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Belonging to a Majority Reduces the Immediate Need Threat from Ostracism in Individuals  
with a High Need to Belong

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**Abstract**

Ostracism—being ignored and excluded—threatens the basic human needs for belonging, self-esteem, control, and meaningful existence. This work introduces belonging to a majority as a buffer against the immediate negative impact of ostracism on basic needs for individuals with a high need to belong, for whom social groups are especially relevant. Three studies show that for individuals high in the need to belong, need threat was attenuated by membership in a majority group, but not by membership in a minority group (Studies 1 and 3) or a group of unknown size (Study 2). By contrast, individuals low in the need to belong—who place less importance on group membership in general—did not benefit from belonging to a majority group. The general pattern replicated across different manipulations of group membership and social exclusion, two measures of need threat, and with participants from two different countries.

Keywords: ostracism, social exclusion, majority, need to belong, need threat

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Social connections play an important role in maintaining physical and psychological health and well-being (see Baumeister & Leary, 1995, for a review). In accord with this, a large body of research shows that ostracism—being ignored and excluded by others—results in serious negative consequences (see Williams, 2007, 2009, for a review). It is well-documented that ostracism poses an immediate threat to the four basic human needs for belonging, self-esteem, control, and meaningful existence, and increases negative affect (e.g., Williams, Cheung, & Choi, 2000; Zadro, Williams, & Richardson, 2004).

There are several situational factors that may be expected to mitigate immediate reactions to ostracism, but most of them have failed to do so. For instance, ostracism remains painful and distressing even when individuals are ostracized by out-group members (Smith & Williams, 2004; Williams et al., 2000; Wirth & Williams, 2009) or by those they despise (Gonsalkorale & Williams, 2007), because of technical difficulties (Eisenberger, Lieberman, & Williams, 2003) or because of a preprogrammed script (Zadro, et al., 2004), and even if individuals have to pay for inclusion (van Beest, & Williams, 2006).

Recent studies, however, have revealed mitigating circumstances (for an overview, see Eck, Schoel, & Greifeneder, 2016). For instance, ostracism is less painful when those ostracized are financially compensated for exclusion (Lelieveld, Gunther Moor, Crone, Karremans, & van Beest, 2013) or when being excluded is consistent with social norms (Rudert & Greifeneder, 2016). Moreover, visualizing oneself in a powerful position alleviates the impact of ostracism on negative affect and the need for control, thereby reducing aggressive retaliation against perpetrators of social exclusion (Schoel, Eck, & Greifeneder, 2014). Because ostracism can result in various detrimental coping behaviors (e.g., aggression or social isolation; Schoel et al., 2014; Williams, 2009), research on ways to mitigate the impact of ostracism on basic needs is highly relevant.

Extending this recent research on mitigating circumstances, the present work introduces belonging to a majority as a potential buffer against the immediate threat ostracism poses to the basic needs. Building on research into social groups (e.g., Moscovici, 1980; Sachdev & Bourhis, 1984, 1991), we propose that majorities to which one belongs possess the potential to protect basic needs. Because group memberships are especially important to individuals with a high need to belong (Leary, Kelly, Cottrell, & Schreindorfer, 2013), we further hypothesized that membership in a majority should buffer especially those individuals with a high need to belong against need threat from ostracism. We next present a derivation of these hypotheses from the literature.

### **Majority groups' potential to protect basic needs**

Most of the literature on social groups defines majorities versus minorities according to numerical size, social power, and/or status (e.g., Erb, Bohner, Hewstone, Werth, & Reinhard, 2006; Kruglanski & Mackie, 1990; Ng, 1982; Sachdev & Bourhis, 1984, 1991). While majorities are always greater in size than minorities, they do not necessarily have greater social power or higher status (Kruglanski & Mackie, 1990). Nonetheless, individuals generally assume the way the majority thinks, judges, and behaves to be better or more likely to be correct, whereas the way the minority thinks, judges, and behaves is assumed to be worse or more likely to be wrong (Kruglanski & Mackie, 1990; Moscovici, 1980; Sachdev & Bourhis, 1984). These associations are likely the result of the high consensus reflected in the numerical size of majorities and the low consensus reflected in the numerical size of minorities. High consensus means that many individuals share a characteristic or opinion with each other. By sharing a characteristic or opinion with many others, individuals feel validated. Moreover, many decisions are based on high consensus, resulting in associations of majorities with high power and recognition. In addition, high consensus is associated with security because consequences of an individual's decision are less extreme when shared with a majority than a minority (Erb, Hilton, Bohner, & Roffey, 2015). Building on these common

associations of majorities, we assumed that perceiving oneself as a member of a majority has the potential to boost one's sense of belonging, self-esteem, control, and meaningful existence. Below we elaborate on each aspect.

### **Belonging**

First, majority groups facilitate feelings of belonging because they comprise many people with whom one may feel connected through shared characteristics or opinions. Research with the minimal group paradigm has repeatedly demonstrated that ostensibly shared characteristics or opinions, for example, in estimation behavior or aesthetic preferences, are sufficient for perceiving others as in-group members (e.g., Petersen & Blank, 2003; Tajfel, Billig, Bundy, & Flament, 1971). The in-group in turn can serve as a social resource for the individual and bolster a sense of belonging (Correll & Park, 2005). Building on these findings, we propose that a numerical majority constitutes a larger social resource than smaller groups. Moreover, knowing that there are many "standing behind oneself" can provide enhanced security and help maintain a satisfactory level of belonging.

### **Self-esteem**

Knowing that there are many "standing behind oneself" may also contribute to maintaining a reasonably high self-esteem because the self-esteem system can be understood as a sociometer that mirrors a person's inclusionary status (Leary, Tambor, Terdal, & Downs, 1995). Moreover, when membership in a particular social group is activated, the most salient attributes of group members' self-concept are likely those that are representative of that group (Hogg & Turner, 1987; Smith & Henry, 1996). In this way, majority groups' frequent associations with positive attributes such as good, right, secure, and privileged (cf. Kruglanski & Mackie, 1990; Moscovici, 1980; Sachdev & Bourhis, 1984, 1991) can contribute to the positive self-esteem of their members when group membership is salient. Given that majority groups provide consensual validation from many similar others, thereby increasing certainty

in one's characteristics or opinions, we presume that their members' high self-esteem is bolstered to a great degree.

### **Control**

In addition, majority groups are often associated with high power (e.g., Keltner, Gruenfeld, & Anderson, 2003; Ng, 1982; see Lücken & Simon, 2005, for empirical evidence). High power individuals in turn have been found to perceive that they have greater control over resources, even when that control is illusory (e.g., when events are largely dependent on chance; Fast, Gruenfeld, Sivanathan, & Galinsky, 2009). Moreover, there is empirical support for a direct majority-control link (Guinote, Brown, & Fiske, 2006). Guinote et al. (2006) manipulated group membership via feedback on a perception task and found that majority members perceived greater control over their behavior and outcomes than did minority members. As a result, one may presume that majority members' elevated sense of control can help them to maintain their perceived control over the social environment at a reasonably high level.

### **Meaningful existence**

Finally, majority groups can also fulfill their members' need for being recognized as existing and being worthy of attention. As reflected in the emphasis on majority rule in many western countries' democracies (Lijphart, 1984), majorities play an important role in society. Because of their great societal influence, majority groups are often the center of attention. Moreover, because of the high intercorrelation of the four basic needs, majorities can fulfill the need for meaningful existence indirectly by enhancing their members' sense of belonging and control, as well as their self-esteem. Together these aspects provide majority groups with a strong potential to protect the need for meaningful existence. Note that we do not question other types of groups' potential to bolster meaningful existence, too (see also General Discussion).

To summarize, majority groups possess the potential to fulfill basic needs, helping their members to maintain a satisfactory need state. However, the desire to belong to the majority is moderated by both personality traits, such as agency or the need for uniqueness, and situationally aroused drives for assimilation and differentiation (Brewer, 1991; Gebauer, Paulhus, & Neberich, 2013; Imhoff & Erb, 2009). We do not expect that the common associations of majorities are reversed for people striving for differentiation but that people striving for differentiation identify less with majorities. By investigating need to belong as a potential moderator, we test the hypothesis that belonging to a majority would meet the basic needs of individuals according to the extent to which they place importance on group memberships in general.

### **The role of the need to belong**

According to Baumeister and Leary (1995) the “need to belong is a fundamental human motivation” (p. 497), and if it is not satisfied, negative effects on health and well-being will result. Leary et al. (2013) further suggested that individuals differ in their striving for acceptance by other people and their desire for belonging to social groups. While individuals with a high need to belong (high NTBs) seek many relationships and are concerned about being accepted by others, individuals with a low need to belong (low NTBs) strive for relationships with only a few others and do not worry about acceptance except by those few (Leary & Kelly, 2009; Leary et al., 2013). High versus low NTBs have been found to show greater cooperation in large groups (DeCremer & Leonardelli, 2003) and greater sensitivity to social cues (Pickett, Gardner, and Knowles, 2004), presumably because both cooperation and sensitivity to social cues may help foster acceptance by others.

Most important for this study, however, is the finding that high and low NTBs differ in the importance they place on social aspects of their identities (Leary et al., 2013, Study 6). In general, individuals differ in the degree to which they typically construe their selves as individuated and personal (i.e., emphasizing individual characteristics and internal states) or

relational and social (i.e., emphasizing interpersonal characteristics, relationships, social groups, statuses, and roles; Markus & Kitayama, 1991; Singelis, 1994). Given that high NTBs have a strong desire for acceptance and belonging, their social self-concept, including both their interpersonal relationships and social groups, should be especially important to them. Correspondingly, Leary et al. (2013) reported a positive correlation between need to belong and importance placed on social identity, but no relationship between need to belong and importance placed on personal identity. Building on this evidence, we hypothesized that high NTBs would be more likely than low NTBs to benefit from belonging to a majority as a buffer against ostracism's immediate impact on basic needs.

In sum, this work investigates whether perceiving oneself as a member of a majority reduces the immediate effects of ostracism on basic needs according to one's dispositional need to belong. In three studies, group membership was manipulated prior to social inclusion versus exclusion. Study 1 compared membership in a majority group and in a group of unknown size with membership in a minority group. Study 2 compared membership in a majority group and in a group of unknown size with a control condition without group assignment (no-group condition). Finally, Study 3 compared membership in a majority group and in a minority group with the no-group condition. The group of unknown size was included to substantiate our reasoning that not just any social group but a majority group in particular possesses the potential to reduce immediate social exclusion effects.

### **Study 1**

Study 1 was designed to gather first evidence for our hypothesis that perceiving oneself as a member of a majority can reduce the impact of ostracism on basic needs for high but not for low NTBs. To this end, we assigned participants to a majority group, a minority group, or a group of unknown size. We expected that high NTBs in the majority group would show less need threat than those in the minority group. By contrast, high NTBs in the group of unknown size and high NTBs in the minority group should not differ in their need threat.



Finally, low NTBs should be hardly affected by group membership but respond to ostracism with less need threat than high NTBs.

In addition to affecting need threat, being ostracized has also been shown to increase negative affect (e.g., Williams et al., 2000). Except for one study on minority groups (Lücken & Simon, 2005), there is no research directly testing the affective experiences of members of a numerical majority versus members of other groups. In that study, members of a minority reported less positive affect than members of a majority, unless the minority members perceived themselves as powerful. However, because there was no control group, it is unclear whether belonging to a majority increases positive affect or belonging to a minority decreases it. We therefore measured participants' mood but refrained from specifying a direct *ex ante* hypothesis regarding the buffering effect of membership in a majority on mood.

## Method

**Participants and design.** Participants were recruited from the online pool of a German university and randomly assigned to a 2 (social experience: inclusion vs. exclusion) x 3 (group: majority vs. minority vs. unknown group size) between-participants factorial design. One hundred and fifteen participants completed the entire online study, but eight participants did not answer the manipulation check for social experience or group correctly (see below); their data were therefore excluded from analyses, which resulted in a sample size of 107 (73% females; 78% students;  $M_{\text{age}} = 25.9$ ,  $SD = 7.7$ ).

**Procedure and materials.** After agreeing to informed consent, participants were randomly assigned to one of the three group conditions.

**Group manipulation.** In order to manipulate group membership, participants first completed a perception task (procedure adapted from Jetten, Spears, & Manstead, 1996), in which they were consecutively shown four pictures for 3 s each. In each picture, different numbers of small and large dots were presented, which participants were asked to estimate. Subsequently, all participants were told that their dot estimates indicated they were more

focused on the small dots, implying that they belonged to the group of detailed perceivers who tend to focus on specifics (versus global perceivers who tend to focus on overall structure). Additionally, participants in the majority condition were told, "Compared with global perceivers, detailed perceivers constitute a majority in the general population. In our studies as well, 86.8% of previous participants were detailed perceivers." Participants in the minority condition were told, "Compared with global perceivers, detailed perceivers constitute a minority in the general population. In our studies as well, merely 13.2% of previous participants were detailed perceivers." Participants in the unknown group size condition received no further information about the percentage of detailed perceivers in the general population.<sup>1</sup>

***Social experience manipulation: My Graduating Class.*** Given that manipulating social experience by means of scenarios is an established practice in the ostracism literature (e.g., Aydin, Fischer, & Frey, 2010; Hitlan, Kelly, Schepman, Schneider, & Zárate, 2006; Wirth, 2016), we induced social inclusion versus exclusion by a newly developed and pretested scenario. Participants were asked to imagine that they were members in an online social network offering the possibility of joining several virtual groups. Joining groups was described as being useful in getting to know members with similar interests or in communicating with people with whom they had something in common, such as the same school. Participants were then told that they found a group of their graduating class that nearly all of their former school fellows belonged to. They were further asked to imagine that they wanted to join the group, too, as they had long wished to have more contact with their graduating class. We manipulated social experience by stating that group membership was either granted or denied. Specifically, participants in the inclusion condition were told, "Your membership request was accepted immediately as your former schoolfellows want you to be in their group very much." By contrast, participants in the exclusion condition were told, "You sent your membership request more than a week ago and you have not been accepted by

the group yet, although both group founders are apparently active in the online social network. Obviously, your former school fellows do not want you to be in their group."

Participants in both groups were asked to imagine themselves in the respective situation and to write down their thoughts and feelings.<sup>2</sup>

**Dependent variables.** After completing the social experience manipulation, participants rated their mood (*bad-good*; *negative-positive*; *unpleasant-pleasant*;  $\alpha = .97$ ; scales from 1 to 9) and stated the degree of threat they experienced to their need for belonging, self-esteem, control, and meaningful existence on 16 items (e.g., "I feel like an outsider"; "I feel powerless"; scales from 1 = *not true* to 9 = *true*; adapted from Williams, 2009). Although they are conceptually separable constructs, it seems reasonable to assume some overlap in the four basic needs (Williams, 2009). In line with this assumption, these needs are generally combined into a single need satisfaction or need threat index with high internal consistency ( $\alpha > .90$ ) when similar immediate effects on the needs are expected (e.g., Lelieveld et al., 2013; Teng & Chen, 2012; van Beest, & Williams, 2006; Zadro, Boland, & Richardson, 2006).<sup>3</sup> Because we expect similar effects on all four needs, we follow this tradition and report an overall need threat index ( $\alpha = .94$ ; but see Table 1 for the relevant results separately for the four needs). Items were (re-)coded such that higher values indicate greater need threat.

**Need to belong.** As a moderator, need to belong was measured with the German version of Leary et al.'s (2013) Need to Belong Scale by Hartung and Renner (2014; 10 items; e.g., "I have a strong need to belong";  $\alpha = .79$ ; scales from 1 = *strongly disagree* to 5 = *strongly agree*). Need to belong was not significantly affected by the group manipulation or the social experience manipulation (all  $ps > .127$ ).<sup>4</sup>

**Manipulation checks.** As a manipulation check for group, participants in the majority and minority conditions were asked whether they belonged to the majority or minority of participants regarding their assigned perception group (1 = *majority*; 2 = *minority*; 3 = *I don't*

*know*). As a manipulation check for social experience, participants were asked whether or not they were included by the group of their former classmates in the scenario described (1 = *yes*; 2 = *no*).

Finally, we collected standard demographic information and assessed control variables such as participants' assumptions about the investigated research question (no correct guesses). The study closed with a debriefing in which participants were informed that the feedback on their perception performance had no informative value and that it was random for experimental reasons. Participants were further debriefed that this proceeding allowed us to investigate effects of belonging to a majority or minority.

## Results

**Manipulation checks.** Regarding the manipulation check for group, one participant in the majority condition incorrectly indicated belonging to the minority, and two participants in the minority condition indicated belonging to the majority or not knowing whether they belonged to the majority or minority. Moreover, five participants (one in the majority condition, one in the minority condition, and three in the unknown group size condition) indicated that they imagined being included by the group of their former classmates although they were in the exclusion condition. The data of these eight participants were excluded from analyses.

**Need threat index.** We conducted a hierarchical regression analysis on the need threat index including dummy-coded social experience (0 = inclusion, 1 = exclusion), dummy-coded group with the minority condition as reference group (0 = minority/unknown group size, 1 = majority; and 0 = minority/majority, 1 = unknown group size), and need to belong as a continuous variable (mean-centered) in Step 1, the two-way interactions in Step 2, and the three-way interactions in Step 3.

In Step 1,  $F(4, 102) = 6.65, p < .001, f^2 = .26$ , both social experience,  $\beta = .29, t(102) = 3.23, p = .002$ , and need to belong,  $\beta = .27, t(102) = 3.02, p = .003$ , significantly predicted

need threat, indicating that need threat was greater in conditions of exclusion and with increasing need to belong. Moreover, in Step 2,  $\Delta F(5, 97) = 2.03, p = .082, f^2 = .10$ , a significant Social Experience  $\times$  Need to Belong interaction was observed,  $\beta = .30, t(97) = 2.80, p = .006$ . Simple slopes analyses revealed a nonsignificant effect of social experience for low NTBs ( $-1 SD$ ),  $\beta = .12, |t| < 1$ . By contrast, for high NTBs ( $+1 SD$ ) need threat was greater under exclusion than inclusion,  $\beta = .68, t(97) = 3.91, p < .001$ . More important, in Step 3,  $\Delta F(2, 95) = 4.30, p = .016, f^2 = .09$ , a significant Social Experience  $\times$  Need to Belong  $\times$  Group (minority vs. majority) interaction,  $\beta = -.33, t(95) = -2.78, p = .007$ , and a significant Social Experience  $\times$  Need to Belong  $\times$  Group (minority vs. unknown group size) interaction,  $\beta = -.31, t(95) = -2.01, p = .047$ , occurred.

Simple slopes analyses revealed that low NTBs ( $-1 SD$ ) were unaffected by exclusion in all three group conditions (all  $ps > .253$ ). As expected, high NTBs ( $+1 SD$ ), however, experienced greater need threat under exclusion than inclusion when belonging to a minority,  $\beta = .94, t(95) = 4.87, p < .001$ , and in tendency when belonging to a group of unknown size,  $\beta = .38, t(95) = 1.66, p = .101$ , but showed no social exclusion effect when belonging to a majority,  $\beta = .11, |t| < 1$ . Point estimates are depicted in Figure 1. All other main and interaction effects were nonsignificant (all  $ps > .114$ ). The statistics of the three-way interactions separately for the four needs are displayed in Table 1.

**Mood.** The same hierarchical regression analysis on mood revealed in Step 1,  $F(4, 102) = 5.94, p < .001, f^2 = .23$ , a significant main effect of social experience,  $\beta = -.38, t(102) = -4.23, p < .001$ , indicating worse mood in conditions of exclusion than inclusion. Also, in Step 2,  $\Delta F(5, 97) = 1.53, p = .187, f^2 = .08$ , a significant Social Experience  $\times$  Need to Belong interaction was observed,  $\beta = -.22, t(97) = -1.99, p = .050$ . Simple slopes analyses revealed—as with need threat—that the simple slope for low NTBs ( $-1 SD$ ) was nonsignificant,  $\beta = -.12, |t| < 1$ , whereas for high NTBs ( $+1 SD$ ) mood was worse under exclusion than inclusion,  $\beta = -.52, t(97) = -2.94, p = .004$ . In addition, the Group (minority vs. unknown group size)  $\times$  Need

to Belong interaction was significant,  $\beta = .24$ ,  $t(97) = 2.07$ ,  $p = .041$ .<sup>5</sup> All other main and interaction effects were nonsignificant (all  $ps > .152$ ).

## **Discussion**

Study 1 provides first support for the hypothesis that high NTBs can be buffered against the negative impact of ostracism on basic needs when belonging to a majority group. By contrast, high NTBs in both the minority condition and unknown group size condition showed the well-known social exclusion effect on basic needs. However, the effect was significantly smaller for high NTBs in the unknown group size condition than for high NTBs in the minority condition. Because Study 1 did not include a control condition without group assignment, both a reduced need threat for high NTBs in the unknown group size condition and an increased need threat for high NTBs in the minority condition is conceivable.

Although we predicted the social exclusion effect for low NTBs to be generally smaller than for high NTBs, its absence in all three group conditions was unexpected. To test whether this finding is contingent on the scenario manipulation chosen, Study 2 employed a different manipulation of social exclusion, namely Cyberball (Williams et al., 2000; Williams & Jarvis, 2006).

Mood was worse under exclusion than inclusion for high but not for low NTBs. Of interest, in contrast with the effect on basic needs, ostracism's impact on mood was not moderated by group membership for high NTBs. Thus, belonging to a majority reduced need threat but did not buffer against worse mood as a result of being ostracized, which seemed to remain an unpleasant experience.

## **Study 2**

The goal of Study 2 was threefold: First, Study 2 aimed to extend the findings of Study 1 by employing Cyberball—a classic and widely used manipulation of social exclusion (Williams et al., 2000; Williams & Jarvis, 2006). Cyberball is a virtual ball-tossing game that participants ostensibly play with two other players over the internet, while, in fact, they are

playing against the computer. In the inclusion condition, tosses are evenly split between players, whereas in the exclusion condition, participants receive only two tosses at the beginning and are then ignored.

Second, Study 2 sought to provide additional evidence that not just any social group but a majority group in particular can reduce the impact of ostracism on basic needs. To this end, we compared the majority condition and unknown group size condition with a control condition in which participants were assigned no group membership prior to the social experience manipulation (no-group condition). We predicted that high NTBs in the majority condition would show less need threat than those in the no-group condition. Moreover, we expected that high NTBs in the unknown group size condition and high NTBs in the no-group condition would not differ in their need threat.

Third, Study 2 introduces the Actual-Desired Need State (ADNS) Scale as an alternative measure to Williams's (2009) need threat items. The need threat items "measure how much belonging, control, self-esteem, and meaningful existence people are experiencing during Cyberball" (van Beest & Williams, 2006, p. 920) and thus are designed to reflect the *level* of basic needs. "As such, [they] only serve as a proxy of whether these needs are threatened" (van Beest & Williams, 2006, p. 920). By contrast, the ADNS Scale is designed to assess *deficits* in basic needs by asking participants to what extent the actual need state differs from the desired one (e.g., for belonging: "I do not have as strong a sense of belonging as I would like"). From a theoretical perspective, this actual-desired comparison appears worthwhile because a need reflects the discrepancy between an actual state and a target or desired state (Blythe, 2013). Need fulfillment is achieved when the actual need state corresponds to the desired one; need threat is experienced to the extent to which the actual need state differs from the desired one.

In a pretest with 41 participants, the ADNS Scale had high reliability ( $\alpha = .95$ ) and showed evidence of high convergent validity, being significantly affected by social inclusion

versus exclusion in Cyberball ( $M_{inclusion} = 3.16$ ,  $SD = 1.38$ , vs.  $M_{exclusion} = 4.53$ ,  $SD = 1.30$ , on a scale from 1 to 7 with higher values indicating greater need threat),  $t(39) = 3.26$ ,  $p = .002$ ,  $d = 1.02$ , and being positively correlated with Williams's (2009) need threat items,  $r = .87$ ,  $p < .001$ .<sup>6</sup> The 12-item ADNS Scale is reported in the Appendix.

## Method

**Participants and design.** Participants were recruited via Amazon Mechanical Turk and randomly assigned to a 2 (social experience: inclusion vs. exclusion)  $\times$  3 (group: majority vs. unknown group size vs. no-group) between-participants factorial design. We set participation requirements such that only individuals could participate (a) with a minimum approval rate on Amazon Mechanical Turk (95% or greater) and (b) who self-identified as U.S. residents, unacquainted with Cyberball, and aged between 18 and 30 years (see Hawkley, Williams, & Cacioppo, 2011, suggesting that need threat experienced in Cyberball decreases with increasing age). One hundred and forty-nine participants completed the entire online study (48% females; 44% students, one participant did not indicate student status;  $M_{age} = 25.3$ ,  $SD = 3.3$ ).

**Procedure and materials.** Participants first gave their informed consent. Next, we collected standard demographic information and randomly assigned participants to one of the three group conditions.

**Group manipulation.** Participants completed the same perception task as in Study 1. Participants in the majority and the unknown group size conditions received the feedback that they belonged to the group of detailed perceivers immediately after the perception task, whereas participants in the control condition without group assignment (no-group condition) were told that the evaluation of the estimation task would take a little time and received the feedback after completing the dependent variables. In addition, participants in the majority condition received the same information on group size as in Study 1. This time, however, the



feedback was accompanied by a picture representing the majority group. To keep the group size salient, this picture was also present during the Cyberball game (see Figure 2a).

***Manipulation check for group.*** Participants in the majority condition were asked whether they, as a member of the detailed perceivers group, belonged to the minority or majority (1 = *minority*; 2 = *majority*). Only participants who answered the manipulation check for group correctly were allowed to continue the study.

***Social experience manipulation: Cyberball.*** Next, all participants played Cyberball with two other supposed players that were actually preprogrammed. In the inclusion condition, participants received the ball ten times out of thirty throws, whereas in the exclusion condition, participants got the ball only twice near the beginning of the game (cf. Williams et al., 2000).

***Dependent variables.*** Subsequent to the Cyberball game, participants completed the 12-item ADNS Scale ( $\alpha = .95$ ; scales from 1 = *not at all* to 9 = *very much*) and a three-item measure of mood (same as in Study 1;  $\alpha = .98$ ; 9-point scales). Items were (re-)coded for analyses so that higher values indicate greater need threat (i.e., a greater difference between the actual and the desired need state).

***Estimation of group size.*** To be able to test our assumption that participants in the unknown group size condition would think of a smaller group than those in the majority condition, we asked all participants to estimate the percentage of the general population belonging to the group of detailed perceivers.

***Manipulation check for social experience.*** As manipulation check for social experience, participants were asked to estimate the number of received throws during Cyberball (cf. Williams et al., 2000).

***Need to belong.*** As a moderator, need to belong was measured with the Need to Belong Scale (Leary et al., 2013; 10 items;  $\alpha = .86$ ; scales from 1 = *strongly disagree* to 5 =

*strongly agree*). Need to belong was not significantly affected by the group manipulation or the social experience manipulation (all  $F$ 's < 1).

Finally, we assessed control variables such as participants' assumptions about the investigated research question (no correct guesses). The study closed with a debriefing in which participants were informed that they had played Cyberball not with other participants but with the computer, that the computer had followed a highly detailed script, and that the course of the game—in particular whether they received few or many balls—had nothing to do with them as a person. The debriefing with regard to the group manipulation was the same as in Study 1.

## Results

**Estimation of group size.** Attesting to the group manipulation's success, participants' estimates of group size were significantly higher in the majority condition (80.9%,  $SD = 13.8$ ) than in the unknown group size condition ( $M = 42.2%$ ,  $SD = 14.8$ ),  $t(146) = 12.56$ ,  $p < .001$ ,  $d = 2.70$ , and the no-group condition ( $M = 41.6%$ ,  $SD = 16.8$ ),  $t(146) = 12.77$ ,  $p < .001$ ,  $d = 2.55$ . Moreover, participants in the unknown group size and no-group conditions did not differ significantly in their estimates,  $|t| < 1$ ; participants in both conditions estimated that detailed perceivers were slightly less represented in the general population than were global perceivers.

**Manipulation check for social experience.** A 2 (social experience: included vs. excluded)  $\times$  3 (group: majority vs. unknown group size vs. no-group) analysis of variance (ANOVA) on the manipulation check for social experience confirmed that participants in the exclusion condition reported fewer received throws ( $M = 9.70$ ,  $SD = 8.69$ ) than those in the inclusion condition ( $M = 36.68$ ,  $SD = 12.96$ ),  $F(1, 143) = 220.39$ ,  $p < .001$ ,  $\eta_p^2 = .61$  (all other  $p$ 's > .355).

**ADNS Scale.** We conducted a hierarchical regression analysis on the ADNS Scale including dummy-coded social experience (0 = inclusion, 1 = exclusion), dummy-coded

group with the no-group condition as reference group (0 = no-group/unknown group size, 1 = majority; and 0 = no-group/majority, 1 = unknown group size), and need to belong as continuous variable (mean-centered) in Step 1, the two-way interactions in Step 2, and the three-way interactions in Step 3.

In Step 1,  $F(4, 144) = 24.80, p < .001, f^2 = .69$ , both social experience,  $\beta = .44, t(144) = 6.78, p < .001$ , and need to belong,  $\beta = .43, t(144) = 6.59, p < .001$ , significantly predicted need threat, indicating that need threat was greater in conditions of exclusion and with increasing need to belong. Moreover, in Step 3,  $\Delta F(2, 137) = 2.51, p = .085, f^2 = .04$ , the predicted Social Experience  $\times$  Need to Belong  $\times$  Group (no-group vs. majority) interaction emerged only as a nonsignificant trend,  $\beta = -.23, t(137) = -1.68, p = .095$ . Simple slopes analyses revealed that low NTBs ( $-1 SD$ ) experienced greater need threat under exclusion than inclusion in both the no-group condition,  $\beta = .40, t(137) = 2.74, p = .007$ , and the majority condition,  $\beta = .60, t(137) = 3.07, p = .003$ . More important, high NTBs ( $+1 SD$ ) experienced greater need threat under exclusion than inclusion in the no-group condition,  $\beta = .64, t(137) = 4.11, p < .001$ , whereas in the majority condition the simple effect of social experience was nonsignificant,  $\beta = .26, t(137) = 1.54, p = .125$ . Point estimates are depicted in Figure 3.

As expected, the Social Experience  $\times$  Need to Belong  $\times$  Group (no-group vs. unknown group size) interaction was nonsignificant,  $\beta = .08, |t| < 1$ . The social exclusion effect on the ADNS Scale for high NTBs in the unknown group size condition was significant,  $\beta = .62, t(137) = 4.06, p < .001$ , and comparable to that for high NTBs in the no-group condition (see above). All other main and interaction effects were nonsignificant (all  $ps > .093$ ). The statistics of the three-way interactions separately for the four needs are displayed in Table 1.

**Mood.** The same hierarchical regression analysis on mood revealed that in Step 1,  $F(4, 144) = 17.84, p < .001, f^2 = .50$ , both social experience,  $\beta = -.44, t(144) = -6.42, p < .001$ , and need to belong,  $\beta = -.32, t(144) = -4.59, p < .001$ , significantly predicted mood, indicating

worse mood in conditions of exclusion and with increasing need to belong. As in Study 1, a significant Social Experience  $\times$  Need to Belong interaction,  $\beta = -.24$ ,  $t(139) = -2.35$ ,  $p = .020$ , was observed in Step 2,  $\Delta F(5, 139) = 1.59$ ,  $p = .166$ ,  $f^2 = .06$ . Simple slopes analyses revealed that mood was worse under exclusion than inclusion for both low NTBs ( $-1 SD$ ),  $\beta = -.36$ ,  $t(139) = -2.76$ ,  $p = .007$ , and high NTBs ( $+1 SD$ ),  $\beta = -.69$ ,  $t(139) = -4.99$ ,  $p < .001$ , but the social exclusion effect was smaller for low NTBs. All other main and interaction effects were nonsignificant (all  $ps > .191$ ).

## Discussion

Employing the newly developed ADNS Scale, Study 2 replicated the finding that high NTBs in the majority condition were buffered against the social exclusion effect on basic needs, whereas high NTBs in the unknown group size condition and the no-group condition showed the well-known social exclusion effect. The results suggest that merely belonging to some social group with undetermined group size is not sufficient to provide high NTBs with the necessary resources to attenuate need threat from ostracism. The social exclusion effect on mood was smaller for low NTBs than high NTBs. As in Study 1, there was no significant moderating effect of group membership, indicating that ostracism remained an unpleasant experience worsening mood regardless of belonging to the majority or not.

We note that the predicted Social Experience  $\times$  Need to Belong  $\times$  Group (no-group vs. majority) interaction failed to reach conventional levels of significance, perhaps reflecting that the group manipulation was not very captivating. Replicating the three-way interaction in Study 3 therefore appeared desirable. We also note that a critical aspect of the Cyberball operationalization may be that the picture symbolizing the majority was shown to players in the majority condition, but no picture was shown to players in the other conditions, which produced a confound. For instance, one could argue that the picture in the majority condition distracted participants, and that this distraction—and not belonging to the majority—might

have reduced need threat. Although this alternative explanation would not hold for the findings observed in Study 1, we experimentally addressed it in Study 3.

### Study 3

Beyond replicating and extending the findings of Studies 1 and 2 by employing a new group manipulation, Study 3 followed three major goals. First, Study 3 sought to substantiate the empirical evidence collected in Study 2 by demonstrating that the reduced need threat for high NTBs in the majority condition cannot be attributed to mere distraction by the picture shown during Cyberball. Second, Study 3 tested the associations between majority groups and the attributes we assumed to contribute to majority groups' potential to protect their members' basic needs. Third, because Study 1 did not include a control condition without group assignment, it did not allow for drawing conclusions about the extent to which belonging to a minority affects need threat. To address this question, a no-group condition was added in Study 3. We predicted that high NTBs in the majority condition would show lower need threat than those in the no-group condition. Moreover, we expected that high NTBs in the minority condition and high NTBs in the no-group condition would not differ in their need threat.

### Method

**Participants and design.** Participants were recruited via Amazon Mechanical Turk and randomly assigned to a 2 (social experience: inclusion vs. exclusion) x 3 (group: majority vs. minority vs. no-group) between-participants factorial design. Prespecified participation requirements were the same as in Study 2. Two hundred and four participants completed the entire online study. Despite the predefined requirements, five participants later indicated to know Cyberball, and three participants did not answer the manipulation check for group correctly;<sup>7</sup> these participants' data were excluded from analyses. The resulting sample size included 196 participants (55% females, one participant did not indicate gender; 32% students;  $M_{age} = 26.3$ ,  $SD = 3.1$ ).

**Procedure and materials.** We used the same procedure and materials as in Study 2 except for the following changes. First, we used a new group manipulation. Given that U.S. voters were in the middle of primaries and caucuses for the presidential election 2016 during data collection, we asked participants to imagine that it was the day of election, and that they were on-site at an election party when the first projection was announced. To induce participants to see themselves as members of a majority (minority), they were further asked to imagine that 82% (18%) of the voters had supported the same candidate as they did. Participants were then asked to write about their thoughts and emotions in response to the majority (minority) situation. Participants in the no-group condition were directly led to the Cyberball game without completing a writing task.

Second, for all participants in all conditions a picture was displayed below their Cyberball player. The picture representing the majority (Figure 2a) or minority (Figure 2b) had already been introduced during the completion of the group manipulation. The picture in the no-group condition (Figure 2c) was introduced at the onset of Cyberball and was of similar size as the one in the majority condition. To the extent that the results of Study 2 were due to distraction by the picture shown in the majority condition, no differential effects across the group conditions should be observed in Study 3.

Third, as a manipulation check for group, participants in the majority and minority conditions were asked to indicate the group to which they belonged with regard to their candidate preference (1 = *minority*; 2 = *majority*).

Fourth, after completing the dependent variables, participants in the majority and minority conditions were asked to indicate their feelings when they learned that they belonged to the majority or minority (same 3 items as mood measure;  $\alpha = .98$ ) and the extent to which they associated specific attributes with a majority or minority group, that is, attributes we assumed to contribute to the buffering effect of majority groups (6 items; e.g., “contributes to a positive self-esteem of its members”; “gives its members a sense of being visible in the

society”;  $\alpha = .95$ ; scales from 1 = *not at all* to 9 = *very much*). Participants in the no-group condition first indicated their associations between the attributes and majority or minority groups in general and were then provided with both versions of the election scenario and asked to indicate how they would feel in the respective majority or minority situation.

As a final change compared to Studies 1 and 2, need to belong was assessed at the study’s beginning (and not end). To prevent effects of scale assessment on subsequent manipulations, the Need to Belong Scale (Leary et al., 2013;  $\alpha = .85$ ) was embedded between two unrelated questionnaires (Life Orientation Test; Scheier & Carver, 1985; Mindful Attention Awareness Scale; Brown & Ryan, 2003).

## Results

**Manipulation check for social experience.** A 2 (social experience: included vs. excluded)  $\times$  3 (group: majority vs. minority vs. no-group) ANOVA on the manipulation check for social experience confirmed that participants in the exclusion condition reported fewer received throws ( $M = 8.34$ ,  $SD = 6.43$ ) than those in the inclusion condition ( $M = 37.71$ ,  $SD = 13.60$ ),  $F(1, 190) = 371.60$ ,  $p < .001$ ,  $\eta_p^2 = .66$  (all other  $F$ s  $< 1$ ).

**ADNS Scale.** We conducted a hierarchical regression analysis on the ADNS Scale ( $\alpha = .95$ ) including dummy-coded social experience (0 = inclusion, 1 = exclusion), dummy-coded group with the no-group condition as reference group (0 = no-group/minority, 1 = majority; and 0 = no-group/majority, 1 = minority), and need to belong as continuous variable (mean-centered) in Step 1, the two-way interactions in Step 2, and the three-way interactions in Step 3.

In Step 1,  $F(4, 191) = 15.58$ ,  $p < .001$ ,  $f^2 = .33$ , both social experience,  $\beta = .34$ ,  $t(191) = 5.33$ ,  $p < .001$ , and need to belong,  $\beta = .33$ ,  $t(191) = 5.13$ ,  $p < .001$ , significantly predicted need threat, indicating that need threat was greater in conditions of exclusion and with increasing need to belong. Moreover, in Step 3,  $\Delta F(2, 184) = 1.87$ ,  $p = .157$ ,  $f^2 = .02$ , the predicted Social Experience  $\times$  Need to Belong  $\times$  Group (no-group vs. majority) interaction

emerged as a nonsignificant trend,  $\beta = -.24$ ,  $t(184) = -1.82$ ,  $p = .071$ . Simple slopes analyses revealed that low NTBs ( $-1 SD$ ) experienced greater need threat under exclusion than inclusion in the majority condition,  $\beta = .53$ ,  $t(184) = 2.94$ ,  $p = .004$ , but not in the no-group condition,  $\beta = .09$ ,  $|t| < 1$ . More important, high NTBs ( $+1 SD$ ) experienced greater need threat under exclusion than inclusion in the no-group condition,  $\beta = .42$ ,  $t(184) = 2.62$ ,  $p = .010$ , whereas in the majority condition the effect was nonsignificant,  $\beta = .25$ ,  $t(184) = 1.62$ ,  $p = .108$ . Point estimates are depicted in Figure 4.

As expected, the Social Experience  $\times$  Need to Belong  $\times$  Group (no-group vs. minority) interaction was nonsignificant,  $\beta = -.05$ ,  $|t| < 1$ . The social exclusion effect on the ADNS Scale for high NTBs in the minority condition was significant,  $\beta = .53$ ,  $t(184) = 2.85$ ,  $p = .005$ , and similarly large as that for high NTBs in the no-group condition (see above). All other main and interaction effects were nonsignificant (all  $ps > .346$ ). The statistics of the three-way interactions separately for the four needs are displayed in Table 1.

**Mood.** The same hierarchical regression analysis on mood ( $\alpha = .98$ ) revealed that in Step 1,  $F(4, 191) = 12.88$ ,  $p < .001$ ,  $f^2 = .27$ , both social experience,  $\beta = -.36$ ,  $t(191) = -5.62$ ,  $p < .001$ , and need to belong,  $\beta = -.24$ ,  $t(191) = -3.67$ ,  $p < .001$ , significantly predicted mood, indicating worse mood in conditions of exclusion and with increasing need to belong. In Step 3,  $\Delta F(2, 184) = 2.81$ ,  $p = .063$ ,  $f^2 = .03$ , these main effects were qualified by a significant Social Experience  $\times$  Need to Belong  $\times$  Group (no-group vs. majority) interaction,  $\beta = .30$ ,  $t(184) = 2.25$ ,  $p = .026$ . Simple slopes analyses revealed that low NTBs ( $-1 SD$ ) experienced worse mood under exclusion than inclusion in the majority condition,  $\beta = -.71$ ,  $t(184) = -3.89$ ,  $p < .001$ , whereas in the no-group condition the effect was nonsignificant,  $\beta = -.21$ ,  $t(184) = -1.33$ ,  $p = .185$ . More important, high NTBs ( $+1 SD$ ) experienced worse mood under exclusion than inclusion in the no-group condition,  $\beta = -.41$ ,  $t(184) = -2.50$ ,  $p = .013$ , but not in the majority condition,  $\beta = -.13$ ,  $|t| < 1$ . All other main and interaction effects were nonsignificant (all  $ps > .197$ ).



**Attributes and feelings associated with group membership.** For participants in the majority and minority conditions, the hierarchical regression analysis on the attributes associated with group membership revealed in Step 1,  $F(3, 128) = 67.44, p < .001, f^2 = 1.58$ , a significant main effect of group (0 = minority; 1 = majority),  $\beta = .77, t(128) = 13.84, p < .001$ , indicating stronger associations of the attributes with a majority group than a minority group. All other main and interaction effects were nonsignificant (all  $ps > .263$ ).

The same hierarchical regression analysis on the feelings associated with group membership also revealed in Step 1,  $F(3, 128) = 86.34, p < .001, f^2 = 2.02$ , a significant main effect of group,  $\beta = .83, t(128) = 16.05, p < .001$ , indicating more positive feelings associated with belonging to the majority than belonging to the minority. Moreover, a nonsignificant trend of need to belong,  $\beta = -.10, t(128) = -1.89, p = .061$ , indicates a tendency of more positive feelings with decreasing need to belong regardless of group membership. All other main and interaction effects were nonsignificant (all  $ps > .098$ ).

No-group participants evaluated attributes before having read the election scenarios. Again, the attributes were more strongly associated with majority groups ( $M = 7.07, SD = 1.38$ ) than minority groups ( $M = 4.64, SD = 1.90$ ),  $F(1, 63) = 74.10, p < .001, \eta^2 = .54$ . This finding allows for the conclusion that the associations with the majority observed in the present study may be general and are not limited to the specific manipulation we used. Moreover, after reading the election scenarios also no-group participants reported more positive feelings associated with belonging to a majority ( $M = 7.93, SD = 1.24$ ) than belonging to a minority ( $M = 3.76, SD = 1.75$ ),  $F(1, 63) = 191.84, p < .001, \eta^2 = .75$ .

## Discussion

Study 3 replicated the finding that high NTBs in the majority condition were buffered against the social exclusion effect on basic needs, while high NTBs in the minority condition and the no-group condition showed the well-known social exclusion effect. Moreover, Study

3 attested to the hypothesized associations between majority groups and the attributes assumed to contribute to majorities' potential to buffer against need threat.

Other than in Studies 1 and 2, in Study 3 high NTBs in the majority condition were also buffered against ostracism's negative impact on mood. Perhaps this is because the election scenario in Study 3 was richer in affect than the more neutral group manipulation employed in Studies 1 and 2. On a speculative note, one may thus conclude that high NTBs can also be buffered against the negative impact of ostracism on mood when belonging to the majority is associated with strong positive feelings. However, the affect-rich election scenario also comes with the downside of a potential confound: belonging to the majority and having success went together. Two considerations are important. First, what unites Studies 1 to 3 is the variation of group status, and not success. Second, high versus low NTBs tended to report fewer positive feelings associated with group membership, suggesting that the moderating effect found for high NTBs in the majority condition is hard to explain by affect only.

As in Studies 1 and 2, need to belong positively predicted need threat. It is therefore hardly surprising that low NTBs have not been universally affected by the social experience manipulation. Specifically, low NTBs did not show an ostracism effect in any of the group conditions of Study 1 and in the no-group condition of Study 3. This finding suggests that low NTBs do not feel as threatened by experiences of social exclusion as do high NTBs.

We note that the predicted Social Experience x Need to Belong x Group (no-group vs. majority) interaction again failed to reach conventional levels of significance. To test the predicted three-way interaction with more statistical power, we conducted a small-scale meta-analysis (Cumming, 2014) with the results of Studies 2 and 3. To this end, we transformed the standardized estimates of the predicted Social Experience x Need to Belong x Group (no-group vs. majority) interaction of Studies 2 and 3 into a Fisher's z-score (Rosenthal & Rubin, 1982) and weighted those z-scores by their sample's inverse variance weight (i.e.,  $n - 3$ ; Hedges & Olkin, 1985). Back-transforming the resultant omnibus z-score into a standardized

measure revealed a significant effect,  $\beta = -.24$ , 95% CI [-.33, -.13]. In the aggregate, therefore, the predicted three-way interaction proved significant, supporting our hypothesis that belonging to a majority reduces the immediate need threat from ostracism in high NTBs.

In Study 3, a picture was displayed below the Cyberball player of all participants in all conditions. While this choice helped address the alternative distraction explanation to Study 2, it harbors a confound between the manipulation of social inclusion versus exclusion and the group manipulation. We have accepted this confound following the general practice in Cyberball studies, which often rely on pictures or colors to make different group memberships of the participant and/or the other players salient (e.g., Bernstein, Sacco, Young, Hugenberg, & Cook, 2010; Gonsalkorale & Williams, 2007; Goodwin, Williams, & Carter-Sowell, 2010; Sacco, Bernstein, Young, & Hugenberg, 2014; Wirth & Williams, 2009). Despite being general practice, or perhaps for that very reason, future research may fruitfully resolve this methodological confound.

### **General Discussion**

A common finding is that ostracism both threatens basic needs for belonging, self-esteem, control, and meaningful existence, and increases negative affect (e.g., Williams et al., 2000; Zadro et al., 2004). To date, very few moderators have been identified that lessen these immediate negative consequences of ostracism (for a recent overview, see Eck et al., 2016). The present studies propose belonging to a majority as a potential buffer against need threat. This is because majority groups provide a sense of belonging, can contribute to the high self-esteem of their members, and give members a feeling of being in control over their social environment as well as being recognized as existing. Yet, not all individuals value group memberships in similar ways, with high NTBs placing greater importance on being part of groups than do low NTBs. Accordingly, the buffering effect of belonging to the majority should be restricted to high NTBs.

In line with this reasoning, the present studies show that belonging to a majority group, but not to a minority group or a group of unknown size, reduces the social exclusion effect on basic needs for high NTBs. By contrast, the reactions of low NTBs were not consistently affected by group membership. These findings replicated across different manipulations of social exclusion and group membership, different measures of need threat, and two cultural settings—one German and two U.S. samples. Furthermore, except for Study 3, belonging to a majority group did not buffer against ostracism's negative impact on mood. More often than not, ostracism seems to remain an unpleasant experience even when needs are not significantly threatened.

That the buffering effect of belonging to a majority was observed only for high NTBs allows for the interesting speculation that belonging to the majority needs to be desired to be effective. Thus, individuals high in agency or in the need for uniqueness, who do not want to belong to majorities, may not benefit from belonging to a majority. Moreover, as people usually belong to several majorities and minorities, a specific group membership likely has to be salient to influence thoughts, feelings, or behaviors (cf. Sachdev & Bourhis, 1984). An interesting finding is that we observed majority effects even with a criterion as irrelevant as focusing on details versus global structure (see Studies 1 and 2).

This research introduced the ADNS Scale as an alternative measure of need threat. Specifically, the ADNS Scale measures the degree to which the actual perceived need state differs from the desired one. This actual-desired comparison distinguishes the ADNS Scale from traditional need threat measures that merely focus on the level of the actual need state. The ADNS Scale therefore appears particularly suitable when researchers are interested not only in differences in situationally experienced belonging, self-esteem, control, and meaningful existence, but also in differences in the desired level of needs (cf. Koudenburg, Postmes, & Gordijn, 2013).

Although our studies provide converging evidence in support of the main hypothesis, some remaining questions require further investigation. First, the criterion on which group assignment was ostensibly based was fairly neutral (being a detailed perceiver) or positive (agreement on opinion). It is an open question whether belonging to a majority would also protect the basic needs of high NTBs when possession of the characteristic shared with other group members would be unfavorable (e.g., proneness for a specific disease). We speculate that majorities based on unfavorable attributes may still provide a sense of belonging, but may not contribute to high self-esteem, control, or meaningful existence because the typical positive associations would likely conflict with the unfavorable attributes. As belonging to a disadvantaged majority should be undesired, however, it is also possible that group membership would not have any buffering effects at all.

By contrast, belonging to a minority group that possesses a rare but desirable characteristic (e.g., a specific ability) may contribute to high self-esteem and meaningful existence. In line with this assumption, research on the scarcity principle has found that individuals evaluate identical characteristics as more extremely positive (or negative) when these are ascribed to a minority rather than a majority (Ditto & Jemmott, 1989). Moreover, a stronger sense of belonging to the minority has been found when the minority was characterized by a positive rather than a negative attribute (Simon and Hamilton, 1994). Yet, the minority might be too small as a social resource to help ostracized individuals maintain a satisfactory level of the need for belonging. Because of high intercorrelations between the four basic needs, it is further unclear whether a boost in self-esteem and meaningful existence could also help maintain satisfactory levels of the needs for belonging and control when being ostracized. Likewise, a reduced satisfaction of the needs for belonging and control in response to ostracism could counteract the strong satisfaction with the needs for self-esteem and meaningful existence. These speculations await further investigation.

Second, although this work focused on social exclusion effects on basic needs and mood, we speculate that group membership may also moderate social exclusion effects on behavioral responses. According to the need-fortification hypothesis (Williams, 2007, 2009), behavior following ostracism is guided by a desire to restore satisfactory levels of those needs most saliently threatened. Williams (2007, 2009) postulates that threats to the needs for belonging and self-esteem motivate individuals to behave in ways that help reestablish social connections. For example, social exclusion enhances memory for social information (Gardner, Pickett, & Brewer, 2000) and increases nonconscious mimicry of and rewards assigned to new interaction partners (Lakin, Chartrand, & Arkin, 2008; Maner, DeWall, Baumeister, & Schaller, 2007). By contrast, threats to the need for control and meaningful existence are postulated to motivate antisocial and aggressive acts because such behaviors can help people recover a sense of control and being noticed (Williams, 2007, 2009; see Tedeschi, 2001, for the social control-aggression link). In line with this reasoning, Schoel et al. (2014) showed that a reduced threat to the need for control and reduced negative affect result in fewer aggressive acts against the perpetrators of social exclusion. Similarly, Warburton, Williams, and Cairns (2006) observed no increased aggression following ostracism when control was restored after the exclusion experience. As majority groups can protect the basic needs of high NTBs, it seems reasonable to predict that for high NTBs belonging to a majority can reduce the likelihood of both prosocial and aggressive responses to ostracism.

Finally, this work investigated the effects of newly assigned groups differing in numerical size. Although this is speculative, it is reasonable to predict that making groups salient that are perceived as significant (e.g., family, friends, athletic team, work group) may also protect some of the basic needs even when the groups are rather small. Consistent with this idea, Knowles and Gardner (2008, Study 2) showed that recalling a time when participants felt intensely rejected heightened group activation, and that the more meaningful and cohesive the activated groups were, the higher was participants' reported state self-

esteem. Furthermore, Ren, Wesselmann, and Williams (2013) examined the moderating effect of interdependent self-construal on initial need threat and recovery from ostracism. They supposed that individuals with a strongly interdependent self-construal would have social connections more cognitively accessible, helping them to recover faster from ostracism. Indeed, they found that the stronger the interdependent self-construal was, the faster was the recovery from threats to belonging and meaningful existence. Perhaps explicitly activating significant groups before being ostracized might have an effect that is strong enough to moderate even the initial threat to the needs for belonging and meaningful existence.

### **Conclusion**

These findings add to a body of research investigating potential moderators of the initial response to being ostracized. Across three studies, belonging to a majority reduced the immediate impact of ostracism on basic needs for high NTBs. By contrast, belonging to a minority or a group of unknown size did not protect basic needs. Given that individuals belong to different social groups, high NTBs facing exclusion may benefit from thinking about a majority they belong to. Such an intervention could be easily taught to school children and thus awaits translational research before being put in practice.

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### Footnotes

<sup>1</sup> We presumed that participants in the unknown group size condition would think that about half of the general population belonged to their group of detailed perceivers. This assumption was tested and confirmed in Study 2.

<sup>2</sup> In the pretest of the scenario, participants ( $N = 41$ ; 88% female;  $M_{age} = 22.6$ ,  $SD = 3.1$ ) reported worse mood and a greater need threat (measured with the same items as in Study 1) in the exclusion condition ( $M_{mood} = 4.89$ ,  $SD = 1.94$ ;  $M_{need\ threat} = 4.43$ ,  $SD = 1.42$ ) than in the inclusion condition ( $M_{mood} = 7.05$ ,  $SD = 1.68$ ;  $M_{need\ threat} = 3.53$ ,  $SD = 1.05$ ),  $t(39) = -3.78$ ,  $p = .001$ ,  $d = -1.18$ , and  $t(39) = 2.27$ ,  $p = .029$ ,  $d = 0.71$ , respectively.

<sup>3</sup> This decision receives empirical support from a principal components analysis with oblimin rotation. According to the scree test criterion (Cattell, 1966), in Study 1 one factor clearly stood out, which explained 53% of the total variance.

<sup>4</sup> In order to assure that need to belong was unaffected by the experimental manipulations, we aimed for a time delay by including two other tasks (personnel selection task; Rosenberg's [1965] Self-Esteem Scale) between the dependent variables and the Need to Belong Scale.

<sup>5</sup> Simple slopes analyses revealed a nonsignificant slope for low NTBs ( $-1\ SD$ ),  $\beta = -.10$ ,  $|t| < 1$ , but a tendency toward better mood for high NTBs ( $+1\ SD$ ) in the unknown group size condition than in the minority condition,  $\beta = .33$ ,  $t(97) = 1.76$ ,  $p = .082$ .

<sup>6</sup> As with the need threat items used in Study 1, the decision to combine the four basic needs measured by the ADNS Scale into a single index receives empirical support from a principal components analysis with oblimin rotation. According to the scree test criterion (Cattell, 1966), one factor clearly stood out, which explained 66% of the total variance.

<sup>7</sup> Two participants in the majority condition incorrectly indicated belonging to the minority and one participant in the minority condition incorrectly indicated belonging to the majority.

*Table 1.* Statistics of the three-way interactions separately for the four needs in Studies 1 to 3.

	SE x NTB x MAJ			SE x NTB x UGS (Studies 1 & 2)/ SE x NTB x MIN (Study 3)		
	$\beta$	$t$	$p$	$\beta$	$t$	$p$
Study 1						
Control	-.28	-2.09	.039	-.46	-2.75	.007
Meaningful existence	-.41	-3.27	.001	-.23	-1.46	.147
Belonging	-.26	-2.34	.021	-.16	-1.11	.271
Self-esteem	-.20	-1.54	.127	-.24	-1.44	.154
Study 2						
Control	-.28	-1.95	.053	.00	0.03	.977
Meaningful existence	-.21	-1.47	.144	-.08	-0.59	.558
Belonging	-.14	-0.94	.350	.09	0.63	.527
Self-esteem	-.19	-1.37	.172	.33	2.38	.019
Study 3						
Control	-.26	-1.80	.073	-.13	-0.77	.445
Meaningful existence	-.11	-0.78	.439	.12	0.76	.451
Belonging	-.22	-1.64	.104	-.05	-0.33	.746
Self-esteem	-.31	-2.30	.022	-.12	-0.82	.414

*Note.* In Study 1 the reference group was the minority condition. In Studies 2 and 3 the reference group was the no-group condition. SE x NTB x MAJ = Social Experience x Need to Belong x Group (majority vs. minority) interaction in Study 1 or Social Experience x Need to Belong x Group (majority vs. no-group) interaction in Studies 2 and 3. SE x NTB x UGS = Social Experience x Need to Belong x Group (unknown group size vs. minority) interaction in Study 1 or Social Experience x Need to belong x Group (unknown group size vs. no-group) interaction in Study 2. SE x NTB x MIN = Social Experience x Need to Belong x Group (minority vs. no-group) interaction in Study 3.

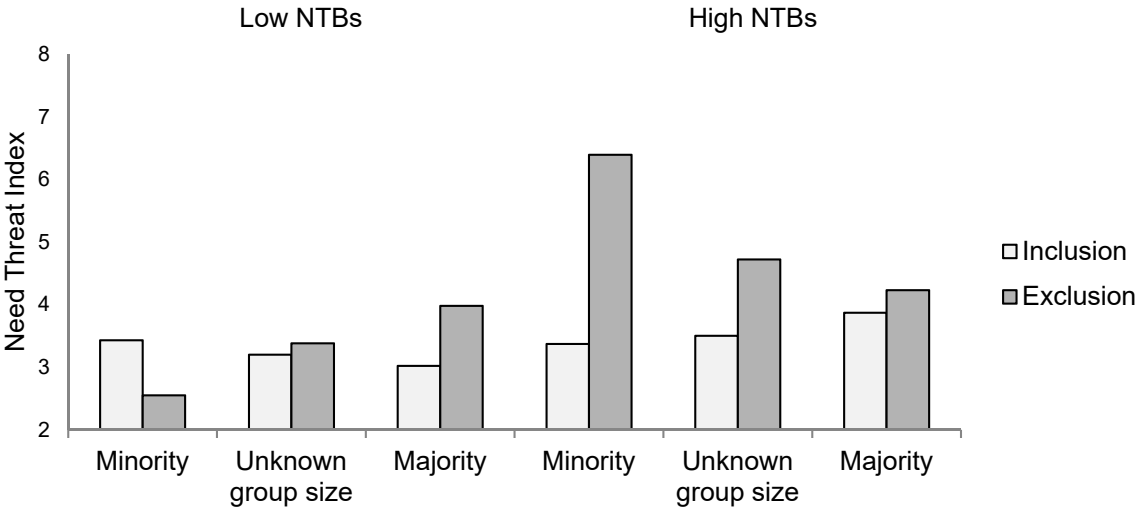


Figure 1. Point estimates of the need threat index as a function of social experience (inclusion vs. exclusion) and group (minority vs. unknown group size vs. majority) for individuals with a low need to belong (low NTBs; - 1 SD) and individuals with a high need to belong (high NTBs; + 1 SD) in Study 1. The need threat index ranges from 1 to 9 with higher values indicating greater need threat.

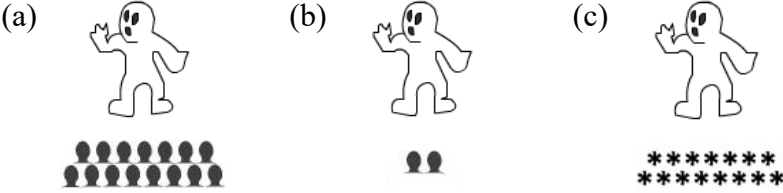
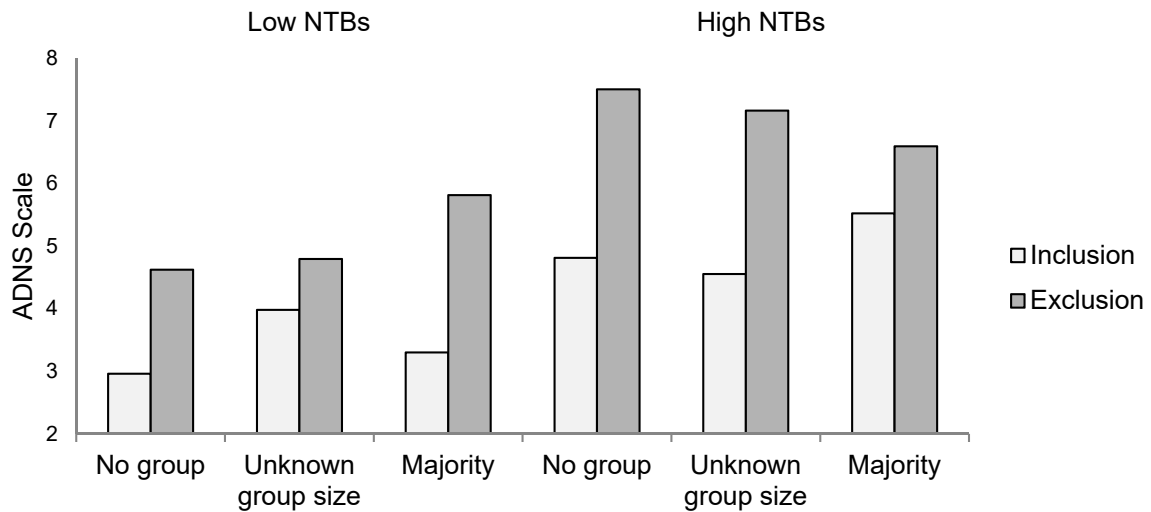
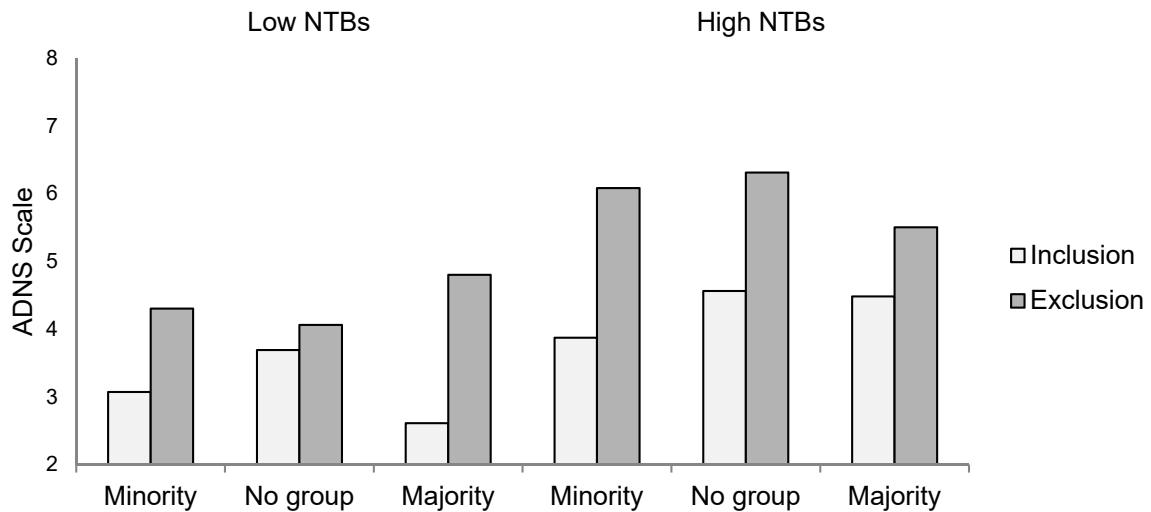


Figure 2. Depiction of the Cyberball player for participants in the (a) majority condition of Studies 2 and 3, (b) minority condition of Study 3, and (c) no-group condition of Study 3.



*Figure 3.* Point estimates of the Actual-Desired Need State (ADNS) Scale as a function of social experience (inclusion vs. exclusion) and group (no-group vs. unknown group size vs. majority) for individuals with a low need to belong (low NTBs;  $-1 SD$ ) and individuals with a high need to belong (high NTBs;  $+1 SD$ ) in Study 2. The ADNS Scale ranges from 1 to 9 with higher values indicating greater need threat (i.e., a greater difference between the actual and the desired need state).



*Figure 4.* Point estimates of the Actual-Desired Need State (ADNS) Scale as a function of social experience (inclusion vs. exclusion) and group (minority vs. no-group vs. majority) for individuals with a low need to belong (low NTBs; - 1 *SD*) and individuals with a high need to belong (high NTBs; + 1 *SD*) in Study 3. The ADNS Scale ranges from 1 to 9 with higher values indicating greater need threat (i.e., a greater difference between the actual and the desired need state).

## Appendix

### Actual-Desired Need State (ADNS) Scale

#### Belonging

1. I do not have as strong a sense of belonging as I would like.
2. I am satisfied with how much others respond to me. (R)
3. Others do not engage with me as much as I wish.

#### Self-esteem

4. Others treat me with as much respect as I wish to receive. (R)
5. I have the feeling that others think worse of me than I would like.
6. At the moment, my self-esteem is lower than I wish.

#### Control

7. I have a feeling of having too little control over what is going on around me.
8. I have a feeling of having too little influence on what is going on around me.
9. I have a feeling of not being able to make enough decisions of my own concerning what is going on around me.

#### Meaningful existence

10. I have the feeling that others are more indifferent to me at the moment than I would like.
11. I have a feeling of being less important at the moment than I wish.
12. I have the feeling that others can do without me more easily at the moment than I would like.

*Note.* Respondents indicated the extent to which each statement applied to their feelings following the game on a 7-point scale (pretest) or 9-point scale (Studies 2 and 3), ranging from 1 (*not at all*) to 7 or 9 (*very much*). (R) indicates that the item is reverse-scored.