Understanding the Relationship Between Developmental Prosopagnosia and the Fusiform Face Area in Face Recognition

By Ryannah Butkovic

Art by Yixin Katherine Shan

Prosopagnosia is an impairment in face recognition in which individuals cannot recognize familiar faces (Hoffman & Haxby, 2000; Kanwisher, 2000). Prosopagnosia can be divided into one of two subtypes called Developmental Prosopagnosia (DP) (Le Grand et al., 2006). A key distinguishing feature of DP is the presence of facial recognition deficits since childhood without an obvious brain lesion causing the agnosia (Le Grand et al., 2006). The

neurological basis of DP has yet to be fully understood (Haxby et al., 2000; Avidan et al., 2005; Avidan & Behrmann, 2009). This literature review asks how Developmental Prosopagnosia affects the Fusiform Face Area (FFA) in Face Recognition. While comparing typical face-processing individuals and DP individuals, the review focuses on the extent to which those with and without DP perceive faces differently. The key difference in typical pro-

cessing recognition is face recognition happens fast and effortlessly, even if a person has seen a face before and has no relation to that person, which DPs cannot recognize (Calder & Young et al., 2005; Corrow et al., 2016; Haxby et al., 2002). Challenges such as the face-inversion effect, object recognition, changes in facial configurations, and viewing faces holistically are reviewed (Duchaine & Nakayama, 2006; Farah et al., 1998; Freire et al., 2000; Yin, 1969; Young et al., 1987). Research has found that individuals with DP lack the same sensitivity to the challenges given while viewing faces compared to individuals with normal facial recognition (Avidan et al., 2011; Duchaine & Nakayama, 2005; Duchaine & Nakayama, 2006; Le Grand et al., 2006). The fusiform face area (FFA), a brain region selective for face recognition, elicits activity when typical-face processing participants identify and respond to upright faces (Haxby et al., 2000; Hoffman & Haxby, 2000; Tong et al., 2000). The FFA activity in DP subjects produces mixed results, with functional magnetic resonance imaging (fMRI) studies showing FFA activity while other studies do not (Avidan et al., 2005; Hadjikhani & De Gelder, 2002). Structural connectivity between the FFA and other subregions responsive to faces in DP may contribute to face recognition deficits, leading toward a possible avenue for future research on developmental prosopagnosia (Avidan & Behrmann, 2009; Hassan et al., 2003).

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