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# Research in Autism Spectrum Disorders

Journal homepage: <http://ees.elsevier.com/RASD/default.asp>

## Differences in social vulnerability among individuals with autism spectrum disorder, Williams syndrome, and Down syndrome



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### ARTICLE INFO

#### Article history:

Received 11 January 2013

Received in revised form 4 April 2013

Accepted 8 April 2013

#### Keywords:

Victimization

Social vulnerability

Autism spectrum disorder

Williams syndrome

Down syndrome

### ABSTRACT

Although individuals with disabilities are at increased risk of victimization, few studies examine persons with different disability conditions to determine whether distinctive cognitive-behavioral profiles are associated with different levels of social vulnerability. To determine the differences in social vulnerability and experiences of victimization, caregiver responses to a Social Vulnerability Questionnaire were examined for 103 caregivers of individuals with autism spectrum disorder (ASD), Williams syndrome (WS), and Down syndrome (DS). Although all three groups experienced similar rates and types of victimization, the specific correlates of social vulnerability differed by disability. Individuals with ASD displayed less risk awareness and had less social protection; those with WS were rated higher on risk factors related to perceived vulnerability and parental independence; and those with DS had less risk awareness and were perceived to be more vulnerable. Safety interventions should be tailored to address each group's specific correlates of social vulnerability.

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### 1. Introduction

Compared to those without disabilities, individuals with intellectual disabilities (ID) experience abuse and exploitation throughout their lifetime. As children, individuals with ID are at least 3 times more likely than those without ID to experience child abuse and neglect (Sullivan & Knutson, 2000). Once they reach school age, youth with ID are more likely to experience bullying and peer victimization than their typically developing peers (Cappadocia, Weiss, & Pepler, 2012; Sentenac, Gavin, Arnaud, Molcho, Godeau, & Gabhainn, 2012; Sterzing, Shattuck, Narendorf, Wagner, & Cooper, 2012a,b). Finally, adults with ID (versus those without) are at increased risk of experiencing physical and sexual assault, robbery, and personal theft (Fisher, Moskowitz, & Hodapp, 2012; Wilson & Brewer, 1992).

Although the prevalence and types of victimization experienced by individuals with ID are generally known, less research has described how individual characteristics relate to specific aspects of social vulnerability. Early research found that individuals with ID might be more at risk if they have lower IQs or less education, live alone or in a group home, are female, and have no or few friends (Doren, Bullis, & Benz, 1996; Greenspan, Laughlin, & Black, 2001; Jawaid, Riby, Owens, White, Tarar, & Schulz, 2012; Sobsey & Doe, 1991; Wilson & Brewer, 1992; Wilson, Seaman, & Nettlebeck, 1996). But such

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(predominantly) demographic variables were generally not tied to types of vulnerability or to other individual characteristics.

To explore this relationship, Fisher et al. (2012) recently developed the Social Vulnerability Questionnaire. They found that social vulnerability could be separated into four distinct areas—risk awareness, social protection, perceived vulnerability, and parental independence. These specific areas of social vulnerability were then related to the individual characteristics of persons with ID that have been described as risk factors for victimization. We found that the presence of an intellectual disability, the absence of friends, and more independence were all related to increased social vulnerability for individuals with disabilities. More specifically, having an intellectual disability was associated with a person's decreased ability to detect risk (risk awareness) and was also tied to the person's seeming more vulnerable (perceived vulnerability). Conversely, not having an intellectual disability (but still having a diagnosed disability such as autism) related to increased opportunities to be independent from parents, which might also increase vulnerability. When few friends exist, individuals likely lack the protection of a supportive peer network (social protection), a situation that may increase the chance of being bullied and experiencing peer victimization. Finally, increased independence may also be related to more vulnerability, as individuals with disabilities may lack the protective skills to detect and avoid victimization (risk awareness).

When considering how IQ, friendship, and independence might relate to areas of social vulnerability, it seems possible that social vulnerability arises because individuals with different ID conditions display distinct cognitive-behavioral profiles (Hodapp & Dykens, 1994). So far, however, most victimization studies have relied on mixed or heterogeneous samples. It is important, then, to examine whether the characteristics of individuals with different ID conditions distinctly relate to social vulnerability, which might lead to differing experiences of social victimization.

Based on the three salient personal characteristics related to social vulnerability (intellectual disability; not having friends; independence), three disability conditions were compared in their ratings of social vulnerability and their experiences of victimization. Individuals with autism spectrum disorder (ASD) display a triad of impairments related to impaired social interaction, abnormal communication, and restricted activities and interests (American Psychiatric Association, 2000). These impairments lead to difficulty with communication and appropriate social engagement, as well as deficits in emotion recognition, atypical social processing and response generation, and deficits in their own communication signals (Jawaid et al., 2012). Between 40% and 84% of individuals with ASD are also diagnosed with intellectual disability, ranging from mild to profound impairment (Dykens & Lense, 2011). Recent research has found that individuals with ASD (compared to those with other ID and those without disabilities) are highly likely to experience victimization in the form of bullying, sexual abuse and physical abuse (Jawaid et al., 2012; Mandell, Walrath, Manteuffel, Sgro, & Pinto-Martin, 2005; Rowley et al., 2012; Sterzing et al., 2012a; Van Roekel, Scholte, & Didden, 2010).

Vulnerability to bullying may be because individuals with ASD are usually socially withdrawn, which often leads to isolation and loneliness that continues into adulthood (Van Roekel et al., 2010). Such isolation then increases the risk of peer victimization, as many of these individuals do not have the protective factor of supportive peers (Cappadocia et al., 2012). Their socio-communicative and behavioral difficulties, as well as difficulties with peer interactions, could lead individuals with ASD to experience increased rates of peer victimization, bullying and ostracism (Cappadocia et al., 2012; Jawaid et al., 2012; Sentenac et al., 2012). Vulnerability to physical and sexual abuse, on the other hand, may be related to IQ and to the inability to detect the intentions of others (Jawaid et al., 2012).

Williams syndrome (WS) is a rare genetic disorder caused by a micro-deletion of genes on chromosome 7, resulting in borderline to moderate levels of intellectual disability (Hillier et al., 2003; Mervis & John, 2010). Contrary to those with ASD, most individuals with WS are extremely social—displaying a lack of fear of strangers and overfriendliness toward strangers, leading many to engage in social encounters with both familiar and unfamiliar people (Jawaid et al., 2012; Jones et al., 2000). Despite their very sociable personality style, individuals with WS often experience interpersonal difficulties, leading to poor peer relationships and social isolation (Davies, Udwin, & Howlin, 1998; Dykens & Rosner, 1999; Jawaid et al., 2012). Thus, while increased sociability is generally considered positive, the overwhelming desire of individuals with WS to engage others increases vulnerability to exploitation, abuse, and being taken advantage of by others. In fact, while few studies have examined the victimization of individuals with WS, we do know that (compared to those with ID or without disabilities) these individuals experience higher rates of sexual abuse (Rosner, Hodapp, Fidler, Sagun, & Dykens, 2004). This vulnerability to sexual abuse as well as to other forms of victimization may be related to their mild to moderate intellectual disability, hypersociability, and other social impairments.

Finally, Down syndrome (DS) is the most common chromosomal cause of intellectual disability, in most cases resulting from a third copy of chromosome 21. Similar to individuals with WS, those with DS are often described as charming, social, friendly and engaging (Dykens, 2000a,b). Unlike individuals with WS and ASD, however, persons with DS usually interact appropriately with others (Rosner et al., 2004); they are social, but not overly so (Jones et al., 2000). Furthermore, as compared to individuals with WS, the social approach displayed by individuals with DS is more likely to go unnoticed, as their poor language skills cause them to have difficulty initiating and maintaining conversations (Porter, Coltheart, & Langdon, 2007). Thus, compared to those with ASD and WS, individuals with DS may possess some protective factors from vulnerability (friendships, less independence). In fact, individuals with DS are generally not mentioned in the victimization literature.

Based on these cognitive-behavioral profiles and potentially differential phenotypic factors, we examined whether individuals with ASD, WS, and DS differed in their experiences of victimization and ratings of social vulnerability. This study aimed to: (1) examine differences in the types of victimization experienced by individuals with different types of disabilities throughout their lifetime and (2) determine whether individuals with these various conditions differed in their ratings of

social vulnerability. We hypothesized that individuals with ASD, WS, and DS would differ in their experiences of victimization. We further hypothesized that, while high percentages in each group would be socially vulnerable, the correlates of social vulnerability might differ by condition.

## 2. Methods

### 2.1. Participants

Participants included 103 parents or guardians (67% mothers) who reported information on adolescents and adults with ASD (29), WS (38), and DS (36; Table 1). Responses did not differ significantly based on the relationship of the respondent to the individual. Individuals with ASD averaged 25.38 (SD = 10.39) years of age, those with WS 25.39 (6.72) years; and those with DS 23.67 (7.71) years. Although distributions of males and females differed,  $\chi^2(100) = 12.28, p < .01$ , this difference reflected the gender distributions of the target populations (i.e., the over-abundance of males among persons with ASD; APA, 2000).

### 2.2. Procedure

Upon receiving approval from Vanderbilt University's institutional review board, participants were recruited through parent support groups, camps for individuals with disabilities, and disability-specific association websites, mailings, or listservs. Respondents were mailed a packet of questionnaires and a consent form, as well as a stamped, self-addressed envelope in which to return the completed questionnaires. Respondents received a \$10 gift card for their participation. The rate of returned packets was 71.5%; most non-responders (after receiving packets) indicated that they did not have time to complete the questionnaires.

### 2.3. Measures

#### 2.3.1. Demographics

The demographics questionnaire asked respondents basic information about the individual with disabilities, including the person's gender, age, estimated range of IQ (which we further divided into those below IQ 70 and those above 70), type of disability, living situation, and number of friends.

#### 2.3.2. Social Vulnerability Questionnaire (SVQ; Fisher et al., 2012)

The SVQ consisted of 30 statements on which the respondent rated an individual with disabilities on a 4-point Likert scale (1 – not true or never to 4 – very true or always). The original SVQ contained 45 items, from which 30 items loaded onto six factors (see Fisher et al., 2012 for description of factor analytic procedures). The 30 items within these 6 factors were used for this study. Emotional bullying included items related to teasing or taunting behaviors or harassing actions performed by others toward the individual with disabilities (Cronbach's alpha = .87). Risk awareness (reverse scored) included items that served as potential protective factors, relating to the individual with disabilities' ability to detect and avoid victimization (alpha = .85). Social protection (reverse scored) included items related to the peer network of the individual with disabilities (.82). Perceived vulnerability included items related to physical traits that could lead others to perceive the individual with disabilities as an easy target for victimization (.66). Parental independence included items related to the amount of independence afforded to the individual with disabilities from the parent (.79). Finally, credulity included items related to reasons why the individual with disabilities might fall for certain types of victimization (.78). After reverse scoring risk awareness and social protection, higher scores on all factors related to more vulnerability within the factor area. The scores on the 6 factors were used as the outcome variable, social vulnerability. These variables were used to determine whether individuals with ASD, WS, and DS differed in their ratings of each type of social vulnerability.

The questionnaire also included an open-ended question: "Can you give us an example of a time when your child/the individual has been taken advantage of?" This question was intentionally left without any specific time frame, as we wished to first gather information on whether the individual had experienced any type of victimization throughout their lifetime. Further, examples were examined and considered to be the most salient forms of victimization that came to mind for the

**Table 1**

Descriptive statistics of individuals with autism spectrum disorder, Williams syndrome, and Down syndrome.

Variable	ASD	WS	DS	$\chi^2/F$
Age of individual	25.38 (10.39)	25.39 (6.72)	23.67 (7.71)	.51
% male	82.8%	52.6%	41.7%	11.62**
IQ below 70 (ID)	44.4%	66.7%	100%	23.99**
Presence of friends				8.59 <sup>†</sup>
No friends reported	50%	21.1%	20.0%	
Has friends	50%	78.9%	80.0%	

Note: ASD, autism spectrum disorder; WS, Williams syndrome; DS, Down syndrome; ID, intellectual disability.

\*  $p < .05$ .

\*\*  $p < .01$ .

respondents. As such, we were able to show the range of victimization experienced by these individuals, rather than focusing on experiences that were most recent or most severe. For this open-ended question, two coders grouped answers into three categories of victimization: teasing and persuasion; money or theft; and physical or sexual abuse (Cronbach's alpha = .86). Responses to this question were used as the outcome variable, lifetime victimization. This variable was used to determine the percentage of individuals who had ever experienced some form of victimization in their lifetime and the different types of victimization experienced within each condition.

#### 2.4. Data analysis

To examine whether individuals with ASD, WS, and DS differed in the ratings of social vulnerability and the type of victimization they experienced, we employed multiple methods of analyses. To examine whether individuals with ASD, WS, and DS are uniquely victimized, we used chi-square analyses. To examine between-groups differences in social vulnerability, we used multivariate analysis of variance (MANOVA) tests, with follow-up analysis of variance (ANOVA) tests with Bonferroni corrections.

### 3. Results

#### 3.1. Preliminary findings

As shown in Table 1, certain individual characteristics were more common in specific conditions. Because there were more males than females with ASD, we first conducted a  $6 \times 2$  MANOVA to compare scores on the six factors of the SVQ by gender within the ASD group. No significant differences emerged between females and males ( $F$ -values ranged from .83 to 3.84, *ns*). We then examined whether age was related to scores on the SVQ. For individuals with ASD and WS, increased parental independence was related to increased age ( $r$ 's = .45 and .43, respectively,  $p$ 's < .01). There was also a moderate negative correlation between risk awareness and age in the WS group ( $r = -.36$ ,  $p < .05$ ), although no such relations were found in DS ( $r = -.08$ , *ns*) or ASD ( $r = .10$ , *ns*).

#### 3.2. Experiences of victimization

We next examined whether there were differences in the percentage of individuals in each group who experienced some form of victimization in their lifetime and if groups experienced different types of victimization. First, 73% ( $N = 75$ ) of respondents provided an example of victimization. Percentages of who were victimized did not differ by group, as 72% of the group with ASD, 79% of those with WS, and 67% of those with DS provided an example,  $\chi^2(2, 103) = .49$ , *ns*.

In further exploring the types of victimization provided in the open-ended question, examples included teasing or persuasion (35%), money or theft (32%), or physical or sexual abuse (21%), with some respondents providing examples of more than one type of victimization. Again, individuals with ASD, WS, and DS showed near-equal examples of victimization related to teasing/persuasion (38%, 37%, and 22%, respectively),  $\chi^2(2, 103) = 2.46$ , *ns*; money/theft (38%, 37%, and 31%, respectively),  $\chi^2(2, 103) = .48$ , *ns*; and abuse (17%, 16%, and 31%, respectively),  $\chi^2(2, 103) = 2.81$ , *ns*.

Finally, the factor emotional bullying on the SVQ was also used as a measure of bullying experienced by the individuals with ASD, DS, and WS. The groups did not differ in scores on the Emotional Bullying factor ( $F(2, 95) = .17$ , *ns*); nor did they differ on any of the individual items within the factor (see Table 2).

#### 3.3. Between-group differences in social vulnerability

A three-group MANOVA, with the six factors of the SVQ as the dependent variables, revealed a significant between-groups main effect, Wilk's  $\Lambda = .43$ ,  $F(12, 152) = 6.63$ ,  $p < .001$ , multivariate  $\eta^2 = .34$ . Follow-up ANOVAs indicated significant differences across disability conditions on 4 of the 6 SVQ factors. As shown in Table 2, individuals with ASD and with DS were rated higher on risk awareness; individuals in these two groups (on average) were rated as less aware of potential risks related to victimization than were those with WS. Examining specific items, individuals with ASD and DS were less likely to tell a parent or authority figure if something questionable happened and were less aware that they had a disability. Individuals with DS (compared to those with WS) were also less able to accurately describe their disability. Finally, compared to persons in the other two groups, those with ASD were less able to read social cues.

In terms of perceived vulnerability, groups with WS and with DS (versus those with ASD) were rated as appearing more vulnerable (those with DS also appeared more vulnerable than those with WS). Individuals with DS were rated as appearing the most vulnerable, as others thought that they looked different from same-aged peers, they were often smaller than individuals the same age, and they were often perceived as having a disability. Compared to those with ASD, individuals with WS were also considered to look different and to be smaller than same aged peers.

Social protection also showed differences across groups, in this instance favoring the groups with DS and WS. Thus, compared to these two groups, persons with ASD were rated higher on social protection, indicating they were less likely to be socially protected from vulnerability. More specifically, individuals with ASD were less likely to have friends or to be considered a part of a social group. Finally, those with WS (versus those with DS) were rated higher on parental

**Table 2**  
Means and standard deviations of the social vulnerability factors and items within significant factors for each condition.

Factor and items within factor	ASD	WS	DS	F (2,81)	Groups differing
Emotional bullying	7.83 (2.81)	8.50 (2.66)	8.21 (2.96)	.39	
Gets picked on by others	1.81 (.65)	1.71 (.75)	1.66 (.86)	.38	
People/peers try to hurt his/her feelings	1.84 (.64)	1.76 (.74)	1.72 (.70)	.26	
People/peers do mean things to him/her	1.68 (.75)	1.54 (.70)	1.62 (.82)	.28	
People/peers make fun of him/her	1.63 (.59)	1.74 (.71)	1.72 (.70)	.26	
Is often called names by others	1.46 (.61)	1.56 (.66)	1.34 (.55)	.96	
Risk awareness	20.71 (6.80)	16.38 (3.51)	20.39 (6.26)	5.58**	ASD, DS > WS
Is likely to tell a parent/authority figure if something questionable happens (bully, scam) <sup>a</sup>	2.73 (1.08)	1.82 (7.45)	2.53 (.97)	8.27**	ASD, DS > WS
Knows he or she has a disability <sup>a</sup>	1.92 (1.20)	1.29 (.67)	1.93 (1.14)	4.41*	ASD, DS > WS
Recognizes potentially dangerous situations (entering a dark area) <sup>a</sup>	2.54 (1.21)	2.11 (.68)	2.30 (.88)	1.59	
Is encouraged to express emotion and to not take it out on someone or something else <sup>a</sup>	1.48 (.72)	1.43 (.61)	1.60 (.81)	.58	
Can accurately describe his/her disability to others <sup>a</sup>	2.69 (1.12)	2.14 (.91)	3.23 (1.07)	9.09**	DS > WS
Knows not to talk to strangers and follows that rule <sup>a</sup>	2.50 (1.17)	2.29 (.79)	2.63 (.89)	1.12	
Was taught to think for him/herself <sup>a</sup>	2.00 (1.06)	1.71 (.67)	2.10 (.96)	1.65	
Consults parents before making important decisions <sup>a</sup>	2.04 (1.15)	1.63 (.69)	2.13 (1.11)	2.44	
Is able to read social cues, such as facial expressions (anger, teasing) <sup>a</sup>	2.73 (1.00)	2.03 (.51)	2.07 (.87)	9.41**	ASD > WS, DS
Social protection	12.71 (3.21)	10.25 (3.17)	9.53 (3.21)	6.91**	ASD > DS, WS
Has many friends <sup>a</sup>	3.21 (1.03)	2.38 (1.04)	2.33 (.96)	7.23**	ASD > WS, DS
Is considered a part of a social peer group <sup>a</sup>	3.18 (.90)	2.46 (1.02)	2.30 (.85)	7.51**	ASD > WS, DS
Lives close to friends <sup>a</sup>	3.21 (1.07)	2.76 (1.12)	2.55 (1.09)	2.92	
Is isolated from peers	2.93 (1.05)	2.43 (.87)	2.39 (1.09)	2.66	
Perceived vulnerability	10.67 (3.25)	12.81 (1.99)	14.54 (2.05)	16.36**	DS > WS > ASD
Others consider him/her to look different from same aged peers	2.38 (1.21)	3.18 (.69)	3.79 (.64)	21.32**	DS > WS > ASD
Others perceive him/her to have a disability	3.28 (1.03)	3.32 (.70)	3.85 (.44)	6.28*	DS > WS, ASD
Others perceive as immature/naïve	3.28 (.92)	3.05 (.73)	3.38 (.85)		
Is smaller than individuals the same age	1.59 (1.12)	3.13 (1.17)	3.53 (.90)	2.845**	DS, WS > ASD
Parental independence	6.54 (3.34)	7.16 (2.80)	5.14 (1.80)	4.31*	WS > DS
Parents are likely to leave alone for extended period of time (overnight)	1.97 (1.27)	1.84 (1.14)	1.24 (.50)	4.85*	WS, ASD > DS
Parents allow to be with individuals of the opposite sex with no supervision	2.07 (1.28)	2.32 (1.18)	1.64 (.90)	3.30*	WS > DS
Parents allow to be with older individuals with no supervision	2.59 (1.22)	2.84 (1.05)	2.41 (.99)		
Credulity	13.88 (4.12)	13.72 (3.03)	12.96 (3.84)	.49	

Note: SVQ, Social Vulnerability Questionnaire; ASD, autism spectrum disorder; WS, Williams syndrome; DS, Down syndrome.

<sup>a</sup> Item is reverse-scored.

\*  $p < .05$ .

\*\*  $p < .01$ .

independence (those with ASD did not differ from either the WS or DS groups). Compared to parents of individuals with DS, parents of individuals with WS were more likely to leave them alone for an extended period of time and to allow them to be with members of the opposite sex unsupervised.

#### 4. Discussion

Extending beyond studies of increased victimization among individuals with disabilities, this study explored the types of victimization and ratings of social vulnerability among individuals with specific disability conditions: ASD, WS, and DS. This study, then, goes beyond prior studies that examined individuals with disabilities as a heterogeneous group, attempting instead to determine whether certain features might make each group more or less vulnerable to victimization. This study produced two main findings.

First, based on the specific phenotype of each disability condition, we hypothesized that individuals with ASD, WS, and DS would experience different types of victimization. Contrary to expectations, however, these three groups reported victimization at equally high rates. In this study, 73% of all individuals were victimized, but such victimization occurred at near-equal rates. Furthermore, individuals in these three groups experienced similar types of victimization, with all groups experiencing victimization related to teasing and persuasion, money and theft, and abuse. Although a trend existed for individuals with DS (versus those with WS and ASD) to experience less teasing and persuasion and more abuse, few striking differences emerged across groups.

At the same time, however, important between-group differences emerged with respect to social vulnerability. Specifically, the social vulnerability of individuals with ASD seemed related to their having less social protection from peers, with this group having fewer friends and being less likely to be a part of a peer network. Indeed, some of these differences were striking, often on the order of an entire standard deviation lower. Conversely, the vulnerability of those with WS more related to parental independence. This independence was specifically related to being left alone overnight and to being allowed to be with members of the opposite sex without supervision. Within the DS group, social vulnerability seemed to combine aspects of several domains that were shared with other groups. Thus, similarly to the group with WS (but not with ASD), the DS group was perceived as looking more vulnerable (look different, smaller physically, perceived to have a disability). Similarly, along with ASD (but not in WS), those with DS were rated as being less aware of risks (less likely to tell authority figure about bullying or scam behaviors, less likely to know that s/he has a disability, and much less able to describe his/her disability to others). Ultimately, the three groups seemed to be reaching the same outcome via different roads – each showed exceptionally high levels of social vulnerability, but the specific forms of social vulnerability differed by group.

Practically, interventions might need to be tailored to different disability conditions. For example, individuals with ASD seemed to be especially vulnerable because they are less likely to have social protection. A strong peer network would seem an important protective factor for decreasing bullying and other interpersonal violence (Cappadocia et al., 2012). Unfortunately, the social isolation experienced by individuals with ASD can increase their risk of being taken advantage of by individuals both known and unknown to them. Thus, providing social skills interventions and ways to increase friendships may help to reduce the vulnerability to victimization specifically experienced by individuals with ASD. In fact, adolescents with disabilities who have greater social skills are significantly less likely to be victimized than those with poor social skills (Sterzing et al., 2012b). Specific strategies thus need to be in place to promote inclusive practices to help students with ASD be fully included in general education classrooms and to develop peer networks (Rose, Espelage, & Monda-Amaya, 2009).

Conversely, the social vulnerability of individuals with WS seemed related to increased independence from their parents. For these individuals, self-protection skills should be taught. Most successful, then, might be programs such as those designed to teach individuals with WS how to appropriately respond to strangers (Fisher, Burke, & Griffin, 2013; Fisher, under review) and how to avoid sexual abuse (Egemo-Helm et al., 2007). The greater use of such programs – specifically targeted to this group – might best allow young adults with WS the independence to be alone without parental supervision while reducing social vulnerability.

The social vulnerability of individuals with ASD and with DS was related to lessened abilities to detect risk in certain situations. This lack of awareness may put them in danger of social victimization, as they might not employ the skills necessary to protect themselves. These individuals were less likely to tell someone if something questionable happened and they were less likely to consult parents before making important decisions. Teaching individuals with ASD and DS the importance of consulting with parents may help them learn more safety skills. Furthermore, these individuals would benefit from training on making appropriate decisions when confronted with a decision-making dilemma (Khemka, Hickson, & Reynolds, 2005) and displaying assertiveness and recognizing mistreatment (Sterzing et al., 2012a).

Finally, compared to those with ASD, individuals with WS and DS were more likely to be perceived as vulnerable, mostly due to each syndrome's physical characteristics. These disabilities both have particular characteristics that make their disability more easily recognized. This perception of having a disability and looking vulnerable could make individuals with WS and DS a good target for predators, as predators often target victims with disabilities because they are perceived to be unable to seek help, detect ill-intentions, or because they might be unable to report the crime (Bryen, Carey, & Frantz, 2003; Lang & Frenzel, 1988). Again, interventions to teach self-protection skills would be an important line of defense for both individuals with WS and DS.

It is also important to acknowledge the limitations of this study. First, because we did not specifically ask at what age victimization occurred, we could not determine the direction of effects between vulnerability and victimization. With future studies including several measures over time, one might determine pathways for victimization. In addition, our questionnaire items pertained to instances of victimization more generally, but did not home in on developmentally relevant forms of victimization. Third, all items were rated by parents and guardians, who may know only a sub-set of instances in which their children have been victimized. Fourth, data were gathered from a sample of convenience – volunteers responding to announcements. As such, respondents may have been biased toward those whose child had experienced some form of victimization. Finally, although this study included over 100 respondents, future research would benefit from examining information with more participants.

Even given these limitations, however, this study expands victimization research by exploring the amount and types of victimization, as well as correlates of social vulnerability for persons with ASD, WS, and DS. Although the rate and nature of victimization appeared similar across the three groups, the hypothesized pathways to social vulnerability differed markedly. By identifying different correlates relating to social vulnerability in these conditions, intervention research should now focus on improving programs aimed at reducing victimization and vulnerability for individuals with ASD, WS, and DS.

## References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., TR). Washington, DC: Author.
- Bryen, D., Carey, A., & Frantz, B. (2003). Ending the silence: Adults who use augmentative communication and their experiences as victims of crimes. *Augmentative and Alternative Communication*, 19, 125–134.

- Cappadocia, C. M., Weiss, J., & Pepler, D. (2012). Bullying experiences among children and youth with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 42, 266–277.
- Davies, M., Udwin, O., & Howlin, P. (1998). Adults with Williams syndrome: Preliminary study of social, emotional, and behavioural difficulties. *British Journal of Psychiatry*, 172, 273–276.
- Doren, B., Bullis, M., & Benz, M. R. (1996). Predictors of victimization experiences of adolescents with disabilities in transition. *Exceptional Children*, 63, 7–18.
- Dykens, E. M. (2000a). Psychopathology in children with intellectual disability. *Journal of Child Psychology and Psychiatry*, 41, 407–417.
- Dykens, E. M. (2000b). Annotation: Psychopathology in children with intellectual disability. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 41, 407–417.
- Dykens, E. M., & Lense, M. (2011). Intellectual disabilities and autism spectrum disorder: A cautionary note. In D. Amaral, G. Dawson, & D. Geschind (Eds.), *Autism spectrum disorders* (pp. 263–270). Oxford: Oxford University Press.
- Dykens, E. M., & Rosner, B. A. (1999). Refining behavioral phenotypes: Personality-motivation in Williams and Prader-Willi syndromes. *American Journal on Mental Retardation*, 104, 158–169.
- Egemo-Helm, K. R., Miltenberger, R. G., Knudson, P., Finstrom, N., Jostad, C., & Johnson, B. (2007). An evaluation of in situ training to teach sexual abuse prevention skills to women with mental retardation. *Behavioral Interventions*, 22, 99–119.
- Fisher, M. H. Evaluation of a stranger safety training program for adults with Williams syndrome, under review.
- Fisher, M. H., Burke, M. M., & Griffin, M. M. (2013). Teaching young adults with intellectual and developmental disabilities to respond appropriately to lures from strangers. *Journal of Applied Behavior Analysis* (advance online publication).
- Fisher, M. H., Moskowitz, A. L., & Hodapp, R. M. (2012). Vulnerability and experience related to social victimization among individuals with intellectual and developmental disabilities. *Journal of Mental Health Research in Intellectual Disabilities*, 5, 32–48.
- Greenspan, S., Loughlin, G., & Black, R. S. (2001). Credulity and gullibility in people with developmental disorders: A framework for future research. In Glidden, L. M. (Ed.), *International Review of Research in Mental Retardation*, 24, 101–135.
- Hillier, L. W., Fulton, R. S., Fulton, L. A., Graves, T. A., Pepin, K. H., Wagner-McPherson, C., et al. (2003). The DNA sequence of human chromosome. *Nature*, 7(424), 157–164.
- Hodapp, R. M., & Dykens, E. M. (1994). Mental retardation's two cultures of behavioral research. *American Journal on Mental Retardation*, 98, 675–687.
- Jawaid, A., Riby, D. M., Owens, J., White, S. W., Tarar, T., & Schulz, P. E. (2012). 'Too withdrawn' or 'too friendly': Considering social vulnerability in two neurodevelopmental disorders. *Journal of Intellectual Disability Research*, 56, 335–350.
- Jones, W., Bellugi, U., Lai, Z., Chiles, M., Reilly, J., Lincoln, A., & Adolphs, R. (2000). Hypersociability in Williams syndrome. *Journal of Cognitive Neuroscience*, 12, 30–46.
- Khemka, I., Hickson, L., & Reynolds, G. (2005). Evaluation of a decision-making curriculum designed to empower women with mental retardation to resist abuse. *American Journal of Mental Retardation*, 110, 193–204.
- Lang, R., & Frenzel, R. (1988). How sex offenders lure children. *Annals of Sex Research*, 1, 303–317.
- Mandell, D. S., Walrath, C. M., Manteuffel, B., Sgro, G., & Pinto-Martin, J. A. (2005). The prevalence and correlates of abuse among children with autism serves in comprehensive community-based mental health settings. *Child Abuse and Neglect*, 29, 1359–1572.
- Mervis, C. B., & John, A. E. (2010). Cognitive and behavioral characteristics of children with Williams syndrome: Implications for intervention approaches. *American Journal of Medical Genetics Part C*, 154C, 229–248.
- Porter, M. A., Coltheart, M., & Langdon, R. (2007). The neuropsychological basis of hypersociability in Williams and Down syndrome. *Neuropsychologia*, 45, 2839–3849.
- Rose, C. A., Espelage, D. L., & Monda-Amaya, L. E. (2009). Bullying and victimisation rates among students in general and special education: A comparative analysis. *Educational Psychology*, 29, 761–776.
- Rosner, B. A., Hodapp, R. M., Fidler, D. J., Sagun, J. N., & Dykens, E. M. (2004). Social competence in persons with Prader-Willi, Williams and Down's syndromes. *Journal of Applied Research in Intellectual Disabilities*, 17, 209–217.
- Rowley, E., Chandler, S., Baird, G., Siminoff, E., Pickles, A., Loucas, T., & Charman, T. (2012). The experience of friendship, victimization, and bullying in children with an autism spectrum disorder: Associations with child characteristics and school placement. *Research in Autism Spectrum Disorders*, 6, 1126–1134.
- Sentenac, M., Gavin, A., Arnaud, C., Molcho, M., Godeau, E., & Gabhainn, S. N. (2012). Victims of bullying among students with a disability or chronic illness and their peers: A cross-national study between Ireland and France. *Journal of Adolescent Health*, 48, 461–466.
- Sobsey, D., & Doe, T. (1991). Patterns of sexual abuse and assault. *Sexuality and Disability*, 9, 243–259.
- Sterzing, P. R., Shattuck, P. T., Narendorf, S. C., Wagner, M., & Cooper, B. P. (2012a). Bullying involvement and autism spectrum disorders. *Archives of Pediatrics and Adolescent Medicine* (published online 03.09.12).
- Sterzing, P. R., Shattuck, P. T., Narendorf, S. C., Wagner, M., & Cooper, B. P. (2012b). Bullying involvement and autism spectrum disorders. Prevalence and correlates of bullying involvement among adolescents with an autism spectrum disorder. *Archives of Pediatrics and Adolescent Medicine*, 166, 1058–1064.
- Sullivan, P. M., & Knutson, J. F. (2000). Maltreatment and disabilities: A population-based epidemiological study. *Child Abuse & Neglect*, 24, 1257–1273.
- Van Roekel, E., Scholte, R. H. J., & Didden, R. (2010). Bullying among adolescents with autism spectrum disorders: Prevalence and perception. *Journal of Autism and Developmental Disorders*, 40, 63–73.
- Wilson, C., & Brewer, N. (1992). The incidence of criminal victimisation of individuals with an intellectual disability. *Australian Psychologist*, 27, 114–117.
- Wilson, C., Seaman, L., & Nettlebeck, T. (1996). Vulnerability to criminal exploitation: Influence of interpersonal competence differences among people with mental retardation. *Journal of Intellectual Disability Research*, 40, 8–16.