EMOTION PERCEPTION AND CULTURE

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ABSTRACT

The process of perceiving and expressing emotion is multifaceted and governed by a plethora of variables. Culture and group membership have been shown to influence how emotions are displayed and interpreted. Individuals demonstrate inaccurate emoting perception to members of an out-group. Furthermore, perceiving emotions depends on contextual cues, preconceived biases, and familiarity. Cultural cues have an embedded meaning that guide emotional inferences. For the present study, a sample of 40 Muslim female participants were shown pictures of veiled female faces. The type of veil was be manipulated using an Islamic niqab or simply a scarf and a winter cap. Participants were asked to identify the emotion being displayed (happiness, sadness, anger, fear, or neutral) within the veiled faces whereby only the eye region of each face will be visible. Overall, participants were able to identify happy and angry faces more accurately compared to neutral, sad and fear. Participants showed no differentiation in perceiving the covered faces between the two head covering conditions This suggests that cultural familiarity with face processing in the presence of head coverings may account for this absence of distinction.

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CHAPTER I

INTRODUCTION

Perceiving emotions from faces is important for interpersonal interactions, as the way(s) we process the face could determine effective (or ineffective) communication. Similarly, the contexts in which we perceive the face, along with our experiences, might influence emotion identification ability. For example, our perception of a surprised face at a party is likely different from a surprised face during an exam in a classroom. Based on our experience, the former may indicate happiness while the latter might signal uncertainty or fear. Additionally, culture is a context that significantly shapes emotion perception. The emotions we choose to express, and our general perception ability, can largely be based on culture. Several factors contribute to cultural differences in emotional experience. One aspect includes the context in which the emotion is displayed. For example, individuals might wear specific cultural clothing or coverings that affect how their emotions are perceived. Cultural garments that hide some facial features may hinder or enhance perception abilities. It is essential to assess emotion perception from a cultural standpoint given that current trends in globalization require cooperation with individuals from various cultures.

Culture and Emotion

The ability to understand emotions is a key skill when communicating with individuals from other cultures. Our current lifestyle is characterized by globalization, which forces individuals to engage with others from various cultural backgrounds. Different cultures have distinct display rules that govern the expression and perception of emotions. Display rules include socialized norms for prescribing the intensity and type of emotions permissible within a particular setting (Ekman, 1972). For example, Japanese individuals tend to express shame predominantly in situations where others (i.e., individuals from Western cultures) may express anger (Boiger, Mesquita, Uchida, & Barrett, 2013). This discrepancy could be due to East Asian collectivist display rules promoting interpersonal harmony and interdependence, while anger and confrontation could interfere with forming and maintaining adaptive social bonds (Liu, 2014). Conversely, Western values of independence support the display of anger as a way of expressing individuality (Boiger, Deyne & Mesquita, 2013). Individuals are encouraged to embrace their uniqueness, which includes communicating emotions as opposed to concealing them. Thus, one's prevailing cultural setting could play a significant role in terms of the types of emotions that are typically displayed, and this could influence others' abilities with perceiving emotional expressions based on these prescribed norms.

One other aspect of culture and emotion perception is the tendency to be better at identifying facial expressions from in-group versus out-group members (Elfenbein, Beaupré, Lévesque & Hess, 2007). One reason for this advantage could be in relation to in-group bias tendencies, which can be characterized by ascribing positive characteristics (and having positive attitudes) toward individuals from our in-group as opposed to those

we classify as out-group members (Tajfel, Billig, Bundy & Flament, 1971). Individuals tend to show behaviors or express attitudes that favor those who appear to be similar to themselves. This preference could manifest in emotion perception accuracy. For instance, individuals are more likely to correctly identify emotions from in-group faces as compared to out-group faces (Meissner & Brigham, 2001). This component of in-group perception has also been observed in assessments of visual looking patterns. For instance, individuals tend to spend more time scanning the faces of in-group relative to out-group members (Hehman, Mania & Gaertner, 2010). This is especially the case when examining attention to eye regions of the face (a key facial feature for discriminating facial emotion), with individuals appearing to be more focused on the eye regions of in-group faces as opposed to out-group faces, which could be a key factor for in-group emotion perception accuracy (Kawakami et al., 2014).

In contrast to in-group bias, additional biases in emotion perception arise when perceiving out-group individuals. This differential treatment might stem from stereotypical thinking or from a lack of familiarity/experience with certain out-groups (Zebrowitz, Bronstad & Lee, 2007). Out-group bias may translate into inaccurate emotion perception. One reason for diminished accuracy could be that individuals are attending to other contextual cues that are irrelevant to an emotional display (i.e., eye color, type of hair, and skin color). Instead of basing perception on facial features most involved in executing an emotional expression (i.e., facial muscles from the eyes and/or mouth), participants might rely on less important secondary cues surrounding the face. Paying attention to non-essential features might also bring to mind preconceived negative ideas leading to diminished perception accuracy. Further, in some cases, out-group bias in

terms of ascribing negative emotions from pleasant ones tend to arise when examining out-group faces (Kret & Fischer, 2017).

Explanations for Group Biases

There are several proposed explanations for biases in emotion perception from facial displays. For one, lack of familiarity with individuals from an out-group could lead to poor identification of out-group emotional faces (Baudouin & Tiberghien, 2000). Conversely, familiarity with individuals from an in-group may help facilitate emotion identification, with prior studies suggesting that familiarity could be key factor in discriminating facial affect (e.g., heightened accuracy with identifying happy expressions from in-group relative to out-group faces; Elfenbein & Ambady, 2002; Claypool, H. M., Hugenberg, Housley & Mackie, 2007; Matsumoto, 2002). Tasks that involve identifying in-group faces provide a familiar context for the participant (Matsumoto, 2002). Here, perceivers may be better at focusing their attention on key features of the face that lead to better perception. Additionally, less time may be spent attending to irrelevant cues/information that hinders accurate identification. When viewing out-group faces, the opposite could be the case. Viewing individuals from an out-group could generate an unfamiliar context whereby perceivers could be paying less attention to salient features of a face that could aid identification (Chiroro & Valentine, 1995; Valentine, 1991). This could then lead to more inaccurate identification of out-group emotional displays.

Another possible explanation for culture-based variability in emotion perception could be related to group biases and stereotypes. Certain out-groups are characterized by negative labels that are easily recalled when confronted with representative individuals from such groups. Such negative labels could be reflected in perceptions of emotional

displays (i.e., perceiving negative emotionality when none is objectively present). In contrast, positive stereotypes are sometimes applied to in-group individuals, leading to either enhanced perception accuracy or even overidentification with positive emotions (Hugenberg, 2005). Additionally, other cultural factors, including display rules, could impact emotional perception leading to biases (Elfenbein, 2015, pp 57-71). These cultural influences have serious implications on how individuals communicate effectively.

Attention and Facial Perception

Attending to specific facial cues could influence accurate emotion perception. For example, paying attention to the eye region of a face can be useful when discriminating certain emotional categories (Schurgin et al., 2014). Specifically, emotions such as anger, fear, and sadness are often associated with distinct eye configurations (i.e., wide eyes for fear; drooping eyebrows for sadness, etc.). Such expressions are more easily identified by focusing attention primarily on the eye region of the face. Previous research investigating attention and facial perception suggest that there is preferential attention to the eye region (Arizpe et al., 2016; Kawakami et al., 2014; Vinette, Gosselin & Schyns, 2004). In one study, participants' initial and longest fixations targeted the eye region when perceiving certain emotions (Eisenbarth, Alpers, 2011). Similarly, the eye region of angry, sad, surprised, and fearful faces received the most attention and engagement from participants in a recent study (Calvo, Fernández-Martín, Gutiérrez-García, Lundqvist, 2018). Thus, when processing specific facial emotions, individuals tend to display selective attention to the eye region.

Eye region processing may also be a way to assess cultural differences in emotion perception. Eye tracking studies have illustrated that individuals focus their attention on

the eye region of in-group faces more than out-group faces (Brigham, Bennett, Meissner & Mitchell, 2007; Kawakami et al., 2014). The eyes of in-group members constitute a familiar context, which may explain higher rates in accurate perception. On the other hand, an out-group face might be perceived as an unfamiliar context leading to decreased attention to the eyes and less accurate perception. For example, when looking at in-group faces, European-Americans, African-Americans, and Asian participants fixated more on the eye region of in-group members relative to out-group faces (Brigham et al., 2007; Goldinger, He & Papesh, 2009; Wu, Laeng & Magnussen, 2012). Paying attention to the eyes when perceiving emotions is influential for determining the quality of the interaction. As noted above, for certain emotional categories, looking at the eye region provides more information than paying attention to other parts of the face (Boucher & Ekman, 1975; Magnano et al., 2018). Similarly, there are specific emotions that are mostly expressed through the eyes. Such expressions may be best identified by paying sufficient attention to the eye region. Thus, a tendency to deploy necessary attention to the eye region of in-group faces as opposed to out-group faces may enhance perception. Conversely, diminished attentional focus on the eye region could interfere with accurate identification when presented with out-group faces.

Self-Presentation and Emotion Perception

Culture can shape emotion perception by self-presentation mechanisms. Each culture has a set of distinct expectations that apply to how individuals dress and present themselves. Based on the way individuals dress, they might signal certain emotions to others that correspond to their cultural expectations. For example, within certain segments of the Muslim culture, women tend to cover their hair and parts of the face

when out in public. These coverings could significantly influence how individuals communicate with Muslim women. For instance, interactions with women wearing a face covering could be limited given that facial expressions may not be easily visible to others. Similarly, quality interpersonal interaction might be challenging when individuals from different cultures interact with Muslim women. Others might assume that these women are not responsive—leading to interpersonal confusion—given that perceivers cannot easily confirm whether their facial affect matches the tone of the interaction. Additionally, stereotypes regarding Muslim head coverings (i.e., niqabs and burkas) being a form of oppression could come to mind when individuals are interacting with Muslim women. Thus, the lack of information from a face, along with potential negative stereotypes associated with Muslim head coverings, could be key predictors of emotional misperception.

Most past research on emotion perception has been conducted using fully visible faces. Additionally, individuals (particularly within Western cultures) are more familiar with viewing visible as opposed to covered faces in daily life. However, covering the whole face, or some features of the face, is encouraged in some cultures. When face coverings are present, essential facial information is blocked, which could lead to challenges with emotion perception. However, two recent studies have investigated how covering certain facial features influences emotion perception. For instance, Kret and colleagues (2012; 2017) have examined how Muslim (i.e., niqab) and more Westernized (i.e., cap and scarf) coverings influence emotion perception. In one study, Kret and Fischer (2017) had Western-European participants view faces presented with an Islamic niqab or a Westernized cap and scarf. Male models were used for the Western face

covering and female models were covered with the niqab. The faces displayed anger, fear, happy, and sad expressions. The pictures were shown for a brief period before participants chose the emotion they thought was being displayed. Overall, participants demonstrated in-group bias manifesting in more accurate perception for faces covered with a cap and scarf. Conversely, participants were less accurate when viewing faces wearing a niqab. Additionally, participants were more likely to ascribe negative emotions to niqab-covered faces that were actually displaying positive and neutral expressions.

While overt attention to the eye regions for the different face categories was not assessed in this aforementioned study, it is possible that differences in facial perception for the two categories could have been accounted for by differential attention to the eye regions. For instance, the Western-European participants may have allocated more attention to the eyes in the cap and scarf condition, with the assumption that a more familiar face covering led to an uptick in in-group expression accuracy. On the other hand, participants might have neglected the eyes when viewing out-group faces (i.e., the niqab condition) and focused more on irrelevant information (i.e., the headdress). Overall, there are at least two possibilities for the out-group accuracy/inaccuracy observed in Kret & Fischer (2017): the first possibility is that participants were more unfamiliar with a niqab head covering, which may have distracted away from processing the important facial features (i.e., eyes) necessary for accurate perception. The second possibility is that the niqab head covering triggered negative out-group biases associated with Muslims, leading to inaccurate perception. Without examining actual overt attention during the task, it is difficult to determine which possibility is most likely. Thus, additional research is necessary to understand how variability in emotion perception can

be due to ones' own experience with exposure to limited facial information (i.e., familiarity with head coverings) and facial processing patterns when viewing covered faces. Research from Kret and colleagues solely included participants of European descent. Thus, all participants were asked to identify certain faces in an unfamiliar context (i.e., niqab head coverings). Diminished accuracy when viewing niqab faces could have been due to at least two possible reasons. First, due to (likely) limited exposure to faces covered by a niqab in one's day-to-day life, misperception could be accounted for by a lack of familiarity. Conversely, a cap-and-scarf provided—perhaps—a more familiar context that could have led to higher identification accuracy. The second possibility is that the Western-European participants were less accurate in their identification due to negative appraisals made regarding the niqab-covered faces (i.e., negative stereotypes ascribed to individuals from an Islamic background), while in-group preference could have led to more accurate perception for cap-and-scarf faces. Whether such biases (related to bias or familiarity) influences how individuals accurately (or inaccurately) identify emotions from covered faces is an open question. To better address this question, the proposed study will include an Arab-Muslim sample (along with a European-American sample) as participants. Arab-Muslim participants provide a useful test case for the familiarity vs. bias framework, given the possibility that they will have notable experience engaging with individuals veiling their faces during everyday interactions. Additionally, having Arab-Muslim participants view veiled faces with both a niqab and cap-and-scarf will allow us to test the role of in-group bias on emotion perception accuracy (i.e., will Arab-Muslim participants be more adept with identifying niqab faces relative to cap-and-scarf faces, mirroring results from participants of

European descent?). Finally, the present study will attempt to identify a potential mechanism for culture-based differences in emotion perception accuracy: attention paid to facial features (i.e., eye region) essential for interrogating facial affect**.** Thus, the focus of the current study will be on examining specific cultural contexts that differentiate emotion perception performance between a European-American and Arab-Muslim sample.

The Present Study

The present research will examine cultural differences in emotion perception as a function of two processes. The first suggests that lack of familiarity with a cultural context might explain potential deficits with identifying emotional displays from out-group members. Conversely, potential negative stereotypes ascribed to out-group members could lead to inaccurate perception. Perception accuracy could also be determined by the amount of attention paid to important facial cues, namely the eye region of a face. This investigation will enable us to test for a potential source of cultural differences/biases in emotion perception. To address these potential explanations for group-based differences in emotion perception, the current study will examine one particular cultural group. Arab-Muslim participants will provide insights as to how familiarity with facial coverings could influence perception. Since these individuals are exposed to in-group members wearing head coverings on a daily basis, they might display higher perception accuracy, regardless of face covering, compared to European-Americans in previous studies. Here, an Arab-Muslim's familiar cultural context might have enabled them to be more adept at identifying emotions through limited information.

Past research has not included Arab-Muslim samples in order to investigate how familiarity/group biases lead to emotion perception performance.

Based on previous research, we will examine a set of hypotheses concerning the Arab-Muslim sample. It includes two possibilities (Hypotheses 1 and 2). The first set of hypotheses could mirror the pattern of the European-Americans, in previous studies, in terms of in-group preference and out-group biases. Here, Arab-Muslim participants would be more accurate when viewing niqab faces and less accurate when viewing cap and scarf faces (Hypothesis 1A). For fixation (Hypothesis 1B), we would expect Arab-Muslim participants to attend less to the eye region of cap and scarf faces (and more toward niqab faces), which would be associated with diminished cap and scarf perception accuracy and enhanced niqab face accuracy. Alternatively, given that Arab-Muslims interact regularly with individuals donning facial coverings, they may be generally more adept at identifying emotions from covered faces, regardless of the type of covering. Thus, cultural context might not have any effect on emotion perception for Arab-Muslims. This would mean that for perception accuracy (Hypothesis 2A), we would predict that Arab-Muslim participants would be better at perceiving all covered faces relative to their European-American counterparts. For fixation (Hypothesis 2B), we would hypothesize that the Arab-Muslims would attend more toward the eye region of all faces, and less toward the head covering for all faces, associated with comparable perception accuracy for both cap and scarf and niqab faces.

CHAPTER II

METHODS

Participants

The intended sample size based on preconceived power analysis was n=50. Although we were able to collect data from 72 Female Muslim participants, the data of only 40 participants were used in the study. One reason for exclusion was that some participants did not complete all parts of the study. The second reason was due to a technical error where the stimulus presentation program (Labvanced) did not record some variables for some participants. The mean age for the sample was $M = 36.2$ and $SD = 11.09$. The Muslim sample was mainly recruited through Amazon Mechanical Turk's CloudResearch survey panel platform. Additional participants were recruited using flyers distributed at local Islamic centers and through other online recruitment services. The majority of the sample came from the US (80%), 5.7% came from Saudi Arabia, and 2.8% came from Australia. Approximately half of the sample (51%) identified as White, 31% as Middle Eastern/North African, 17% as Asian, 2.9% as Hispanic, and 5.7% as "other" (See Table 2 for additional demographic information). All participants (regardless of recruitment source) entered a raffle for a chance to receive one of two $20 gift cards as compensation for their participation.

Measures

Image Stimuli

The image stimuli were selected from the Karolinska Directed Emotional Faces database (KDEF; Lundqvist, Flykt, and Ohman, 1998). This stimulus set has been used in several studies on emotion perception. The mean biased hit rate within the KDEF is 72%. Also, test-retest reliability for accurate emotion identification is quite high (87.96%). A total of 10 images of women models was selected and edited using Adobe Photoshop to apply one of two headdress configurations: a cap and a scarf or a niqab. The images include five expressions: happiness, sadness, fearful, anger and neutral. There was a total of 200 trials for each participant. Stimulus examples for each headdress configuration can be seen in Appendix F.

Stimulus Presentation and Eye Tracking

The protocol was be administered online using Labvanced software (Finger et al., 2017). We intended to implement webcam eye tracking. Unfortunately, technical issues precluded us from utilizing the eye tracking apparatus. Participants were asked to complete the experiment using either a laptop or desktop computer.

Self-Report Measures

Two self-report affective measures were included in order to determine whether any pre-experiment mood states could impact emotion perception accuracy. The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegan, 1988) was administered to assess general mood prior to the experimental session, and the Center for Epidemiological Studies depression scale (CES-D; Radloff, 1977) was included to screen for depressive symptomology.

Bias Corrected Hit Rate

To calculate perception accuracy for each participant's emotion, we used a conservative metric, referred to as a *Hu* score (Wagner, 1993). These values can range from 0 to 1. This bias-corrected score accounts for the number of times participants choose the right emotion label while also accounting for incorrect identifications (both false positive and false negatives). A simple example is as follows: if a participant correctly identifies 14 of 20 niqab happy faces (70% raw hit rate), but incorrectly labels 2 non-happy niqab faces as "happy," their *Hu* score would be: $14^2/(20 \times 16) = .61$.

Islamic Questionnaire

We asked participants three questions related to their religiosity to determine if it has an effect of their perception accuracy. The first asked participants about how often you interact with individuals wearing Islamic head coverings on a scale from one to 5 with five being the highest. The second question asked about if they live or have lived in a Muslim majority country. The last question was a follow up about the number of years they have lived in a Muslim majority country (See Table 1).

Procedure

The study was conducted online through the Labvanced software platform. Participants provided electronic informed consent prior to participating. After consenting, participants completed the self-report affect measures (PANAS and CES-D). Next, participants became oriented with the emotion perception task. The emotion perception task comprised a series of facial images (one face per trial) veiled by a head covering (cap/scarf or niqab). Only the eye region of each face was visible to participants. Participants viewed a series of happy, sad, fearful, angry, and neutral facial images across

the two head covering combinations. Prior to the full experiment, two practice trials were presented (one for each head covering condition) to familiarize participants with how the task would proceed. Next, each trial began with a fixation cross at the center of the screen for 2 seconds, followed by a face image for 1.5 seconds. After image presentation, participants selected the emotion label that best matched the expression in a self-paced manner. From here, a new trial began. Participants viewed a total of 200 faces (100 per head covering condition; 40 per emotion category; 20 per KDEF model). At the end of the experimental trials, participants were debriefed and thanked for their time. The entire protocol lasted approximately 45 minutes.

CHAPTER III

RESULTS

Due to technical issues with implementing the web-based eye tracking platform, as well as difficulty with participant recruitment resulting from these technical issues, suitable eye tracking data could not be obtained. Thus, the main analyses only include an assessment of perception accuracy for the facial stimuli. A 2 (head covering: cap/scarf vs. niqab) x 5 (emotion type: happy, sad, anger, fear, neutral) repeated measures ANOVA was conducted for bias-corrected *Hu* scores on perception accuracy. Data from two participants were removed because their *Hu* scores were 3 *S.D* above the mean for more than 50% of emotion and face covering combinations. Greenhouse-Geisser corrections were implemented to account for violations of sphericity. A significant main effect of emotion type was observed $F(2.958, 109.460) = 8.66$, $p < .001$, $\eta^2 = .19$. However, the main effect of head covering, $F(1, 37.000) = 2.79$, $p = .10$, $\eta^2 = .070$, and the interaction, $F(2.588, 95.750) = 2.20$, $p = .10$, $\eta^2 = .06$, were non-significant.

To decompose the direction of the emotion main effect, a series of pairwise comparisons (Bonferroni-corrected to account for an inflated family-wise error rate when conducting multiple comparisons) were conducted to examine differences in perception accuracy across the five emotion types collapsed across head covering condition. Overall,

happy faces were perceived more accurately than sad (*M*_diff = .114, SE = .03, *p* = .002), fear (*M*_diff = .114, SE = .02, *p* = .000), and neutral faces (*M*_diff = -.114, SE = .02, *p* = .000). Fear faces were perceived more accurately than neutral faces (*M*_diff = .134, SE = .03, *p* = .000). Anger faces were perceived more accurately than sad (*M*_diff = .08, SE =.03, *p* = .009) and neutral faces (*M*_diff = .08, SE = .03, *p* = .002). Overall, happy, anger, and fear faces tended to be perceived most accurately, with sad and neutral faces being perceived the least accurately (see Figure 1). Additionally, to assess whether there was a systematic bias in terms of inaccurate emotion perception (i.e., when a face was mis-identified, was there a bias in the emotion label used, such as ascribing negative emotions to happy and neutral faces especially when viewing out-group faces), a confusion matrix was constructed. As can be seen in Table 3, there were systematic patterns in terms of inaccurate perception, regardless of head covering condition (with the potential exception of some level of consistency in happy being confused with neutral and vice versa).

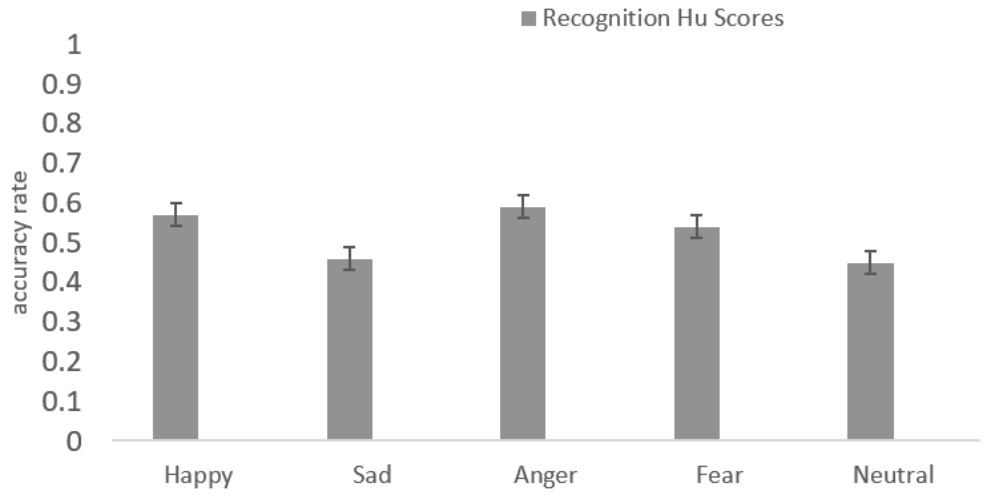

Figure 1. Accuracy rates based on *Hu* scores across the five emotion types.

Table 1. Frequency of interaction with participants wearing any niqab and cap/scarf-type head coverings

Frequency of interaction with individuals wearing any type of head covering	*N*	*%*
1	4	10.5%
2	4	10.5%
3	7	18.4%
4	11	28.9%
5	12	31.6%

Table 2. Sample Demographics

Country	*N*	*%*
US	36	94.7%
Saudi Arabia	2	5.3%
AU	1	2.6%
Race		
ME/ North African	10	26.3%
White	19	50%
Hispanic	1	2.6%
Asian	3	7.9%
Other	2	5.3%
Age		
18-28	15	39.5%
29-38	14	36.8%
38 and older	9	23.7%

Table 3. Confusion matrix for percentages of accurate and inaccurate recognition (rows indicate the emotion depicted in each picture presented).

Cap & Scarf	Happy	Sad	Fear	Anger	Neutral
Happy	-	4%	3%	3%	21%
Sad	3%	-	10%	16%	11%
Fear	2%	10%	-	12%	7%
Anger	3%	11%	8%	-	6%
Neutral	8%	12%	5%	4%	-

Niqab	Happy	Sad	Fear	Anger	Neutral
Happy	-	9%	3%	4%	22%
Sad	3%	-	6%	13%	13%
Fear	4%	12%	-	10%	8%
Anger	3%	12%	8%	-	12%
Neutral	7%	15%	5%	5%	-

CHAPTER IV

DISCUSSION

The present study explored the effect of familiarity and out-group bias/stereotyping on emotion perception using a female Muslim sample. We predicted that Muslim participants' performance would follow one of two possibilities. First, it was possible that participants would demonstrate higher perception accuracy for the niqab condition compared to the cap and scarf condition, which would reflect an in-group bias in emotion perception. This prediction mirrors findings from previous research where Western European participants showed an in-group bias in their emotion perception in the opposite direction as what was predicted for the present study (i.e., the Western European sample had better perception accuracy for cap and scarf relative to niqab faces; Kret & Fischer, 2017). The second possibility was that female Muslim participants in the present sample would exhibit no differentiation in perception accuracy between the head covering conditions. This pattern of results could be reflected in the notion that cultural familiarity with head coverings—in general—would lead to comparable levels of perception accuracy irrespective of whether viewing a niqab face or a cap and scarf face. Results from the current study are more in line with the latter set of predictions, whereby

participants did not differentiate in their perception accuracy as a function of head covering. Participants were equally accurate when viewing niqab and cap and scarf faces.

Main Effect of Emotion

There were no specific hypotheses regarding the effect of discrete emotions on perception accuracy. Prior studies have observed emotion effects when faces have been misidentified based on cultural context (i.e., White Europeans ascribed more negative emotionality to positive and neutral out-group faces wearing a niqab, see Kret & Fischer, 2017). For the present study, there was a main effect of emotion on perception accuracy. This was reflected in happy, anger, and fear faces being the most accurately identified emotions, overall, with sad and neutral faces being the least accurately identified. These results are generally in line with past research suggesting that certain emotion prototypes are distinguishable by eye configurations, particularly when only the eye region is visible (Kret & Gelder, 2012; Kret & Fischer, 2017). For certain emotions, eye configuration is presumed to be essential to accurate identification. This is particularly the case for the emotions of sadness, fear, and anger (Guarnera, Hichy, Cascio & Carrubba, 2015), whereas mouth configurations are helpful for distinguishing alternative emotion prototypes; namely happiness and disgust (Li et al., 2023; Fox et al., 2000; Schurgin et al., 2014). Additional research suggests that eye region processing can be sufficient for distinguishing a variety of emotional expressions, including happiness (e.g., Keltner & Ekman, 2000). For instance, participants in one study deployed the most attention to eye regions of the face when perceiving happy, sad, angry, and fearful facial images (Schurgin et al., 2014). Furthermore, increased eye region processing—whether a full face is visible or just the eye region—is predictive of enhanced emotion perception

accuracy across several emotion categories (Adams & Kleck, 2003; Eisenbarth & Alpers, 2011; Peterson & Eckstein, 2012).

Participants in the present study were least accurate at identifying sad and neutral faces, which is similar to findings from some past research (Kret & Gelder, 2012). In one recent study that used medical face masks to cover the lower part of the face, participants confused sad and neutral expressions the most (Rinck et al., 2022). Another recent study revealed that sad expressions were the least accurately identified when covered with a facial mask (Saito, Motoki & Takano, 2023). Interestingly, Rinck and colleagues used the KDEF facial database; thus, perhaps some aspects of the sadness and neutral model expressions within this database leads to diminished perception accuracy. For instance, it is possible within this facial database that eye configurations of sadness and neutral expressions are rather subtle, which may impact perception accuracy relative to other expressions.

No Differences in Emotion Perception as a Function of Head Covering

Previous studies have shown that White European participants demonstrate in-group bias when perceiving emotions, with higher perception accuracy for faces wearing a more Westernized head covering (i.e., cap and scarf) in comparison to faces wearing a non-Western Islamic head covering (i.e., niqab; Kret & Fischer, 2017). This is in line with previous studies with other racial and ethnic groups, whereby in-group facial emotion identification is more accurate when viewing in-group relative to out-group faces (Palomares, Smith, & Manrique, 2016). Conversely, in the present study, female Muslim participants did not appear to demonstrate any sort of in-group preference or out-group bias, as perception accuracy did not differ as a function of head covering condition.

This suggests that certain in-group vs. out-group social signals (in this case via head covering) did not seem to impact perception accuracy. The fact that the sample did not show any sort of diminished perception when viewing a cap and scarf as compared to a niqab may reflect just a generalized level of perception accuracy regardless of head covering type, which could be reflective of how familiarity with viewing faces with a head covering (regardless of type) is not a major impediment to reading the facial emotions of others.

Another possibility for a lack of difference in perception accuracy between the two head covering conditions could be related to the sample accessed in the present study. Most of the participants came from Western countries (82.9%), where a cap-and-scarf head covering would perhaps be common and familiar. Perhaps some amount of regular exposure to a cap and scarf configuration (similar to what was expected in terms of niqab exposure for this sample) in the West may not be perceived as relatively novel or salient, thus providing little impediment to perception accuracy. Additionally, the cap-and-scarf may not connote a similar level of out-group bias/stigma when compared to White Europeans viewing a niqab head covering. A niqab head covering is a salient cultural symbol for stigmatized individuals within certain Western societies, which could provide a stark out-group context that could lead to biased perception accuracy (particularly ascribing negativity to neutral expressions) in previous studies within White European samples (see Kret & Fischer, 2017). Given that the current sample may not have any stigmatized associations with Western cultural symbols (i.e., cap and scarf), no out-group bias emerged when viewing the cap-and-scarf faces (at least to the level of discriminating their perception accuracy). Overall, it is possible that participants may

have been sufficiently familiar with both niqab and cap/scarf head coverings—as well as hold no stigmatized associations with a symbol of Western cultural garb—which could translate to comparable perception accuracy (or lack of any demonstrable bias in perception accuracy), regardless of head covering condition.

A further analysis was conducted using a confusion matrix to examine possible outgroup bias (table 3). This matrix outlines the percentages of inaccurate choices made by participants and which specific emotion they chose when they did not choose the correct emotional label. As illustrated in the matrix, happy was accurately identified 68% of the times and was inaccurately perceived as neutral 21% of the times for the out-group condition (cap and scarf). Similarly, happy was accurately labeled 63% of the times and neutral was misattributed to happiness 22% of the times in the in-group (niqab) condition. Thus, the study did not detect systematic inaccuracy for pleasant and neutral expressions having a negative label being attached to them similar to what was shown in previous European samples.

One other plausible explanation for a lack of difference in perception accuracy as a function of head covering condition could be related to aspects of the experimental procedure. Specifically, when comparing the present study to previous studies using similar stimulus sets (cap and scarf vs. niqab faces), the presentation time available for participants to view the faces was quite different. For instance, in Kret and colleagues' studies (2012; 2017), presentation times were quite rapid (less than 1000 ms), whereas in the present study, the presentation interval was extended (1,500 ms) to allow for assessments of potential overt attentional biases during facial viewing. Rapid presentation intervals could elicit more automatic forms of information processing (Ratcliff & Rouder,

1998). It is possible that certain forms of in-group preference and/or outgroup bias operate within a more automatic/implicit time frame (Payne, 2001). Thus, the in-group preference/out-group biases observed in Kret and colleagues' perception tasks could be related to the viewing constraints present in those studies. It should also be noted that the overall perception accuracy in those studies was much lower than in the present study. For instance, when comparing the present study from those of Kret & Fischer (2017), overall Hu scores were lower for each emotion category: anger = 0.49 vs. 0.64; fear = 0.53 vs. 0.62; happy = 0.28 vs. 0.58; sad = 0.2 vs. 0.46. Thus, the longer presentation interval in the present study may have alleviated some perception constraints, leading to upticks in perception accuracy relative to these past studies. Furthermore, participants were given the explicit goal to be as accurate as possible. Perhaps more deliberate processing was available given the presentation interval provided in the present study, allowing the explicit task goal to override any potential automatic stereotypes/in-group preference. In sum, providing participants with more time to view the stimuli and execute a decision might have decreased the possibility of detecting any sort of in-group/out-group bias in the present sample.

Limitations and Future Directions

There are a few limitations to note for the current study. The first is the lack of a true cultural comparison with samples from different cultural backgrounds. Only Muslim females, with the majority residing in Western countries, were sampled for the current study. A more thorough cross-cultural comparison could be conducted to explore the impact of familiarity vs. stigma/bias on perception accuracy. In order to assess divergent levels of Western vs. Muslim familiarity/bias with Western (i.e., cap and scarf) and

Muslim (i.e., niqab) head coverings and its impact on perception accuracy, a comparison of participants recruited from various backgrounds is required. For instance, participants could be recruited from Muslim-majority countries (Muslims and non-Muslim Westerners) as well as from Western countries (Muslims and non-Muslim Westerners). Here, generalized familiarity to discern facial emotion from covered faces may be highest among Muslims living in Muslim-majority countries (assuming greater levels of exposure to covered faces within that culture) relative to, perhaps, Western participants living in Western countries where a long history of exposure to facial coverings may be more limited (cf., the recent advent of face masking resulting from the COVID-19 pandemic). Muslims from Western countries and Western participants from Muslim countries might show comparable levels of accuracy considering that both groups are familiar with the out-group face covering (cap and scarf and niqab). Western participants from Western countries might exhibit the least accuracy with the niqab face covering since the niqab resembles a novel head covering (as well as the stigma associated with this head covering in Western countries).

As noted previously, the stimulus presentation interval could be considered a limitation in the current study. Presenting facial images for a brief period of time might decrease perception accuracy by limiting deliberate information processing. However, this rapid exposure could be what is needed to assess stereotypic categorizations (Ratcliff & Rouder, 1998). The presentation time for the image stimuli in the Kret studies discussed earlier (Kret & Gelder, 2012; Kret & Fischer, 2017) was relatively rapid, which could have helped facilitate the biased perception accuracy for out-group stimuli in those studies. Short exposures map onto automatic perceptual biases that limit access to

deliberate decision-making processes (Dekel & Sagi, 2020). The current study allowed participants to examine the stimuli for a period that is approximately 3 times longer than in those previous studies. This increased presentation interval might have yielded more deliberate choices and less evidence for biases in perception accuracy as a function of cultural symbols. Varying the presentation interval in future studies could better interrogate this possibility.

Participants' racial identification can be considered a limitation is the current study. A novel racial classification category of Middle Eastern North African (MENA) has become more common as a demographic identifier. The impact of personal identification with the MENA racial identity on emotion perception is perhaps quite complex and multifaceted. Several factors may influence this relationship, and individuals' experiences, attitudes, and cultural contexts could play a significant role. Stereotypes and biases associated with the MENA racial identity, whether positive or negative, could have internally influenced participants' self-perceptions, which may have impacted their emotion perception performance. Research in this area is ongoing, and the relationship between personal identification with the MENA racial identity and emotion perception likely results from a combination of cultural, social, and individual factors. Understanding these complexities is crucial for promoting inclusivity and avoiding stereotypes when studying emotion perception.

In the current study, happiness and anger were among the two most accurately identified emotions. An assumption can be made that relatively high levels of happiness perception accuracy is primarily due to happiness being the only positively-valenced emotion category presented to participants. However, this explanation does not account

for the comparably high levels of anger accuracy. The level of anger accuracy observed in the current study may be related to the aforementioned MENA demographic category association, particularly within an out-group immigrant context. As most participants in the current sample consisted of individuals with a somewhat recent immigrant history within their current country of residence, it is important to keep in mind how these participants' probable experiences with stigma could have influenced their perception of certain emotions, particularly anger. Members of stigmatized groups are on the receiving end of inordinately biased social interactions. Persistent negative experiences may lead individuals to internalize stereotypes and biases ascribed to membership in the stigmatized group (Krendl, Kensinger & Ambady, 2012). One possible outcome is the emergence of cognitive biases resulting from internalized stereotypes, which in this instance may be reflected in a hypervigilance/heightened perception of anger cues. Hence, individual identification as an immigrant from stigmatized group could lead to such nuanced emotion perception abilities. Further research is needed to better assess how certain group membership identification dynamics influence in and out-group social perception.

A final limitation in the current study was the inability to implement the intended eye tracking methods to assess how attentional patterns work as a mechanism for emotion perception processing. Previous studies have shown that viewing times to eye regions of facial stimuli is correlated with perception accuracy for certain emotion types (Peterson & Eckstein, 2012; Jack, Blais, Scheepers, Schyns & Caldara, 2009; Schurgin et al., 2014). It would be useful to assess how visual attention patterns to information that convey emotional meaning (eyes) versus those that would distract (head covering) could

help better understand mechanisms behind emotion perception accuracy/inaccuracy. Examining participants' eye fixation duration and location while viewing the images could shed light on the factors influencing their accuracy in emotion recognition. Therefore, incorporating an eye-tracking system to analyze eye movements during the task may offer valuable insights into this relationship in future studies.

Conclusion

In the present study, there were no differential patterns of perception accuracy as a function of head covering. Cultural familiarity with face processing in the presence of the head covering (and/or the lack of a negative association with/exposure to Western-style head coverings) may help explain this lack of a difference. Specific sample characteristics and an elongated presentation interval relative to previous studies provide additional possible explanations. These findings suggest that for the present Muslim sample—who were predominantly recruited within a Western cultural context—did not differentiate in their perception accuracy when viewing faces with Muslim vs. Western cultural symbols. Future studies could expand on these findings by comparing samples from various Muslim vs. Westernized cultural backgrounds. Overall, these findings contribute to the growing body of research on cross-cultural communication and emotion perception.

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APPENDIX A

Participants' Demographics

Age

……..

Race

- White or European American
- Hispanic, Latina or Spanish origin
- African or African American
- Middle Eastern, North African or Arab
- Asian or Asian Indian
- Other

APPENDIX B

Consent Form

Eric S. Allard
Department of Psychology
UN 259
Cleveland, OH 44114

Cleveland State University Department of Psychology

Informed Consent for Participation in "Emotion Perception and Culture"

Primary Investigator: Eric Allard, Ph.D

Co-Investigator: Yosra Abualula

Introduction: This study tests how people read emotions. You are here today because you are a Muslim woman between the ages of 18-50. Your participation is voluntary.

Purpose of the Study: We want to understand how your background and what you pay attention to influences how you read emotions.

Descriptions of the Procedure: The research will take place online. You will be asked to view a series of faces while your eyes are tracked with your computer web

camera. You will also be asked to answer questions about your background and personality. The tasks will take place in one session. The tasks will be completed in less than 1 hour.

Possible Risks or Discomforts: To the best of our knowledge, the things you will be doing in this study pose no harm or risks greater than what you would experience on a normal day. If you feel uncomfortable or experience a troubling response to the faces, we can refer you to www.nami.org for assistance.

Benefits to Participants: If you are a CSU student, you may receive course credit for your participation. In addition, all participants, whether a CSU student or non-student, will enter a raffle for a 5% chance to receive one of 5 $20 gift cards.

Costs: You do not have to pay to participate in this research study.

Compensation: If you are a CSU student, you may receive course credit if you have registered for this study through the SONA system. Should you choose to end your participation, you will receive ½ study credit for every half-hour of the study you completed. In addition, all participants enter a raffle for a 5% chance to receive one of 5 $20 gift cards.

Right to Withdraw from the Experiment: Your participation is voluntary. You may quit the study at any time. You will not be penalized for quitting the study.

Confidentiality: You will not be asked to provide your name or any personally identifying information during this study. All data collected will be stored securely on a server that is not linked to any personal information.

Contact Person for Questions: You may contact the Principal Investigator, Dr. Eric Allard (216-687-2531 or e.s.allard@csuohio.edu.) or the Co-PI Yosra Abualula, (857-498-7375 or y.abualula@vikes.csuohio.edu) with questions or comments.

I understand that if I have any questions about my rights as a research subject, I can contact the Cleveland State University Institutional Review Board at (216) 687-3630.

Certification: I have read and believe I understand this document. I believe that I understand the purpose of the study and what I will be asked to do. I understand that I may stop my participation at any time. I understand that I can refuse to answer any question(s). I understand that if I have any questions about my rights as a research subject, I can contact the Cleveland State University Institutional Review Board at (216) 687-3630. I hereby acknowledge that I am over the age of 18 and give my informed consent to participate in this study.

o I consent to participate

o I do not consent to participate

APPENDIX C

Exposure Survey

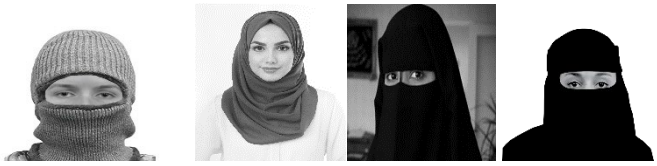
Please answer the following questions.

1) How often do you interact day to day with individuals who wear an Islamic face covering whether in person or remotely/virtually?

   Verry much 1 2 3 4 5 Not at all

2) Do you (did you use to) wear a face covering similar to one of the presented below?

   Yes No



3) Do you live in a Muslim majority country? If yes for how long have you lived there?

   Yes, for …….. years No

APPENDIX D

The Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) PANAS Questionnaire

This 20-item scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. Indicate to what extent you feel this way right now, that is, at the present moment OR indicate the extent you have felt this way over the past week.

Example

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

1. Interested

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

2. Distressed

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

3. Excited

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

4. Upset

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

5. Strong

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

6. Guilty

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

7. Scared

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

8. Hostile

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

9. Enthusiastic

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

10. Proud

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

11. Irritable

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

12. Alert

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

13. Ashamed

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

14. Inspired

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

15. Nervous

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

16. Determined

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

17. Attentive

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

18. Jittery

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

19. Active

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

20. Afraid

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

21.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

APPENDIX E

Center for Epidemiologic Studies Depression Scale (CES-D), NIMH.

Below is a list of the ways you might have felt or behaved. Please tell me how often you have felt this way during the past week.

1. I was bothered by things that usually don't bother me.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

2. I did not feel like eating; my appetite was poor.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

3. I felt like I could not shake off the blues even with help from my family or friends.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

4. I felt I was just as good as other people.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

5. I had trouble keeping my mind on what I was doing.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

6. I thought my life had been a failure.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

7. I felt fearful.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

8. My sleep was restless.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

9. I felt depressed.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the					Most of all of the time (5-7 days)

time (less than 1 day)

10. I felt that everything I did was an effort.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

11. I felt hopeful about the future.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

12. I was happy.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Rarely or none of the time (less than 1 day)					Most of all of the time (5-7 days)

13. I talked less than usual.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

14. I felt lonely.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5

Very slightly or not at all — Extremely

15. People were unfriendly.

○ 1 ○ 2 ○ 2 ○ 3 ○ 4 ○ 5

Very slightly or not at all — Extremely

16. I enjoyed life.

○ 1 ○ 2 ○ 2 ○ 3 ○ 4 ○ 5

Very slightly or not at all — Extremely

17. I had crying spells.

○ 1 ○ 2 ○ 2 ○ 3 ○ 4 ○ 5

Very slightly or not at all — Extremely

18. I felt sad.

○ 1 ○ 2 ○ 2 ○ 3 ○ 4 ○ 5

Very slightly or not at all — Extremely

19. I felt that people dislike me.

○ 1 ○ 2 ○ 2 ○ 3 ○ 4 ○ 5

Very slightly or not at all					Extremely

20. I could not get going,

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

21. Jittery

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

22. Active

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

23. Afraid

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5
Very slightly or not at all					Extremely

24.

○ 1	○ 2	○ 2	○ 3	○ 4	○ 5

Very slightly or not at all	Extremely

APPENDIX F

Examples of the niqab and cap and scarf headdresses

Niqab 1

Niqab 2

Cap and scarf 1

Cap and scarf 2

APPENDIX G

Debriefing Form

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Culture and Emotion Perception

The purpose of this present study is to investigate cultural differences in facial emotion recognition abilities. The study incorporates different styles of headdresses to understand how recognition is influenced by in-group and out-group biases. With eye tracking, we also hope to determine whether participants' visual attention to the type of headdress has influenced their performance on the recognition task. We hope that this research will help provide insights into how aspects of emotional knowledge is influenced by culture and in and out group membership.

If you have any further questions about the nature of your participation or to learn more about this study, please feel free to contact the lead investigator of this study, Dr. Eric S. Allard (contact information listed at the top of this form).

Thank you very much for your participation!