

Received: 09 November, 2023

Accepted: 22 November, 2023

Published: 23 November, 2023

***Corresponding author:** Yahya Gordani, Department of English, Salman Farsi University of Kazerun, Kazerun, Iran, Tel: 989179635801; E-mail: ygordani@kazerunfsu.ac.ir

ORCID: <https://orcid.org/0000-0003-4356-321X>

Keywords: Down syndrome; Requesting; Language production; Politeness

Copyright: © 2023 Gordani Y, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

<https://www.peertechzpublications.org>



Research Article

The productive skill of requesting in children with Down syndrome: A case study

Yahya Gordani* and Mahnaz Ezhdehakosh

Department of English, Salman Farsi University of Kazerun, Kazerun, Iran

Abstract

The present case study aimed to investigate the nature of making requests by a child with Down Syndrome (DS) who has never received any medical intervention. To this aim, more than 180 hours of observation of a four-year-old male case in the field, together with interviews of parents and a relative, were analyzed qualitatively. Findings demonstrated a strong enthusiasm by the DS child to get involved in social communication. Although the DS child did not clearly understand the context of communication in terms of the rules for manner (mainly politeness and face), and he also lacked a sound understanding of the social functions to negotiate the meaning, he could differentiate among different settings in which there is need for a range of communication degrees. With mental and physiological issues contributing to problems with language production, the case had developed a limited repertoire, including voices, some fixed words or expressions, and mostly gestures to help him make requests.

On the other hand, the child demonstrated good receptive skills; he could perceive the illocutionary force behind requests. However, if the sentence got a bit complicated in terms of pragmatics, he would become confused and prefer to stay silent rather than trying to insist on another response. It is hoped that by providing a good education for these children in a place where they are socially welcomed, they can forge useful relationships with their peers and take positive actions to become socially mature and be good community members.

Introduction

Developmental neurogenesis disorders are known to be associated with multiple clinical features, which are the fundamental contributors to subsequent cognitive breakdowns. Progressive cognitive disorders can severely circumscribe the scope of a patient's accessibility to cognitive organizations, including language, joint attention, problem-solving, etc. Developmental disorders are characterized by special diagnostic criteria, based on which a better understanding of the nature of the disorders can be achieved. Such disorders can often be heterogeneous in multiple dimensions, including their root cause. Neural disorders can inflict too much pain on families regarding the socio-economic burden, the howness of treating disordered children by family members, degree of resilience, functioning, and intimacy [1-5]. Recognizing the

core diagnostic characteristics has assisted scientists with discerning the types of disabilities inflicting emotional and economic burdens upon families and societies.

Clinically speaking, Down Syndrome (DS) is the most frequent neuro-developmental disorder accompanied by a wide range of cognitive and intellectual disabilities. This chromosomal condition involves approximately 1 out of 691 populations; therefore, many community individuals would be dealing with such conditions [6,7]. Various investigations have established the presence of intellectual disabilities spanning across a wide range of items. Intellectual deficits can be reflected in many ways and various degrees. Failing to show proper adaptive behaviors, employing articulatory mediums in order to communicate orally, being unable to process the flow of speech and finally showing alien social behaviors are some of the aftermaths of dealing with these health conditions.



Language obviously would be one of the main targets of DS. Children with DS represent expressive language with a significant delay, although their receptive language seems to be not that much challenged. As children grow up, they may face additional barriers toward articulating lexical items [8]; however, some of the hardships would probably be overcome with early interventions. One of the fundamental defects characterizing DS would be disrupted expressive language. Yet DS patients heavily rely upon nonverbal language to communicate. Executing bodily movements (e.g., gaze shift, movements of the head, etc.) would contribute to a better understanding of the linguistic message.

The current study aims to better understand communication skills in terms of the language function of requesting in cases diagnosed with DS. Children with DS reported suffering from troubles as they wanted to make a request (Munday, et al. 1998). Having a better understanding of alternative communicative skills in DS patients would provide remarkable insights into the nature of neurogenetic syndromes and offer opportunities for effective treatments.

Down syndrome (DS)

Down syndrome is the most common neurodegenerative disorder rooted in a genetic condition. Such chromosomal conditions would result in intellectual disabilities mirrored by various characteristics [6,9-11]. DS can negatively affect the mental health of both patients and families and their cognitive functions [12,13]. DS is mostly described by the difficulties posed by the motor (i.e., hearing impairment, language disability) and intellectual activities (i.e., joint engagement for social interaction), which create the fundamental principles of a healthy social life [14-22]. Defects accompanying motor coordination may, at last, lead to further failures of motor activities, including the loss of synchronization between different articulatory parts (i.e., jaw, lips, tongue, etc.) [23]. Hence the spontaneous flow of speech in DS children would be less understandable [19,24].

Unfortunately, such differences between normally developing children and DS patients in terms of intellectual capabilities seem to grow greater [25]. Children coping with genetic disorders charted by changes affecting underlying cognitive operations and neural platforms find themselves having trouble with communication difficulties and manipulation of language in their desired direction [26]. These shortcomings contribute to the further aggravation of other symptoms [27]. Delays in the use of spoken language could lead to the delayed emergence of nonverbal language as well. This demonstrates that linguistic and non-linguistic skills are intertwined [24,28]. The expressive form of language has been found to be severely impaired relative to the receptive form of language [29-31]. Carl, et al. [32] demonstrated that DS children struggle with the correct realization of acoustic vowels, which is one of the main reasons for speech intelligibility. The authors concluded that their study shows motor deficits in these subjects, failing to find the right place of articulation. Articulation is irregularly delayed in DS children; therefore, expressive forms of language will not appear timely [31,33,34].

In fact, comprehending several subbranches of linguistics, including phonology, semantics, syntax, and pragmatics, could be tough for DS patients [7]. Mundy, et al. [35] suggested that exhibiting difficulties with respect to expressive forms of language can contribute to the rise of subsequent issues with language. According to the prevailing interpretation of the evidence, the researchers believe that challenges with a spoken form of language inhibit DS patients from employing bodily gestures in order to ask for something. It is assumed that language functions and expressive language are quite entangled. Deficits with expressive language would probably result in the deficiency of other cognitive functions (i.e., problem-solving) as well. Such difficulties set barriers against achieving a comprehensive perception and maintaining tenacity [36,37].

Non-verbal communication

Parents begin to notice the decisive differences between their children and healthy counterparts in the third stage when the child is supposed to widely use acquired vocabulary for communication. In truth, DS children show delayed performance in expressing their very first sentence or word, which is accounted as the milestone of expressive language [38]. Social communication consists of various underlying components, including kinetic movements, facial expressions, eye contact, and, most importantly, language. Language as a medium of communication serves multiple purposes, mainly transferring messages implicitly or explicitly.

DS patients have been found to be demonstrating significantly lower accuracy in the case of comprehending the pragmatic aspect of language, meaning that they cannot extract the hidden meaning of the message [7,14,26].

Pragmatic aspects of communication drastically contribute to our daily conversational practices, the deficits of which would trouble individuals considerably. Such sub-branch of linguistics includes a wide range of both linguistic and non-linguistic skills such as turn-taking abilities, maintaining cohesion and coherence while speaking, using language functions for aims of various natures, and using bodily gestures for better transmitting the message [26,39,40].

Nonverbal communication skills offer a variety of communicative opportunities through eye contact, gaze shift, facial expression, vocalization, and gestures [41]. Non-verbal communication is a strong ally to verbal communication and cannot be suppressed easily. While expressive language scope seems to be significantly circumscribed in DS children, nonverbal communication is an opportunity to expand their communication repertoire [42]. In fact, employing non-linguistic communicative strategies in DS children has been viewed as a strong chance to build relationships before the first utterances appear [43]. Some scholars have also proposed that exposing DS children to non-verbal communication could contribute to the relative amelioration of expressive language deficits [44].

Furthermore, in the early stages of development, non-verbal communication could enrich child-parent interactions



and cognitive functioning development, lower the levels of anxiety on both sides and goad self-regulation [45,46] (Vallotton, 2008). However, despite all attempts, the results achieved in this regard could be notoriously heterogeneous (Linn, et al. 2018) [47]. Some researchers concluded that gestural repertoire is a strong positive point in communication [42]; on the opposite side, some scholars do not see such an advantage for DS children [47].

Steffanini, Caselli, and Volterra [24] demonstrated that iconic manual movements could be correctly or incorrectly in times associated with the spoken language in DS children. However, they pinpointed the fact that DS children could benefit from using gestures because gestures could help the interlocutor understand what the DS patient intends to say, even though she cannot express it linguistically. These researchers found that iconic gestures were the most produced gestures among DS children, whether denoting the correct concept of the word or not. The findings propose that gestural representations did not necessarily have to transmit the correct concept of a word; they could be either correct or incorrect.

Also, it has been reported that the representation of manual movements in DS children differs from the typically developing children, especially with respect to the times when they want to ask for something or make a request [35,47]. Due to the delayed development of expressive language skills, DS patients encounter major difficulties when asking for instrumental or social purposes. Feeley, et al. [48] substantiated the claim that effective critical interventions can exert beneficial influences on the acquisition of goal-directed verbal imitation and the development of requesting skills. Their study also showed that DS children particularly found instrumental requesting challenging and were reluctant to use such language functions. Gestures used by DS patients often can be understood concerning the physical setting because pointing to the objects, gaze shifting, and other nonverbal movements cannot be understood otherwise [49].

The present study aims to realize how the function of requesting in a child with Down syndrome is being fulfilled. Requesting a specific language function has different categories, and obviously, the speaker is given multiple opportunities to use such a function in order to fulfill his wishes. Following the same line of research, it is understandable that nonverbal communication plays a pivotal role in conversational interactions with regard to DS patients. The current case study aims to clarify the most used manual gestures employed by a DS child who has never been exposed to clinical interventions.

Politeness and face

Politeness has been the focus of much research since Goffman proposed his ideas on the concept of face [50] and also since Brown and Levinson [51] introduced their universal politeness theory. This concept has been examined in different contexts, with different classes, ages, and sexes of people of many different nationalities and social statuses.

Goffman has had a central role in the introduction of the concept of politeness through the notion of 'face' [50]. We

pretend to be someone we would like others to think of us; that is, we project a self-image to others that is ideal to us and one that may not be the real picture of ourselves [51]. This is referred to as our 'faces.' Wardhaugh believes that in our daily interactions, we are involved in mini-dramas in which we have to protect the faces of all the parties involved in the interaction (p.276). As he cites Scollon and Scollon (2001), our faces are involved in every conversation and interaction and thus are prone to threats from others. Brown and Levinson [51] refer to this as Face Threatening Acts (FTA). The participants in a conversation carry out speech acts that can threaten the face of the participants; therefore, to attach to the politeness principle, they have to devise politeness strategies.

Methods

Context of the study

The primary participant of the current study was a 4-year-old boy diagnosed with Down syndrome after he was born. The exact reason for his health condition has not been identified yet, but it is assumed that the mother's age could be involved in this issue. Samiar (The pseudonym selected for the case) lives a nomadic life, constantly migrating between different areas. He has never been exposed to medical interventions, and his parents did not seem to be fully aware of their son's condition. His mother would permanently show oversensitive behaviors toward her child, knowing that her son cannot speak must have been caused due to some sort of congenital genetic issue was the main source of discomfort to her. Therefore, we mostly decided to maintain contact with Samiar's father to forestall any possible misunderstanding.

Ethical considerations

Before the data collection process began, both parents were provided with an explanation of the purpose of the study and assured that the results would only be used for research purposes. In addition, they agreed that results could be published under a pseudonym. They both welcomed us dearly, appreciating the efforts to give a broader insight into Down syndrome to their family and other families.

Data collection and analysis

The boy was under surveillance for approximately thirty sessions, monitoring his behaviors when he intended to communicate a message. His abilities for communication were seriously limited, yet interestingly he had mastered his language system for communication with other members. Samiar initially remained reserved, avoiding performing any specific behavioral pattern in our presence. But he also seemed to be keenly interested in understanding why we were by his side almost every weekend. His persistent refusal to communicate made the researchers take another shift. We asked the father to be constantly in contact with their son, doing their normal chores.

Furthermore, we asked if there was someone in the family with whom Saimar felt more comfortable. The boy seemed to have formed an intimate relationship with his aunt. After

talking to his aunt, she agreed to be part of the cycle every weekend. Aside from being present in the field to investigate the overall characteristics of the child, interviewing parents and the aunt continued. The behavioral pattern of the child was recorded across various conditions. These recordings, together with the transcriptions of the interviews, were later analyzed qualitatively to shed light on the nature of the non-verbal language used by the case for communicating messages.

Findings

Based on the observations and results of interviews, it could be realized that the DS child had a great social interest, permanently requesting to be in social events, take pictures with strangers, be hospitable to the guests, and fulfill their wishes (e.g., asking for a glass of water). Samiar indeed wanted to be acclaimed for his positive performance in the housing framework. Positive feedback from parents and other guests present in the condition pulled him in another direction to be more efficient and decent. On the contrary, there were times when he wanted to make requests in the wrong ways, including several extreme cases of slapping the guests across the face. He would then forthwith burst into laughter, although the guests were amazed at his indifference. This clearly shows that the child did not understand the underlying basic principles of politeness and face. The DS child did not clearly understand the context and setting regarding cooperative maxims of conversation.

However, the child clearly perceived the need to demonstrate different communication degrees in other contexts and with other participants. For instance, when he wanted to play with the children of his age, he used more proportion of vocalizations and bodily gestures, trying to get his message across. Peers tried their best to abide by the child's rules and understand him as much as possible. However, as the communication between the children and the DS child gets more complex, communication begins to titter on the edge of collapse.

When Samiar could not understand his peers what he actually wanted others to do, he would rather depend on showing his anger. In other words, he could not have a sound understanding of teamwork or social functions in the groups and preferred to demonstrate an irresistible urge for dictatorship and stubbornness. Of course, such feature is believed to be varied in different groups of DS children based on their living environment and lifestyle. Perhaps, some of the DS children refuse to be that unreasonable in voicing their anger in interaction with peers. Such reactions may also increase in numbers as peers socially refuse DS children, as they want to defend the circle of their friends. The same may occur to DS children, for they want to show their indication of being part of a social community and communicate with other children; however, as they are rejected, they prefer to use anger as a defensive mechanism.

Due to the abnormal growth of elements of oral apparatuses such as lips and tongue, children with DS are inhibited from producing a set of intact speech sounds [52]. Such abnormal sound production could also negatively affect the social

feedback children may receive from their peers or negatively affect their social relationships [53]. Such external factors can affect the quality of production in DS children and inhibit them from naturally producing expressive vocabularies. In order to facilitate the movements of the mentioned muscles, specific training sections are initiated in the population of DS children, helping such children to produce sounds and establish oral communication [54]. In terms of productive skills, the boy in the present study had learned to use familiar voices dedicated to each person personally. For instance, Samiar called his uncle 'DuaDua' or his aunt 'Da.' He mostly implemented alveolar and bilabial sounds to produce verbal messages and communicate with other interlocutors. While speaking, his production demonstrated a great deal of nasality, and due to the abnormal growth of the oral cavity of the mouth, and tongue, oral production was highly accompanied by excessive breathing through the mouth [55]. The present study demonstrated that the DS child, despite having trouble with implementing verbal language as a means of communication, managed to use different voices and relate them to a variety of conditions of people to express his concerns and feelings, such as anger or happiness.

Similarly, Samiar mostly relied on gestures or using a few words to show that he was requesting something. Occasionally, he forced his parents to look in a specific direction to understand his demands. Likewise, he would utter specific words and use his hands accompanied by voice to make them understand her is asking for a special object.

For instance, given that the family's main source of income was animal husbandry, the child had grown up in a friendly environment accompanied by the sounds of animals. Samiar had learned the sounds, and at times, he wanted to help his parents with handling the daily chores; he produced the sound of every animal to understand his parents that something needed to be done about a specific group of animals on the farm. There were also times when the child did not exactly produce the sound of the animals but imitated the sounds his parents would produce to call every animal. For example, Samiar's mother would call the chicken "Kish Kish" to force the chicken and other similar birds to leave the central door. Samiar had heard the sound and always referred to the chickens as "Kish Kish." In another case, his mother called the sheep "Akh" to lead the animals toward the feeding sections. Samiar chose the sound as a form of a word instead of telling sheep. Likewise, when Samiar wanted to mention something about turkeys, he produced the sound "Bee Bee Bee Bee" because his mother produced the same sound to call turkeys for feeding time. Birds also knew the sound and gathered to be fed. Most interestingly, Samiar referred to an egg with a glottal sound of /ʔ/. He obstructed airflow in his vocal tracts and released it at once to show that the chicken has to put too much force to push out the egg!! Therefore, the egg should also be represented with a sound that demonstrates the pressure as well. The last example especially shows that the child shows great levels of creativity in his verbal representations and can use curious methods to coin new sounds for mentioning new objects. It could be assumed that Samiar looked for common



ground between his verbal representations and other people; in other words, he used sounds or other features commonly used by other people. He wanted them to understand him too, which is a curious aspect of communication in DS children.

His parents grew accustomed to his creative methods of inventing his language and a way of establishing communication with his parents. Ever since the parents have been very successful in better understanding Samiar's needs and satisfying them. One of the other interesting ways that Samiar employed to communicate more complex sentences to his parents was playing the role of the thing he had in mind. For instance, Samiar's grandmother had left him two months earlier than expected due to suffering from an autoimmune disease, preventing her from walking comfortably. Samiar pointed to his right leg and pretended he could not walk or was walking in a lot of pain. Afterward, he touched the floor of the house three times, meaning that he brought my grandmother home. We asked the child if he was saying he wanted his grandmother back, and he shook his head three times as his tongue was out of his mouth, inhibiting him from freely forming sentences.

On the other hand, the child demonstrated good receptive skills; he was able to absorb the message in concrete terms. Due to his special context of living (mostly mountains, high hills, and neighboring valleys), the child would be asked most of the time to stay in and not get out of the tent. Imperative statements would be uttered persistently, addressing him "Stay inside..... Don't get out..... Don't make me crazy! I said stay in." The child would stubbornly hit his father, sitting on the ground and shouting angrily. It is clear that he could understand the messages. However, there were some troubles with using the vocal apparatuses to articulate messages and use terms to convey verbal messages and instead relied on using voices haphazardly. But, Samiar realized that in times of fury, he should raise his voice or try to hit the other speaker physically, showing his disagreement.

However, if the sentence became pragmatically complicated, he could not understand the sentence and started acting irrationally or merely staring at the speaker. If the sentence got a bit complicated in terms of pragmatics, he would become confused and prefer to stay silent rather than trying to insist on another response. Other studies held by Smith, et al. [26] also advocate similar results and mention that children of various age levels suffering from progressive neural disorders, such as DS, struggle to understand pragmatic sections of conversations. Researchers showed that children in this class have trouble comprehending the pragmatic bases of sentences in different categories. Failure to understand the pragmatic aspects of linguistic messages results in the failure to communicate and transmit messages. Human beings are by nature social, and they are wired to be socially active in communities; therefore, any disruption in communication could have undesirable outcomes for children with Down syndrome [56]. Gaining a helpful insight into the implementation of pragmatics in DS children would have an array of positive results for children, as scientists could help them be more socially involved in

communications and handle their responsibilities in two-way communication. Likewise, researchers could ensure whether specific aspects of pragmatics need to be strengthened in children to better experience social relationships with peers or other individuals in different social positions [26]. Lee, et al. (2017) demonstrated that children with DS, in comparison to their healthy counterparts, achieve a good mastery over their pragmatics skills at a considerably slower pace; the authors encourage other researchers to further analyze the subject and consider the subjects from practical and theoretical aspects.

Pragmatics is an inevitable part of linguistic inputs, requiring the speaker to reflect on the intended meanings of the sentence in a multidimensional manner. In addition, this subbranch of linguistics enables the speakers to be fully cognizant of other abilities such as turn-taking, signing the willingness to take part in the conversation, using expressive gestures, staying involved in one topic during the conversation, and attempting to stick with a consistent flow of speech even though there would be communication breakdowns [57]. Based on the observations and in line with the findings of Laws and Bishop [58], we realized that the child in question of our study, in times of communication breakdown with his parents tried his best to attract attention once again and request what he was asking in another way through uttering sounds and showing signs. There were also other occasions when the child would perform an act opposite to the parents' demands to garner attention and have his wish fulfilled. It can be perceived that this is a form of intact receptive skills; the child understands the speech act as the mother mostly uses imperative verbs (e.g., bring me; come here) instead of asking him (e.g., would you please? Could you please?) to understand him he should obey her call. In times when a friend would show up at the doorstep and demand an object, even though parents asked the child to bring them the object needed, he would plainly prefer to remove the object from the location and resist the demands. The child did not perceive the necessity of being respectful to the other person and often showed aberrant behaviors associated with harsh sounds toward the other people, indicating that in some areas of pragmatics, the child lacks the required skills and needs to be trained properly. As observed, one of the ways the child would mostly employ to request a different action was to adamantly perform another action contrary to what was expected. The findings of other studies suggest that there are flickers of hope for DS boys to get better at using syntax and pragmatics over a certain period. As the two mentioned skills are interconnected, the development of one of the skills would also lead to the development of the other [34].

Pragmatics could be employed in various ways to enable the interlocutors to transmit specific messages based on their intentions. Based on Bishop's definition of pragmatics [59], pragmatics refers to one's sound understanding of different forms of communication, whether verbal or nonverbal. In the case of the current study's subject, on most occasions, the child used voices fueled with emotions of happiness, anger, or satisfaction to transmit his final message to the other speaker. Nonetheless, the child would act out of proportion when his



peers could not fully understand what he actually intended to say through unclear sounds, leading to the emergence of anger and rage from the side of the DS child. On such occasions, instead of peacefully maneuvering over his demands, he showed selfish desires to own the game or hit the other mates. Also, researchers observed that the child experienced challenges with fully understanding the context of the events. For instance, the child would not mistakenly take mockery instead of humor and preferred to show anger instead of a more appropriate reaction [60–62].

Conclusion

In conclusion, even though DS children share a stronger enthusiasm for getting involved in social communication and using different voices or gestures to communicate with parents, friends, and close relatives, there are still discrepancies between their motivation for getting involved in conversations and their abilities to masterfully lead a conversation. Children with Down syndrome may exhibit deficits in various areas of pragmatics based on their age cohort and their gender; thus, it can be hoped that children with DS can manage to use pragmatics in their daily language use to somehow lead a conversation and follow the normal regulations in a conversation that any speaker would follow to reach the ultimate goals and have his message transmitted. Similarly, parents also have a leading role in developing good communication abilities in DS children by providing a good education and helping them realize that different social behaviors are expected in different social contexts. With every person, a specific kind of behavior is welcomed, and the child is not allowed to treat people in different manners. As it was realized, parents tried to communicate with the child in any form possible, whether by uttering purposeless sounds or by showing facial signs and expressive body language to compensate for the lack of verbal communication on the child's behalf. Parents, though, mostly relied on using imperative sentences to better communicate with the child as the child demonstrated a lack of understanding when the sentence became pragmatically complex. However, the results also demonstrated that the child was creative in communicating with his parents, friends, and even strangers. He could use a more complicated form of language to convey different meanings in his interactions with others. It is hoped that by providing a good education for these children in a place where they are socially welcomed, they can forge useful relationships with their peers and take positive actions to become socially mature and be good community members.

References

1. Dodd DC, Zabriskie RB, Widmer MA, Eggett D. Contributions of family leisure to family functioning among families that include children with developmental disabilities. *Journal of Leisure Research*. 2009; 41: 261-86.
2. Risdal D, Singer GH. Marital adjustment in parents of children with disabilities: a historical review and meta-analysis. *Research and Practice for Persons with Severe Disabilities*. 2004; 29: 95-103: 317-37.
3. Hodapp RM. Families of persons with Down syndrome: new perspectives, findings, and research and service needs. *Ment Retard Dev Disabil Res Rev*. 2007;13(3):279-87. doi: 10.1002/mrdd.20160. PMID: 17910081.

4. Povee K, Roberts L, Bourke J, Leonard H. Family functioning in families with a child with Down syndrome: a mixed methods approach. *J Intellect Disabil Res*. 2012 Oct;56(10):961-73. doi: 10.1111/j.1365-2788.2012.01561.x. Epub 2012 Apr 25. PMID: 22533693.
5. Hodapp RM, Ly TM, Fidler DJ, Ricci LA. Less stress, more rewarding: parenting children with Down syndrome. *Parenting, Science and Practice* 2001;1.
6. Parker SE, Mai CT, Canfield MA, Rickard R, Wang Y, Meyer RE, Anderson P, Mason CA, Collins JS, Kirby RS, Correa A; National Birth Defects Prevention Network. Updated National Birth Prevalence estimates for selected birth defects in the United States, 2004-2006. *Birth Defects Res a Clin Mol Teratol*. 2010 Dec;88(12):1008-16. doi: 10.1002/bdra.20735. Epub 2010 Sep 28. PMID: 20878909.
7. Martin GE, Klusek J, Estigarribia B, Roberts JE. Language Characteristics of Individuals with Down Syndrome. *Top Lang Disord*. 2009 Apr;29(2):112-132. doi: 10.1097/tld.0b013e3181a71fe1. PMID: 20428477; PMCID: PMC2860304.
8. Næss KA, Lyster SA, Hulme C, Melby-Lervåg M. Language and verbal short-term memory skills in children with Down syndrome: a meta-analytic review. *Res Dev Disabil*. 2011 Nov-Dec;32(6):2225-34. doi: 10.1016/j.ridd.2011.05.014. Epub 2011 May 31. PMID: 21628091.
9. Reilly PR. Commentary: The federal 'Prenatally and Postnatally Diagnosed Conditions Awareness Act'. *Prenat Diagn*. 2009 Sep;29(9):829-32. doi: 10.1002/pd.2304. PMID: 19548258.
10. Bull MJ; Committee on Genetics. Health supervision for children with Down syndrome. *Pediatrics*. 2011 Aug;128(2):393-406. doi: 10.1542/peds.2011-1605. Epub 2011 Jul 25. Erratum in: *Pediatrics*. 2011 Dec;128(6):1212. PMID: 21788214.
11. Pueschel SM. Down syndrome. In S Parker & B Zuckerman, Behavioral and developmental pediatrics: A handbook for primary care. New York, NY: Little Brown. 1995; 116-119.
12. O'Toole C, Lee AS, Gibbon FE, van Bysterveldt AK, Hart NJ. Parent-mediated interventions for promoting communication and language development in young children with Down syndrome. *Cochrane Database Syst Rev*. 2018 Oct 15;10(10):CD012089. doi: 10.1002/14651858.CD012089.pub2. PMID: 30321454; PMCID: PMC6516877.
13. Bull MJ. Down Syndrome. *N Engl J Med*. 2020 Jun 11;382(24):2344-2352. doi: 10.1056/NEJMr1706537. PMID: 32521135.
14. Abbeduto L. Pragmatics development. *Down Syndrome Research and Practice*. 2008; 13: 57-59.
15. Laws G, Hall A. Early hearing loss and language abilities in children with Down syndrome. *Int J Lang Commun Disord*. 2014 May-Jun;49(3):333-42. doi: 10.1111/1460-6984.12077. Epub 2014 Mar 21. PMID: 24655309.
16. Roizen N. Down syndrome. In: Batshaw ML, Pellegrino L, Roizen NJ editor(s). *Children with Disabilities*. 6th Edition. Baltimore (MD): Brookes Publishing Co. 2007:263-74.
17. Bull MJ. Improvement of Outcomes for Children with Down Syndrome. *J Pediatr*. 2018 Feb; 193:9-10. doi: 10.1016/j.jpeds.2017.11.014. Epub 2017 Dec 6. PMID: 29212622.
18. Chapman RS. Language and communication in children and adolescents with Down syndrome. *International Review of Research in Mental Retardation*. 1997; 3: 307-312.
19. Rice ML, Warren SF, Betz SK. Language symptoms of developmental language disorders: An overview of autism, Down syndrome, fragile X, specific language impairment, and Williams syndrome. *Applied Psycholinguistics*. 2005; 26: 7-27.
20. Roberts JE, Price J, Malkin C. Language and communication development in Down syndrome. *Ment Retard Dev Disabil Res Rev*. 2007;13(1):26-35. doi: 10.1002/mrdd.20136. PMID: 17326116.



21. Adamson LB, Bakeman R, Deckner DF, Ronski M. Joint engagement and the emergence of language in children with autism and Down syndrome. *J Autism Dev Disord.* 2009 Jan;39(1):84-96. doi: 10.1007/s10803-008-0601-7. Epub 2008 Jun 26. PMID: 18581223; PMCID: PMC2640949.
22. Matthews TJ, Allain DC, Matthews AL, Mitchell A, Santoro SL, Cohen L. An assessment of health, social, communication, and daily living skills of adults with Down syndrome. *Am J Med Genet A.* 2018 Jun;176(6):1389-1397. doi: 10.1002/ajmg.a.38721. Epub 2018 Apr 25. PMID: 29696786.
23. Miller JF. Development of speech and language in children with Down syndrome. In I. T. Lott & E. E. McLoy (Eds.), *Clinical care for persons with Down Syndrome.* New York: Academic Press. 1992; 39-50.
24. Stefanini S, Caselli MC, Volterra V. Spoken and gestural production in a naming task by young children with Down syndrome. *Brain Lang.* 2007 Jun;101(3):208-21. doi: 10.1016/j.bandl.2007.01.005. Epub 2007 Mar 26. PMID: 17379294.
25. Patterson T, Rapsey CM, Glue P. Systematic review of cognitive development across childhood in Down syndrome: implications for treatment interventions. *J Intellect Disabil Res.* 2013 Apr;57(4):306-18. doi: 10.1111/jir.12037. PMID: 23506141.
26. Smith E, Næss KB, Jarrold C. Assessing pragmatic communication in children with Down syndrome. *J Commun Disord.* 2017 Jul;68: 10-23. doi: 10.1016/j.jcomdis.2017.06.003. Epub 2017 Jun 9. PMID: 28624322.
27. Hadley PA, Rice ML. Conversational responsiveness of speech- and language-impaired preschoolers. *J Speech Hear Res.* 1991 Dec;34(6):1308-17. doi: 10.1044/jshr.3406.1308. PMID: 1787713.
28. Mundy P, Kasari C, Sigman M, Ruskin E. Nonverbal communication and early language acquisition in children with Down syndrome and in normally developing children. *J Speech Hear Res.* 1995 Feb;38(1):157-67. doi: 10.1044/jshr.3801.157. PMID: 7537345.
29. Abbeduto L, Murphy MM, Cawthon SW, Richmond EK, Weissman MD, Karadottir S, O'Brien A. Receptive language skills of adolescents and young adults with down or fragile X syndrome. *Am J Ment Retard.* 2003 May;108(3):149-60. doi: 10.1352/0895-8017(2003)108<0149:RLSOAA>2.0.CO;2. PMID: 12691594.
30. Dodd B. Recognition and reproduction of words by Down's syndrome and non-Down's syndrome retarded children. *Am J Ment Defic.* 1975 Nov;80(3):306-11. PMID: 127529.
31. Abbeduto L, Warren SF, Conners FA. Language development in Down syndrome: from the prelinguistic period to the acquisition of literacy. *Ment Retard Dev Disabil Res Rev.* 2007;13(3):247-61. doi: 10.1002/mrdd.20158. PMID: 17910087.
32. Carl M, Kent RD, Levy ES, Whalen DH. Vowel Acoustics and Speech Intelligibility in Young Adults with Down Syndrome. *J Speech Lang Hear Res.* 2020 Mar 23;63(3):674-687. doi: 10.1044/2019_JSLHR-19-00204. Epub 2020 Mar 11. PMID: 32160481.
33. Yoder P, Woyonoski T, Fey M, Warren S. Effects of dose frequency of early communication intervention in young children with and without Down syndrome. *Am J Intellect Dev Disabil.* 2014 Jan;119(1):17-32. doi: 10.1352/1944-7558-119.1.17. PMID: 24450319; PMCID: PMC4059517.
34. Tager-Flusberg H, Caronna E. Language disorders: autism and other pervasive developmental disorders. *Pediatr Clin North Am.* 2007 Jun;54(3):469-81, vi. doi: 10.1016/j.pcl.2007.02.011. PMID: 17543905.
35. Mundy P, Sigman M, Kasari C, Yirmiya N. Nonverbal communication skills in Down syndrome children. *Child Dev.* 1988 Feb;59(1):235-49. PMID: 2963734.
36. Pitcairn T, Wishart J. Reactions of young children with Down's syndrome to an impossible task. *British Journal of Developmental Psychology.* 1994; 12: 485-489.
37. Esbensen AJ, Seltzer MM, Krauss MW. Stability and change in health, functional abilities, and behavior problems among adults with and without Down syndrome. *Am J Ment Retard.* 2008 Jul;113(4):263-77. doi: 10.1352/0895-8017(2008)113[263:SACIHF]2.0.CO;2. PMID: 18564887; PMCID: PMC2836825.
38. Chapman RS. Language and communication in individuals with Down syndrome. In L. Abbeduto, *International Review of Research in Mental Retardation: Language and Communication.* Amsterdam. 2003; 27(1-34).
39. Helland WA, Lundervold AJ, Heimann M, Posserud MB. Stable associations between behavioral problems and language impairments across childhood - the importance of pragmatic language problems. *Res Dev Disabil.* 2014 May;35(5):943-51. doi: 10.1016/j.ridd.2014.02.016. Epub 2014 Mar 15. PMID: 24642228.
40. Gallagher TM. Language skill and the development of social competence in school-age children. *Language, Speech, and Hearing Services in Schools.* 1993; 24: 199-205.
41. Halberstadt AG, Parker AE, Castro VL. Nonverbal communication: Developmental perspectives. In JA Hall & ML Knapp, *Handbooks of communication science.* Berlin: De Gruyter Mouton. 2013; 2.
42. Caselli MC, Vicari S, Longobardi E, Lami L, Pizzoli C, Stella G. Gestures and words in early development of children with Down syndrome. *J Speech Lang Hear Res.* 1998 Oct;41(5):1125-35. doi: 10.1044/jshr.4105.1125. PMID: 9771634.
43. Linn K, Sevilla F, Cifuentes V, Eugenin MI, Río B, Cerda J, Lizama M. Desarrollo de habilidades comunicativas en lactantes con síndrome de Down posterior a capacitaciones sistematizadas en comunicación gestual [Development of communicative abilities in infants with Down syndrome after systematized training in gestural communication]. *Rev Chil Pediatr.* 2019 Apr;90(2):175-185. Spanish. doi: 10.32641/rchped.v90i2.670. PMID: 31095234.
44. Goodwyn S, Acredolo L. Impact of symbolic gesturing on early language development. *J Nonverbal Behav.* 2000; 24(2):81-103.
45. Acredolo L, Goodwyn S. How to build a baby that can read minds: Cognitive mechanisms in mindreading. *Curr Psychol Cogn.* 2001; 13(5):513-52.
46. Acredolo L, Goodwyn S. The long-term impact of symbolic gesturing during infancy on IQ at age 8 (dissertation). Brighton (UK): International conference on infant studies. 2000.
47. Iverson JM, Longobardi E, Caselli MC. Relationship between gestures and words in children with Down's syndrome and typically developing children in the early stages of communicative development. *Int J Lang Commun Disord.* 2003 Apr-Jun;38(2):179-97. doi: 10.1080/1368282031000062891. PMID: 12745936.
48. Feeley KM, Jones EA, Blackburn C, Bauer S. Advancing imitation and requesting skills in toddlers with Down syndrome. *Res Dev Disabil.* 2011 Nov-Dec;32(6):2415-30. doi: 10.1016/j.ridd.2011.07.018. Epub 2011 Aug 5. PMID: 21820858.
49. Goldin-Meadow S. Pointing sets the stage for learning language—and creating language. *Child Dev.* 2007 May-Jun;78(3):741-5. doi: 10.1111/j.1467-8624.2007.01029.x. PMID: 17517001.
50. Wardhaugh R. *An introduction to sociolinguistics.* Victoria. 2006.
51. Brown P, Levinson S. *Politeness: Some universals in language use.* Cambridge. 1987.
52. Johansson I. Early language intervention in children with down syndrome. In: Chigier E, editor. *Looking up at down syndrome.* London. 1990; 193-96.
53. Pentz AL Jr, Gilbert HR. Relation of selected acoustical parameters and perceptual ratings to voice quality of Down syndrome children. *Am J Ment Defic.* 1983 Sep;88(2):203-10. PMID: 6227243.
54. Limbrock GJ, Hoyer H, Scheying H. Regulation therapy by Castillo-Morales in children with Down syndrome: primary and secondary orofacial pathology. *ASDC J Dent Child.* 1990 Nov-Dec;57(6):437-41. PMID: 2147925.



55. Montague JC Jr, Hollien H. Perceived voice quality disorders in Down's syndrome children. *J Commun Disord.* 1973 Jun;6(2):76-87. doi: 10.1016/0021-9924(73)90011-7. PMID: 4272968.
56. Gleason JB, Ratner NB. *The development of language.* New York, NY: Pearson. 2012.
57. Grice HP. Logic and conversation. In: Cole P, Morgan JL, editors. *Syntax and semantics 3: Speech acts.* New York. 1975; 41-58.
58. Laws G, Bishop D. Pragmatic language impairment and social deficits in Williams syndrome: a comparison with Down's syndrome and specific language impairment. *Int J Lang Commun Disord.* 2004 Jan-Mar;39(1):45-64. doi: 10.1080/13682820310001615797. PMID: 14660186.
59. Bishop DVM. *Uncommon Understanding: development and disorders of language comprehension in children.* Hove, UK. 1997.

60. Özçalışkan Ş, Adamson LB, Dimitrova N, Baumann S. Early gesture provides a helping hand to spoken vocabulary development for children with autism, Down syndrome and typical development. *J Cogn Dev.* 2017;18(3):325-337. doi: 10.1080/15248372.2017.1329735. Epub 2017 Jun 8. PMID: 30271277; PMCID: PMC6157926.
61. Sterling AM, Warren SF. Communication and language development in infants and toddlers with Down syndrome and fragile X syndrome. In J. Roberts, C. Chapman, & S. Warren (Eds.), *Speech & language development & intervention in Down syndrome & fragile X syndrome.* Baltimore, MD: Brookes. 2008; 53-76.
62. Temple V, Sabat S, Kroger R. Intact use of politeness in the discourse of Alzheimer's sufferers. *Language & Communication.* 1999; 19:163-180.

Discover a bigger Impact and Visibility of your article publication with Peertechz Publications

Highlights

- ❖ Signatory publisher of ORCID
- ❖ Signatory Publisher of DORA (San Francisco Declaration on Research Assessment)
- ❖ Articles archived in worlds' renowned service providers such as Portico, CNKI, AGRIS, TDNet, Base (Bielefeld University Library), CrossRef, Scilit, J-Gate etc.
- ❖ Journals indexed in ICMJE, SHERPA/ROMEO, Google Scholar etc.
- ❖ OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting)
- ❖ Dedicated Editorial Board for every journal
- ❖ Accurate and rapid peer-review process
- ❖ Increased citations of published articles through promotions
- ❖ Reduced timeline for article publication

Submit your articles and experience a new surge in publication services

<https://www.peertechzpublications.org/submission>

Peertechz journals wishes everlasting success in your every endeavours.