology 23*(1). https://doi.org/10.1037/0012-1649.23.1.54

Swineford, L. B., Thurm, A., Baird, G., Wetherby, A. M., & Swedo, S. (2014). Social (pragmatic) communication disorder: A research review of this new DSM-5 diagnostic category. *Journal of neurodevelopmental disorders 6*(1). https://doi.org/10.1186/1866-1955-6-41

Taylor, L. J., & Whitehouse, A. J. O. (2016). Autism Spectrum Disorder, Language Disorder, and Social (Pragmatic) Communication Disorder: Overlaps, Distinguishing Features, and Clinical Implications. Australian Psychologist 51(4). https://doi.org/10.1111/ap.12222

Tomblin, J. B., Records, N. L., Buckwalter, P., Zhang, X., Smith, E., & O'Brien, M. (1997). Prevalence of specific language impairment in kindergarten children. *Journal of speech, language, and hearing research 40*(6). https://doi.org/10.1044/jslhr.4006.1245

Wiig, E. H. (2008). *SEE: Social Emotional Evaluation*. Super Duper Publications.

Wray, C., Norbury, C. F., & Alcock, K. (2016). Gestural abilities of children with specific language impairment. *International journal of language & communication disorders 51*(2). https://doi.org/10.1111/1460-6984.12196

Wray, C., Saunders, N., McGuire, R., Cousins, G., & Norbury, C. F. (2017). Gesture Production in Language Impairment: It's Quality, Not Quantity, That Matters. *Journal of Speech, Language, and Hearing Research 60*(4). https://doi.org/10.1044/2016_JSLHR-L-16-0141