



## Reactive/proactive aggression and affective/cognitive empathy in children with ASD

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### ABSTRACT

The main aim of this study was to examine the extent to which affective and cognitive empathy were associated with reactive and proactive aggression, and whether these associations differed between children with an Autism Spectrum Disorder (ASD) and typically developing (TD) children. The study included 133 children (67 ASD, 66 TD, *Age* = 139 months), who filled out self-report questionnaires. The main findings showed that the association between reactive aggression and affective empathy was negative in TD children, but positive in children with ASD. The outcomes support the idea that a combination of poor emotion regulation and impaired understanding of others' emotions is associated with aggressive behavior in children with ASD.

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## 1. Introduction

Aggressive behaviors have been frequently observed in children with Autism Spectrum Disorder (ASD) (Bronsard, Botbol, & Tordjman, 2010; Farmer & Aman, 2011; Kanne & Mazurek, 2011), which are also related to more frequent mental health referrals (Mash & Barkley, 2003). Clinicians sometimes argue that aggressive behaviors in children with ASD should not be interpreted the same way as in typically developing (TD) children (Matson & Nebel-Schwalm, 2007). In fact, despite the high prevalence of aggressive behaviors in young and/or intellectual disabled children with ASD, little research has been done to examine aggressive behavior in high-functioning young adolescents with ASD. In TD children, a lack of empathy is associated with higher levels of aggression (e.g., Jolliffe & Farrington, 2006). Although children with ASD are known for their atypical empathic development (Jones, Happe, Gilbert, Burnett, & Viding, 2010), it has never been studied in relation to their aggressive behavior. Therefore, in this study, the main aim was to examine the relationship between empathy (affective and cognitive) and aggression in children and young adolescents with ASD, as compared to their TD peers.

### 1.1. Aggression in children with ASD

Research is suggesting that aggression is a common problem in children with ASD (Farmer & Aman, 2011; Kanne & Mazurek, 2011). For example, young and older children with ASD exhibit various externalizing behaviors such as damaging others' belongings, tantrums, and self-injurious behaviors (Horner, Carr, Strain, Todd, & Reed, 2002). Kanne and Mazurek (2011) investigated 1380 children with ASD from 4 to 17 years old and found that 68% displayed aggressive behavior toward

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a caregiver and 49% toward non-caregivers. However, these studies examining aggressive behavior in children with ASD mainly include intellectually disabled children with ASD. Despite this high prevalence of aggressive behaviors in this population of children with ASD, to date, little research is done on aggressive behavior in high functioning young adolescents with ASD. Furthermore, not much is known about possible causes or motives of these behaviors.

Aggressive behavior can be divided into reactive and proactive aggression. Reactive aggression is seen as defensive behavior in reaction to real or perceived external provocation without thought to personal gain (Crick & Dodge, 1996). It is a response to poor emotion regulation, feelings of anger, and hostile (mis)attributions or misunderstandings (Marsee & Frick, 2007). Proactive aggression refers to instrumental aggression, which children engage in to reach a certain goal (e.g., material or territorial gain or social control), without being provoked (Crick & Dodge, 1996). It has been argued that proactive aggression is not necessarily anger-driven (e.g., Crick & Dodge, 1996). However, Hubbard et al. (2002) showed that children who display higher levels of proactive aggression also report higher levels of anger. Yet, these children appear to be particularly skilled in controlling their anger expressions.

Since children with ASD are known for their poor emotion regulation especially in social situations (Laurent & Rubin, 2004), one would expect higher rates of reactive aggression in this group. Farmer and Aman (2011) analyzed parent reports on different subtypes of aggression in children and adolescents with ASD (from 3 to 20 years old) and indeed found higher instances of behaviors linked to reactive aggression, such as hot-headedness, impulsive reactions, and difficulties with cooling off (Farmer & Aman, 2011). Children and adolescents with ASD are also reported to use more physical aggression, such as pinching, biting, and throwing objects toward others, compared to children without ASD (Farmer & Aman, 2011). These behaviors are especially seen in stress-evoking situations further emphasizing the intent of reactive aggression (Bronsard et al., 2010). Note, however, that a higher intelligence is related to less reactive aggression (Brereton, Tonge, & Einfeld, 2006; Nas, De Castro, & Koops, 2005), and that the presently cited studies examined low functioning individuals with ASD.

There is not much known about whether children with ASD display more proactive aggression than TD children. However, there are some studies examining bullying behavior in children with ASD, which could be seen as a form of proactive aggression, because bullies initiate aggressive behavior in order to dominate others (Camodeca, Goossens, Terwogt, & Schuengel, 2002). Furthermore, bullies show and report high rates of proactive aggression (Salmivalli & Nieminen, 2002). A study of Farmer and Aman (2009) investigated different subtypes of aggressive behavior in children with ASD and other intellectual/developmental disabilities and found that parents of children with ASD score their children higher on bullying, compared to children without ASD. Yet, other studies based on parent or self-report showed no differences in the frequency of bully behaviors between children with ASD and TD children (Montes & Halterman, 2007; Rieffe, Camodeca, Pouw, Lange, & Stockmann, 2012; Twyman, Saylor, Saia, Macias, Taylor, & Spratt, 2010). Conclusively, there are no clear study results supporting children with ASD would display more proactive aggression compared to TD children.

## 1.2. Empathy in children with ASD

Empathy refers to the ability to accurately perceive and understand another person's emotions and to react to these emotions appropriately (Rieffe, Ketelaar, & Wiefferink, 2010). It is an important feature of human interpersonal behavior, necessary to interact effectively in the social world. Furthermore, empathy is a complex construct that exists of lower order (affective empathy) and higher order processes (cognitive empathy) (Leiberg & Anders, 2006).

Affective empathy, or contagion (Hoffman, 1987), is linked to mirror neurons in the parietal-frontal region of the brain. These mirror neurons are activated whilst observing another's goal directed action (Cattaneo & Rizzolatti, 2009), also creating arousal in the observer. Although earlier studies suggested mirror neuron abnormalities in children with ASD (Dapretto et al., 2006), recent studies indicate that the mirror neuron system in children with ASD is intact (Fan, Decety, Yang, Liu, & Cheng, 2010; Press, Richardson, & Bird, 2010). Children with ASD are as emotionally aroused (based on skin conductance activity) when witnessing another's distress as TD children (Blair, 1999), and did not score lower than TD children on a self-report questionnaire measuring affective empathy (Jones et al., 2010). Furthermore, children with ASD have been found to score equally to TD children on affective empathy tasks (Dziobek et al., 2008).

Additionally, for an adaptive empathic response, the focus of concern should be other-oriented rather than self-oriented (Eisenberg et al., 1996). In other words, observers should recognize that their own arousal is a consequence of the other's emotion and not their own. When observers are unable to locate the source of the arousal and misinterpret its cause, this will cause personal distress in the observers. In TD children, personal distress can be observed in very young children, but it decreases naturally with age when children's skills for emotion regulation develop (Rieffe et al., 2010). Furthermore, a certain level of cognitive empathy is required to decrease personal distress. Cognitive empathy refers to the ability to adopt another's point of view, and represent the other's thoughts, intentions, beliefs, and knowledge, which facilitates the observer to interpret and understand others' emotions. The ability to infer mental states, also known as Theory of Mind (ToM) (Blair, 2005), is the capacity to understand or predict others' behaviors based on the subjective desires and/or beliefs of that person (Gordon, 1992). A ToM is typically established around the age of four. Children with ASD are known for their impairments in this domain (Baron-Cohen, Leslie, & Frith, 1985; Dziobek et al., 2008; Jones et al., 2010; Rogers, Dziobek, Hassenstab, Wolf, & Convit, 2007), and in fact, seem well aware of this impairment and also score lower than TD children on self-report items that measure understanding others' emotions (Dziobek et al., 2008; Jones et al., 2010).

Empathy is supposed to cause prosocial behaviors, such as helping, sharing, comforting, in attempt to alleviate the other person's distress. Especially these kinds of behaviors seem overly absent or limited in children with ASD (Sigman, Kasari,

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