

# Alexithymia and Emotion Recognition in People with Autism Spectrum Disorder: A Review

Ruby Jamil, M.A., University of Windsor  
Anne-Marie DePape, Ph.D., Mohawk College

## Abstract

Autism spectrum disorder (ASD) is a neurodevelopmental disorder involving social-communication deficits, and rigid and repetitive behaviours. Individuals with ASD also demonstrate emotion-processing deficits, such as difficulties recognizing their own or others' emotions. There is evidence to suggest that co-occurring alexithymia, or difficulties recognizing emotions within oneself, and not ASD may account for these difficulties. This paper reviews the literature about alexithymia to better understand emotion recognition skills in ASD. Implications are discussed in terms of possible therapeutic interventions involving alexithymia, which may improve emotional and social outcomes among those with ASD.

---

## Résumé

Le trouble du spectre de l'autisme (TSA) est un trouble neurodéveloppemental impliquant des déficits sur le plan de la communication sociale, ainsi que des comportements rigides et répétitifs. Les personnes atteintes du TSA présentent également des déficits au chapitre du traitement des émotions, comme la difficulté à reconnaître ses propres émotions ou celles d'autrui. Certaines études donnent à penser que c'est la coexistence de l'alexithymie, à savoir la difficulté à reconnaître ses émotions à l'intérieur de soi, et non le TSA, qui expliquerait ces difficultés. Le présent article passe en revue la littérature sur l'alexithymie afin de mieux comprendre les habiletés à reconnaître les émotions chez les personnes atteintes du TSA. Les implications des interventions thérapeutiques possibles en présence d'alexithymie, qui sont susceptibles d'améliorer les acquis sociaux et émotionnels des personnes atteintes du TSA, sont examinées.

Autism spectrum disorder (ASD) is a disorder characterized by social-communication deficits and rigid and repetitive behaviours (American Psychiatric Association, 2013). ASD is also associated with emotion-processing deficits, including difficulties recognizing one's own (Ketelaars, Mol, Swaab, & van Rijn, 2016; Milosavljevic et al., 2016) and others' emotions (Uljarevic & Hamilton, 2013). Current research suggests that co-occurring alexithymia, or difficulty recognizing one's own emotions, and not ASD may account for these difficulties in emotion recognition (Bird et al., 2010; Cook, Brewer, Shah, & Bird, 2013). These findings are supported by the fact that 42 to 55 percent of individuals with ASD experience alexithymia (Ketelaars et al., 2016; Milosavljevic et al., 2016), and it might be that these individuals with ASD struggle to identify emotions within themselves and in turn struggle to identify others' emotions. This paper reviews the literature about alexithymia to better understand emotion recognition skills in ASD.

## Autism Spectrum Disorder and Emotion Recognition Skills

Emotion recognition skills emerge at an early age. Typically developing children distinguish between basic emotions as early as 7 months old, and around 9 months old, babies use facial expressions to gauge situations using social referencing (Walker-Andrews, 1998). Of the basic emotions, children learn to recognize happiness and sadness first and later fear and disgust (Camras & Allison, 1985). As children grow up, their ability to correctly identify facial emotions improves (Durand, Gallay, Seigneuric, Robichon, & Beaudoin, 2007). These basic skills are important to social development because they help children learn about others' feelings and serve as prerequisite skills for higher order emotional processing (Uljarevic & Hamilton, 2013).

Children with ASD struggle with emotion recognition skills, which can hinder their learning about others' emotions and in turn, impact their social relationships (Uljarevic & Hamilton, 2013). However, the ASD literature is divided on whether deficits in



emotion recognition are a characteristic feature of ASD. Some studies show individuals with ASD having emotion recognition deficits compared to controls (e.g., Bal et al., 2010; Corden, Chilvers, & Skuse, 2008; Lindner & Rosen, 2006), while others have not found such deficits (e.g., Castelli, 2005; Robel et al., 2004; Rosset et al., 2008; Rutherford & Towns, 2008). These mixed findings emerge in children (e.g., Balconi, Amenta, & Ferrari, 2012; Rump, Giovannelli, Minshew, & Strauss, 2009) and in adults (e.g., Ashwin, Chapman, Colle, & Baron-Cohen, 2006; Humphreys, Minshew, Leonard, & Behrmann, 2007; Wallace, Coleman, & Bailey, 2008) with ASD. Some studies have concluded that individuals with ASD have difficulty identifying negative emotions, such as fear (e.g., Humphreys et al., 2007; Pelphrey et al., 2002; Wallace et al., 2008), disgust, and sadness (Wallace et al., 2008), rather than having a global deficit in emotion recognition skills (Ashwin et al., 2006). One potential reason for these inconsistencies may relate to functioning level. That is, the ASD literature consists of both low and high functioning children, whereas the adult ASD literature is skewed with mostly high functioning individuals (Harms et al., 2010). Functioning level is an important factor to consider because intellectual quotient (IQ; i.e., intelligence and problem solving skills [Wechsler, 2008]) is related to the ability to understand emotions among children with ASD (Dyck, Piek, Hay, Smith, & Hallmayer, 2006). These inconsistencies call for a strong, evidence-based consensus about the emotion recognition skills of individuals with ASD (Lozier, Vanmeter, & Marsh, 2014).

### **Autism Spectrum Disorder and Alexithymia**

Alexithymia is a Greek word which translates into “lacking words for feelings” and is characterized by difficulties experiencing and explaining one’s own emotions (Lumley, Neely, & Burger, 2007). People with alexithymia respond with vague answers, seem confused, or talk about physical sensations when asked about feelings (Lumley et al., 2007), potentially because they cannot identify their own emotions (Bird & Cook, 2013). Although alexithymia is not a formal diagnosis, it is often associated with poor physical and mental health (e.g., depression, anxiety; Lumley et al., 2007). Thus, understanding alexithymia and its relationship with ASD can help clinicians with case conceptualizations and treatment selection (Lumley et al., 2007).

Approximately 42 to 55 percent of individuals with ASD experience alexithymia (Ketelaars et al., 2016;

Milosavljevic et al., 2016) compared to only 10 percent of the general population (Salminen, Saarijarvi, Aarela, & Toikka, 1999). Bird and Cook (2013) argue that the mixed results of emotion recognition studies can partly be attributed to the high rate of alexithymia in individuals with ASD. As such, they developed the Alexithymia Hypothesis, which suggests that emotion recognition difficulties in individuals with ASD can be attributed to co-occurring alexithymia (Bird & Cook, 2013). Given the high incidence of alexithymia in individuals with ASD, it is important to examine emotion recognition skills more closely in this population. This is particularly the case given that emotion recognition and ASD studies did not concurrently measure alexithymia, and so it is possible that a confounding variable might explain their results (Cook et al., 2013).

Cook and colleagues (2013) sought to identify whether ASD features or alexithymia were associated with difficulties on an emotion recognition task. These researchers recruited 32 alexithymia-matched participants in two groups: 16 participants with ASD (15 males, *M* age = 39 years) and 16 participants without ASD (12 males, *M* age = 33 years). Results indicated that no differences existed between the two groups on their emotion recognition abilities, likely because these groups were matched on alexithymic features (Cook et al., 2013). In the overall sample, alexithymic features accounted for a substantial amount of the variance in emotion recognition skills, whereas ASD features did not (Cook et al., 2013). These results suggest that associated alexithymic features, not ASD features themselves, may account for the emotion recognition difficulties in individuals with ASD.

The fact that alexithymic features overlap with emotion recognition abilities can be explained through the Shared Network Hypothesis. This hypothesis posits that alexithymia co-occurs or possibly underlies emotion-recognition difficulties because the same neural networks are required to process one’s own and others’ emotions (Bird et al., 2010). A specific part of the brain known as the anterior insula has a “dual function” for representing subjective feelings (i.e. feelings within oneself) and empathy (i.e. understanding others’ emotions; Singer et al., 2004; Singer, Critchley, & Preuschoff, 2009). Recent research on the anterior insula suggests that it is important for emotional awareness (Gu, Hof, Friston, & Fan, 2013). For example, this region is activated and causes the observer to feel disgust by viewing another person’s disgusted face (Singer & Tusche, 2014).

Overall, both the Alexithymia Hypothesis and the

Shared Network Hypothesis help explain the overlap between alexithymia and emotion recognition difficulties. That is, if people have difficulty identifying emotions within themselves, it follows that they would struggle to identify others' emotions, given that the same brain areas are needed for these skills (Singer et al., 2004; Singer et al., 2009).

### Significance and Future Research

Further research is needed to understand the relationship between alexithymia and emotion recognition in individuals with ASD. Specifically, matching participants with ASD and controls on their alexithymic features or controlling for alexithymic features in statistical analyses might elucidate the inconsistent findings on whether individuals with ASD truly exhibit emotion recognition deficits (Cook et al., 2013). Examining alexithymia and emotion recognition may also provide information about characteristics of subgroups of individuals with ASD, which may inform treatment-planning decisions (Lai, Lombardo, Chakrabarti, & Baron-Cohen, 2013; Milosevljevic et al., 2016). Finally, shedding light on the relationship between alexithymia and emotion recognition may help individuals with ASD to access appropriate therapy (Kennedy & Franklin, 2002). This therapy may allow those with ASD and alexithymia to focus on recognizing feelings within themselves and others while improving their social relationships.



### References

- American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Arlington, VA: American Psychiatric Publishing.
- Ashwin, C., Chapman, E., Colle, L., & Baron-Cohen, S. (2006). Impaired recognition of negative basic emotions in autism: A test of the amygdala theory. *Social Neuroscience, 1*(3), 349–363. doi:10.1080/17470910601040772
- Bal, E., Harden, E., Lamb, D., Van Hecke, A. V., Denver, J. W., & Porges, S. W. (2010). Emotion recognition in children with autism spectrum disorders: Relations to eye gaze and autonomic state. *Journal of Autism and Developmental Disorders, 40*(3), 358–370. doi:10.1007/s10803-009-0884-3
- Balconi, M., Amenta, S., & Ferrari, C. (2012). Emotional decoding in facial expression, scripts and videos: A comparison between normal, autistic and Asperger children. *Research in Autism Spectrum Disorders, 6*(1), 193–203. doi:10.1016/j.rasd.2011.04.005
- Bird, G., & Cook, R. (2013). Mixed emotions: the contribution of alexithymia to the emotional symptoms of autism. *Translational Psychiatry, 3*(7), 1-8. doi:10.1038/tp.2013.61
- Bird, G., Silani, G., Brindley, R., White, S., Frith, U., & Singer, T. (2010). Empathic brain responses in insula are modulated by levels of alexithymia but not autism. *Brain, 133*(5), 1515-1525. doi:10.1093/brain/awq060
- Camras, L. A., & Allison, K. (1985). Children's understanding of emotional facial expressions and verbal labels. *Journal of Nonverbal Behavior, 9*(2), 84–94. doi:10.1007/BF00987140
- Castelli, F. (2005). Understanding emotions from standardized facial expressions in autism and normal development. *Autism, 9*(4), 428–449. doi:10.1177/1362361305056082
- Cook, R., Brewer, R., Shah, P., & Bird, G. (2013). Alexithymia, not autism, predicts poor recognition of emotional facial expressions. *Psychological Science, 24*(5), 723–732. doi:0956797612463582
- Corden, B., Chilvers, R., & Skuse, D. (2008). Avoidance of emotionally arousing stimuli predicts social-perceptual impairment in Asperger's syndrome. *Neuropsychologia, 46*(1), 137–147. doi:10.1016/j.neuropsychologia.2007.08.005
- Durand, K., Gallay, M., Seigneuric, A., Robichon, F., & Baudouin, J. Y. (2007). The development of facial emotion recognition: The role of configural information. *Journal of Experimental Child Psychology, 97*(1), 14–27. doi:10.1016/j.jecp.2006.12.001
- Dyck, M. J., Piek, J. P., Hay, D., Smith, L., & Hallmayer, J. (2006). Are abilities abnormally interdependent in children with autism? *Journal of Clinical Child & Adolescent Psychology, 35*(1), 20–33. doi:10.1207/s15374424jccp3501\_3
- Gu, X., Hof, P. R., Friston, K. J., & Fan, J. (2013). Anterior insular cortex and emotional awareness. *The Journal of Comparative Neurology, 521*(15), 3371–3388. doi:10.1002/cne.23368
- Harms, M. B., Martin, A., & Wallace, G. L. (2010). Facial emotion recognition in autism spectrum disorders: A review of behavioral and neuroimaging studies. *Neuropsychology Review, 20*(3), 290-322. doi:10.1007/s11065-010-9138-6
- Humphreys, K., Minshew, N., Leonard, G. L., & Behrmann, M. (2007). A fine-grained analysis of facial expression processing in high-functioning adults with autism. *Neuropsychologia, 45*(4), 685–695. doi:10.1016/j.neuropsychologia.2006.08.003
- Kennedy, M. & Franklin, J. (2002). Skill based treatment for alexithymia: An exploratory case series. *Behavior Change, 19*(3), 158-171. doi:10.1375/behc.19.3.158
- Ketelaars, M. P., Mol, A., Swaab, H., & van Rijn, S. (2016). Emotion recognition and alexithymia in high functioning females with autism spectrum disorder. *Research in Autism Spectrum Disorders, 21*, 51-60. doi:10.1016/j.rasd.2015.09.006
- Lai, M.C., Lombardo, M.V., Chakrabarti, B., & Baron-Cohen, S. (2013). Subgrouping the autism "spectrum": Reflections on DSM-5. *PLoS Biology, 11*(4), e1001544.

- doi:10.1371/journal.pbio.1001544
- Lindner, J. L., & Rosen, L. A. (2006). Decoding of emotion through facial expression, prosody and verbal content in children and adolescents with Asperger's syndrome. *Journal of Autism and Developmental Disorders*, 36(6), 769–777. doi:10.1007/s10803-006-0105-2
- Lozier, L. M., Vanmeter, J. W., & Marsh, A. A. (2014). Impairments in facial affect recognition associated with autism spectrum disorders: A meta-analysis. *Development and Psychopathology*, 26(4), 933-945. doi:10.1017/S0954579414000479
- Lumley, M. A., Neely, L. C., & Burger, A. J. (2007). The assessment of alexithymia in medical settings: Implications for understanding and treating health problems. *Journal of Personality Assessment*, 89(3), 230–246. doi:10.1080/00223890701629698
- Milosavljevic, B., Leno, V. C., Simonoff, E., Baird, G., Pickles, A., Jones, C. R., ... & Happé, F. (2016). Alexithymia in adolescents with autism spectrum disorder: Its relationship to internalizing difficulties, sensory modulation and social cognition. *Journal of Autism and Developmental Disorders*, 46(4), 1354-1367. doi:10.1007/s10803-015-2670-8
- Pelphrey, K. A., Sasson, N. J., Reznick, J. S., Paul, G., Goldman, B. D., & Piven, J. (2002). Visual scanning of faces in autism. *Journal of Autism and Developmental Disorders*, 32(4), 249–261. doi:10.1023/A:1016374617369
- Robel, L., Ennouri, K., Piana, H. N., Vaivre-Douret, L., Perrier, A., Flament, M. F., et al. (2004). Discrimination of face identities and expressions in children with autism: Same or different? *European Child & Adolescent Psychiatry*, 13(4), 227–233. doi:10.1007/s00787-004-0409-8
- Rosset, D. B., Rondan, C., Da Fonseca, D., Santos, A., Assouline, B., & Deruelle, C. (2008). Typical emotion processing for cartoon but not for real faces in children with autistic spectrum disorders. *Journal of Autism and Developmental Disorders*, 38(5), 919–925. doi:10.1007/s10803-007-0465-2
- Rump, K. M., Giovannelli, J. L., Minshew, N. J., & Strauss, M. S. (2009). The development of emotion recognition in individuals with autism. *Child Development*, 80(5), 1434–1447. doi:10.1111/j.1467-8624.2009.01343.x
- Rutherford, M. D., & Towns, A. M. (2008). Scan path differences and similarities during emotion perception in those with and without autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 38(7), 1371–1381. doi:10.1007/s10803-007-0525-7
- Salminen, J. K., Saarijärvi, S., Äärelä, E., Toikka, T., & Kauhanen, J. (1999). Prevalence of alexithymia and its association with sociodemographic variables in the general population of Finland. *Journal of Psychosomatic Research*, 46(1), 75–82. doi:10.1016/S0022-3999(98)00053-1
- Singer, T., & Tusche, A. (2014). Understanding others: Brain mechanisms and theory of mind and empathy. In P. W. Glimcher & E. Fehr (Eds) *Neuroeconomics: Decision making and the brain* (pp. 513-528). Elsevier: London, UK.
- Singer, T., Critchley, H. D., & Preuschoff, K. (2009). A common role of insula in feelings, empathy and uncertainty. *Trends in Cognitive Sciences*, 13(8), 334-340.
- Singer, T., Seymour, B., O'Doherty, J., Kaube, H., Dolan, R. J., & Frith, C. D. (2004). Empathy for pain involves the affective but not sensory components of pain. *Science*, 303(5661), 1157-1162. doi:10.1126/science.1093535
- Uljarevic, M., & Hamilton, A. (2013). Recognition of emotions in autism: A formal meta-analysis. *Journal of Autism and Developmental Disorders*, 43(7), 1517-1526. doi:10.1007/s10803-012-1695-5
- Walker-Andrews (1998). Emotions and social development: Infants' recognition of emotions in others. In J. G. Warhol (Ed.) *New Perspectives in Early Emotional Development* (pp. 109-118). Johnson & Johnson Pediatric Institute: USA.
- Wallace, S., Coleman, M., & Bailey, A. (2008). An investigation of basic facial expression recognition in autism spectrum disorders. *Cognition and Emotion*, 22(7), 1353–1380. doi:10.1080/02699930701782153
- Wechsler, D. (2008). *Wechsler Adult Intelligence Scale – Fourth Edition Technical and interpretive manual*. San Antonio, TX; NCS Pearson.