Research Summary

Design

Social and communication difficulties many children and adolescents with Autism Spectrum Disorder (ASD) experience has been hypothesized to be related to difficulty with basic processing of emotions (Baron-Cohen & Belmonte, 2005), for example, having difficulty correctly identifying facial expressions of emotions. However, little research has examined emotion processing using other modalities. Evidence suggests, however, that children with ASD are able to accurately identify emotions through non-verbal (instrumental) music excerpts (Quintin et al., 2011, 2013). Thus, the purpose of this research is to examine emotion processing in music, an area in which children with ASD often show great interest and skill (Heaton, 2009).

The primary objective of my doctoral research is to directly compare recognition of music-evoked emotions and facial expressions of emotions, a comparison which has yet to be studied. In addition, given that much of the research on emotion processing more generally has been conducted with children with average or above average cognitive skills (e.g., IQ), a secondary objective was to investigate emotion recognition of children with a range of cognitive skills, as well as ASD symptomatology, to better understand the relationship between these characteristics and emotion processing across modalities.

Methodology

Thus far, 23 adolescents with ASD between the ages of 12-17 years with varying levels of cognitive skills (i.e., low and high IQ) have participated in this ongoing study. As part of a larger school-based music intervention study, participants completed two emotion recognition tasks where they are asked to identify basic emotions (i.e., happy, sad, or fearful) conveyed in facial expressions as well as in short musical clips displayed on a computer screen. The facial expressions were selected from a standardized set of expressions used for research purposes (Roy et al., 2007), and the orchestral musical clips were adapted from Quintin et al., 2011. Participants listened to the music clips using headphones, and rated whether the musical and facial expressions of emotion were happy, sad, or fearful. Full scale IQ and verbal ability specifically was measured using the Wechsler Intelligence Scale for Children, 5th Ed. (Wechsler, 2014).

The participants’ teachers also completed the Social Responsiveness Scale (Constantino, 2012), a standardized questionnaire to provide information on level of behavioural symptoms associated with ASD, as observed in the classroom. This scale measures 5 aspects of behaviour: social awareness, social cognition, social communication, social motivation, and restricted or repetitive behaviours.

Data collection to investigate emotion recognition in other modalities (i.e., vocal expressions of emotion) and using different methods of responding (i.e., ratings of
emotional valence ([i.e., positive-negative] and arousal [i.e., low-high energy]) is ongoing. Additionally, parent-reported levels of alexithymia (i.e., difficulty verbalizing one’s emotions) are also being collected.

Outcomes

Preliminary results of this ongoing study suggest that adolescents with ASD showed high rates of accuracy and speed in identifying emotions in facial expression and music, regardless of their level of cognitive functioning (IQ) including verbal skills, i.e. whether they their cognitive or verbal skills level is below or above the general population average. Greater emotion recognition accuracy also appears to be related to having fewer difficulties with social cognition (when identifying facial expressions of emotion), and social awareness (when identifying music-evoked emotions). Further, adolescents had greater emotion recognition overall on both tasks when they were reported to exhibit fewer restrictive or repetitive behaviours in the classroom.

Preliminary findings have/will be presented to scientific and parent/community audiences at the Brain-Child-Partners Conference (Toronto, Ontario, November 2017), Ontario Association on Developmental Disabilities Research Day (Kingston, Ontario, April 2018), International Society for Autism Research (Rotterdam, Netherlands, May 2018), and International Congress for Applied Psychology (Montreal, Quebec, June 2018).

Practical findings

Preliminary findings from this study suggest that adolescents with ASD with a range of cognitive skills can identify basic emotions in music and in faces comparably well. This study thus far also demonstrates that although children with ASD have been shown to have difficulty in identifying emotions in faces, perhaps adolescents may show fewer difficulties, or their difficulties may be limited to more complex emotions. As the study is ongoing, the next steps in this research will involve comparing these findings with younger children with ASD, as well as with typically developing children, to better understand the overall development of these skills across development and ability level.

These findings suggest that utilizing both modalities (visual and musical) may be useful in developing and teaching emotion recognition skills in this population. Further, it may be useful to target children with greater levels of ASD symptoms (i.e., social cognition, awareness, and restricted or repetitive behaviours) in developing emotion recognition and social skills interventions, and particularly incorporating music education as a strengths-focused approach at school and beyond.

Implications

Classrooms are social settings, encouraging learning and rewarding efforts often using social means. Despite efforts to include children with ASD in mainstream learning environments, little has been done to modify mainstream curricula to systematically
remediate weaknesses in social and communication skills areas, combined with a focus on capitalizing on non-verbal strengths. Musical skills may be one of these strengths that could be used to learn socio-emotional skills.

Naturally, the teaching of emotion is through socialization or use of social interaction and stimuli (e.g., facial and vocal expression); however, there may be added benefit in teaching basic emotion recognition simultaneously through non-social stimuli such as music, which children with ASD often enjoy. Given the push for more inclusive learning environments in schools, it is necessary to consider how mainstream educational curricula can be modified to accommodate children with special needs.

Findings from this study may contribute to the advancement of science in the area of educational psychology and music education, and will provide insight into adapting curricula to promote effective emotional, social, and communication skills learning in children with ASD.

References


