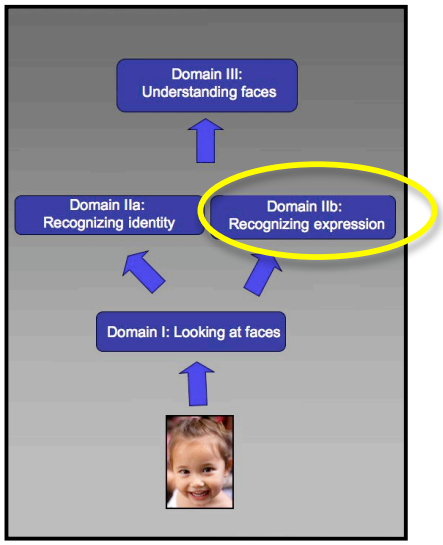
Domain IIb

Recognition of Facial Expressions



Important information about a person's emotional state is obtained through the recognition of their facial expressions. Expression recognition is an especially poignant feature in the common characteristics of individuals with autism. Expression recognition is linked directly to the communicative properties of Domain III (*social meaning of facial cues*). Because expression recognition is a relatively testable phenomenon, a great deal of research exists concerning this section of the Hierarchical Face Processing Model.

Researchers tested the ability of children with autism to label schematic and photographic faces according to basic emotional expressions (e.g., happy, sad, disgusted) [26]. Compared to age- and IQ-matched typically developing children and children with general special needs, the ASD group demonstrated a marked impairment in their ability to select the correct emotion. This inability to grasp the emotional content of a face may not reflect an incapacity to process emotional information; it could instead be the result of a general inattentiveness to facial expression. As a test of this explanation, researchers asked ASD and non-ASD children to sort faces that varied by gender, emotional expression, and type of hat. Non-ASD children sorted by gender first, followed by emotional expression, and then by type of hat [64]. Children with autism, on the other hand, grouped the pictures by gender, then by type of hat, and

finally by expression. Even when two pictures differed only in their facial expressions, many children with autism were reluctant to sort on the expression dimension, but did so if prompted by the experimenter. Each group had presumably sorted the faces according to the categories most salient to them. The contrasting degrees of saliency could reflect an object bias in ASD individuals, a product of the previously noted face avoidance behavior. Or, perhaps, individuals with autism are unable to easily make discriminations between different facial expressions.

The research is less clear about the nature or severity of the problems individuals with autism encounter with expression recognition. Some studies suggest the ability to identify facial emotions is relatively intact in individuals with ASD [8, 10, 21, 45]. In contrast, other studies indicate that expression recognition is compromised when examined compared to control groups [11, 36, 39]. In a recent paper, Rump, Giovannelli, Minshew, & Strauss, [50] argue that the discrepancy in the findings can be explained by a number of factors. For example, individuals with ASD have little difficulty perceptually matching basic expression or more subtle expressions when presented for a longer duration [10, 20, 26, 27, 45, 48]. In addition, individuals with ASD have difficulties if the differential features of facial expressions are relatively small [27]. As a whole, it appears that individuals with ASD have difficulty processing simple expressions rapidly and discerning subtle differences in complex expressions. These more fine-grain deficits could easily impede everyday social interactions that depend on the interpretation of fleeting facial expressions.

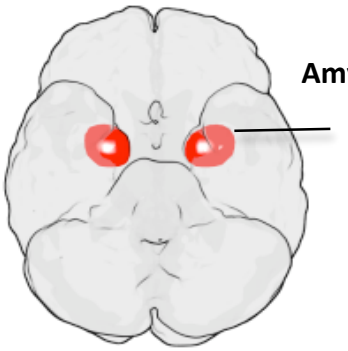
Quick Summary!

Research indicates that individuals with autism show no clear deficits when matching basic expressions or detecting subtle expressions when presented for a longer duration. However, they appear to have difficulty when processing simple expressions rapidly and discerning subtle differences in complex expressions.

Neurological

At the neuroanatomical level, the amygdala nuclei, a structure located in the medial temporal lobe of the brain, has been shown to play a key role in the processing of emotional stimuli [65]. Studies of brain-damaged patients demonstrate that lesions to the amygdala impair performance on tasks of emotion, such as the recognition of basic

facial expressions, while leaving other cognitive abilities relatively intact (Adolphs et al., 2001). Some researchers hypothesize that the social and emotional deficits of autism are linked to amygdala processes (Baron-Cohen et al., 2000). Support for this suggestion comes from neuroimaging studies, where for normal control participants, the amygdala becomes activated when viewing pictures of fearful faces. However, the amygdala is *not* activated for individuals with autism when viewing the same (fearful) faces (Critchley et al., 2000). The amygdala was similarly unengaged when ASD individuals interpreted an eye gaze stimulus with respect to its social information (Baron-Cohen, 1995). Thus, neuroimaging studies have identified possible connections between the behavioral deficits in facial expression processing to breakdowns of amygdala function.



Amygdala Nuclei

Definition

The **Amygdala Nuclei** is a structure located in the medial temporal lobe of the brain. It has been shown to play a role in the processing of emotions. Some researchers believe that the emotional difficulties in individuals with autism are linked to the amygdala.

Because Domain II is comprised of both identity (a) and expression (b) recognition, many of the activities provided for Domain II address both elements of face recognition simultaneously. The goal of these activities is to provide individuals who have difficulty recognizing expressions a method of assessing the nature of these deficits. Furthermore, these activities facilitate the acquisition of skills for recognizing facial expressions. Recognizing expression is a crucial component of the Hierarchical Face Processing Model. The ability to recognize expression can give us clues about how another person is feeling. This ability is linked to the understanding of social cues and facilitates social interactions. Impairments to this level of processing can create a faulty groundwork for the more complex processing of the social meaning of facial cues (Domain III). One can practice skills for expression recognition by focusing on the Domain II activities provided by *LFI!*.