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PRAGMATICS IN CHILDREN WITH DOWN SYNDROME: HOW CAN STRENGTHS
AND CHALLENGES IMPACT THERAPY

by

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B.S., Southern Illinois University Carbondale, 2004

A Research Paper
Submitted in Partial Fulfillment of the Requirements for the
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RESEARCH PAPER APPROVAL

PRAGMATICS IN CHILDREN WITH DOWN SYNDROME: HOW CAN
STRENGTHS AND CHALLENGES IMPACT THERAPY

By

Rebecca L. Compton

A Research Paper Submitted in Partial

Fulfillment of the Requirements

for the Degree of

Master of Science

in the field of Communication Disorders and Sciences

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Children with Down syndrome (DS) are frequently described as “charming, social, friendly, and engaging,” (Rosner, Hodapp, Fidler, Sagun, & Dykens, 2004, p. 210). But is this simply a stereotype, and if so, how can that stereotype impact therapy? Inconsistent or poor social skills, also known as pragmatics, on the part of the child with DS who is expected to be social and friendly may prove frustrating for both the child and the speech-language pathologist (SLP) when expectations of that child are set too high and the environment is not manipulated appropriately for the needs of that child (Hepburn, Philofsky, Fidler, & Rogers, 2008). Pragmatics is defined as, “Aspect(s) of language concerned with language use within a communication context,” (Owens, 2008, p. 461). This is an investigation of pragmatic skills of children with DS in order to discover how those skills impact therapy in order to improve service provision.

Strengths in Social Functioning in Children with DS

Children with DS have many strengths in socio-emotional skills that serve them well when functioning with others. This is especially true of younger children with DS (Adams et al., 2008). These children have been described as having “charming personalities” (Hepburn et al., 2008, p. 48), being cheerful and having a social personality style (Rosner et al., 2004), and displaying a socially responsive personality (Mundy, Sigman, Kasari, & Yirmiya, 1988). Children with DS also have a higher social quotient than IQ score, which can lead to good socialization with peers and teachers (Aprico, 2004). These strengths allow

children with DS to compensate for other limitations that are associated with the syndrome, such as expressive language and syntax (John & Mervis, 2010).

Children with DS frequently have better social skills and low rates of emotional and behavioral problems compared to children with other learning disabilities (Rosner et al., 2004). The frequency of laughter is higher in children with DS than children with other syndromes, such as fragile X syndrome, Prader-Willi (PW) syndrome, and Williams syndrome (Reddy, Williams, & Vaughan, 2002). Children with DS are less likely than children with fragile X syndrome to "...display hyperactivity, hyperarousal, and hypersensitivity" (Abbeduto, Warren, & Conners, 2007, p. 248). Children with DS are also more socially competent when compared to children with PW syndrome (Rosner et al., 2004). Although expressive language is often thought to be a challenge in children with DS, these children have lower rates of perseverative and off-topic language compared to children with other syndromes. They are also less likely than children with Williams syndrome to "...initiate conversations inappropriately or use stereotyped language in conversations" (Abbeduto et al., 2007, p. 253).

Children with DS actually display more social interaction behaviors than children without disabilities (Mundy et al., 1988). Infants with DS smile more frequently at people than at objects (Wishart, 2007). Due to the high sociability of children with DS, they have a competence in forming relationships with others (John & Mervis, 2010). These children have a "desire to communicate" (Kumin, 1996, p. 113) and show a strength in social interactional skills. They are also able

to learn games and teach the rules of those games to other children. Children with DS are often able to stay on-topic and respond well to adult demands. These children also show no difference in responding to requests for clarification in communication breakdowns than other children (Kumin, 1996). Children with DS are "...more skilled with laughter and humorous interactions than children with other developmental disorders" (Reddy et al., 2002, p. 224). Older children and adults with DS are more involved in organizations than people with PW syndrome and their behaviors are rated more positive than those with PW. Overall, children with DS have less maladaptive behaviors than children with other disabilities (Abbeduto et al., 2007). Older individuals with DS also show a fair amount of job skills, have a relative strength in socialization and daily living skills, and have a relatively low rate of maladaptive behaviors (Rosner et al., 2004).

Challenges in Social Functioning in Children with DS

Despite indicated strengths in pragmatics, children with DS do display challenges when compared to typically developing children. There are delays in smiling and laughing in infants with DS when compared to typically developing children (Wright, Lewis, & Collins, 2006). Laughter occurs less in infants with DS than in typically developing infants. For example, children with DS often smile when the typically developing infants laugh (Reddy et al., 2002). Skills in areas such as joking, chatting, and small talk are limited in children with DS (Soresi & Nota, 2000), and children with DS have fewer strategies to monitor their own

behavior than do typically developing children (Landry, Garner, Pirie, & Swank, 1994).

Interpersonal functioning has also shown to be a challenge in children with DS and they have a delay in acquiring conversational skills (Kumin, 1996). Inattention, stubbornness, and non-compliance are some behaviors that may be displayed in children with DS (Rosner et al., 2004). When presented with challenging tasks, children with DS may use social engagement to avoid those tasks, which may in turn limit learning (Abbeduto et al., 2007). Children with DS also have a poor understanding of words that convey emotions, thus contributing to difficulties understanding the perspectives of others (Abbeduto et al., 2007). Similarly, these children are less likely to take into account the needs of their listeners and fail to signal a need for clarification during communication breakdowns (Roberts, Price, & Malkin, 2007). They also fail to use scaffolding to repair these communication breakdowns (Roberts et al., 2007). Children with DS may also have difficulties initiating social interactions and difficulty responding to social cues, which leads to fewer social interactions compared to typically developing peers (Landry et al., 1994). Children with DS also have difficulties learning from others and display parallel play rather than collaboration with peers (Wishart, 2007), which can lead to difficulty participating in group dynamics, which may hinder their ability to form positive relationships with teachers and peers. Leonard, Msall, Bower, Tremont, and Leonard (2002) showed that one-quarter of children with DS had no friends and only two-thirds had 2 or more

friends. They may also have problems forming relationships with authority figures, which can lead to problems in work settings (Soresi & Nota, 2000).

There appears to be much conflicting information regarding the pragmatic skills of children with DS. Aprico (2004) claimed that children with DS have a high social quotient, which can lead to appropriate socialization with peers and teachers, while Wishart (2007) claimed that children with DS have difficulty learning from others and their propensity for parallel play rather than collaborative play with peers could indicate future problems in forming relationships with teachers and peers. Also, Rosner et al. (2004) stated that older individuals with DS have a fair amount of job skills, while Soresi and Nota (2000) claimed that people with DS may have trouble forming relationships with authority figures, which could lead to difficulties in work settings. Finally, Kumin (1996) stated that children with DS are often able to stay on-topic and show no differences in initiating requests for clarification when repairing communication breakdowns than any other children, while Roberts et al. (2007) stated that children with DS are less likely to take into account the needs of their listeners and fail to signal the need for clarification during instances of communication breakdowns. They further noted that children with DS do not use scaffolding techniques to repair communication breakdowns. So a question could be asked as to whether interpersonal functioning tends to be a strength or a challenge in children with DS. More research is needed to adequately answer this question.

The Aprico (2004) investigation had a small sample size of only 18 children with DS between the ages of 11 to 12 months. It does not appear to be safe to make assumptions about the social quotient of children with DS based on such a small sample size and then generalize that information to relationships with peers and teachers. Conversely, the Wishart (2007) investigation examined the social strengths of children with DS as old as 18 years of age, thus giving this investigation more credibility when discussing the ability of children with DS and their interactions with teachers and peers.

The Rosner et al. (2004) investigation included 65 children and adults with DS when examining their social abilities and competency in the workplace when compared with people with other disabilities, whereas the Soresi & Nota (2000) investigation had a sample size of only 20 individuals with DS in which to make judgments about their abilities to get along with others and function in a work setting. This investigation, however, had random assignment of participants for the conditions of the investigation and matched the participants for age and IQ. A possible limitation of the Rosner et al. (2004) investigation is that the information was completely gleaned from parental reports via a questionnaire, which could certainly be biased information in favor of the strengths of the individuals with DS.

Both the Kumin (1996) and Roberts et al. (2007) investigations are simply reviews of previous research. They do not contain any numerical data either verifying or discrediting the notion that children with DS do or do not have trouble

initiating or responding to repair strategies when faced with communication breakdowns. This does not make the information in these investigations invalid, however. They simply need to provide more information to prove or disprove their points.

More research is needed in all of these areas when trying to make determinations about the social skills of individuals with DS. Longitudinal investigations need to be conducted that first consider the abilities of children with DS when faced with the need to use strategies in communication breakdowns. Those children should then be followed to examine their abilities to form relationships with peers and teachers in a school setting. Finally, those same individuals should be followed into the workplace in order to make determinations about their abilities to function in a work setting and form relationships with authority figures. An investigation of this scope could possibly provide SLPs with ideas on how to target the social skills of children with DS.

Comparing and Contrasting DS with Autism

Although many children with DS have charming personalities, some children present with personality and behavioral characteristics normally associated with autism spectrum disorder. Autism is not usually associated with DS and there are no known similarities in their behavioral characteristics. If a child with DS has no close relatives with autism, it is likely that the child will also not have autism. However, if a child with DS has anyone in his immediate family with autism, the chances are higher that the child with DS may also have autism (Ghaziuddin, 2000).

The pragmatic skills of children with DS are typically not impaired when compared to the pragmatic skills of children with autism. Early language development in children with DS is especially advanced when compared with children with autism, which can make a differential diagnosis easier if autism is suspected in a child with a confirmed diagnosis of DS. Children with DS may even be advanced in skills such as syntactic ability compared to children with autism. Children with DS also show more interest in toys than children with autism. In an investigation by O'Neil and Happe (2000) comparing children with DS and children with autism, the children with DS explored the toys longer, had more interest in the toys, interacted with the toys in the same pattern and manner as typically developing children, and had more joint attention than the children with autism. Children with DS and typically developing children directed their behaviors at the experimenter more often than did the children with autism. The children with DS had most of their interactions with the experimenter and rarely with their mothers, but the children with autism had little to no interaction with either the experimenter or their mother.

If no autistic tendencies are noted in a child with DS prior to the age of 3, they likely will not emerge at all (Hepburn et al., 2008). And for those children with DS that do not have autism, they are better at showing interest in others, cooperating, sharing, and reacting to the distress of others than children with autism (Abbeduto et al., 2007).

If a child with DS has a direct family member with autism, that child is more likely to also have autism or autistic-like traits. Comorbidity of DS and

autism may be as high as 7%. Because a diagnosis of autism is often not suspected in children with DS, it is frequently diagnosed much later than children who are diagnosed with just autism, making the appropriate therapy for these children be more delayed than it could be if a diagnosis was made sooner (Ghaziuddin, 2000).

When compared with typically developing children, the children with DS in the O'Neil and Happe (2000) study rarely interacted with their mothers, had less joint attention, fewer initiating behaviors, and less parental referencing. This lack of appropriate social behaviors could lead a parent or SLP to suspect that a child with DS may also have autism, especially if there is a pronounced lack of those behaviors. If a child with DS does present with autistic tendencies, those tendencies become more pronounced as the child ages. Some of the most common of these tendencies that are evident in children with DS are restricted interests, repetitive body movements such as hand flapping and body rocking, compulsivity, lack of awareness of their surroundings, isolation, and poor use of eye gaze (Hepburn et al., 2008).

While autism has received much attention during the last several years, there have not been many investigations conducted regarding children with both autism and DS. This may account for the low number of comorbid diagnoses. It is possible that when parents, SLPs, and physicians see a child with the physical characteristics of DS, they may not even think to look for signs of autism. Autistic tendencies may simply be dismissed as signs of DS. More investigations need to

be conducted to fine tune which pragmatic skills are most associated with DS and which are most associated with autism in order to assist with differential diagnoses.

The investigations that do exist regarding DS and autism have some fundamental limitations. The Ghaziuddin (2000) investigation had a small sample size of only 11 children with DS and autism and 7 children with just DS. Though this is a valid investigation exploring the similarities and differences in children with DS and autism and those with just DS, a larger sample size would allow the investigators to make broader generalizations about these populations. The O'Neill and Happe (2000) investigation also had a small sample size of 20 typically developing children, 11 children with DS, and 10 children with autism. Again, this makes it difficult for one to generalize the findings in this investigation to all children with DS and autism.

The Hepburn et al. (2008) investigation also consisted of a small sample size, but it had the advantage of being a longitudinal investigation. The children in this investigation were examined from age 2 to 4 years old. Although this is not a significantly lengthy investigation, the investigation started examining these children before the typical age of an autism diagnosis, which is age 3. This allowed the authors to examine the pragmatic skills of children with DS prior to a dual diagnosis of autism, which in turn gave them the opportunity to examine how the pragmatics of children with DS progressed and how that progression

differed from the children with a dual diagnosis. Of the original sample size of 20 children, however, only 8 children participated in the final follow-up investigation.

The Abbeduto et al. (2007) investigation is simply a review of other investigations, but it does have excellent ideas for future directions of research. Some of these ideas include getting more data on the learning processes of children with DS and comparing those processes to children with other disorders in order to determine the similarities and differences in learning mechanisms, which could then improve and tailor service provision for both children with DS and children with other disorders. Also, information about syndrome specificity could improve language intervention in children with DS. Finally, more longitudinal investigations are needed about children with DS in order to determine how these children learn language and pragmatics, thus maximizing intervention from one stage of linguistic and pragmatic acquisition to the next in order to give children the best foundation for learning, which in turn will assist them with reaching their full potential in adulthood.

Additionally, more research needs to be conducted comparing and contrasting children with DS and children with autism. The O'Neill and Happe (2000) investigation sets a firm foundation for this research, but more research with a larger sample size is needed to determine the similarities and differences of children with DS and children with autism, which could then assist with making comorbid or differential diagnoses with these children. An accurate and early

diagnosis is necessary in ensuring that children with DS receive appropriate intervention as early as possible.

Pragmatic Strengths in Children with DS and Clinical Implications

It is possible that the misconceptions about the pragmatic skills of children with DS can create problems in therapy, especially if that child presents with autistic tendencies. With so much conflicting information, the question could be asked as to whether children with DS do or do not have appropriate pragmatic skills, and how can those skills impact therapy provision. In order to answer that question, the pragmatic skills of children with DS need to be examined in more detail. Pragmatics is generally considered to be an area of strength in children with DS, though those strengths are not consistent in all areas (Roberts et al. 2007). Kumin (1996) stated that children with DS show the greatest strength in semantics as well as pragmatics. The pragmatic skills of children with DS progress in the same order as typically developing peers, but are delayed compared to those peers (Berglund, Eriksson, & Johansson, 2001). The knowledge that the pragmatics skills in children with DS advance in the same order as typically developing children can be very advantageous when planning a course of therapy. And like typically developing peers, children with DS use pragmatics to meet social ends. Girls with DS typically have better pragmatic skills than boys with DS (Berglund et al., 2001). The pragmatic skills of children with DS are certainly a strength when compared to children of other etiologies, such as Williams syndrome (John and Mervis, 2010).

Children with DS also have a relative strength in nonverbal communication skills. They show strengths in nonverbal social interaction skills (Mundy et al., 1988). These children are more advanced in language and gesture comprehension than in language production (Berglund et al., 2001). They are also likely to correctly interpret nonverbal gestures directed toward them (John & Mervis, 2010). These children also use gestures effectively and respond accurately to instrumental gestures, such as “Come here,” (Kumin, 1996). This relative strength in gesturing can be used to further advance communication.

Aspects of receptive and expressive language, though delayed, are also considered to be relative strengths in children with DS. These children are able to discuss absent objects, owners, and past and future situations (Berglund et al., 2001). According to Mundy et al. (1988), children with DS have no deficits in receptive language. These receptive language skills can be used to further enhance expressive language skills in therapy.

SLPs often encounter many varied behaviors exhibited by clients that can impact therapy. Though not necessarily considered to be a part of pragmatics, fear and behaviors motivated by fear can impact therapy provision and must therefore be considered when working with children with DS. Children with DS tend to experience less fear than typically developing children. These children experience less distress when placed on a “visual cliff” and also when they are separated from their caregiver (Wishart, 2007). This could be advantageous for a SLP when trying to build rapport with a child with DS.

Imitation is also considered to be a strength in children with DS. Imitation is a stronger feature in children with DS than in typically developing infants (Wright et al., 2006). This strength may serve these children well in social play situations and in therapy, as imitation is a building block of future communication skills (Abbeduto et al., 2007).

Children with DS also have appropriate attention and joint attention skills. These children are as likely to initiate and respond to initiations of joint attention as typically developing children who are matched for developmental level (Abbeduto et al., 2007). Also, maintaining the interest of a child with DS is more likely to be accomplished in a joint-play situation (Landry et al., 1994). Joint attention is crucial in furthering the communication skills of any child. Without it, the child will not know to what the communication partner is referencing.

Requesting is also considered to be a strength in children with DS. Abbeduto et al. (2007) stated that there is no delay in requesting in some children with DS and that increased rates of commenting and requesting lead to better outcomes in language development. Kumin (1996) stated that children with DS can use requests and commands effectively and are able to vary their usage according to their audience and change strategies based on individual situations in order to meet their needs. In the Mundy et al. (1988) investigation, the children with DS had no deficits in making requests of the experimenter to repeat a physical interaction in a game.

Children with DS show significant compliance with receptive requests. In an investigation by Wright et al. (2006), children with DS were more compliant than typically developing infants. Directive and explicit requests, however, were more likely to be followed than suggestive and implicit requests. The children with better expressive language skills also showed more compliance with requests. The children with DS also had normal compliance with peer exchanges (Landry et al., 1994). Compliance with requests is crucial if any gains are to be made in therapy.

Finally, children with DS respond well to social scripts (Kumin, 1996) and have a relative strength in symbolic play (Rosner et al., 2004). The Mundy et al. (1988) investigation found that children with DS have no deficits in symbolic play when compared to typically developing children. Social scripts and symbolic play are both excellent ways to further communication skills: social scripts in setting up the environment for routine communication and symbolic play to foster more abstract thinking.

Pragmatic Challenges in Children with DS and Clinical Implications

Again, even though children with DS have many relative strengths in pragmatics, they do possess many challenges that need to be considered when planning for and implementing therapy. Abbeduto et al. (2007) emphasized that there is a general delay in the pragmatic skills of children with DS. Berglund et al. (2001) stated that pragmatic problems were noted in children with DS, especially in the prelinguistic period of language acquisition. Berglund et al. (2001) further

noted that boys have poorer pragmatic skills than girls and that the lag in pragmatic skills in children with DS is greater than the lag in grammar, which leads to difficulty for these children in talking about “here and now.”

Children with DS also may have deficits in nonverbal communication skills. They display fewer nonverbal requesting behaviors than typically developing children and have fewer nonverbal requests for objects (Mundy et al., 1988). Children with DS are also less advanced in gesture production (Berglund et al., 2001).

Expressive language is generally considered to be the most obvious deficit in children with DS, accompanied by articulation and grammar deficits (Rosner et al., 2004). Children with DS can have expressive language deficits that are disproportionately more severe than their cognitive limitations (Mundy et al., 1988). Children with DS have problems forming utterances to convey their intent effectively and often produce ambiguous language. They have less sophisticated language and fail to convey information effectively, which can make them difficult to comprehend (Abbeduto et al., 2007). This can lead to frustration on the part of the child with DS due to not being clearly understood (Kumin, 1996), which can have serious repercussions in therapy. A frustrated child is often a non-responsive child in a therapy setting.

Although children with DS showed less fear on a “visual cliff” and when being separated from caregivers, they showed more overall fear than typically developing children (Wishart, 2007). This fear could negatively impact therapy if

these children are afraid to experience new things and learn new ideas, which could then hinder new learning.

Children with DS may also have deficits with attention and joint attention. They have trouble with reciprocal eye contact and may engage longer and more intensively than typically developing peers (Abbeduto et al., 2007). These children also have difficulty regulating their attention. Redirecting the interest of children with DS is less likely in joint play and these children experience difficulty in changing their attention from a preferred toy to a non-preferred toy when that change of attention is initiated by their mother (Landry et al., 1994).

Children with DS also have difficulty in requesting when compared to other pragmatic functions (Kumin, 1996). They are more delayed in requesting than typically developing peers and make fewer requests, particularly those designed to change the behavior of others. Children with DS also experience a delayed rate of growth of requests when compared to children with other etiologies (Abbeduto et al., 2007). They also experienced difficulty when requesting objects from their mothers (Landry et al., 1994) and had deficits in nonverbal requests for objects or assistance with objects when compared to typically developing children (Mundy et al., 1988).

Children with DS also experience difficulty with receptive requests and compliance. As mentioned previously, suggestive requests are less likely to be followed than directive requests and implicit requests are less likely to be followed than explicit requests. These children also display fewer compliant

behaviors with their mothers than typically developing children (Landry et al., 1994). Children with DS also have difficulty following the requests of their teachers (Soresi & Nota, 2000) and will engage in avoidant or diversional behaviors when given tasks are above or below their current developmental level (Wishart, 2007). The developmental level of the child needs to be closely considered when choosing therapy activities.

Finally, in an investigation by Landry et al. (1994), the children with DS did not take advantage of turn-taking opportunities in the same manner as typically developing children. Where the typically developing children took advantage of turn-taking opportunities presented to them by their mothers, the children with DS did not. This could negatively impact the learning potential of children with DS, as turn-taking with a caregiver is an essential building block for future learning and language acquisition.

Again, there is much conflicting information regarding the pragmatic skills of children with DS, and some of those conflicts are found within single investigations. Kumin (1996) stated that children with DS use gestures effectively and respond to instrumental gestures, such as "Come here," while Berglund et al., (2001) stated that children with DS are less advanced in gesture production.

Berglund et al. (2001) further stated that children with DS are able to use expressive language to discuss absent objects, owners, and past and future situations, while Rosner et al. (2004) stated that children with DS have a deficit in expressive language, with accompanying deficits articulation and grammar.

Mundy et al. (1988) stated that these children have expressive language deficits that are more severe than their cognitive limitations. Abbeduto et al. (2007) stated that these children have problems forming utterances, use less sophisticated and ambiguous language, fail to convey information effectively, and are difficult to comprehend. Finally, Kumin (1996) stated that children with DS experience frustration at not being understood.

Wishart (2007) had conflicting information regarding the fear of a child with DS within her own investigation. She stated that children with DS experience less distress when placed on a “visual cliff” and are better able to be separated from their caregivers than typically developing peers, but further stated that children with DS experience more overall fear than typically developing children.

Abbeduto et al. (2007) also had conflicting information regarding the requesting skills of children with DS. They stated that children with DS have no delays in requesting, but then stated that children with DS (a) are delayed in requesting behaviors, (b) make fewer requests, especially those to change the behaviors of others, and (c) are delayed in their growth rate of requests when compared to children with other etiologies. Other investigations also have conflicting information about the requesting skills of children with DS. Kumin (1996) stated that children with DS use requests and commands effectively, are able to vary their usage, and change strategies to meet their needs. Mundy et al. (1988) stated that these children had no deficits when making requests of the experimenter while playing games. Kumin (1996) did state, however, that

children with DS have difficulty with requesting compared to other pragmatic skills.

Finally, there is conflicting information regarding the receptive requests and compliance of children with DS. Wright et al. (2006) stated that children with DS are more compliant than typically developing children. Landry et al. (1994) stated that these children showed normal compliance during peer exchanges. In contradiction, Landry et al. (1994) stated that these children showed less compliance with the requests of their mothers, and Wishart (2007) stated that children with DS will engage in avoidant and divisional behaviors when facing tasks that are below or above their developmental level. With so much conflicting information, it can be difficult for the SLP to discern which pragmatic skills are areas of strengths or challenges in children with DS.

The strengths and challenges of some of the investigations in the previous section, such as Kumin (1996), Rosner et al. (2004), Abbeduto et al. (2007), and Wishart (2007), have previously been examined. Investigations that have yet to be analyzed are Berglund et al. (2001), Mundy et al. (1988), Wright et al. (2006), and Landry et al. (1994).

The Berglund et al. (2001) investigation, which examined the expressive and receptive language skills of children with DS, had a large sample size of 330 children with DS between the ages of 1-5 years. It compared the skills of those children with 336 typically developing children between the ages of 1 year, 4 months and 2 years, 4 months. The children with DS and typically developing

children were matched for mental age. This appears to be an adequate sample size in which to make generalizations about the expressive and receptive language skills of children with DS when compared to typically developing peers. In contrast, the Mundy et al. (1988) investigation had a much smaller sample size of 30 children with DS and 17 children who did not have DS but were mentally challenged. In addition to having a small sample size, this investigation also made comparisons between the expressive and receptive language skills of children with DS and typically developing children, even though this investigation did not use typically developing children in any part of the study. This brings the claims about children with DS into serious doubt when comparing them to typically developing children, as they were compared with only children with mental challenges in the investigation. The Berglund et al. (2001) investigation also acknowledged some flaws in their investigation. Their information was gleaned from parental questionnaire, which made it impossible for them to determine the nonverbal mental ages of the children with DS. They also stated that they would have liked to examine the medical records of these children in order to determine hearing status, as deficits in hearing have been linked to deficits in expressive language skills.

The Wright et al. (2006) investigation consisted of three separate experiments examining the receptive request and compliance of children with DS. Each experiment consisted of 18 children with DS and 18 typically developing children, for a total of 36 children in each condition and 108 children

in the entire investigation. Although this may not be considered to be a very large sample size, each group of children was averaged for mental age and all three experiments had the same number of children. This allowed the authors to make generalizations between investigations because of the matched sample sizes. The Landry et al. (1994) investigation also consisted of a small sample size of 28 children with DS and 28 children who were typically developing and mentally matched to the children with DS, but again, they could make comparisons between the two groups of children due to the identical sample sizes.

Future Research

With so much additional conflicting information, more investigations are needed to examine very specific pragmatic skills of children with DS in comparison to typically developing children, such as nonverbal communication skills, expressive and receptive language, joint attention, requesting, and compliance. The sample sizes of these investigations need to be adequate in order to generalize the findings to children with DS. Specific knowledge of the strengths and challenges of children with DS in these areas could greatly assist the SLP with knowing what target areas to address in therapy and what challenges may arise in therapy provision.

Children with DS have many strengths and challenges that can impact their progress in therapy. Though the investigations mentioned have done an excellent job of exploring many of the pragmatic skills of these children, there is still much that needs to be learned in order to maximize the potential of these

children from infancy until adulthood. Adequate sample sizes for more thorough investigations may be difficult to attain, however, due to DS's low occurrence of only 1 in 700 births (Abbeduto et al., 2007). This sparseness makes it necessary to sometimes gain information from parental questionnaires, which can contain information that is possibly flawed or skewed.

In order to get a better understanding of the pragmatic skills of children with DS and how those skills can impact therapy, several investigations need to be conducted in the future. First, larger sample sizes are required in order to make generalizations about children with DS. Children with DS vary in their abilities and challenges, so in order to understand what strengths and challenges these children may possess as a whole, much larger sample sizes are required in order to determine patterns across the population. These investigations may need to be conducted in larger cities where the prevalence of DS is higher and more parents may be willing to allow their children to participate in the investigations.

Second, more research needs to be conducted with a finer scope on specific pragmatic skills of children with DS, such as joint attention, commenting, humor, and social interaction. Some investigations have already been conducted examining pragmatic skills such as requesting and compliance. Investigations with greater specificity are required in order to pinpoint which pragmatic skills may or may not be an issue with children with DS.

Third, longitudinal investigations need to be conducted during the entire span of the childhood of children with DS in order to understand how the strengths and challenges of these children could impact their lives as adults. Only then can SLPs understand which pragmatic skills require the most emphasis in the early years to make a more positive impact on the children when they become adults.

Fourth, more investigations need to be conducted comparing and contrasting children with DS and children with autism. More distinctions need to be made between these two groups of children to better enable physicians, with the assistance of SLPs, to make differential or comorbid diagnoses. The earlier these children are correctly diagnosed, the sooner they can receive appropriate treatment and therapy to maximize their potential.

Finally, more investigations need to be conducted comparing children with DS to children with other syndromes, such as fragile X syndrome, PW syndrome, and Williams syndrome. Many investigations that compare these groups of children lump children with DS in amongst children with several different etiologies. Though this is often necessary due to the scarcity of children with these other etiologies, it would be helpful to examine children with DS against one single etiology. Focus on specific similarities and differences between children with DS and children of other single etiology groups could be made. Individual case studies may be the only way to accomplish this goal.

Conclusion

Children with DS, like other children, have many strengths and challenges in the area of pragmatics. It is important to know what those strengths and challenges are when providing therapy in order to maximize the potential of these children. With so much conflicting information, however, it can be difficult to know where those pragmatic strengths and challenges lie. Because of these uncertainties, it can be helpful to have knowledge of these strengths and challenges, but the SLP can not depend on them absolutely. All children, including those with DS, are different, and they bring their own unique abilities and experiences with them into the therapy setting. To assume that these children fit into a neat category when it comes to pragmatics is to set oneself up for certain failure and frustration. The best course of action is to examine the pragmatic skills of each child while providing therapy and provide individualized services that will maximize the potential of that child. The knowledge gleaned from these investigations should be used as a guide, but not as an absolute truth. Children with DS are their own unique individuals, and they should be treated accordingly.

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