EMOTION RECOGNITION, GENDER AND FACE MASK WEARING DURING THE COVID-19 PANDEMIC

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INTRODUCTION

Evidence based research conducted globally suggest face masks can provide effective protection against COVID 19 in the community, as acknowledged in recommendations from the United Kingdom and other countries (National Health Service, 2020). Sri Lanka has also developed strict health guidelines relating to curtailing the spread of the coronavirus since the first detection of a COVID positive case in the country in January 2020. Mandatory usage of masks in public places and other methods such as social distancing and restricting mobility via travel restrictions are some of the regulatory methods still in place in Sri Lanka (Erandi, Mahasinghe, Perera & Jayasinghe ,2020).

Our faces display key information about our personal identity as well as additional socially viable information such as age, attractiveness, and sex (Bruce & Young, 1986). Human communication mainly depends on the accurate perception of emotions (McArthur & Baron, 1983) and facial cues are one main form through which humans gather information about emotions during social interactions (Przybylo, 2008 as cited in Tarnowski, Kolodziej, Majkowski, Rak, 2017). Facial emotion-related cues also affect human responses to other individuals (Elfenbein & Ambady, 2002) which means, facial emotional recognition influences human emotional competency and social competency. Accurate emotion recognition is vital in social interactions for many reasons. According to the emotion-as-social-information model, an emotional expression is a process, which informs cognitions and actions (Kleef, 2009). If emotion recognition fails in a social situation it may lead the participating individual to act in inappropriate ways.

Some authors point out that there are no gender-specific differences in emotional competence; Kumar (2014), in her study in which emotional management of nurses was analyzed using a gender perspective, concluded that there is no gender based difference in emotion management. Another research conducted with Iranian undergraduates showed that there was no significant difference between the genders on their total score measuring emotional intelligence. However a relatively larger number of researches show evidence to the opposite. A research using an equally gendered sample showed males reporting higher emotional intelligence levels in comparison to females as measured by the Emotional Quotient Inventory (EQ-i) (Ahmad et al., 2009). On the contrary, females were found to score higher in emotional intelligence than males in a study conducted by Rooy, Alonso and Visvesaran, (2005).

Cross-cultural comparisons of facial expressions in several studies challenge the universality in emotional expression. Western cultures display the six basic emotions with a distinct set of facial movements common to the group, while those from Eastern cultures such as South Asians represent emotional intensity with distinctive dynamic eye activity. Similarly, perception of facial expressions has also been found to differ across cultures (Jack, 2012).

Face masks that are commonly worn during the COVID-19 pandemic covering the nose and mouth, cover about 60–70% of the area of the face. Those areas are the most important for emotion reading and emotional expression, and are crucial for effective nonverbal communication of emotional states. One study found sunglasses to obscure our ability to accurately read emotions from facial expressions (Roberson et al., 2012) and wearing face masks have been found to lower

accuracy and confidence in assessment of displayed emotions indicating emotional reading was strongly mediated by the presence of a mask (Carbon, 2020). Another study conducted in Germany found that face masks decrease a person's ability to accurately categorize an emotional expression and make target persons appear less close (Grundmann, 2021). As above results revealed, wearing face masks clearly has an underlying psychological impact on emotional and social competence. However a study conducted in the USA, Canada and Netherlands about whether a witness wearing a niqab or a hijab would affect the ability of a member of the jury to detect deception found contradictory results. Participants were better able to detect deception in individuals wearing a niqab or hijab (Leach et al, 2016).The possible reason for this difference is the extensive focus placed on the eyes when detecting deception and generally when forming social impressions (Janik, Wellanda, Goldberg & Dell' Osso, 1978). Moreover witnesses in niqabs or hijabs were found to use more verbal cues to compensate for the covering of facial expressions when expressing themselves (Leach et al, 2016). As wearing a face mask only leaves the eyes visible, whether similar results will be found in relation to emotion recognition was explored in the present study.

Many of these researches relating to face mask wearing and emotional perception have been conducted in the context of individualistic cultures. Though recognition of basic emotions has been found to be similar across cultures (Ekman& Friesen, 1971), more recent research have found cross cultural differences. A research conducted in India has found that in comparison to Dutch participants Indian participants were more likely to rate emotions displayed as genuine, higher in valence, and also less intense (Mishra, Ray & Srinivasan, 2018). The present study hopes to fill this gap in research relating to emotion recognition and factors that might play an influencing role in this process (gender and wearing face masks) within a culture that is more collectivist-inclined like Sri Lanka. A further aim is to explore the psychological impact the preventive strategy of wearing face masks can have on individuals in terms of the ability to recognize emotions.

METHODOLOGY

Participants: The total respondents for this study were 200 of which majority were female (Females = 162, Males= 38). The majority of participants belonged to the 20-30 age group (94%), while only 4%, 1.5% and 0.5% belonged to 31-40 years, 41-50 years and 51 and above age categories respectively. 47% of the sample also belonged to the lower income category and this could be due to the majority of participants belonging to the student population. In terms of residential province the highest percentage; 35.5% of the sample were from the Central Province and the lowest percentage of 0.5% were from the Northern Province of Sri Lanka.

Measures: A Google form was developed consisting the two main sections. The first section consisted of a demographic form where respondents were to provide information about their gender, age, income and residential province. The second section consisted of a series of male and female face stimuli depicting six main emotional states: happy, sad, fear, anger, disgust and neutral. Photographs were taken of an average male and female face depicting the six different emotions and for the application of the face masks to the 12 original pictures, an image of a typically used blue surgical mask edited onto each original image of the faces. Editing was done to make the male and female pictures as similar in expression as possible to the original pictures, and realistic shadows were also added to improve clarity.

Therefore the different conditions of the independent variable were: 2 (male and female faces) x 6 (emotions) x 2 (no face mask and with face mask) = 24 face stimuli.

Procedure: The online survey was shared via social media platforms. Data collection took place between the 1st to the 20th of April 2021. The participants were required to provide informed consent prior to taking part in the study and were also given the right to withdraw at any point

during and after data collection. Each participant was exposed to the all 24 face stimuli in a standardized manner. They were asked to spontaneously select which emotion was depicted from the list of emotional states: happiness, sadness, fear, anger, disgust, and neutral.

RESULTS AND DISCUSSION

A repeated measures paired sample t test indicated a significant difference in emotion recognition in the masked ((M=8.24 SD= 1.39) and the non-masked conditions ((M= 10.28 SD=1.39); t (198) =16.83 , p=0.00. Therefore in the present sample wearing a mask considerably lowered the ability to recognize emotions. This finding is similar to the findings found in other studies relating to face masks/substantial covering of the face and emotion recognition (Carbon, 2021 & Grundman, 2021).

Further analysis revealed in the case of the both the male and female masked faces, participants found it significantly more difficult to recognize the emotional state of disgust (Male masked condition: M= 0.0150, SD=0.122, Female masked condition= 0.550, 0.498). Moreover the emotional state of fear was also comparatively more difficult to accurately judge in the female masked condition (M=0.590, SD=.492) while the emotion of sadness in the masked male face (M=.295. SD=.457) was also judged inaccurately by the majority of participants. Previous studies have also found that "disgust" as an emotional state that tends to get misinterpreted when complete facial depictions are lacking. This could be due to the fact that the mouth area is the main expressive element when it comes to the expression of disgust and when the mask occludes this cue it is more difficult to recognize (Wegryz et al, 2017). Recognition of fear in faces relies more on focusing on the eyes. However this emotion was not accurately judged in the female masked face while it was judged accurately in the male masked face. Moreover in comparison with the other five emotional states the fear state in the non-masked female was also reported lower mean values. This could also be due to the particular female face photographed for the study being limited interms of accurately depicting fear.

Gender wise comparisons indicated that females ((M=10.35 SD=1.12) were more apt at recognising emotions in the non-masked condition than males ((M=9.89 SD=1.44); t (198) =2.09, p=0.033 which indicates that their emotion recognition ability is higher than that of males in the current sample. This finding is supported by the study conducted by Rooy, Alonso & Visveswaran (2005) where females scored higher on emotional intelligence measurements than males. However this difference was not found in some studies (Kumar, 2014), and other studies have found males to be higher in emotional competencies than females (Ahmad et al., 2009) .Therefore further research has to be conducted in gender differences in emotion recognition.

Interms of the ability to identify different types of emotional states based on whether the emotion is seen on a female or male face, females were significantly more likely to be able to recognize disgust (Female recognising disgust M=.932, SD=.252, Male recognising disgust M=-815,SD=.252, t (198) = 2.27, p=0.00) and fear (Female recognising fear M=.895, SD= .307, Male recognising fear M= .756,SD=.434, t (198)= 2.27, p= 0.00). Females were also significantly more likely to recognize expressions of anger (M = .963 SD=.189) in the unmasked male condition than the male participants (M=.921, SD=.273), t (198)=1.120, p=0.029. There was no significant gender difference in emotion recognition in the non-masked male face and masked female and male faces by the participants. Previous research has indicated that females are more sensitive to and therefore are more likely to recognize negative emotions (Bilapur, Kia, Chua & Subramanian, 2017). Especially when it comes to recognising negative emotions in a male face the sensitivity presented by female participants could partly be due to an evolutionary protective reaction (Li et al, 2020).

CONCLUSIONS AND RECOMMENDATIONS

Using of face masks has been repeatedly found to be effective in the prevention of the spread of COVID-19. However the obscuring of the major part of the face could have psychological impacts on individuals specially in terms of developing emotional competence and therefore social competencies as well. Since COVID-19 is likely to be a long term ordeal that the human species has to face, the usage of face masks in the long term and its impact on emotion recognition and associated correlates should be investigated further. Moreover whether this would lead to an increase in social skill-related deficits, and therefore social interaction related disorders such as social anxiety disorder in the long run has to be explored. Gender comparisons in the study indicated that being female might be a protective factor in developing emotional competencies but it ceases to be a buffer against loss of ability to recognize emotions when face masks are used. Therefore it is important to focus on compensatory mechanisms such as using more verbal cues when expressing emotions as well as recognising emotions when using face masks as a safety precaution. Further, future research could also focus on the impact of wearing masks on language comprehension, lip reading, and perception-related skills across different contexts.

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