


# Conceptualizing bullying in children with autism spectrum disorder: Using a mixed model to differentiate behavior types and identify predictors

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## Abstract

Children with autism spectrum disorder experience bullying more frequently than their typical peers. Inconsistent definitions for and imprecise measurement of bullying in the literature impede a better understanding of this difference, and multiple types of bullying topographies create additional dimensions for analysis. In this study, participants rated the severity of bullying depicted in written vignettes of child-dyadic interactions. The vignettes varied across child age (4–15 years old) and described either one of four different types of bullying or non-bullying behavior. Participants included teachers and parents of children with autism spectrum disorder and community members without an autism spectrum disorder child. Participants' severity ratings of vignettes that described bullying differed by bullying type (i.e. verbal, physical, cyber, and interpersonal). Multilevel modeling revealed that bullying severity ratings are impacted by the age of children in the vignette, being a community member without children, and other demographic variables. These findings have implications for research methodology, assessment, and conceptualization of bullying in typical children as well as those with autism spectrum disorder.

## Keywords

assessment, autism spectrum disorders, bullying, methodology, parents, teachers, victimization, vignette

Children with autism spectrum disorder (ASD) are bullied by peers more frequently than typically developing children (Humphrey and Symes, 2010). The published rates of bullying in children with ASD vary considerably, from 46% to 94% (Sreckovic et al., 2014); these rates are higher than reported for typical children (8%–42%; Nowell et al., 2014; Zeedyk et al., 2014) and often exceed those from other child clinical populations (Blake et al., 2012; Mayes et al., 2015). The high prevalence rates in children with ASD are particularly concerning, given that bullying carries its own set of adverse consequences, including internalizing problems, negative emotional responses, and physiological distress (Bitsika and Sharpley, 2014; Zablotsky et al., 2013; Zeedyk et al., 2014). Without intervention, these problems with mental and physical health often extend into adulthood (Copeland et al., 2013; Schwartz et al., 2015; Wolke et al., 2013).

Proposed explanations for the higher rate of bullying reported in children with ASD include: social communication deficits (Cappadocia et al., 2012; Schroeder et al.,

2014), poor executive function skills (Jahromi et al., 2012; Kloosterman et al., 2014; Rieffe et al., 2012), and the presence of repetitive behaviors (Adams et al., 2014). These variables may interact with each other to increase children with ASD's vulnerability for experiencing bullying (Crowley et al., 2016). Theoretical mechanisms warrant further research; however, recent meta-analyses conclude that bullying prevalence rates in children with ASD are imprecise due to differences in conceptualizing and measuring bullying across studies (Maïano et al., 2016; Sreckovic et al., 2014). Thus, it is unclear if the bullying prevalence differences reported between children with ASD and other populations are due to true group

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differences or perhaps reflect methodological variation and weakness.

### **Bullying definition**

Bullying was initially conceptualized as verbal or physical aggression, and has since shifted to include interpersonal bullying (Smith, 2016). Cyberbullying has also recently emerged as an area of concern (Olweus and Limber, 2018). Perhaps, in part, due to this expanding conceptualization, there is no single generally accepted definition of bullying in either typical children or those with ASD (Espelage and Swearer Napolitano, 2003). As demonstrated below, bullying definitions are variable and often nonspecific.

The definition coined by Olweus (1993, 1997) is perhaps referenced most frequently:

A person is bullied when he or she is exposed, repeatedly and over time, to negative actions on the part of one or more other persons, and he or she has difficulty defending himself of herself.

More recently, the Centers for Disease Control and Prevention (CDC) published the following definition from their Uniform Bullying Definition Project:

Bullying is any *unwanted aggressive behavior(s)* by another youth or group of youths who are not siblings or current dating partners that involves an *observed or perceived power imbalance and is repeated multiple times or is highly likely to be repeated*. Bullying may inflict harm or distress on the targeted youth including physical, psychological, social, or educational *harm*. (emphasis in original; Gladden et al. (2014: 7))

Smith et al. (2013) summarize bullying definitions by listing the following criteria:

- It is an aggressive act.
- It is perpetrated via any of the forms of aggression (e.g. physical, verbal, cyber, direct, or indirect).
- There is an imbalance of power between the perpetrator and the target (the victim finds it difficult to defend him/herself).
- It has some element of repetition (these things can happen frequently).

These definitions all describe bullying as aggressive behavior directed by one individual toward another and require an imbalance of power. Differences in these bullying definitions include a requirement for repeated offenses, the intent to cause harm, the types of bullying behaviors described, and the inclusion of exemplar behaviors. When definitions of bullying do include exemplar behaviors, these tend to overrepresent overt or physical bullying (Sawyer et al., 2008), which may generate under-reporting in specific populations (e.g. girls; Hartung et al., 2011). It

is also not known how these bullying definitions apply to the experiences of children with ASD. Lack of specificity for children with ASD further impedes comparison of results across studies (Humphrey and Hebron, 2015; Schroeder et al., 2014).

### **Bullying types**

Bullying can be characterized as verbal, physical, interpersonal (aka. social and relational), or cyber/electronic types of bullying behaviors (Cappadocia et al., 2012; Gladden et al., 2014). Within each type, children with ASD are bullied more frequently than their typical peers (Campbell et al., 2017). Within the ASD population, some types of bullying may occur with higher frequency than others. Mixed results indicate that physical bullying may be more common than interpersonal bullying (Humphrey and Symes, 2010); in contrast to these findings, other studies have reported that verbal and interpersonal bullying occur more frequently than other types (Cappadocia et al., 2012; Maiano et al., 2016). Children with ASD may be at an increased risk of cyberbullying due to their affinity for digital interactions (Kowalski and Fedina, 2011); however, similar prevalence rates have been found in comparison to typical children (Campbell et al., 2017). Cyberbullying may occur less frequently than other types (Schroeder et al., 2014), but it is important to note the relative lack of research compared with other bullying types (Gladden et al., 2014; Humphrey and Symes, 2010). Studies on bullying in children with ASD often do not distinguish among these bullying types. Differentiating prevalence estimates for each type of bullying would provide a more precise assessment of bullying in children with ASD (Maiano et al., 2016; Nowell et al., 2014). Consistency is also needed across studies regarding which exemplar behaviors are provided to describe each type of bullying (Farmer and Aman, 2009; Kloosterman et al., 2013). The use of inconsistent definitions for each bullying type further contributes to the prevalence rate variability.

### **Bullying assessment**

Bullying in children with ASD is most commonly measured using self-report questionnaires administered to parents or teachers. The questionnaire used in a given study varies and can include those designed to measure bullying in typical children (The Bully Victimization Scale; Reynolds, 2003; Twyman et al., 2010; the Olweus Bully-Victim Questionnaire (OBVQ); Kowalski and Fedina, 2011; Olweus, 1993, 1997; and the University of Illinois Bully Scale, Fighting Scale, and Victimization Scale; Espelage and Holt, 2001) or researcher-selected items about peer interactions from other child behavior questionnaires (e.g. Child Behavior Checklist (CBCL); Achenbach and Rescorla, 2009; Nowell et al., 2014; Strengths and

Difficulties Questionnaire (SDQ), Goodman, 1997; Rowley et al., 2012). Asking caregivers a general question is also commonly used to determine if a child is bullied (e.g. “has your child experienced bullying in the past month?”; Cappadocia et al., 2012; Montes and Halterman, 2007; Van Roekel et al., 2010; Zablotsky et al., 2012). Alternatively, some researchers developed a coding algorithm to quantify conversations (e.g. Autism Diagnostic Observation Schedule (ADOS) Module 3 questions about relationships; Rowley et al., 2012) or created new measures to assess bullying in children with ASD (e.g. Bullying and School Experiences of Children with ASD Survey (BSE); Zablotsky et al., 2013, 2014).

Direct comparison of these bullying assessment methods produces variable prevalence rates in both children with disabilities (Bear et al., 2015) and typical samples (Hartung et al., 2011; Sawyer et al., 2008). A recent review of bullying in children with ASD found that only 2 of 15 studies used the same questionnaire to report prevalence rates (Sreckovic et al., 2014). Many assessment methods contain different definitions for or exemplar behaviors of bullying, which compounds difficulty with reliable comparison across studies (Hartung et al., 2011; Nowell et al., 2014). For example, higher rates of bullying are reported when respondents are asked about specific behaviors as opposed to the use of a general statement (i.e. “My child was bullied in this school; Bear et al., 2015). Systematic and consistent assessment measures that are conceptually and methodologically sound would likely reduce variability in prevalence rates (Maïano et al., 2016). The experiences of children with ASD may also differ from typical children, warranting consideration of adapted assessment measures (Schroeder et al., 2014; Sterzing et al., 2012).

### ***Bullying informant***

The relationship of the informant (e.g. parents and teachers) to a child with ASD may also impact reported bullying prevalence. Some research has found consistency between parent- and teacher-reports of bullying in both typical children (Nowell et al., 2014) and those with ASD (Rowley et al., 2012). However, greater frequency of bullying has been reported by teachers (Chen and Schwartz, 2012) or parents of children with ASD in comparison with other respondent groups (Hebron and Humphrey, 2014; Nowell et al., 2014). Having a relationship with an ASD child may also influence that individual’s interpretation of a bullying or non-bullying event (Blood et al., 2013; Nowell et al., 2014). Finally, some types of bullying may be less familiar or observable to informants (e.g. cyberbullying; Kowalski and Fedina, 2011).

### ***Child age***

Bullying behavior changes with development, which likely impacts prevalence rates. In typical children and

those with ASD, overall bullying frequency generally decreases with age (Cappadocia et al., 2012; Hartung et al., 2011). Some research also suggests a spike in bullying behaviors in middle school (Sreckovic et al., 2014). Similar interactions between developmental trajectories and type of bullying behavior have been reported for children with ASD and typical development, including a decrease in physical bullying with age but increase in other forms of bullying with age (i.e. verbal, relational, and cyber; Cappadocia et al., 2012; Fu et al., 2016; Little, 2002).

Child age, combined with an ASD diagnosis, may also influence an informant’s response on bullying assessment measures. Parents of children with ASD may be more attune to bullying in older, rather than younger children (Nowell et al., 2014). Developmental relevance of exemplar bullying behaviors may also create differences in age-related reports of bullying between typical children and those with ASD (Farmer and Aman, 2009). Further investigation of developmental trajectories for different types of bullying in children with ASD is needed (Sreckovic et al., 2014).

### ***Present study***

There is a lack of established definition or gold-standard assessment tool for measuring bullying in children with ASD, and the different types of bullying are also not reliably defined or measured. Thus, responses to bullying assessment questionnaires are subject to individual interpretation and likely impacted by many external variables. This study aims to investigate differentiation among types of bullying behaviors and how external variables may impact responses on bullying assessment measures (i.e. bullying type, participant group, child age, and demographic variables). Conceptualizing differences among types of bullying behavior and investigating variables that impact bullying assessment in children with ASD could enhance understanding of prevalence rate variability and the phenomenology of bullying for children with ASD.

## **Method**

### ***Participants***

Criteria for participation are as follows: at least 18 years of age, ability to read English, and access to the Internet. Participants were 297 adults, divided into groups based on the existence and type of relationship to a child with ASD. The following groups were identified: parent of child with ASD (ASD Parent;  $n=63$ ), teacher of child with ASD (ASD Teacher;  $n=70$ ), both parent and teacher of child with ASD (ASD ParTeach;  $n=28$ ), parent of typically developing child (Typical Parent;  $n=28$ ), and community member without children (No Child;  $n=108$ ). Groupings were based on questions about having a relationship with a

child with special needs. However, when an individual noted a relationship with a special needs child, this primarily referred to a child with ASD (ParentASD: 80% child with ASD; TeacherASD: 74%). Also of note, the ASD teacher classification comprised any participants providing educational or other direct services for individuals with special needs. Recruitment efforts were broad and solicited members of the above groups. Participants were recruited from local and regional school districts, advocacy and parent groups, organizations that provide clinical services, community announcement boards, the researchers' university electronic listservs, and the researchers' website. See Appendix 1 for further characterization of the sample.

### Materials

Participants in this study completed the author-developed *Bullying Scenarios Survey* and demographic questions. Participants could enter their name and contact information in a separate questionnaire for a chance of compensation via gift card drawing. All participation occurred online (via SurveyMonkey).

*The bullying scenarios survey.* The *Bullying Scenarios Survey* contains 80 vignettes that describe brief (2–3 sentences) interactions between two school-age children. Names of the children in the vignettes are represented with initials to eliminate the possible confound of sex. The vignettes vary by the age of the children being described (4–15 years old), with both children in each vignette being the same age. There are 64 bullying vignettes that vary by the type of bullying behavior (i.e. physical, verbal, interpersonal, and cyber). The survey also contains 16 vignettes of age-appropriate (non-bullying) behavior.

Vignettes were developed based on a review of the bullying literature. This review identified 24 examples of bullying behaviors used in other studies or measures for children with ASD. These examples were organized into the four latent classes or types of bullying: physical, verbal, interpersonal/relational, and cyber (Bradshaw et al., 2015). Vignettes were then written describing child-dyadic interactions for four example behaviors within each bullying type. Of note, cyberbullying vignettes were based on subtypes identified via factor analysis (Palladino et al., 2015). One vignette was written for each age group (i.e. 4–6, 7–9, 10–12, and 13–15 years old) within each bullying type, producing 64 bullying and 16 non-bullying vignettes. Each non-bullying vignette was composed by modifying a bullying vignette to describe a similar but neutral interaction. See Table 1 of Appendix 2 for descriptions of initial vignette subtypes.

Each participant was quasi-randomly presented with 16 bullying vignettes, including one vignette from each subtype and varying across age. Each participant also saw

four non-bullying vignettes, varying by subtype and age. For each vignette, participants rated the severity of the child-dyadic interaction and indicated which type(s) of bullying were present (see Figure 1 of Appendix 2 for vignette example and full rating scale).

### Planned analyses

The primary outcome variable for this study was the severity ratings (from the 0–7 Likert-type scale) for each of the bullying types and overall. Differences for bullying versus non-bullying severity ratings were computed using a paired-samples *t*-test; differences among bullying types were computed using a general linear model (analysis of variance (ANOVA)). Multilevel modeling was used to examine how group type, bullying type, child age, and other demographic variables might predict variability in subjective ratings of bullying severity. Multilevel modeling consists of a linear regression modified for models with hierarchical (or nested) data structures. A repeated measures multilevel model was used to account for the impact of each participant viewing 20 different vignettes. Within this model, vignettes were nested within participants.

### Preliminary vignette classification

As described above, 16 vignettes were written for each of the bullying types (e.g. verbal and physical) and also for non-bullying behaviors. Participant responses were used to confirm classification of each vignette prior to analysis of subjective severity ratings.

*Bullying versus non-bullying.* Classification of each vignette as describing a bullying versus non-bullying interaction was confirmed based on the most frequent participant response (e.g. “None” versus a bullying type endorsed—sum of “Verbal,” “Physical,” “Interpersonal,” or “Cyber” responses). Two vignettes were excluded because there was not a 50% consensus for a bullying or non-bullying classification. This failure to achieve 50% consensus can be explained by the possibility for respondents to characterize vignettes as “Other” or to indicate they did not know what type of behavior was present.

*Bullying type comparisons.* Participant responses were also used to confirm classification of bullying vignettes across the four types of bullying behaviors. One additional bullying vignette was excluded because there was not a 50% consensus for the type of bullying it described. See Table 2 of Appendix 2 for final vignette classification.

Respondents could provide more than one classification for a vignette by selecting multiple checkboxes. However, confirmation of vignette classifications (described above) was based on responses when only one type of bullying (or non-bullying) was assigned. A singular

classification was provided by 23%–60% of respondents for each vignette. Agreement between researcher planned and participant classifications was high, with 80% of vignettes retaining their original bullying type classification. The analyses below were conducted for the full data set based on the participant-response classifications. See Table 3 of Appendix 2 for more detailed vignette descriptions.

## Results

### Preliminary analyses

To identify outliers, the mean and median number of vignettes seen by each participant were examined. A total of 45 participants who discontinued participation before responding to all 20 vignettes were identified as statistical outliers and were excluded from the analyses. Next, severity ratings for bullying versus non-bullying vignettes were compared to determine if respondents differentiated between bullying and non-bullying behaviors. Overall, bullying vignettes were rated as more severe ( $M=3.38$ ,  $SD=1.05$ ) than non-bullying vignettes ( $M=0.44$ ,  $SD=0.80$ ;  $t(296)=42.83$ ,  $p<0.001$ ; see Appendix 2). Across respondent groups, severity rates also differed among bullying types ( $F(4,567.05)=745.54$ ,  $p<0.001$ ). Post hoc probing with Bonferroni correction revealed significantly higher severity ratings for physical bullying vignettes ( $M=3.95$ ,  $SD=0.08$ ) in comparison to cyberbullying vignettes ( $M=3.49$ ,  $SD=0.08$ ,  $p<0.001$ ). Both physical and cyberbullying vignettes were rated as more severe than interpersonal bullying vignettes ( $M=3.05$ ,  $SD=0.07$ ,  $p<0.001$ ) or verbal bullying vignettes ( $M=3.00$ ,  $SD=0.07$ ,  $p<0.001$ ) which did not differ from each other. Each of the four bullying types was also rated as more severe than non-bullying vignettes (all  $p$  values  $<0.001$ ; see Appendix 3).

### Mixed model

Prior to modeling, dummy coding was used to create a unique variable for each factor level of polytomous variables. This coding allows calculation of the variance contributed by each factor level. A random intercept was included to examine the effect of predictor variables against reference groups. For group type, the ASD teachers group was used as the reference (intercept) group. This approach permitted investigation of how not only the presence but also the type of ASD relationship might impact bullying perceptions. For vignette type, non-bullying vignettes were used as the comparison group. Finally, continuous variables were mean centered in preparation for modeling.

A repeated measures mixed model was used to investigate the impact of external variables on bullying severity

ratings. We compared  $-2LL$  estimates using chi-square statistics to build a model of variables that predicts variance in severity ratings. The compound symmetry (CS) covariance structure was used to account for within-subject effects. A covariance structure that considers the distance between and order of responses was not deemed appropriate due to the randomized presentation of vignettes.

The best-fit model revealed several significant predictor variables. Each type of bullying predicted significantly higher vignette severity ratings. Being a community group member without children predicted significantly lower vignette severity ratings. All interactions between group type  $\times$  vignette type were not significant and thus, not included in the best-fit model.

Regarding child age, older age of children in the vignettes also predicted higher severity ratings. Significant interactions between child age and vignette type revealed that older child age predicted higher severity ratings for verbal and cyberbullying. In contrast, older child age predicted lower severity ratings for physical bullying vignettes. Finally, group type significantly interacted with child age such that being an ASD parent predicted increased severity ratings especially as child age increased.

Finally, the impact of demographic variables on vignette severity ratings was explored. All demographic variables of interest were added to the model and then individually removed using backward deletion. This method sequentially identifies and removes the variable that contributes the least amount of variance to the model (smallest absolute  $t$ -value) until only variables that contribute significant variance are retained. This exploration revealed that being an individual with some college education and being a bully or victim in youth predicted increased vignette severity ratings. In contrast, being an individual with a college degree, being married, and growing up in the western United States region predicted decreased vignette severity ratings. Predictors that did not significantly impact model fit included the following: age, gender, race, type of area grew up in (e.g. urban, suburban, or rural), attending a public school in youth, and having a relative with a mental health diagnosis. These nonsignificant predictors were not included in the final model.

The final model was a better fit than the initial baseline model without any predictors ( $\chi^2(19)=-3100.28$ ,  $p<0.001$ ). The final model was also a better fit than the model without demographic predictors at the trend level ( $\chi^2(6)=-11.39$ ,  $p<0.1$ ). Variability in remaining covariance (as measured by Wald  $Z$ ) was noted throughout model testing and prevented calculation of how much variance these predictors explained. Such variability can occur in two-level models and may be due to chance fluctuations (Snijders and Bosker, 1994). The coefficients for the final model are presented in Appendix 4.

## Discussion

The purpose of this study was to differentiate among types of bullying and determine factors that may impact variability in bullying assessment. Without a gold-standard assessment tool for or definition of bullying, bullying prevalence rates are likely impacted by respondent perceptions. These results indicate that the type of bullying behavior does impact perceived severity of bullying (i.e. physical >cyber >interpersonal=verbal >non-bullying). The highest severity ratings for physical bullying vignettes is congruent with emphasis on physical bullying in the literature (Sawyer et al., 2008). The physical bullying examples in this study all described a bully doing something directly to a victim, which also supports distinction between direct and indirect behaviors (Olweus, 1997).

Within the mixed model, increased child age predicted higher bullying severity ratings. This relationship was even stronger for ASD parents, indicating that bullying may be viewed as especially problematic by parents of older children with ASD. Significant interactions between child age and type of bullying also highlight potential differences in developmental trajectories of bullying severity. These interactions are consistent with trajectories of bullying frequency and child age (Fu et al., 2016; Hebron and Humphrey, 2014). For example, reduced frequency of physical bullying in older children (Bradshaw et al., 2015) may be partially explained by physically bullying also being viewed as less severe as children age. In addition, increased child age predicting greater severity of verbal bullying may reflect the use of more sophisticated verbal bullying strategies by teenagers. Finally, the increase in severity of cyberbullying with child age is consistent with increased use of social digital technology in older children. This finding is especially important given that many assessments of bullying do not reference cyber behavior (Gladden et al., 2014).

Regarding group membership variables, being an ASD parent was not a significant predictor of bullying severity ratings in comparison to ASD teachers. Thus, the type of relationship with an ASD child does not significantly impact perceptions of bullying. However, being an individual without children predicted significantly lower subjective ratings of bullying severity in comparison to ASD teachers. This finding provides some support for previous research that having a relationship with an ASD child impacts interpretation of bullying situations (Blood et al., 2013). However, it is not known how this type of relationship might contribute to reported frequency of bullying.

Demographic variables that predicted subjective severity ratings may also impact the way respondents complete bullying assessment measures. The nonsignificant impact of gender and race on severity ratings is congruent with existing research that these variables also do not explain the likelihood to experience bullying (Hebron

and Humphrey, 2014). However, perpetrating or experiencing bullying in youth predicted higher severity ratings. It is possible that adults who were previously involved in bullying are more attuned to the bullying experience of a child. The presence of additional significant demographic predictors (i.e. some college education, 4-year college degree, married status, western United States origin) highlights the complexity of understanding bullying. Additional research is needed to examine how particular regional or demographic factors may impact bullying perceptions. The marginal improvement in model fit with these demographic predictors supports previous findings that it is difficult to predict bullying vulnerability (Redmond, 2011). Bullying is a complex construct, particularly in children with ASD.

## Limitations

This study contributes understanding of how individuals conceptualize bullying and non-bullying child interactions; however, several limitations are noted. First, classification of bullying vignettes was based on the most frequently endorsed type among respondents who only indicated one bullying type. Vignette classification may have differed if all respondents were required to only select one bullying type. Allowing multiple responses to collect a breadth of information about respondent perceptions was prioritized. Second, participant groupings were based on reported relationship to a child with special needs. This methodology increased our power to detect group differences. A high percentage of parents and teachers of children with special needs indicated that the referent child(ren) did have an ASD diagnosis. Thus, these results likely represent perceptions of individuals who have ASD relationships. Finally, information was not collected about the occupation of respondents. Some individuals may have held occupations peripherally related to a special needs teacher that impacted their perceptions (e.g. general education teacher, sports coach, other healthcare provider, and psychologist).

## Conclusion and future directions

These results indicate bullying is a broad construct that can be impacted by many factors. Simplifying questions into the dichotomous presence/absence of bullying likely contributes to heterogeneity in prevalence estimates. The differences in severity ratings among bullying types indicate the need to assess each of these different types of behavior (e.g. Cappadocia et al., 2012). Defining each bullying type would also likely increase reliable responding and facilitate more consistent assessment across studies.

Significant interactions among respondent relationship, bullying type, and child age further highlight the complex nature of bullying assessment. Bullying behaviors may

have different topography in special populations and as children age. In addition, bullying experienced by typically developing children may be different than ASD children (who can have discrepancies between their chronological and mental ages).


To the authors' knowledge, this is the first study investigating types of bullying using individual's interpretation of specific behaviors. This work should be extended by including child perceptions of bullying, as differences have been noted between parent and youth report (Zeedyk et al., 2014). Self-report of bullying in many children with ASD can be limited by difficulty processing abstract concepts and answering open-ended questions (White et al., 2009). Thus, asking children with ASD about specific and concrete events may increase accuracy of bullying self-report (Humphrey and Symes, 2010). Some vignettes from the *Bullying Scenarios Survey* may be useful exemplars of different types of bullying behavior.

It is important to note that this study investigated adult interpretations of child-dyadic interactions. Our findings may be useful to better understand some of the mixed literature on bullying prevalence. The relatively small predictive utility of demographic variables suggests that future studies should investigate both the magnitude and direction of reported effects. Research is also needed to understand how the severity and frequency of bullying may be related. Finally, variables that predict severity perceptions should not be assumed to explain the frequency of bullying, and causal inferences are beyond the scope of this article. The variation in perception identified by this research emphasizes the need for established definitions and streamlined assessment of bullying behaviors.

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### Appendix I. Participant demographics.

	ASD Parent	ASD Teacher	ASD ParTeach	Typical Parent	No Child
n	63	70	28	28	108
Age (SD)	40.3 (7.8)	30.8 (12.3)	45.8 (8.4)	45.0 (13.1)	23.4 (7.0)
Female (%)	93.7	82.9	96.4	82.1	71.3
Marital status—married (%)	74.6	30.0	60.7	78.6	6.5
Race—Caucasian (%)	73.0	72.5	85.7	82.1	72.9
Attended public school (%)	82.5	80.6	89.3	92.9	79.6
Education (%)					
High school or less	19.0	8.6	14.3	14.3	10.2
Some college	33.3	30.0	35.7	21.4	50.9
4-year degree	20.6	18.6	3.6	28.6	17.6
Graduate work/degree	27.0	42.9	46.4	35.7	21.3
“In your youth, did you...?”					
Experience Bullying (yes %)	73.0	64.3	71.4	53.6	70.1
Bully Others (yes %)	9.5	22.9	14.3	10.7	30.8

ASD: autism spectrum disorder; ASD ParTeach: parent and teacher of child with ASD.

## Appendix 2

Vignette descriptions.

**Table I.** Intended vignette type and subtype.

Type	Subtype
Verbal (n = 16)	Calls others names Baits others Teases about race/ethnicity Threatens others
Physical (n = 16)	Steals Shoves or pushes Shove or lock someone indoors
Interpersonal (n = 16)	Hits others with object Spreads rumors Left out of things Makes others do things
Cyber (n = 16)	Ignores others Written-verbal Visual Impersonate
Non-bullying (n = 16)	Exclusion Non-verbal Non-physical Non-interpersonal Non-cyber

A total of 64 bullying and 16 non-bullying vignettes were presented across participants.

H. and A. are 9 years old and classmates in school. H. tells other children in the classroom that A. fears the dark and sleeps with a nightlight.

1. How severe is the bullying behavior in this scenario?

0	1	2	3	4	5	6	7
No bullying	Minimal bullying	Minor bullying	Moderate bullying	Significant bullying	Major bullying	Extreme bullying	Hazardous bullying

2. What type of bullying behavior is present in this scenario (check all that apply)?

- Verbal bullying.
- Physical bullying.
- Interpersonal bullying.
- Cyber bullying.
- None: Age appropriate interaction.
- I don't know.
- Other (please specify): \_\_\_\_\_.

**Figure 1.** Vignette example and rating scale.

**Table 2.** Final vignette classification.

Type	N
Bullying	61
Verbal	22
Physical	14
Interpersonal	13
Cyber	12
Non-bullying	16

**Table 3.** Detailed vignette descriptions.

#	Subtype	Child Age	Type Intended	Type Assigned	Result	#	Subtype	Child Age	Type Intended	Type Assigned	Result
1	Names	4	V	V		49	Written	4	C	V	Reassign
2	Names	7	V	V		50	Written	7	C	C	Reassign
3	Names	10	V	V		51	Written	10	C	C	Reassign
4	Names	13	V	V		52	Written	13	C	–	Exclude
5	Baits	5	V	N	Reassign	53	Visual	5	C	I	Reassign
6	Baits	8	V	V		54	Visual	8	C	C	
7	Baits	11	V	V		55	Visual	11	C	C	
8	Baits	14	V	V		56	Visual	14	C	C	
9	Tease	6	V	V		57	Exclusion	6	C	C	
10	Tease	9	V	V		58	Exclusion	9	C	–	Exclude
11	Tease	12	V	V		59	Exclusion	12	C	C	
12	Tease	15	V	V		60	Exclusion	15	C	C	
13	Threat	4	V	V		61	Impersonate	6	C	C	
14	Threat	7	V	V		62	Impersonate	9	C	C	
15	Threat	10	V	V		63	Impersonate	11	C	C	
16	Threat	13	V	V		64	Impersonate	13	C	C	
17	Steal	5	P	–	Exclude	65	Names	5	N	N	

**Table 3.** (Continued)

#	Subtype	Child Age	Type Intended	Type Assigned	Result	#	Subtype	Child Age	Type Intended	Type Assigned	Result
18	Steal	8	P	I	Reassign	66	Baits	8	N	N	
19	Steal	11	P	I	Reassign	67	Tease	11	N	N	
20	Steal	14	P	I	Reassign	68	Threat	14	N	N	
21	Shove	6	P	P		69	Steal	4	N	N	
22	Shove	9	P	P		70	Shove	7	N	N	
23	Shove	12	P	P		71	Lock	10	N	N	
24	Shove	15	P	P		72	Hit	13	N	P	Reassign
25	Lock	4	P	P		73	Rumor	6	N	N	
26	Lock	7	P	P		74	LeftOut	9	N	N	
27	Lock	10	P	P		75	Makes	12	N	N	
28	Lock	13	P	P		76	Ignore	15	N	N	
29	Hits	5	P	P		77	Written	5	N	N	
30	Hits	8	P	P		78	Exclusion	11	N	N	
31	Hits	11	P	P		79	Visual	8	N	N	
32	Hits	14	P	P		80	Impersonate	14	N	N	
33	Rumor	6	I	V	Reassign						
34	Rumor	9	I	V	Reassign						
35	Rumor	12	I	V	Reassign						
36	Rumor	15	I	V	Reassign						
37	LeftOut	4	I	V	Reassign						
38	LeftOut	7	I	V	Reassign						
39	LeftOut	10	I	I							
40	LeftOut	13	I	I							
41	Makes	5	I	P	Reassign						
42	Makes	8	I	I							
43	Makes	11	I	I							
44	Makes	14	I	I							
45	Ignore	6	I	I							
46	Ignore	9	I	I							
47	Ignore	12	I	I							
48	Ignore	15	I	I							

P: physical; C: cyber; V: verbal; I: interpersonal; N: non-bullying. See Table 1 for full descriptions of each bullying subtype.

### Appendix 3. Severity ratings by group and overall.

	ASD Parent	ASD Teacher	ASD ParTeach	Typical Parent	No Child	Overall	F	Contrast
Overall	2.74 (0.85)	2.85 (0.90)	2.64 (0.77)	2.75 (1.05)	2.67 (0.84)	2.73 (0.87)	745.54**	P > C > I = V > N
Bullying	3.40 (1.03)	3.52 (1.08)	3.21 (0.91)	3.43 (1.27)	3.29 (1.02)	3.37 (1.05)		
Physical	4.05 (1.38)	3.97 (1.42)	4.00 (1.40)	3.84 (1.69)	3.90 (1.31)	3.95 (1.39)		
Cyber	3.44 (1.46)	3.76 (1.31)	3.23 (1.19)	3.69 (1.46)	3.36 (1.25)	3.49 (1.32)		
Interpersonal	3.04 (1.20)	3.22 (1.27)	2.81 (1.24)	3.20 (1.31)	2.96 (1.26)	3.05 (1.25)		
Verbal	3.04 (1.10)	3.15 (1.26)	2.79 (0.77)	3.00 (1.52)	2.95 (1.11)	3.00 (1.16)		
Non-bullying	0.31 (0.61)	0.65 (1.17)	0.71 (1.03)	0.26 (0.46)	0.35 (0.54)	0.44 (0.80)		

ASD: autism spectrum disorder; ASD ParTeach: parent and teacher of child with ASD.

Mean (SD) displayed for each column.

\*\* $p < 0.001$ .

**Appendix 4.** Predictors of severity ratings.

	<i>B</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Intercept	2.67	0.10	26.32	<0.001
Group membership				
ASD Parent	0.04	-0.11	0.39	0.70
ASD Parent/Teacher	-0.01	-0.14	-0.06	0.95
Typical parent	0.22	-0.14	1.57	0.12
No children	-0.29	0.11	-2.59	<0.05
Bullying type				
Physical bullying	0.20	0.04	5.61	<0.001
Verbal bullying	1.30	0.04	30.98	<0.001
Interpersonal bullying	0.24	0.04	5.83	<0.001
Cyberbullying	0.57	0.04	12.92	<0.001
Child age	0.07	0.00	11.72	<0.001
Child age*physical	-0.10	0.01	-10.23	<0.001
Child age*verbal	0.05	0.01	4.27	<0.001
Child age*cyber	0.09	0.01	6.20	<0.001
ASD Parent*child age	0.02	0.01	2.49	<0.05
Additional predictors				
Bullying exposure	0.22	0.11	2.01	<0.05
Some college education	0.19	0.08	2.35	<0.05
4-year degree education	-0.21	0.10	-2.15	<0.05
Married	-0.18	0.07	-2.45	<0.05
Western region	-0.30	0.13	0.02	<0.05

Continuous predictors were entered in their centered form.