

Risk compensation during COVID-19: The impact of face mask usage on social distancing

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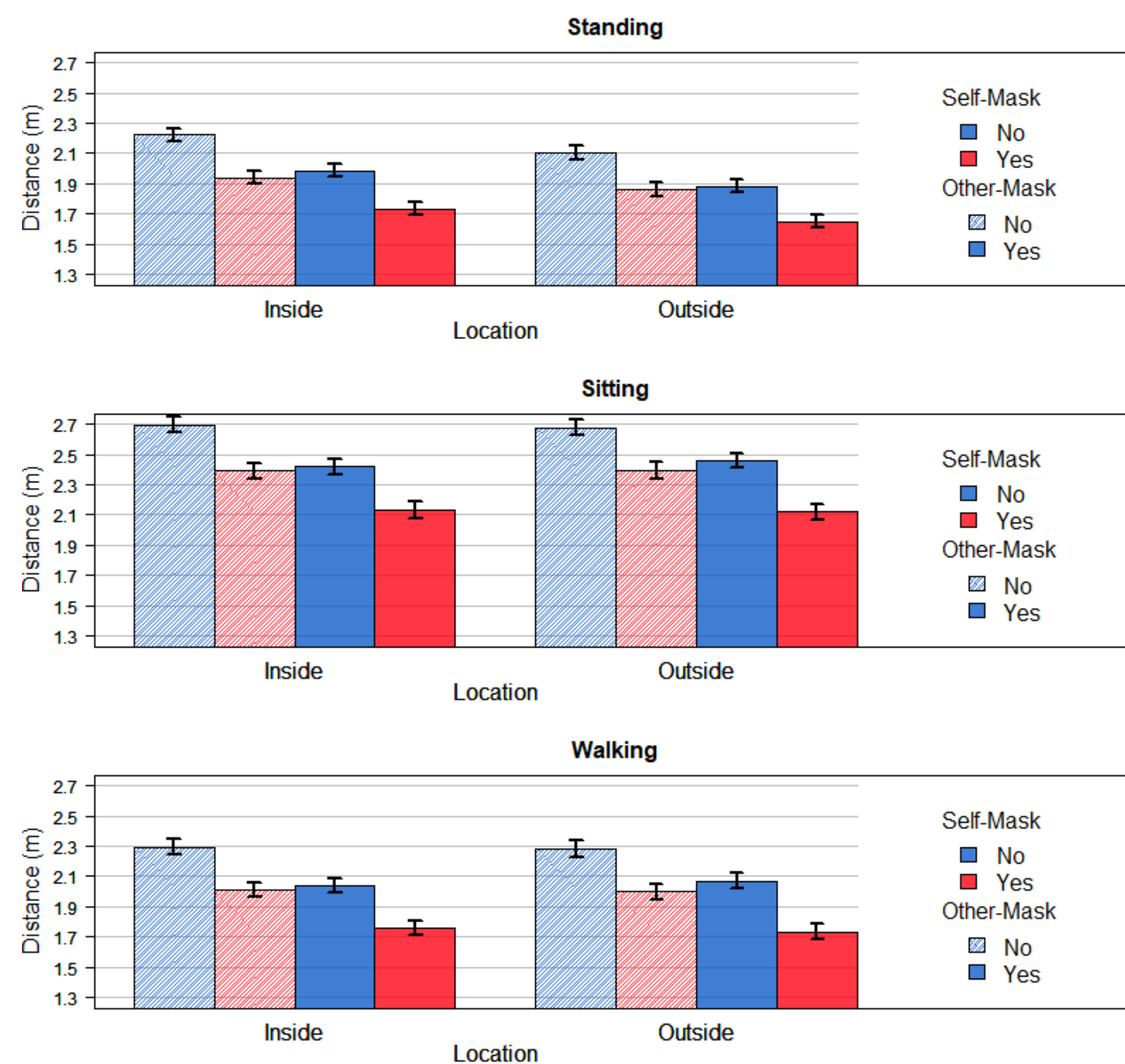
Summary

A frequent concern when introducing new health or safety interventions is that people will compensate for the reduced risk offered by the intervention, by increasing their risk taking in related behaviours (Peltzman, 1975; Underhill, 2013). We ran two pre-registered online studies, during the first lockdown of the coronavirus pandemic in the UK, to see whether introducing mandatory mask usage may have negative impacts on compliance with other health precautions, particularly physical distancing. In both studies we found results consistent with risk compensation. Participants indicated they would keep shorter distances from other people if either party was wearing a mask. These results were also stronger for participants who believed masks were effective at preventing catching/spreading the virus.

Research Question

- Do people engage in risk compensation, by reducing physical distancing, when wearing a mask?
- Alternatively, do masks act as a signal to maintain or increase distancing (Seres et al., 2020)?
- Do people at higher risk from coronavirus (e.g. those aged over 65 years), show less risk compensation?
- Are changes in distancing related to belief's about the effectiveness of masks at reducing coronavirus risk?

Study 1 Results

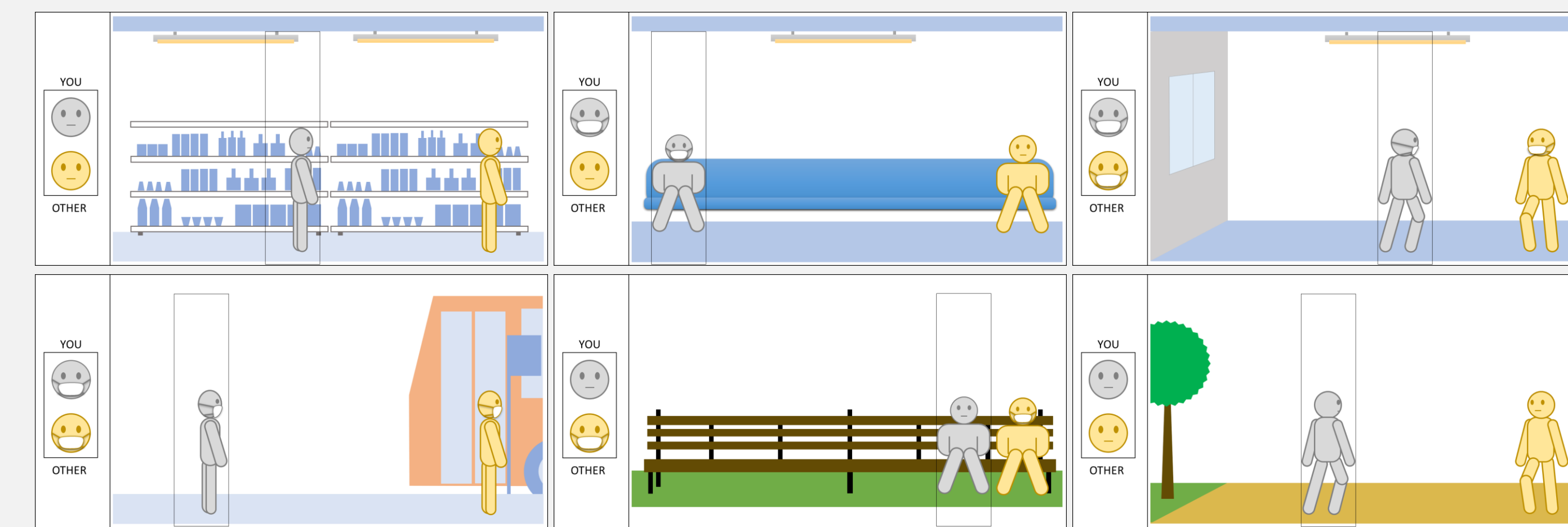


- We found evidence of risk compensation for both self, and other mask usage.
- Participants reduced distancing when wearing a mask for all 3 activities (Stand: $F(1, 372) = 157, p < .001, \eta_p^2 = 0.29$; Sit: $F(1, 372) = 168, p < .001, \eta_p^2 = 0.31$; Walk: $F(1, 372) = 163, p < .001, \eta_p^2 = 0.31$).
- Participants also reduced distancing when the stranger was wearing a mask, for all activities (Stand: $F(1, 372) = 120, p < .001, \eta_p^2 = 0.25$; Sit: $F(1, 372) = 115, p < .001, \eta_p^2 = 0.24$; Walk: $F(1, 372) = 142, p < .001, \eta_p^2 = 0.28$).

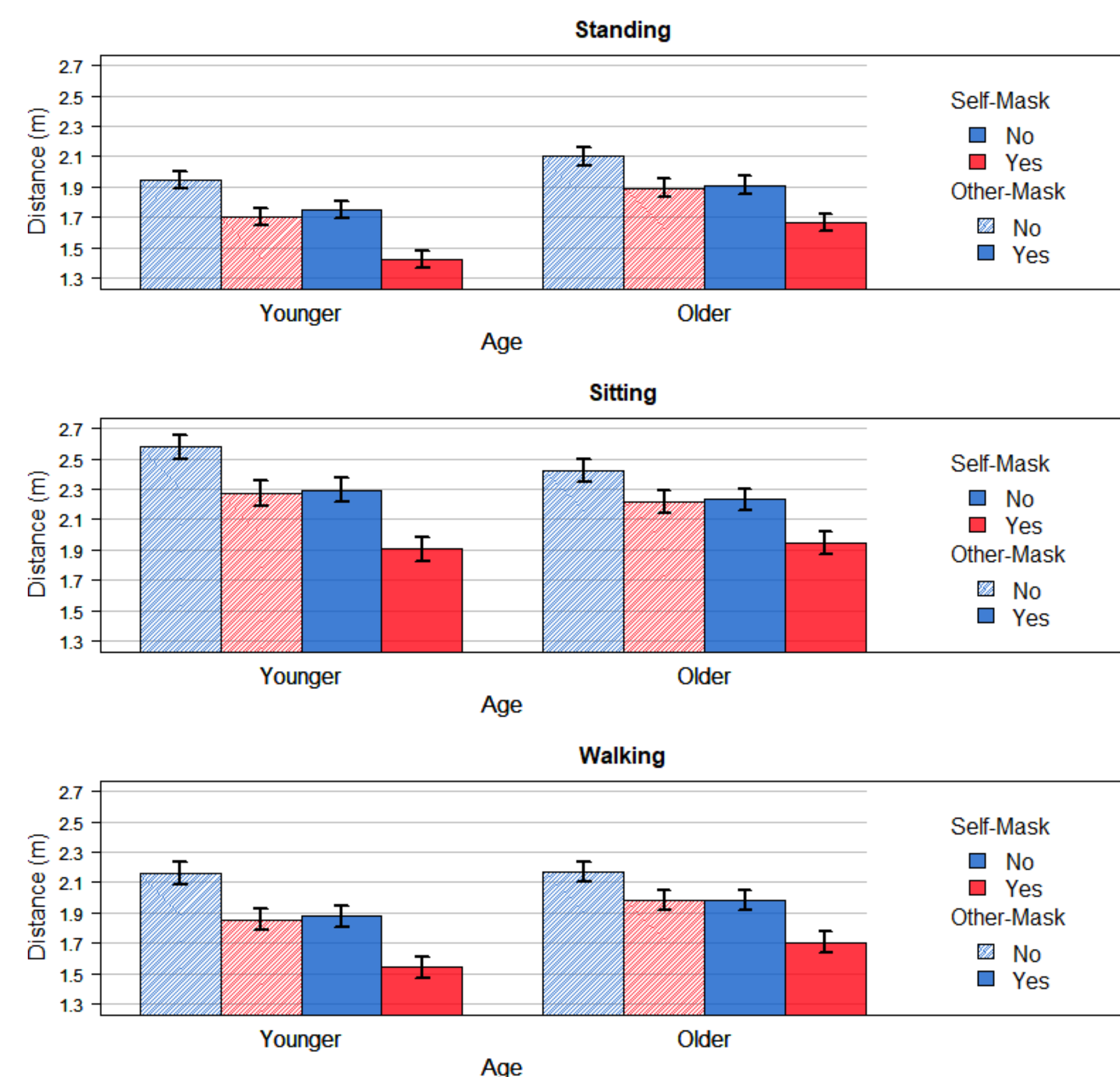
Method

- UK residents recruited from Prolific for 2 online pre-registered studies.
 - Study 1: 401 participants aged 18+ years.
 - Study 2: 200 participants aged 18-40 years, 200 aged 65+ years.
- Participants asked to judge the closest they would sit/stand/walk from a stranger in 24 scenarios, manipulating 4 factors (see Figure for examples):
 - Activity: Standing in queue (left), Sitting on a bench (middle), walking by someone (right).
 - Location: Activity occurring indoors (top) or outdoors (bottom).
 - Self-mask: Whether the participant (grey figure) was wearing a mask.
 - Other-mask: Whether the stranger (yellow figure) was wearing a mask.
- Participants provided judgements by moving the grey figure (representing the participant) to the appropriate distance from the yellow figure (representing the stranger) in a stylized representation of the scenario (Examples in Figure 1).

- In addition, participants were asked to rate how effective masks are at preventing the wearer spreading Covid-19, and catching Covid-19.
 - For analysis these variables were median split.



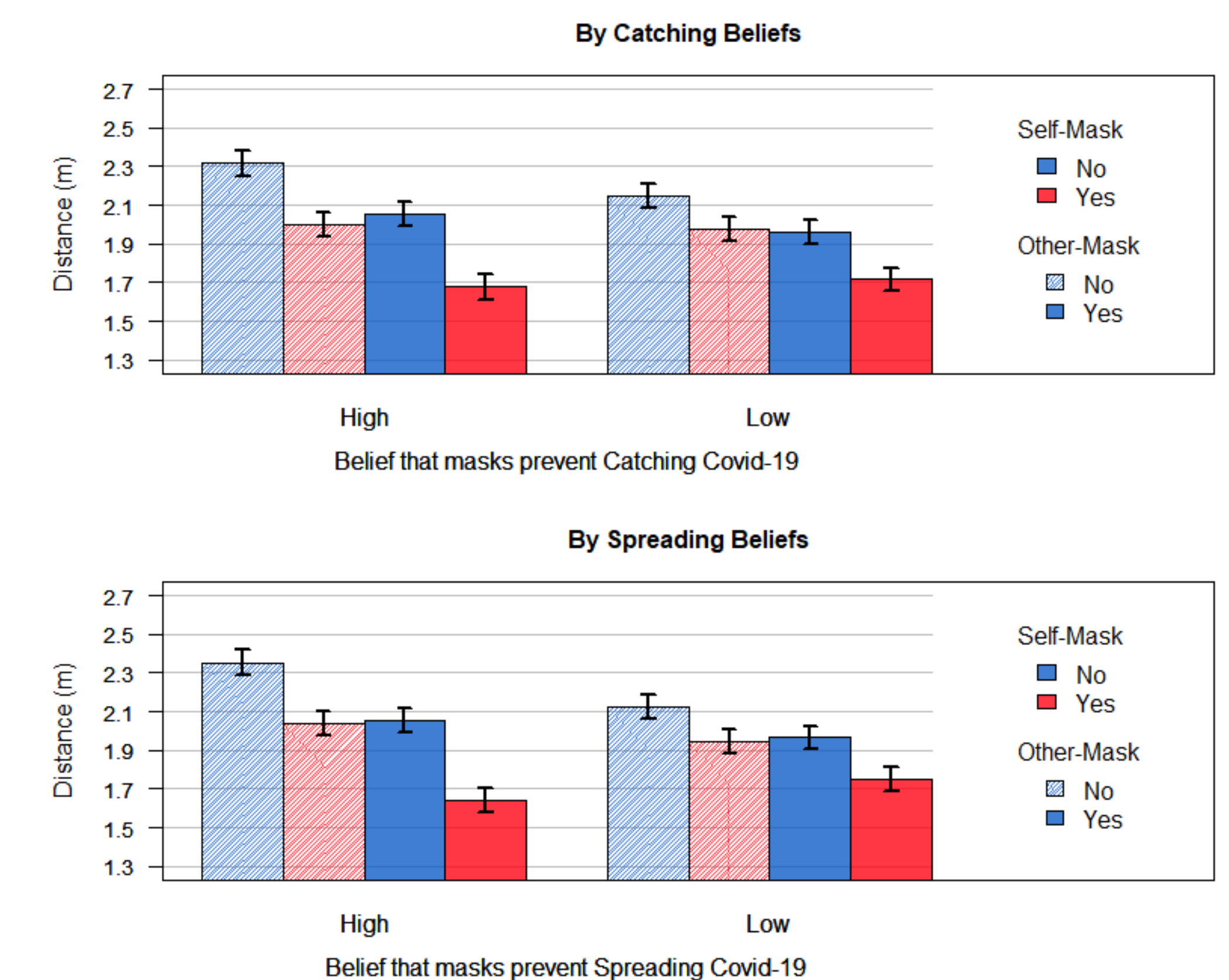
Study 2 Results



- Study 2 replicated the self-mask effect for all three activities (Stand: $F(1, 355) = 161, p < .001, \eta_p^2 = 0.31$; Sit: $F(1, 355) = 174, p < .001, \eta_p^2 = 0.33$; Walk: $F(1, 355) = 168, p < .001, \eta_p^2 = 0.32$).
 - Risk compensation was also greater for younger participants than older participants for Sitting and Walking, but not Standing (Stand: $F(1, 355) = 1.96, p = 0.162, \eta_p^2 = 0.006$; Sit: $F(1, 355) = 4.98, p = 0.026, \eta_p^2 = 0.014$; Walk: $F(1, 355) = 4.24, p = 0.04, \eta_p^2 = 0.012$).
- Study 2 also replicated the other-mask effect for all three activities (Stand: $F(1, 355) = 146, p < .001, \eta_p^2 = 0.29$; Sit: $F(1, 355) = 152, p < .001, \eta_p^2 = 0.30$; Walk: $F(1, 355) = 187, p < .001, \eta_p^2 = 0.35$).
 - Risk compensation was greater for younger participants when Sitting, but not Standing or Walking (Stand: $F(1, 355) = 0.72, p = 0.398, \eta_p^2 = 0.002$; Sit: $F(1, 355) = 4.18, p = 0.042, \eta_p^2 = 0.012$; Walk: $F(1, 355) = 1.28, p = 0.26, \eta_p^2 = 0.004$).

Belief Results

- Participants who believed that masks prevent the wearer **catching** Covid-19, showed a greater reduction in distancing when wearing a mask than those with weaker beliefs ($F(1, 349) = 5.78, p = 0.017, \eta_p^2 = 0.016$).
- Participants who believed that masks prevent the wearer **spreading** Covid-19, showed a greater reduction in distancing when either the stranger, or participant was wearing a mask (Other-mask \times belief: $F(1, 349) = 15.63, p < .001, \eta_p^2 = 0.043$; Self-mask \times belief: $F(1, 349) = 10.21, p = 0.002, \eta_p^2 = 0.028$).
- These effects did not interact with age (not shown in Figure).



References

- Peltzman, S. (1975). The effects of automobile safety regulation. *Journal of political Economy*, 83(4), 677-725.
- Seres, G., Balleyer, A., Cerutti, N., Danilov, A., Friedrichsen, J., Liu, Y., & Stier, M. (2020). Face Masks Increase Compliance with Physical Distancing Recommendations During the COVID-19 Pandemic. *Argument*, 20, 44.
- Underhill, K. (2013). Study designs for identifying risk compensation behavior among users of biomedical HIV prevention technologies: balancing methodological rigor and research ethics. *Social science & medicine*, 94, 115-123.

Microsoft Teams Link for Poster Session

Working paper and pre-registrations available at: <https://osf.io/rs6nu/>