



## Response to McKenzie et al. 2021: Keep It Simple; Young Adults With Autism Spectrum Disorder Without Intellectual Disability Can Process Basic Emotions

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### Abstract

We recently read the interesting and informative paper entitled “Empathic accuracy and cognitive and affective empathy in young adults with and without autism spectrum disorder” (McKenzie et al. in *Journal of Autism and Developmental Disorders* 52: 1–15, 2021). This paper expands recent findings from our lab (Ben-David in *Journal of Autism and Developmental Disorders* 50: 741–756, 2020a; *International Journal of Audiology* 60: 319–321, 2020b) and a recent theoretical framework (Icht et al. in *Autism Research* 14: 1948–1964, 2021) that may suggest a new purview for McKenzie et al.’s results. Namely, these papers suggest that young adults with autism spectrum disorder without intellectual disability can successfully recruit their cognitive abilities to distinguish between different simple spoken emotions, but may still face difficulties processing complex, subtle emotions. McKenzie et al. (*Journal of Autism and Developmental Disorders* 52: 1–15, 2021) extended these findings to the processing of emotions in video clips, with both visual and auditory information.

**Keywords** Autism spectrum disorder · ASD · ASD-without-ID · High function ASD · Emotions · Empathy · Social cognition · Affect

We recently read the interesting and informative paper entitled “Empathic accuracy and cognitive and affective empathy in young adults with and without autism spectrum disorder” (McKenzie et al., 2021). This paper expands recent findings from our lab published in the *Journal of Autism and Developmental Disorders* (Ben-David et al., 2020a) and a recent theoretical framework (Icht et al., 2021) that may suggest a new purview for McKenzie et al.’s results. Namely, these papers suggest that young adults with autism

spectrum disorder (ASD) without intellectual disability (ID) can successfully recruit their cognitive abilities to distinguish between different simple spoken emotions, but may still face difficulties processing complex, subtle emotions.

McKenzie et al. tested whether young adults with ASD without ID had impairments in Cognitive Empathy, Affective Empathy, or Empathic Accuracy (the ability to track changes in others’ thoughts and feelings) compared to typically developing (TD) individuals. Participants watched video clips of people recollecting emotionally-charged real-life autobiographical events (dynamic stimuli involving auditory, visual and verbal information; the Empathic Accuracy Task), and were asked to provide continuous ratings of the narrators’ emotional intensity as the clip unfolds (indexing Empathic Accuracy), to label the emotions displayed (Cognitive Empathy) and to report whether they shared the depicted emotions (Affective Empathy). Five simple emotions were examined: anger, happiness, sadness, fear, as well as a neutral-event condition. The results showed that for all measures but one (empathic accuracy for anger), participants with ASD without ID did not differ in emotional processing from TD controls. The authors stated that their findings are in contrast to previous results in the literature. Indeed,

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several studies showed that people with ASD perform significantly worse than TD individuals in experimental tasks measuring cognitive empathy (e.g., Lockwood et al., 2013; Mul et al., 2018). McKenzie et al. postulated that the special characteristics of their test (video clips rather than still photographs) may explain this discrepancy.

Interestingly, recent work from our lab echoes McKenzie et al.'s findings (Ben-David et al., 2020a) when only auditory information was available. In our study, twenty young adults with ASD without ID and a matched group of 20 TD young adults were asked to rate the extent of simple emotions (happiness, sadness, anger, and neutrality) presented in spoken sentences, in which the emotional lexical and prosodic content appear in different combinations from trial to trial (using the T-RES, Ben-David et al. 2019; for full details, see Taitelbaum-Swead et al., 2022; Carl et al., 2022). No differences were found in the performance of the two groups, in either of the tested tasks (gauging emotion identification, selective attention of emotional channel, and integration of semantics and prosody). A recent meta-analysis of the literature (Icht et al., 2021) conducted in our lab, reviewed 26 data sets, comparing identification of spoken emotions between individuals with ASD-without-ID and TD controls, with over 1250 participants, from nine countries. No sufficient evidence was found to suggest that individuals with ASD-without-ID differ from TD controls in the identification of simple emotions, such as the ones used by McKenzie et al. However, a substantial effect was found in the identification of complex emotions (e.g., envy and boredom) across studies, in which individuals with ASD-without-ID performed significantly worse than TD controls. McKenzie et al.'s study broadens existing findings from auditory to cross-modal visual-auditory presentation of emotions. In other words, it seems that the ability to identify simple emotions in others is preserved in this population, in both the auditory and cross-modal domains.

Several theories can be used to contextualize this selective effect of emotional complexity on individuals with ASD-without-ID. The first theory holds that there is a difference between first- and second-order affective theory of mind (ToM), as evident in the tested populations (Baron-Cohen et al., 2001; Happé & Frith, 2006). Namely, the ability to identify complex emotions such as envy and gloating among individuals with ASD-without-ID relates to difficulty to adopt the psychological point of view of others (Shamay-Tsorri, 2008). Another conceptualization relates to the empathizing-systemizing model (Lawson et al., 2004). It affords the categorization across two dimensions: Empathizing, the tendency to respond emotionally to emotions and thoughts in others; and Systemizing, the inclination to analyze and establish systems to understand events in the world (Baron-Cohen, 2002). Traditionally, females and males have been seen as being more inclined to empathizing

and systematizing thought, respectively, while autism was considered an extreme case that relied mostly on systematizing thought (Baron-Cohen, 2002). Thus, individuals with autism (mostly males) may be able to identify simple emotions based on systemizing by identifying a small set of overt cues (such as facial expressions). However, they may fail to identify complex emotions that requires deeper social understanding and empathic abilities (Empathizing).

The latter theory can be complemented by Feldman-Barrett's "Language as Context" model (Feldman-Barrett et al., 2007) suggesting that simple emotions can be classified based on valence, whereas complex emotions rely on a social consensus about categories (Adolphs et al., 2019) presenting a challenge for the target population. Following, the weak central coherence theory (Happé, 1999; Happé & Frith, 2006) alongside the reduced generalization theory (Plaisted, 2001) imply that autism may impair the ability to combine cues from several sources and apply affective knowledge to novel situations across different contexts. For simple emotions, that can be perceived through a single dimensionality (e.g., valence), this might not be apparent. However, these effects are particularly important for complex emotions, such as embarrassment and shyness (evident in social interaction), which are influenced by many factors, including the event context, semantic content, prosody, and facial expressions. Finally, it appears that these hypotheses tackle the issue from different angles but draw the same picture: complex emotions call for resources that individuals with autism cannot implement.

In sum, we suggest that the interesting results of McKenzie et al. with video clips may emanate from the type of stimuli used. Individuals with ASD-without-ID were found in the literature to successfully process simple spoken emotions, but show difficulties processing complex emotions in speech. Clearly, future studies should further test this notion, directly comparing processing of simple emotions such as anger, happiness, and sadness with complex emotions that are more belief-, context- and culture-dependent such as envy, boredom, guilt and embarrassment (Harris, 1989) that have been previously found to be impaired in Autism (Kleinman et al., 2001). Comparisons should be executed using sophisticated tools, with visual and auditory information as the one suggested by McKenzie et al. focusing on the auditory domain like the T-RES (Ben-David et al., 2016), or focusing on empathy and ToM, like the EmpaToM task (Kanske et al., 2015).

Emotion recognition is a fundamental element in social understanding and develops from simple to more complex emotions during developmental stages (the "basic emotion approach"; Sauter et al., 2013; Scarantino & Griffiths, 2011). Individuals with ASD typically show difficulties in recognizing emotions and mental states in others (Baron-Cohen, 2000). However, the mounting evidence on the ability of

individuals with ASD-without-ID to identify simple emotions points to a strength in this population. Interventions can be based on this intact ability to compensate for other more impaired abilities. For example, when designing telehealth solutions and gamification, as necessary in response to COVID-19 social restrictions, such an ability should be taken in consideration (e.g., Ben-David et al., 2020b; Tziraki et al., 2017). On the other hand, individuals with ASD show difficulties in introspection and appraisal of their own emotional experience, especially for complex emotions that involve self-reflection (for a discussion, see Zalla et al., 2014). This is also hinted by the large increase on the Difficulty Describing Feeling subscale of the Alexithymia questionnaire (for a meta-analysis, see Kinnaird, 2019). As a consequence, interventions might focus on improving introspection, in addition to training the detection of complex emotions in others.

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