

Spatial Frequencies and Threat Perception

Brock DeGagne

Brandon University

Supervisor: Dr. Nicholas Watier

The current research examines a certain type of visual information that underlies our ability to discriminate among faces that vary according to threat. Specifically, the visual information under investigation is known as spatial frequency (SF) information. SFs operate along a continuum and can be described as ranging from low to high.

The task participants were asked to perform was to identify which pair of faces, of the two pairs presented, contained two different faces. One pair contained different faces while the other pair was made up of two identical faces. The identical faces were neutral in their perceived level of threat. The different faces were either threatening and neutral (high threat) or non-threatening and neutral (low threat) in their perceived level of threat. Participants performed this task 50 times and their data was then analyzed.

The aim of the study was to identify how much SF information participants required to be contained in the image for them to be able to consistently perform the discrimination task. Less SF information contained in the image, which translates to more extreme SFs contained in the image, meant a harder task. More SF information contained in the image, which translates to less extreme SFs contained in the image, meant an easier task. The minimum amount of information required to be preserved in the image for participants to consistently discriminate is called a threshold. Thresholds were calculated for both high threat faces and low threat faces for both low SFs and high SFs. To help conceptualize this, a low SF threshold of 2 spatial frequencies would mean that the discrimination task can be done consistently with all SFs 2 and below (i.e., 1.9,

1.8, etc.). Additionally, a high SF threshold of 6 spatial frequencies would mean that the discrimination task can be done consistently with all SFs 6 and above.

This study produced an average SF threshold for the high threat condition that was more extreme than that of the low threat condition. Results of this study suggest that less visual information is required to process threatening faces compared with non-threatening faces, and are consistent with previous findings that demonstrate an advantage for threatening stimuli in perceptual and cognitive processing.