Physical activity in a virtual context of weight-related stigma affects emotion recognition performance in inactive women

Joël Guérette[1], Aurélie Baillot[1], Paquito Bernard[2], Stéphane Bouchard[3] & Daniel Fiset[3]

1École interdisciplinaire de la santé, Université du Québec en Outaouais, Gatineau, Canada
2Département des sciences de l'activité physique, Université du Québec à Montréal, Montréal, Canada
3Département de psychoéducation et de psychologie, Université du Québec en Outaouais, Gatineau, Canada

Context

Women face many barriers, including weight-related stigma, when they try to adopt a physically active lifestyle (Fikkan & Rothblum, 2012; Puhl et al., 2018). Stigmatizing elements could not only undermine motivation to exercise but also influence the way facial expressions are perceived. The aim of the present study is to determine whether physical activity during exposure to weight-related stigma alters post-exercise facial emotion recognition. The proposed hypothesis is that being expose to weight-stigmatizing environment will compromise emotion recognition performance.

Method

Physical activity in virtual reality

To test this hypothesis, we created a virtual gym with and without weight-related stigmatizing components, in which we asked physically inactive women to engage in physical activity. The project is an experimental crossover study. Participants (n = 28) were adult women (M_{age} = 41.5 years, SD = 12.76) recruited as part of a larger project. They were exposed to both virtual environments (stigmatizing; non-stigmatizing), in which they performed 30 minutes of aerobic exercise on an ergocycle at 70% of their reserve heart rate. Heart rate (HR) was projected onto the stationary bike's virtual screen, enabling participants to adjust intensity to reach a zone within plus or minus 5 beats per minute of target heart rate. Participants received a vocal instruction from the virtual environment to increase speed or resistance when HR was too low, or to decrease speed or resistance when HR was too high.
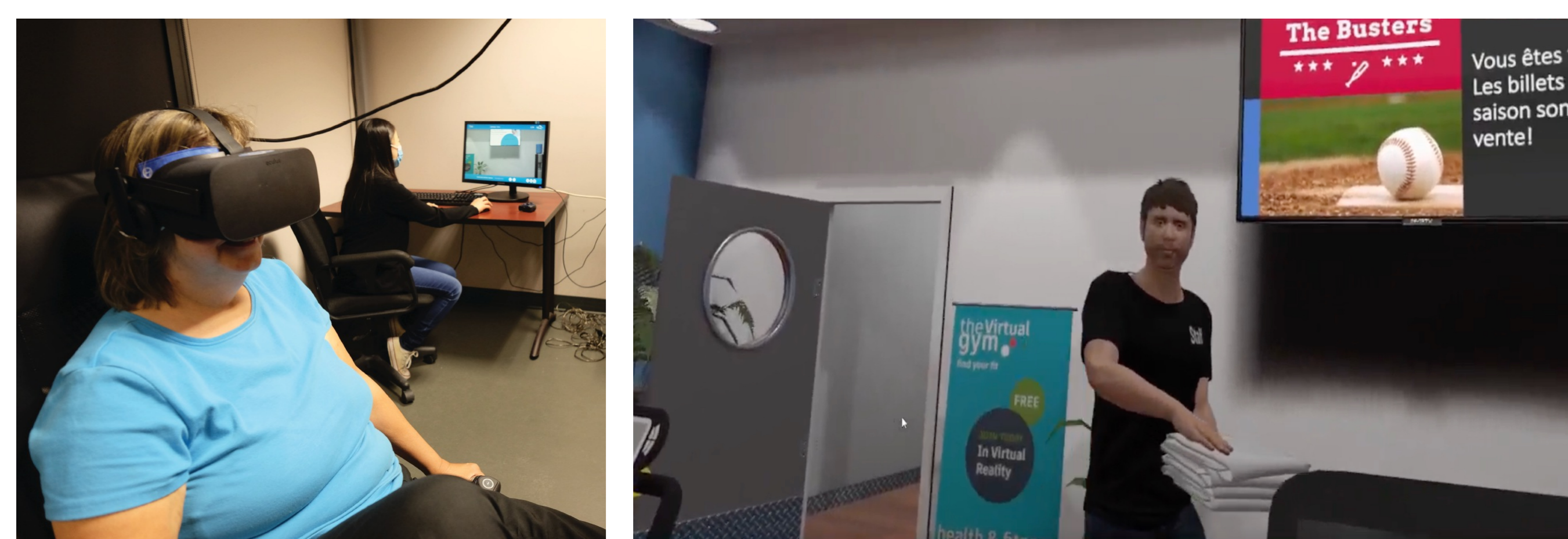

Figure 1 – A participant exercising on an ergocycle in the virtual environment.

Weight Stigma

The bike used by the participants faces a TV set on which health information and advertisements in areas as varied as food, beauty products, cars, vacations, and more are projected. Variations between the neutral and stigmatizing versions can be observed in the information presented on TV and in the behavior of the gym employee who makes appearances. The same products, company logos and messages in both conditions remains constant, apart from the stigmatizing elements that constitute the independent variable under study.

Figure 2 – Examples of stigmatizing and non-stigmatizing advertising.

Facial expression megamix

After each exercise session, participants completed a computer-generated facial expression megamix (Young & al., 1997) comprising four expressions (fear, happiness, anger, disgust). Five blocks of 84 trials were performed every session, for a total of 420 trials per condition.
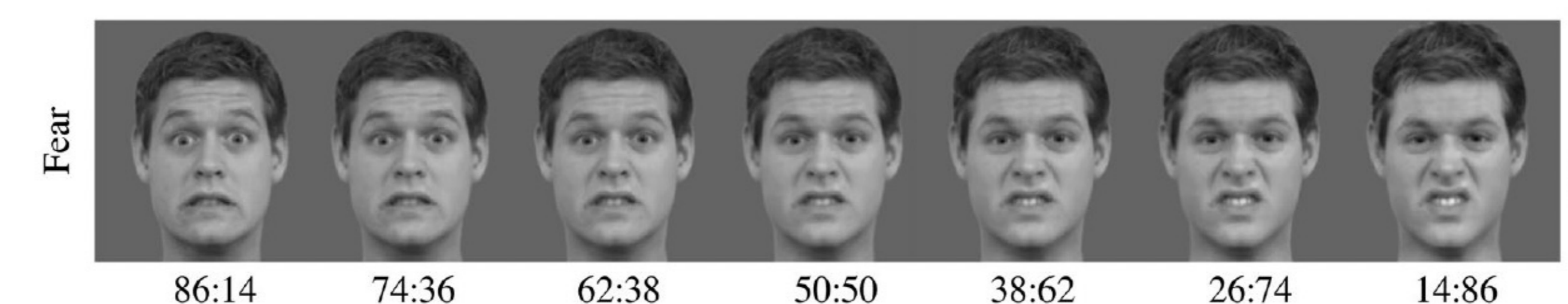

Figure 3 – Continuum of morphed emotions, from fear to disgust.

Results

Analyses were performed using ANOVA. Results indicate a significant interaction between condition (stigmatizing; non-stigmatizing) and emotion on recognition performance ($F_{(3,78)}$=3.94; p=0.011; η^2=0.03). Bonferroni post-hoc analyses suggest a significant decrease in the ability to recognize disgust in the stigmatizing condition ($F_{(1,26)}$=12.0; p=0.008).
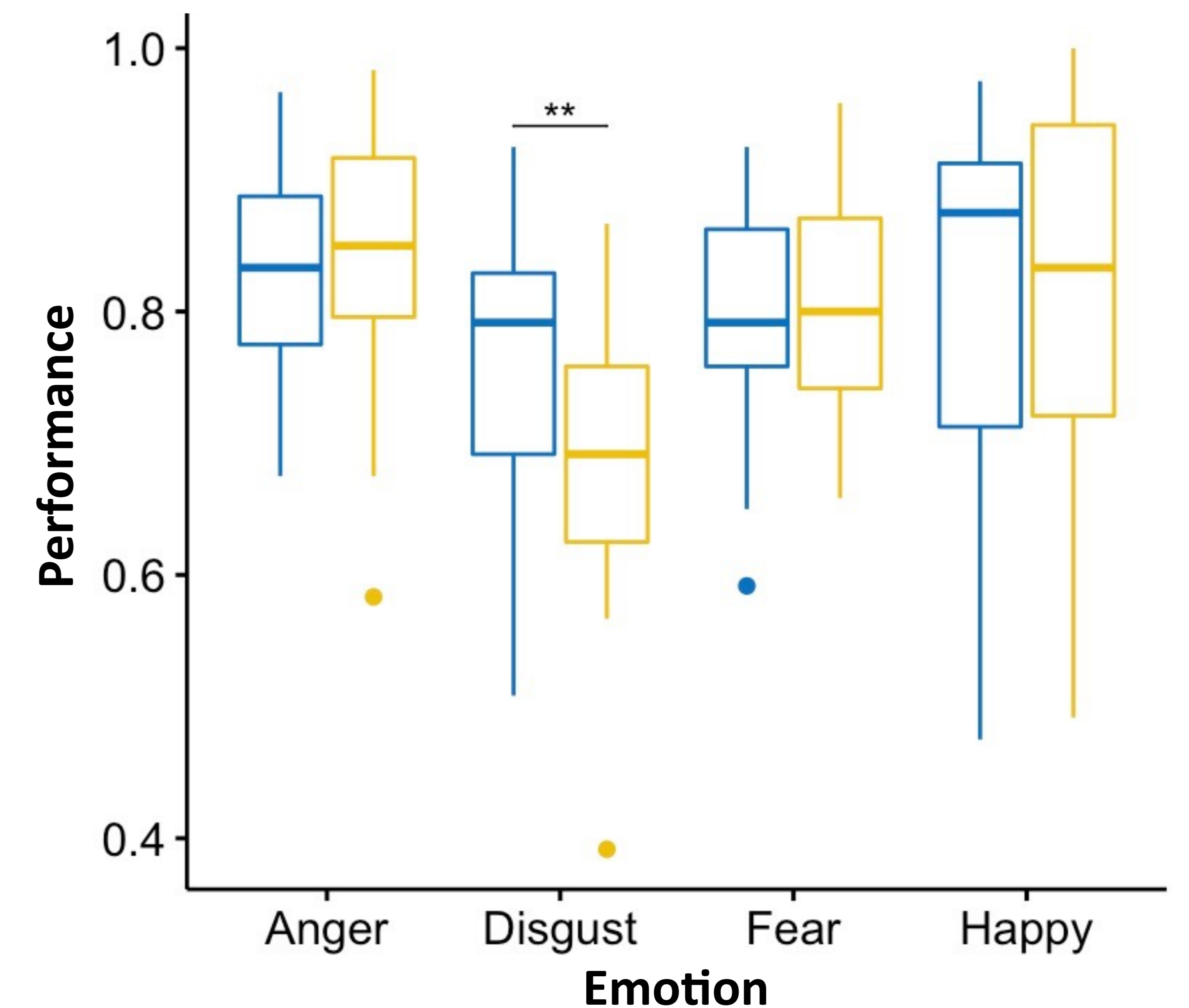

Figure 4 – Box plot of emotion recognition performance, by emotion and condition. Condition : Blue = No stigma; Yellow = Stigma.

Discussion and Conclusion

Weight-related stigma have several negative effects on people lives. The present project suggests that among these effects, there would be a decreased ability to detect disgust after exposure to a weight-stigmatizing environment. These results could be explained by an increase in stress following stigmatizing exposure (Daudelin-Peltier et al., 2017). This decline in performance may act as a coping mechanism to protect self-esteem in physically inactive women.

References

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