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Recognizing Emotion Intensity and Compound Expressions

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Background

- Decades of research have agreed on 6 universally recognized facial expressions of emotion: anger, disgust, fear, happiness, sadness, and surprise[1]
- People with autism spectrum disorder (ASD) often have impaired emotion recognition, though some interventions effectively train this skill
  - Few interventions have targeted subtle expressions, despite the fact that people with ASD have the greatest difficulty recognizing them[2]
- Grimace is a tool that creates subtle facial expressions using the sparsely researched topics of *emotion intensity recognition* and *compound expressions*[3]
  - Emotion intensity recognition: knowing not just which emotion someone is feeling, but also how strongly they are feeling it
  - Compound expressions: facial expressions that show multiple emotions simultaneously
  - Previous research in these topics has used morphs between two photographs of facial expressions, but Grimace's simplicity, flexibility, and intuitive technological design may be more engaging to people with ASD
- Recognizing subtle facial expressions is essential for navigating social situations
  - Difficulties in this skill can inhibit one's social inclusion, and more research is needed in methods of improving this skill

Objective

- Examine Grimace's potential as a tool for improving social understanding and community inclusion by creating recognizable subtle facial expressions

Method

- Young adults without ASD were surveyed about Grimace and morphed faces
  - Intensity Recognition: participants labeled facial expressions, then rated each expression's emotional intensity on an 8-point scale
  - Compound Expressions: participants labeled the two emotions expressed by Grimace and were scored on choosing both, half, or neither of the correct emotions (i.e., 1, .5, or 0)

Results

Figure 1. Compound Expressions (Average Recognition Score)

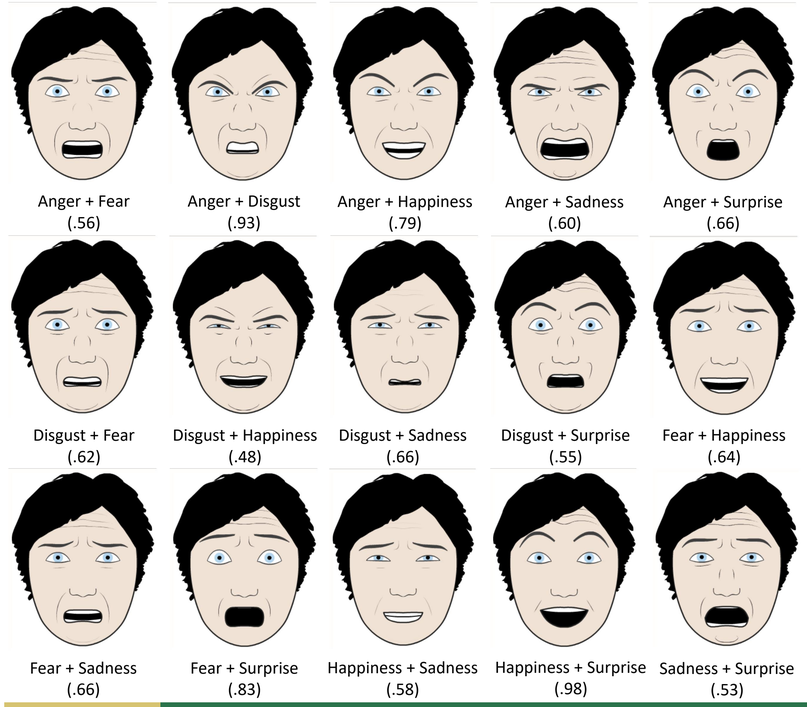

Figure 2. Recognition Accuracy (Proportion Correct) Versus Emotion Intensity

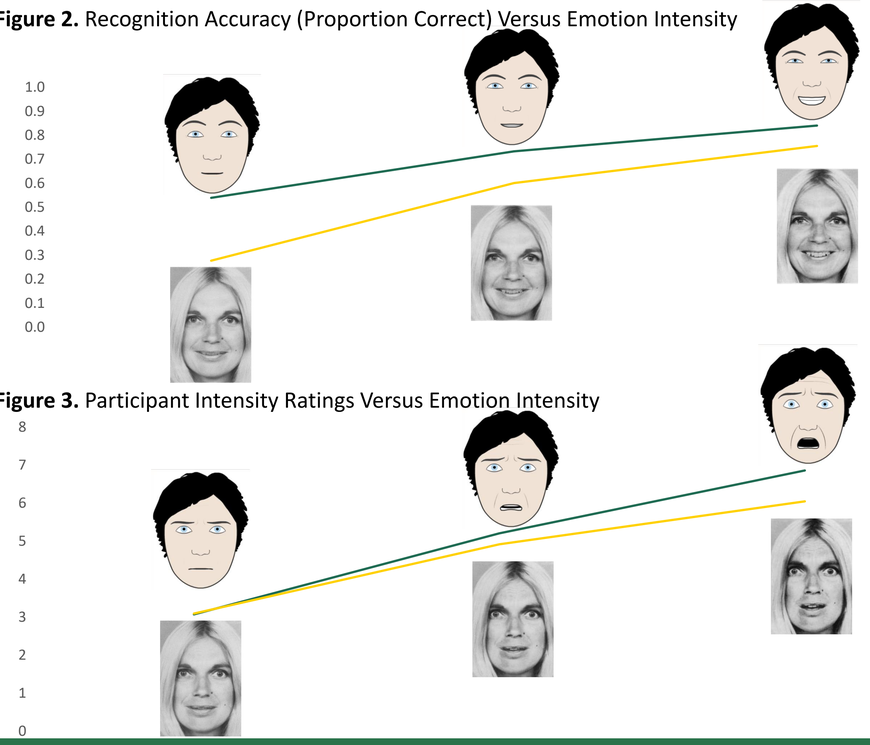

Figure 3. Participant Intensity Ratings Versus Emotion Intensity

Conclusions

- Grimace faces express recognizable emotional intensities and compound emotions, demonstrating its potential as a tool for training emotion recognition
- Future research should examine the nature of deficits in subtle facial expression recognition in people with ASD, and how these deficits affect their social inclusion
  - Grimace may be used as a tool for assessing deficits in facial expression recognition, in addition to training these skills
- Interventions developed from Grimace may also benefit people without disabilities that affect social cognition. Clinicians especially require an understanding of a wide range of subtle facial expressions to effectively include vulnerable populations in their practices

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