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A matter of vertical position: Consequences of ostracism differ for those above versus below its perpetrators

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Abstract

Vertical position in space has been linked to perceptions of power, and high-power individuals have been shown to be less influenced by both the situational context and other people. Building on this literature, we hypothesized that a high spatial position as compared with a low one would reduce the threat from social exclusion and might help prevent aggressive acts of retaliation. To investigate this hypothesis, two arrangements of "Cyberball"—a classic manipulation of social exclusion—were compared: in the standard arrangement, participants are positioned below the excluding players; for the new arrangement, the standard arrangement was vertically flipped, so that participants were positioned above the excluding players, and thus "aloof" from the situation. Results show that only individuals positioned below (implying low power), but not individuals positioned above (implying high power), exhibited increased aggression when being ostracized. Threatened need for control and negative mood mediated the tendency toward aggressive behavior.

Key Words: social exclusion, power, embodiment, aggression

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Ostracism—being ignored and excluded by others—has strong negative consequences (for an overview, Williams, 2007). Directly after an exclusion event, individuals perceive their fundamental needs for belonging, control, self-esteem, and meaningful existence as under threat and experience negative affect (e.g., Williams, Cheung, & Choi, 2000). In this reflexive stage, distress levels and brain activity are comparable to those of physical pain (e.g., DeWall et al., 2010; Eisenberger, 2012; Eisenberger, Lieberman, & Williams, 2003). Subsequently, in a reflective stage, victims try to cope and to restore those needs most threatened (Williams, 2009), for example, by acting less prosocially (Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007) or showing increased aggression (Twenge, Baumeister, Tice, & Stucke, 2001; Twenge & Campbell, 2003; Warburton, Williams, & Cairns, 2006; Wesselmann, Butler, Williams, & Pickett, 2010; see Leary, Twenge, & Quinlivan, 2006, for a review).

One way to investigate ostracism effects is “Cyberball,” an online ball tossing game, in which the participant is ostensibly connected with two other players over the internet (Williams et al., 2000). Typically, two conditions are compared: In the inclusion condition, throws are evenly split between players, whereas in the exclusion condition, the participant receives the ball only a few times and is then ignored. In the standard paradigm, agents are positioned in an upside-down triangle, with the two supposed other players on top and the participant below. This layout makes "ecological sense" as things lower in our visual field are perceived as closer while things higher are perceived as farther away (Goldstein, 2007). Because people tend to envision themselves in close spatial proximity and others as farther away, this should translate into bottom-to-top representations in two-dimensional space (such as on a computer screen). It also, however, introduces a subtle, and thus far unacknowledged,

spatial bias, in that the other players occupy a position that is not only vertically, but also *psychologically*, higher.

Our study investigated whether participants' spatial position has an influence on their reactions to being ostracized. Drawing on embodiment research, we hypothesized that excluded participants would react less aggressively towards the perpetrators when positioned above (versus below), and thus "aloof" from the situation.

Vertical Position and Power

According to research in cognitive linguistics (e.g., Lakoff & Johnson, 1980), conceptual metaphors help people to understand abstract concepts such as personality traits and person characteristics by associating them with more concrete concepts (for an overview see Landau, Meier, & Keefer, 2010). Moreover, people often ground their conceptual thinking in a perceptual basis, such as sensory experiences and bodily states (Barsalou, 1999; Niedenthal, Barsalou, Winkielman, Krauth-Gruber, & Ric, 2005). With regard to power, people often think in terms of the spatial dimension and use the metaphors "up" for powerful and "down" for powerless. Being "above" or "at the top" is thus associated with high power, whereas being "below" or "at the bottom" is associated with low power. The link between spatial position and power may have evolutionary and/or social origins. For instance, children literally look "up" to their more powerful parents; in the animal kingdom, often the biggest and strongest members of a species dominate in the struggle for survival (e.g., Parker, 1974); and among humans, taller persons are the ones who are more likely to attain powerful job positions and earn more money (e.g., Judge & Cable, 2004).

Providing empirical support for the spatial position-power link, Schubert (2005) reported that for circle pairs arranged in different angles, vertical compared to horizontal depictions were more strongly associated with power-related propositions. In addition, he found that reaction-time based judgments of a group's power were influenced by the group's vertical position on a computer screen. In a similar vein, Giessner and Schubert (2007)

showed that vertical position in an organization chart influenced judgments of a leader's power and, conversely, that information about a leader's power influenced his or her vertical positioning in an organization chart (for additional evidence, e.g., Giessner, Ryan, Schubert, & van Quaquebeke, 2011; Lakens, Semin, & Foroni, 2011; Meier & Dionne, 2009; Meier, Hauser, Robinson, Friesen, & Schjeldahl, 2007; Schubert, Waldzus & Giessner, 2009; Zanolie et al., 2011).

Power, Control, and Affect

Power reflects the relative capacity to influence others through control of resources (e.g., Emerson, 1962; Keltner, Gruenfeld, & Anderson, 2003; Magee & Galinsky, 2008). Powerful individuals therefore perceive themselves as free from constraints and so act on their own will without fearing serious social consequences. Powerless individuals, in contrast, have less access to resources and must cope with social threats, sanctions, dependency, and (social) constraints (Keltner et al., 2003; Overbeck, Tiedens, & Brion, 2006). As a consequence, high-power individuals tend to be less influenced by the situation or other people than do low-power individuals. For instance, they show greater self-concept consistency in terms of more coherent and consistent self-descriptions and less variability in their trait ratings across different situations (Kraus, Chen, & Keltner, 2011). Moreover, high-power individuals are less influenced by context when generating creative ideas, adhere more to their personal values, show less conformity in their attitudes and opinions (Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008), and are less affected by social comparison information (Johnson & Lammers, 2012). In addition, whereas individuals with low power (Van Kleef, De Dreu, Pietroni, & Manstead, 2006) or poor alternatives (Sinaceur & Tiedens, 2006) tend to concede more to angry opponents in negotiations, the behavior of those with high power or good alternatives remains unaffected by their counterpart's emotional expressions.

Building on these lines of research, we suggest that individuals with high power might also be less easily affected than those with low power when confronted with ostracism. This

advantage may result from both perceptions of control and current mood. First, because power results in an asymmetric control over resources (e.g., Keltner et al., 2003), high-power individuals likely experience greater control over other people and their environment than do low-power individuals. Moreover, high-power individuals have been shown not only to experience control over outcomes that are connected with their power, but also to perceive illusory control: they believe they have control even over outcomes that are based on chance or fall outside their influence (Fast, Gruenfeld, Sivanathan, & Galinsky, 2009). As a consequence, one may expect that high-power individuals will perceive their fundamental need for control as less threatened when being ostracized.

Second, high-power individuals have been shown to experience and express more positive and fewer negative emotions than low-power individuals (Anderson & Berdahl, 2002; Berdahl & Martorana, 2006; Langner & Keltner, 2008; Hecht & LaFrance, 1998; but see, Galinsky, Gruenfeld, & Magee, 2003; Smith & Trope, 2006; Weick & Guinote, 2008, for mixed or null relationships between power and mood). Moreover, Van Kleef and colleagues (2008) observed that high-power individuals not only differ from low-power individuals in their baseline emotion, but also exhibit fewer negative emotional reactions and physiological stress responses to the suffering of other individuals. As a consequence, one may expect that high-power individuals may not respond to being ostracized with greater negative mood.

Linking Control and Affect with Aggression

We have argued above that power may reduce the impact of social exclusion on control and mood. In addition, earlier research has linked social exclusion with aggressive behavior (see Leary et al., 2006). Against this background, one may venture the hypothesis that power diminishes aggressive acts of retaliation that result from being socially excluded. To bolster this argument, we report on literature linking both control and mood to aggression.

According to Williams' (2009) need-threat model of ostracism, individuals fortify those needs that are most obviously threatened. With the need for control under salient threat,

individuals display acts of aggression and retaliation (for a meta-analysis of empirical findings, see Gerber & Wheeler, 2009). Several theories provide explanations for this control-aggression link. For instance, social interaction theory (Tedeschi & Felson, 1994) conceptualizes aggression as a tool of coercive control over others to meet one's wishes and goals, but also to exact, for example, retributive justice for past wrongdoings. Other work interprets aggression as a way to restore a sense of control and personal power (Depret & Fiske, 1993; Frieze & Boneva, 2001), or as a symbolic way to assert superiority over others (see Baumeister, Smart, & Boden, 1996; Williams & Warburton, 2003).

With regard to mood, Berkowitz (1989, 1990, 1993) extended the early frustration-aggression hypothesis (Dollard, Doob, Miller, Mowrer, & Sears, 1939) and postulated that different kinds of aversive events such as frustration or provocation (but also noise, hot temperatures, or unpleasant odors) first produce negative affect (e.g., anger), which then activates aggressive thoughts, emotions, and behavioral tendencies. Following this reasoning, negative mood induced by social exclusion may increase the inclination to behave aggressively.

Moreover, the General Aggression Model (Anderson & Bushman, 2002) posits that cognition, affect, and arousal are highly interconnected and can mediate the effects of situation and person variables on aggression separately or combined. Thus, if in a given situation such as social exclusion, both a perceived loss of control and negative affect co-occur, they may produce a combined effect on aggressive behavior. In bringing these various areas of research together, we suggest that power moderates the relationship between social exclusion and aggression and that this moderating effect is mediated via threatened control and negative mood.

The Present Study

To investigate the impact of power on need for control, mood and aggression, we flipped the typical Cyberball arrangement vertically, so that the participant would be

positioned above the other two players. We compared this new Cyberball version with the standard arrangement in which the participant is positioned below. We expected participants in this new Cyberball arrangement (a) to respond to ostracism with less threat to their need for control as well as less negative mood, and (b) to display less retaliation as a consequence. In contrast, due to higher levels of threatened control and negative mood, participants in the standard arrangement should show the replicable finding of increased aggression after social exclusion. As being in power does not necessarily fulfill the need for belonging, self-esteem, and meaningful existence, no ex ante hypotheses were specified with regard to these needs.

Method

Pretest

Because higher location in the visual field corresponds with being farther away (Goldstein, 2007), envisioning oneself above others might be less intuitive than the standard Cyberball procedure of being positioned below. We first tested, therefore, whether the new Cyberball arrangement would be more difficult to imagine. In a pretest with 40 university students (48% female, M_{age} = 21.7, *SD* = 4.2), participants played 30 rounds of Cyberball and received the ball one third of the time (standard inclusion procedure; Williams et al., 2000). Consistent with the new position manipulation, half of the participants were positioned above, and half below (standard arrangement) the other two Cyberball players (see Figure 1).

Subsequently, participants were asked where they were spatially located with regard to the other players (1 = *below the other players*; 7 = *above the other players*) and to indicate the general ease of imagining the situation (two items, e.g., “How easy or difficult was it for you to imagine yourself in the situation?”, $r = .60$, $p < .001$). Then, they completed an adopted version of the Measures of Communication-Evoked Imagery Processing (MIP; Ellen & Bone, 1991) in order to assess the quantity (two items, e.g., “While I played Cyberball, all sorts of pictures, sounds, tastes and/or smells came to my mind.”, $r = .50$, $p = .001$), ease (two items, e.g., “How easy was it for you to visualize the situation while you played Cyberball?”,

r = .68, p < .001), and vividness (11 items, e.g., "The imagery that occurred while I played Cyberball was: clear, vague,…", α = .92) of imagination. Finally, as a manipulation check, participants indicated the number of throws received ("What percent of the throws were thrown to you during the ball tossing game?") and their perception of inclusion ("To what extent were you included by the other participants during the game?," items adopted from Zadro, Williams, & Richardson, 2004).

Results are displayed in Table 1. In support of the position manipulation, participants positioned below versus above differed significantly in their perception of spatial position. Importantly, however, there were no significant differences between conditions in general ease of imagination, on the subscales of the MIP, regarding the ratings of received throws, and perceived inclusion. Thus, although participants perceived differences in spatial position, these differences did not affect the ease or vividness with which they imagined the two arrangements.

Participants and design

In total, 116 participants (60% female, M_{age} = 21.9, SD = 2.8) took part in the main study. About half of the participants (n = 59) were university students who completed the computer experiment in the lab; the other half (n = 57) were an age-matched group of online participants recruited from a university's online pool; both groups were separately and randomly assigned to a 2 (social experience: included vs. excluded) x 2 (vertical position: below vs. above) between-participants factorial design. We recruited two different samples to test whether the expected findings would hold across experimental settings (type of assessment: lab vs. online). Across all analyses only one significant effect of type of assessment emerged;[1] type of assessment was therefore dropped from the analyses reported below.

Materials and procedure

After agreeing to informed consent and providing demographic information,

participants played Cyberball with two supposed other players. Included participants received the ball one third of the time, whereas excluded participants got the ball only twice near the beginning of the game (Williams et al., 2000). Orthogonal to this ostracism manipulation, position was manipulated: Half of the participants were positioned above the other players, and half of the participants were positioned below. Subsequently, participants rated their mood during the game (*bad-good; negative-positive*; $r = .95$, $p < .001$) and stated the experienced degree of threat to the need for control (e.g., ”I felt influential;” $\alpha = .96$), meaningful existence (e.g., ”I felt disregarded;” $\alpha = .80$), belonging (e.g., ”I felt rejected;” $\alpha = .90$), and self-esteem (e.g., ”I had a high self-esteem;” $\alpha = .81$) on three items each (9-point Likert scales; 1 = *not at all*; 9 = *very much*; adapted from Williams, 2009). For analyses, positively phrased items were reverse coded such that higher values would indicate more negative mood and more need threat.

To measure aggression, participants were asked to imagine they would order lunch for the other two players, knowing they were allergic to spicy meals. They then chose the spiciness of the meal for each player (adapted from Warburton et al., 2006; one question per player, scaled from 1 to 5 chili peppers, $r = .80$, $p < .001$). Finally, participants estimated the number of received throws as a manipulation check for ostracism.

Results

A 2 (social experience: included vs. excluded) x 2 (vertical position: below vs. above) analysis of variance (ANOVA) on the manipulation check item confirmed that participants in the exclusion condition reported fewer received throws ($M = 7.70$, $SD = 4.87$) as compared with the inclusion condition ($M = 35.42$, $SD = 9.02$), $F(1,111) = 425.04$, $p < .001$, $\eta^2 = .79$ (all other ps > .52). The same ANOVA on the mean index of aggressive behavior against the perpetrators revealed a significant main effect for social experience, $F(1,112) = 9.85$, $p = .002$, $\eta^2 = .08$, indicating that the excluded group ($M = 2.48$, $SD = 1.17$) chose more chili peppers for the other players than the included group ($M = 1.88$, $SD = 0.86$). The main effect

for position was not significant, $F(1,112) = 0.23$, $p = .64$, $\eta^2 = .002$. Most importantly, however, the expected interaction with vertical position qualified the ostracism main effect on aggression, $F(1, 112) = 9.34$, $p = .003$, $\eta^2 = .08$ (see Figure 2). Planned contrasts revealed that participants low in spatial position showed more aggressive behavior in the exclusion ($M = 2.81$, $SD = 1.15$) than in the inclusion condition ($M = 1.66$, $SD = 0.66$), $t(48.37) = 4.82$, $p < .001$. As expected, however, there was no significant effect of social exclusion ($M = 2.15$, $SD = 1.12$) compared with inclusion ($M = 2.14$, $SD = 0.99$), for participants positioned above, $t(53.97) = 0.06$, $p = .96$.[2]

We also conducted separate 2 (social experience: included vs. excluded) x 2 (vertical position: below vs. above) ANOVAs on negative mood and the four need threat indices. For all variables, a significant main effect of social experience was observed (all Fs > 21.61, ps < .001), indicating more negative feelings and greater need threat in the exclusion than in the inclusion condition (see Table 2). For position, no significant main effect occurred (all ps > .09). Most importantly, significant interactions with vertical position qualified the ostracism main effects on threatened control, $F(1, 112) = 5.95$, $p = .02$, $\eta^2 = .05$, and on negative mood, $F(1, 112) = 4.43$, $p = .04$, $\eta^2 = .04$ (all other interactions, ps > .31). As can be seen in Table 2, the impact of being excluded versus included was smaller when positioned above as opposed to below for both threatened control ($d_{above} = 1.48$, $d_{below} = 2.05$) and negative mood ($d_{above} = 1.15$, $d_{below} = 1.94$).

Next, we tested two mediated moderation models with the SPSS macro provided by Hayes (in press), using 5,000 bootstrap estimates for the construction of a 95% bias-corrected confidence interval for the indirect effect of the Social Experience x Position interaction on aggression via threatened control and negative mood. Both analyses yielded a confidence interval that does not include zero, indicating that both threatened control (indirect effect = 0.04, bootstrapped 95%CI = [.01; .12]) and negative mood (indirect effect = 0.05, bootstrapped 95%CI = [.01; .13]) mediated the interactive effect of social experience and

position on aggression.

Because threatened control and negative mood were highly interrelated (r = .66; p < .001), we calculated a mean index by averaging the two variables. We then subjected this index to the same ANOVA and mediated moderation test as specified above. In short, the ANOVA resulted in the identical pattern reported above, namely a significant main effect of social experience, $F(1,112) = 117.80$, $p < .001$, $\eta^2 = .51$, and a significant Social Experience x Position interaction, $F(1, 112) = 7.45$, $p = .01$, $\eta^2 = .06$. Moreover, mediation analyses again revealed a significant indirect effect (indirect effect = 0.06, bootstrapped 95%CI = [.01; .16]).

Discussion

Being literally "at the top," "above," or "up" in space is linked to high power. Individuals high in power, in turn, have been shown to be less influenced by situations or other people. Building on this literature, we turned one classic manipulation of ostracism—Cyberball—upside down and compared the responses to social exclusion of participants positioned above versus below. In line with previous research we found that individuals in the standard Cyberball arrangement (i.e., below) exhibited increased aggression when being ostracized. In contrast, individuals in the new Cyberball arrangement (i.e., above) did not show this reaction: their aggression did not differ between the inclusion and exclusion conditions. A high position in space thus helped to mitigate the effect of ostracism on aggression. Moreover, we found that both threatened control and negative mood mediated the moderating effect of vertical position on the relationship between social experience and aggression. Specifically, both the need for control and the mood of participants positioned above the perpetrators were less influenced by the Cyberball manipulation of social ostracism. As a consequence, those positioned above may have experienced less inclination to defend their needs than participants positioned below, resulting in a lower degree of retaliatory intent towards the perpetrators.

Implications for Ostracism Literature

These findings add to the ostracism literature in several ways. They provide first evidence that power (induced by being literally above) can help to cope with the threat of being ostracized. Consistent with previous work that shows high-power individuals being less responsive to the situational context and other people's states and behaviors (e.g., Galinsky et al., 2008; Van Kleef et al., 2006), individuals positioned above were less influenced by the social experience than individuals positioned below. Moreover, the observed mediation by threatened control and negative mood corroborates theories that propose a link between control and aggression (e.g., Depret & Fiske, 1993) as well as affect and aggression (e.g., Berkowitz, 1989).

The mediation via threatened control is consistent with Williams' (2009) claim that behaviors in the reflective stage (i.e., aggression) are particularly influenced by the needs most thwarted when ostracized (i.e., control). Our study extends research by Warburton and colleagues (2006) who observed that restoring control after a social exclusion event extinguished effects on aggressive behavior. Moreover, our results add to a study by van Beest and Williams (2011) who have reported that the prospect of being excluded by God decreased prosocial behavior in religious people and that this decrease was mediated by a perceived threat to control.

With regard to the affect-aggression link, our study is first to show that aggression towards the perpetrators of social exclusion is also mediated via negative mood. This finding receives conceptual support from research investigating the opposite of taking revenge—forgiveness. Specifically, a meta-analysis by Fehr, Gelfand, and Nag (2010) found a negative relationship between negative mood and forgiveness, suggesting that experiencing negative mood works against forgiving. Moreover, powerful individuals have been shown to be more forgiving than powerless individuals (Karremans & Smith, 2010). It is interesting to note that the affect-aggression link observed here extends earlier findings by Warburton and colleagues

(2006) as well as van Beest and Williams (2011) who did not observe a statistically significant mediation of this kind. Perhaps what differentiates our study from earlier research is the target of the aggressive behavior. In particular, in the earlier sets of findings, the (aggressive and reduced prosocial) behavior was addressed to a third party not involved in the social exclusion event. In contrast, in this study, the aggression was targeted at the perpetrators of ostracism themselves and can be seen as "letting off steam" through revenge or retaliation.

Implications for Embodiment Literature

The present findings extend earlier evidence for the link between verticality in space and power (e.g., Schubert, 2005). Whereas previous research primarily focused on the perception of other people and groups (e.g., Giessner & Schubert, 2007; Schubert, 2005), the results presented above show how this link can play an important role in self-perception (for the link between metaphors and perception of the self, see also Landau et al., 2011). In addition, the present findings demonstrate that the verticality-power link may influence subsequent behavioral intentions (i.e., reduced retaliation) and provide insight into the underlying processes. Mediation via combined threatened control and negative mood suggests that the effects of being high in space on feelings of control and on mood are comparable to those of having high power, thus conceptually extending existing research on the link between power and control and power and mood.

Moreover, the current research illustrates that a subtle change—which, however, is crucial from an embodied perspective—in the arrangement of Cyberball is able to modify the highly replicable finding that social exclusion leads to increased aggression (for an overview see Gerber & Wheeler, 2009). This finding demonstrates that taking an embodied perspective may provide new insights into other lines of research, allowing for new and testable hypotheses that link thus far unconnected areas of investigation.

Methodological Implications

In looking beyond the hypothesis tested, three lines of thought deserve a brief discussion. First, in this study, social exclusion only led to increased aggression when participants were positioned below the other players and not when positioned above. One may wonder whether these findings call the "standard Cyberball" paradigm into question. Although our results indicate that a subtle visual change in the setup of experimental materials can critically affect participants' perceptions and behaviors—with important implications for constructing experimental manipulations and questionnaires in future research of all sorts—it appears reasonable to take ecological reality into account when evaluating the suitability of a specific setup. In particular, in everyday life, being below and being ostracized likely walk in tandem more often than not, and victims of social exclusion will often be the powerless. A setup in which the participant is positioned below the perpetrators may thus have high ecological validity. In addition, it is important to realize that although Cyberball is one of the most common paradigms to manipulate social exclusion, it is not the only one. Other paradigms show similar effects on aggression (see Leary et al., 2006).

Second, previous research with the Cyberball paradigm showed that although behaviors in the reflective stage can be modulated by moderators (e.g., Twenge et al., 2007; Warburton et al., 2006), immediate feelings of need threat in the reflexive stage seem to be unavoidable (Williams, 2007; 2009), even when the individual benefits from being excluded (e.g., van Beest & Williams, 2006; van Beest, Williams, & van Dijk, 2011). In contrast, we found changes occurring in the reflexive state. Most likely, this is because the variable investigated here—position in space—was introduced *simultaneously* with the ostracism manipulation, as compared with before or after the rejection event in earlier research. We suggest that this small change in setup may have affected the perception of the exclusion experience more directly, as timing appears psychologically critical when buffering threat. Future research investigating the reflexive stage may fruitfully build on this timing

dissociation.

Third, these findings were obtained using Cyberball as one experimental operationalization of ostracism and position in space as one manipulation of power, and are thus, strictly speaking, empirically restricted to this setup. This caveat notwithstanding, there is reason to believe that the conceptual conclusions offered with respect to social exclusion and power can be extended beyond the specific operationalizations employed here, because—although differing in important respects—different exclusion manipulations (e.g., Gardner, Pickett, & Brewer, 2000; Nezlek, Kowalski, Leary, Blevins, & Holgate, 1997; Sommer & Baumeister, 2002; Twenge et al., 2001) and different power manipulations (e.g., Chen, Lee Chai, & Bargh, 2001; Galinsky et al., 2003; Smith & Trope, 2006) are operationalizations of the same underlying concepts.

Conclusion

In conclusion, our findings show that a high vertical position in space mitigates aggressive retaliation against the perpetrators of social exclusion. On a more general level, one may conclude that being in a position of power helps to buffer the effect of ostracism on threatened control and negative mood, thereby reducing the risk of aggressive retaliation.

Footnotes

[1] Over all 2 (social experience: included vs. excluded) x 2 (position in space: below vs. above) x 2 (type of assessment: lab vs. online) analyses, there was only one significant effect of type of assessment, in that participants in the lab as compared with those recruited online assigned more chili peppers to the Cyberball players, signifying more aggressive behavior (main effect: $M = 2.40$, $SD = 1.11$; $M = 1.99$, $SD = 1.00$; $F(1,108) = 6.48$, $p = .01$, $\eta^2 = .06$).

[2] The Levene's test for equality of variance was significant for aggression ($F(3,112) = 2.88$, $p = .04$) and threatened control ($F(3,112) = 6.39$, $p < .001$), indicating that the variances were heterogeneous. We therefore report planned contrasts based on separate variance estimates with regard to these two variables.

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Table 1. Means (standard deviations) in the pretest of perceived spatial position, ease of imagination (general and MIP subscales), received throws and perceived inclusion as a function of position in the Cyberball game.

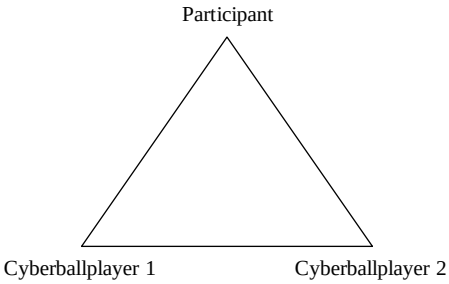
	Relative position to other players			
	Above	Below	*t*	*p*
Perceived spatial position	5.30 *(1.72)*	2.75 *(1.77)*	4.62	<.001
General ease of imagination	3.75 *(0.85)*	3.33 *(1.03)*	1.43	.16
MIP Quantity	2.93 *(1.07)*	2.98 *(0.99)*	-0.15	.88
MIP Ease	3.33 *(1.04)*	3.28 *(0.98)*	0.16	.88
MIP Vividness	3.02 *(0.83)*	2.76 *(0.95)*	0.92	.36
Received throws	37.00 *(11.53)*	33.30 *(7.37)*	1.21	.23
Experienced inclusion	6.50 *(1.47)*	6.85 *(1.23)*	-0.82	.42

Table 2. Means (standard deviations) of negative mood and need threat scales as a function of social experience and position in the Cyberball game. Different superscripts indicate significant differences between conditions.

	Relative position to other players	
	Above	Below
Social Experience	Negative Mood	
Inclusion	4.60[a] (*1.42*)	3.97[a] (*1.79*)
Exclusion	6.43[b] (*1.54*)	7.05[b] (*1.58*)
	Threatened Control	
Inclusion	5.77[a] (*1.51*)	4.98[a] (*2.14*)
Exclusion	7.80[b] (*1.20*)	8.37[c] (*0.87*)
	Threatened Meaningful Existence	
Inclusion	4.31[a] (*1.60*)	3.69[a] (*1.71*)
Exclusion	7.31[b] (*1.40*)	6.89[b] (*1.81*)
	Threatened Belonging	
Inclusion	3.60[a] (*1.85*)	3.30[a] (*1.79*)
Exclusion	6.81[b] (*1.68*)	7.16[b] (*1.70*)
	Threatened Self-Esteem	
Inclusion	4.29[a] (*1.41*)	3.92[a] (*1.87*)
Exclusion	5.68[b] (*1.95*)	5.60[b] (*1.77*)

Figure 1. Schematic depiction of Cyberball arrangement with participants' relative spatial position (a) above (new arrangement) versus (b) below (standard arrangement) the other players.

(a)



(b)

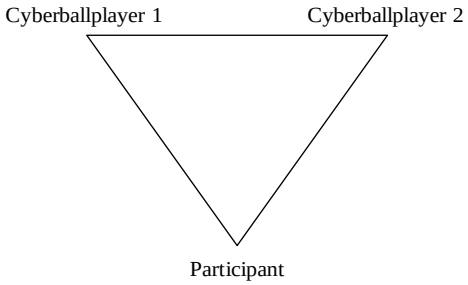


Figure 2. Mean scores (with standard errors) of aggression (chili peppers chosen for Cyberball players) as a function of social inclusion versus exclusion and being above versus below the other Cyberball players in space. Different indices designate significant differences.