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SHORT AND SWEET

Close to me? The influence of affective closeness on space perception

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Abstract. Recent data show that psychosocial factors affect visual perception. We tested this hypothesis by investigating the relationship between affective closeness and the perception of apertures between two people. People feel discomfort when they are near someone they are not affectively close to. Therefore, we predict that they will be less likely to perceive that they can pass between two people not affectively close to them. Participants had to imagine passing through the aperture between two life-size classmate pictures. We found that the closer participants felt to their classmates, the more they felt able to pass between them. This provides the first evidence of a relationship between affective closeness and the perception of aperture between two people, suggesting that psychosocial factors constrain space perception.

Barack feels lucky he does not have to go in the other room because he would have to pass between Sarah and John whom he doesn't like very much. We argue that, in such situations, his weak affective closeness toward these people might lead him to underestimate whether he can pass between them (ie passability judgment—Warren and Whang 1987).

Perceptual judgments are influenced by factors related to the potential cost of the intended actions. Factors such as effort, intentions, and fear (Stefanucci et al 2008; Witt et al 2004) affect our perception of spatial layouts. A recent work also suggests that one might find less difficult to climb a hill when in the presence of a friend (Schnall et al 2008). In this study, participants estimated a hill to be less steep when accompanied by a friend than when alone.

To extend the role of psychosocial factors in space perception, we tested whether perceived passability between two people is reduced when we do not feel affectively close to them. The reasons for this prediction are twofold. First, people maintain a personal space around them and feel discomfort when someone is physically too close (Hayduk 1981). Second, this feeling of discomfort is stronger when they do not feel affectively close toward this person (Bell et al 1988). If perception of physical space depends on social considerations, therefore, affective closeness should influence passability judgments. This translates into two predictions. First, for a given aperture between two classmate pictures, participants will be more likely to perceive that they can pass if they feel affectively close to them. We then expect a positive correlation between affective closeness and this passability judgment. Second, when adjusting the minimal distance between the two classmate pictures allowing them to pass (ie the critical aperture width), participants will choose a narrow aperture when feeling affectively close to their classmates. We then expect a negative correlation between affective closeness and the critical aperture width.

In this study, twenty-nine female participants had to imagine passing through an aperture between two different classmate[1] pictures whose bodies were represented by

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[1] Both participants and their classmates were females.

a wooden mannequin (figure 1). These images were projected on a white wall in front of the participants. Participants made a 'yes' or 'no' passability judgment on 30 trials as to whether they perceived that they could pass between the two classmate pictures without rotating their shoulders. For each passability judgment, they had to imagine themselves doing this action. After each judgment, they adjusted[(2)] the distance between the two classmate pictures to indicate the critical aperture width, namely the shortest aperture width allowing them to pass without rotating their shoulders. Initial aperture widths varied between 33.6 cm and 101.7 cm and were randomly presented. Finally, participants rated their affective closeness to each classmate (0 = not at all to 7 = a great degree). We computed a closeness score by summing the ratings of the two classmates for each pair. Upon completion of the experiment, participants' shoulder widths were recorded.

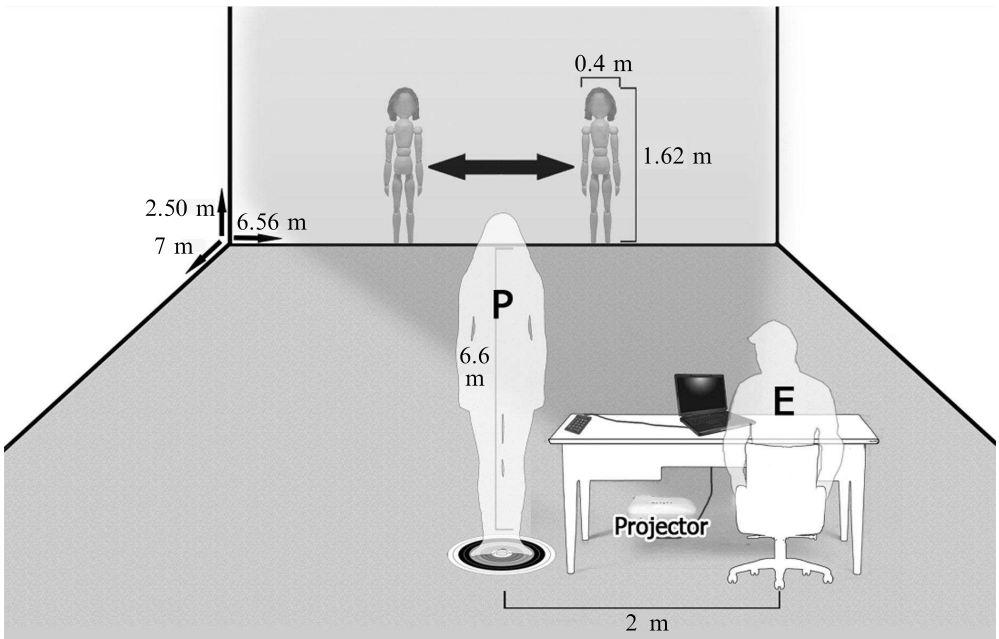

Figure 1. Experimental setup and device (P = participant; E = experimenter). The distances shown are in metres.

As predicted, we found a positive correlation between the affective closeness score and the mean percentages of 'passable' judgments ($r = 0.45$, $p = 0.014$). The closer participants felt to their classmates, the more passable apertures between classmate pictures appeared. Importantly, we also found a negative correlation between the closeness score and the mean critical aperture widths expressed in π ratio (aperture width/shoulder width—Warren and Whang 1987; $r = -0.48$, $p = 0.008$). Thus, the closer participants felt to their classmates, the less space they needed to pass.

The present data show that affective closeness and perception of aperture between two people are related. This is in line with the 'economy of action' account, which assumes that spatial layouts are perceived in relation to the potential to act on the environment and the costs associated with these actions (Proffitt 2006). Although our paradigm may seem to lack ecological validity, we can notice that the value of the π ratio (mean: 1.12) did not differ significantly from that found in Warren and Whang's experiment (mean: 1.16, $t_{24} = -1.24$, $p = 0.22$). Furthermore, it has been shown that passability judgments with projected apertures are just as accurate as passability judgments with real doorways (Guardia et al 2010). These authors found that the critical

[(2)] Participants made these visual estimates by pressing the up and down keys on a keyboard positioned to their right.

aperture width was larger for anorexics than for controls. This value was related to illness duration and to the degree of body dissatisfaction, suggesting that body size overestimation in anorexia nervosa is partly due to impaired neural processing of body dimensions. Finally, Schnall et al (2008) found similar effects in terms of slope perception in the actual presence of a friend and when imagining the presence of this friend.

The question remains as to the nature of the potential cost associated with the anticipation of personal space invasion. The intention to pass between two people may imply anticipation of two possible consequences: (i) a social norm violation, like interpersonal distance expectations, or (ii) an affective response, like stress (Schnall, in press). Nevertheless, our study supports the idea that one's affective closeness toward peers might indeed affect the perception of space.

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