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## Methodological considerations when assessing restricted and repetitive behaviors and aggression

A.J. Keefer<sup>a,\*</sup>, L. Kalb<sup>b</sup>, M.O. Mazurek<sup>c</sup>, S.M. Kanne<sup>c</sup>, B. Freedman<sup>d</sup>, R.A. Vasa<sup>e</sup><sup>a</sup> Center for Autism and Related Disorders, Kennedy Krieger Institute, 3901 Greenspring Avenue, Baltimore, MD 21211, USA<sup>b</sup> Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, Hampton House, 624 N. Broadway, 8th Floor, Baltimore, MD 21205, USA<sup>c</sup> University of Missouri, Department of Health Psychology and Thompson Center for Autism and Neurodevelopmental Disorders, 205 Portland Street, Columbia, MO 65211, USA<sup>d</sup> Center for Disabilities Studies, University of Delaware, 461 Wyoming Road, Newark, DE 19716, USA<sup>e</sup> Center for Autism and Related Disorders, Kennedy Krieger Institute, Department of Psychiatry, Johns Hopkins University School of Medicine, 3901 Greenspring Avenue, Baltimore, MD 21211

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## ABSTRACT

Methodological issues impacting the relationship between aggression and restricted, repetitive, and stereotyped behaviors and interests (RRSBI) were examined in 2648 children and adolescents with autism spectrum disorders (ASD) using a multi-method, multi-informant analysis model to assess the effects of informant, assessment method, and aggression phenotype. Overall, a significant, but small relationship was found between RRSBI and aggression ( $p < .05$ ). There was significant heterogeneity of estimates with large effect sizes observed when utilizing teacher report and a broad phenotype of aggression. Variance in estimates was attributed to differences in informant and assessment method with two times greater effect attributed to informant. Results suggest strategies to optimize future investigations of the relationship between RRSBI and aggression. Findings also provide the opportunity for the development of targeted interventions for aggression in youth with ASD.

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### 1. Introduction

Aggression is a common and highly impairing problem in individuals with autism spectrum disorders (ASD), impacting the individual, family, and community. Two large cross-sectional studies of aggression in youth with ASD report a prevalence of 56% (Kanne & Mazurek, 2011) and 54% (Mazurek, Kanne, & Wodka, 2013), respectively. Consequences of aggression in individuals with developmental disabilities can be serious and include increased risk for personal injury (Akrami, Ekehammar, Claesson, & Sonnander, 2006), out-of-home placement (Bromley & Blacher, 1991), long-term inpatient care (Matson & Nebel-Schwalm, 2007), crisis intervention re-referrals (Shoham-Vardi et al., 1996) and parent stress (Baker, Blacher, Crnic, & Edelbrock, 2002). The presence of aggression can also compromise the effectiveness of therapeutic interventions (Horner, Diemer, & Brazuea, 1992) and academic instruction (Chalfant, Rapee, & Carroll, 2007). As a result, the assessment and treatment of aggression in individuals with ASD has been identified as a critical area for future research (Matson & LoVullo, 2008; Matson & Nebel-Schwalm, 2007).

\* Corresponding author. Tel.: +1 4439237603.

E-mail address: [keefera@kennedykrieger.org](mailto:keefera@kennedykrieger.org) (A.J. Keefer).

Despite its multiple deleterious effects and high incidence, correlates of aggression in youth with ASD have not been identified. For example, aggression is not associated with any particular demographic factors (i.e., race, age, gender, parental marital status, and parental education) in the ASD population (Dominick, Davis, Lainhart, Tager-Flusberg, & Folstein, 2007; Hartley, Sikora, & McCoy, 2008; Kanne & Mazurek, 2011; Mazurek et al., 2013; McTiernan, Leader, Healy, & Mannion, 2011; Shattuck et al., 2007). Studies examining the relationship of ASD symptom severity, communication delays, and social deficits with aggressive behavior have also not yielded consistent findings (Dominick et al., 2007; Durand, 1993; Kanne & Mazurek, 2011; Matson & Rivet, 2008; Matson, Neal, Fodstad, & Hess, 2010; Mazurek et al., 2013). However, there is some preliminary support for a relationship between restricted, repetitive, and stereotyped behaviors and interests (RRSBI) and aggression in individuals with ASD. Dominick et al. (2007) examined children with ASD and found that among a number of potential correlates, RRSBI was the only significant variable associated with aggressive behavior. Similarly, Kanne and Mazurek (2011) found that self-injurious behaviors, ritualistic behaviors, and resistance to change were positively associated with aggression in youth with ASD. Additionally, Matson and Rivet (2008) reported a positive correlation between RRSBI and challenging behaviors (i.e., aggression, self-injury, and disruptive behaviors) in adults with both ASD and ID.

Several important methodological aspects of the aggression literature should be considered when interpreting current findings. First, studies employed various assessment methods (e.g., semi-structured interviews, standardized, normative-based rating scales, project specific questionnaires) and different informants (e.g., parent, residential worker, data collector, teacher). Second, there is a lack of uniformity in the phenotype of aggression utilized in previous investigations. For example, physical aggression has been defined as targeting an individual's body (e.g., hitting, biting, kicking) in some studies and targeting others using objects and implements in other studies. Additionally, some studies include affective symptoms (e.g., irritability; mood lability) and self-injury in the definition of aggression; whereas, others adhere to strictly behavioral definitions (e.g., physical injury to others) (Hartley et al., 2008; Kanne & Mazurek, 2011; Matson & Rivet, 2008). As a result, it is difficult to determine whether the relationship between aggression and clinical correlates differs as a function of measurement strategy and/or operational definition. Therefore, while data on the characteristics of aggression are emerging, it will be important to parse out the effects of informant, assessment method, and aggression phenotype.

Given the preliminary evidence for a relationship between aggression and RRSBI, the current study is a first attempt to examine how methodological factors (i.e., informant, assessment method, aggression phenotype) impact this relationship. Accordingly, the first objective of the study will be to investigate the prevalence of aggression in children and adolescents with ASD using varying assessment methods. The second objective will be to determine if RRSBI is positively associated with the presence of aggression and if this relationship holds across multiple informants and assessment methods. The final objective will be to identify what assessment factors (i.e., informant vs. assessment method) have a greater effect on the relationship between aggression and RRSBI and if aggression phenotype (i.e., either narrowly defined as physical aggression or broadly defined across multiple behaviors) affects this association. It is hypothesized that RRSBI will be positively associated with increased aggressive behavior overall, but that differences in informant, assessment method, and aggression phenotype will substantially impact the strength of this relationship.

## 2. Methods and measures

### 2.1. Participants and procedures

Data for the present study came from a large, multisite research network known as the Simons Simplex Collection (SSC), a 12-site North American, university-based research study. The SSC measurement battery includes biological and phenotypic data from families with a single child with ASD between the ages of 4–17 years. Inclusion criteria for the SSC include: (a) no first through third-degree family members, besides the affected child (or proband), can be diagnosed or suspected of having an ASD; (b) the child must have idiopathic ASD; (c) the proband must have an established diagnosis of ASD (i.e., DSM-IV diagnoses: Autistic Disorder, Asperger's Disorder, or Pervasive Developmental Disorder Not Otherwise Specified) based on meeting clinical cutoff criteria on the Autism Diagnostic Interview – Revised (ADI-R; Rutter, Le Couteur, & Lord, 2003) and the Autism Diagnostic Observation Schedule (ADOS; Lord, DiLavore, & Risi, 2002), both of which were administered by research reliable clinicians. The Institutional Review Board at each site approved the study.

Data used in the present analyses involved 2648 children ( $M = 9.0$  y,  $SD = 3.6$  y, 87% male, 74% Caucasian).<sup>1</sup> Full scale IQ scores ranged from 7 to 167 (mean score = 81.2,  $SD = 27.9$ ). Mothers, the primary informants, were well-educated (9% no college; 65% some college to bachelor's degree; 25% graduate-level education).

Minimal data were missing (<3% for any variable of interest) from the database for all measures except the teacher report version of the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001a, 2001b), which was available on 58% of children (ages 6 and older,  $n = 1193$ ). Similarly, data from the teacher-report version of the Social Responsiveness Scale (SRS; Constantino et al., 2003) was available on a subset of the sample ( $n = 1310$  or 64% of children  $\geq 6$  years).

<sup>1</sup> Kanne and Mazurek (2011) examined data from an earlier subset of the SSC database (approximately half of the current study sample) in their investigation of aggression in children with ASD. The objectives, methods, and analytic plan of the current study (i.e., to examine the influence of multiple assessment methods on aggression prevalence and its relation to repetitive behaviors) are distinct from those previously reported by Kanne and Mazurek (2011).

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