

Online Supplemental Materials

Data sets for all experiments reported in the paper are available for review at:

https://osf.io/jh2km/?view_only=f5fa3b2780ad4c8cb54ba4e86bdd5e06. All variables mentioned in the manuscripts are in the datasets along with syntax files and a variable coding sheet.

Additional Analyses from Experiment 1

Factor Analysis. Correlations between dependent variables are presented in Table 1. The correlations across all variables are high. Research has suggested that the sub-scales of William's fundamental needs may not be as distinct as once assumed (Gerber, Change, & Reimel, 2016) and further work on this topic should be explored, however for the current study we followed previous research (e.g. Wirth & Williams, 2009) in considering the fundamental needs and identification as unique constructs (see discussion for further details). An exploratory factor analysis was conducted to determine if the identification items and belonging items would load on separate factors. The five items of the belonging scale and the eight items from the group identification were examined using an exploratory factor analysis (using principal axis functioning) with an oblimin rotation to minimize the number of variables with high loadings on each other for a more straightforward interpretation. Results supported a 2-factor structure (eigenvalues >1) with the first factor accounting for 69% of the variance and the second accounting for 10%. The belongingness items all loaded onto the first factor, and all the identification items loaded onto the second factor, though both the first and second factors were correlated (.635). These results suggest that the belonging and identification scales are related but are separate factors, which supports our predictions that the scales would be related but

conceptually different. Nonetheless, future work should examine the relationship between the belongingness and identification constructs.

Self-uncertainty, Exploratory Analysis. We ran a mixed ANOVA with uncertainty at Round 1 and 2 as the within factor and ostracism condition as the between factor. Results found that there was no change in uncertainty from Round 1 to Round 2 ($F(1,182) = .66, p = .417, \eta_p^2 = .004$) and there was no interaction between ostracism and change in uncertainty across the rounds ($F(3,182) = .75, p = .525, \eta_p^2 = .012$). Within each round there was no significant difference between conditions on uncertainty, (R1 – $F(3,182) = .47, p = .702, \eta_p^2 = .008$; R2 – $F(3,182) = .758, p = .519, \eta_p^2 = .012$). Overall, ostracism at Round 1 or 2 did not have a significant impact on self-uncertainty

Discussion from Experiment 1

As predicted, results from Experiment 1 demonstrated that being ostracized first and then later included by the same group significantly increased group identification. Importantly, these participants reported the highest level of needs satisfaction and strongest group identification of all conditions, at any time point. Ostracizing an individual first before including them causes even greater group identification than if they had been included from the beginning. Not only do these participants show full recovery of fundamental needs after inclusion (replicating previous research, e.g. Tang & Richardson, 2013; Zvolinski, 2014), but they also feel like they fit very strongly within the group. Also in line with predictions, participants who were included and then subsequently ostracized showed significant decreases in their fundamental needs, mood, and identification with the group. As predicted, being included before ostracism does not protect individuals from the negative impacts of ostracism and causes them to feel like they do not fit well with the group.

Experiment 1 offers support for the social identity perspective rather than identity fusion and peripheral membership hypotheses. Findings suggest that being included and then ostracized did not motivate compensatory processes to re-affiliate with one's group, but rather being ostracized after inclusion damaged group identification. These results are in line, however, with an unpleasant initiation process, such that ostracizing an individual before including them may have caused them to exaggerate the positive qualities of the group and identification with them upon entry. These perspectives will be clarified in Experiment 2, where perceptions of the group are measured.

Additional Analyses from Experiment 2

Those in the inclusion-inclusion condition showed significant increases in perceived status (M_s 3.46 vs. 3.99, $\Lambda = .975$, $F(1,320) = 8.09$, $p = .005$, $\eta_p^2 = .025$) and perceived entitativity (M_s 4.95 vs. 5.44, $\Lambda = .983$, $F(1,320) = 5.59$, $p = .019$, $\eta_p^2 = .017$). There was also a nonsignificant marginal increase in perceived warmth (M_s 2.99 vs. 3.22, $\Lambda = .989$, $F(1,320) = 3.63$, $p = .058$, $\eta_p^2 = .011$), but no changes in perceived competence (M_s 3.07 vs. 3.18, $\Lambda = .997$, $F(1,320) = .88$, $p = .350$, $\eta_p^2 = .003$).

Finally, participants in the ostracism-ostracism condition showed no changes in perceived status (M_s 2.39 vs. 2.25, $\Lambda = .998$, $F(1,320) = .60$, $p = .441$, $\eta_p^2 = .002$), perceived entitativity (M_s 3.26 vs. 3.07, $\Lambda = .998$, $F(1,320) = .72$, $p = .397$, $\eta_p^2 = .002$), or perceived warmth (M_s 1.59 vs. 1.51, $\Lambda = .999$, $F(1,320) = .42$, $p = .518$, $\eta_p^2 = .001$), but reported a significant decrease in perceived competence (M_s 2.66 vs. 2.39, $\Lambda = .983$, $F(1,320) = 5.48$, $p = .02$, $\eta_p^2 = .017$).

Discussion from Experiment 2

Findings from Experiment 2 confirm that successive experiences of inclusion and ostracism significantly influence group perceptions. As predicted, participants who were

ostracized first and then included showed significant increases in perceived warmth, competence, status, and entitativity from Round 1 to Round 2. Further, ostracism-inclusion participants reported the most positive group perceptions of warmth, status, and entitativity out of any condition after Round 2—even higher than participants who had been included by their group the whole time. The predicted increases were found not to be due to simultaneous changes in fundamental needs or mood as covarying these variables yielded results that were not significantly different, suggesting that the effects of experimental condition and time were the driving factor of the results of Experiment 2. Ostracizing someone before including them strengthens their group identification and enhances perceptions of group warmth, competence, status, and entitativity.

Also in line with predictions, participants who were included and then ostracized showed significant decreases in perceived status, entitativity, warmth, and competence. Being accepted by a group and then later ignored by its members lead to participants seeing the group in a less positive manner. Those included and then ostracized were also shown to significantly decrease in needs, mood, and identification, as in Experiment 1. Experiment 2 also replicated the findings of Experiment 1 in showing that inclusion after ostracism led to recovery of fundamental needs and mood as well as significant increases in identification with the group.

While the results of Experiment 2 replicate the findings of Experiment 1 for the included-ostracized and ostracized-included groups, there were also significant increases found for the included-included condition on belonging, meaningful existence, control, mood, and identification. This was an unexpected result that is likely due to a small effect size that the increase in sample size and power in Experiment 2 allowed the analyses to detect (in comparison to Experiment 1). The sense of being doubly included seems to make individuals feel slightly

better about themselves and their group, but these individuals do not reach the levels of fulfilled needs, mood, and identification of those that were first ostracized prior to their inclusion.

Overall, these results extend the findings of Experiment 1, further supporting the perspective that group identification and positive group perceptions are stronger when group members are first ostracized and then later included. These results are consistent with the notion that unpleasant initiation may predict the most positive group perceptions, group identification, and ingroup bias.

Additional Justification for Using the Middle 10 Balloons of the BART

Dahne, Richards, Ernst, MacPherson, and Lejuez (in press) state that when breaking down the 30 balloons into 10 balloon trails, correlations between each third of balloons are acceptable and that a selection of 10 balloons out of the 30 total is reasonable. Upon evaluating these correlations in Experiment 3 between the adjusted average pump counts, the adjusted average pump count for the middle 10 balloons (Round 1 - .919; Round 2 - .956) correlated highest with the overall adjusted average pump count in comparison to the adjusted average pump count for the first 10 balloons (Round 1 - .861; Round 2 - .877) and the adjusted average pump count for the last 10 balloons (Round 1 - .867; Round 2 - .858). For these reasons, we chose to analyze the adjusted average pump count for the middle 10 balloons.

Additional Analyses from Experiment 3

Belonging, self-esteem, meaningful existence, control, and mood were included in the model as covariates. The covariates included in this analysis were selected to eliminate any possible influence of William's fundamental needs (Williams, 2009) on changes in risk taking and allowed the isolation of the impact of identification. The model did not differ significantly when omitting the covariates. In the overall mediation model, identification ($b = .306$, $t(184) =$

1.99, $p = .049$) did not significantly mediate the relationship between condition and risk taking, $F(9, 184) = 1.04, p > .05, R^2 = .05$. The direct effect for condition on risk was not significant, $F(3, 184) = 0.75, p = .525, R^2 = .012$. However, to test the planned mediation analysis for the ostracized-included group, indirect effects of condition on risk through identification were conducted by dummy coding our multicategorical predictor variable via indicator coding within PROCESS (Hayes & Rockwood, 2016), using the included-included condition as the reference category. The ostracized-included condition ($b = .108, SE = .074$, bias corrected 95% CI = [.006, .310]) showed a significant increase in identification, leading to an increase in risk. The ostracized-ostracized condition ($b = -.048, SE = .054$, bias corrected 95% CI = [-.214, .018]) demonstrated that identification did not mediate the relationship between ostracism and risk taking.

We ran the mediation analysis from Experiment 3 excluding the covariates. In the overall mediation model, identification ($b = .308, t(188) = 2.22, p = .027$) did not significantly mediate the relationship between condition and risk taking, $F(9, 188) = 1.68, p = .14, R^2 = .04$. The direct effect for condition on risk was not significant, $F(3, 188) = 1.25, p = .29, R^2 = .019$. However, to test the planned mediation analysis for the ostracized-included group, indirect effects of condition on risk through identification were conducted by dummy coding our multicategorical predictor variable via indicator coding within PROCESS (Hayes & Rockwood, 2016), using the included-included condition as the reference category. The ostracized-included condition ($b = .156, SE = .093$, bias corrected 95% CI = [.011, .388]) showed a significant increase in identification, leading to an increase in risk.

Analyses were also conducted using the overall adjusted average pump count where all 30 balloon trails were included. The overall effect of condition on risk was not significant, $\Lambda =$

.982, $F(3,190) = 1.14$, $p = .335$, $\eta_p^2 = .018$, but planned pairwise comparisons revealed the hypothesized significant effects between conditions.

For risk taking as measured by overall adjusted average pump count, planned comparisons (Rosenthal & Rosnow, 1984) for time were used in evaluating changes in risk from Round 1 to Round 2. As predicted, participants who were first ostracized and then included were significantly riskier from Round 1 to Round 2 (M_s 26.55 vs. 32.41, $\Lambda = .943$, $F(1,190) = 11.47$, $p = .001$, $\eta_p^2 = .057$). Participants in both the inclusion-ostracism condition (M_s 32.34 vs. 35.80, $\Lambda = .975$, $F(1,190) = 4.89$, $p = .028$, $\eta_p^2 = .025$), and the ostracism-ostracism condition (M_s 30.31 vs. 34.89, $\Lambda = .965$, $F(1,190) = 6.85$, $p = .010$, $\eta_p^2 = .035$) also showed significant increases in risk taking from Round 1 to Round 2. There were no significant differences for included-included participants (M_s 28.68 vs. 30.31, $\Lambda = .995$, $F(1,190) = .986$, $p = .322$, $\eta_p^2 = .005$).

Overall adjusted average pump count was also used in the planned mediation analysis to confirm that group identification was driving increases in risk taking for ostracized-included individuals. Belonging, self-esteem, meaningful existence, control, and mood were included in the model as covariates. In the overall mediation model, identification ($b = .328$, $t(184) = 2.23$, $p = .027$) did not significantly mediate the relationship between condition and risk taking, $F(9, 184) = 1.05$, $p > .05$, $R^2 = .05$. The direct effect for condition on risk was not significant, $F(3, 184) = 0.73$, $p = .537$, $R^2 = .012$. However, to test the planned mediation analysis for the ostracized-included group, indirect effects of condition on risk through identification were conducted by dummy coding our multicategorical predictor variable via indicator coding within PROCESS (Hayes & Rockwood, 2016), using the included-included condition as the reference category. The ostracized-included condition ($b = .167$, $SE = .097$, bias corrected 95% CI = [.013, .406]) showed a significant increase in identification, leading to an increase in risk. The

ostracized-ostracized condition ($b = -.022$, $SE = .056$, bias corrected 95% CI = $[-.179, .062]$) demonstrated that identification did not mediate the relationship between ostracism and risk taking. Similar to our findings with the middle third balloons, our planned mediation analysis confirmed that from Round 1 to Round 2, ostracized-included individuals were significantly more willing to take risks for their group, and stronger group identification explained this increase.

Discussion from Experiment 3

Experiment 3 demonstrated that group behavior changes depending on different combinations of ostracism and inclusion over time. Specifically, participants who were first ostracized and then included took significantly more risks to benefit the group. In line with social identity literature, the increase in risk taking was explained by strengthened group identification, as shown by the planned mediation analysis. Indeed, high identification can push group members to behave in ways that are risky (Hogg et al., 2011) or extreme (Hogg, 2007; Hogg & Adelman, 2013), and the current study demonstrated that one way to increase risk-taking to benefit the group is to first ostracize group members before granting them membership. Contrary to predictions, the included-ostracized group did not significantly differ in risk taking between Round 1 and Round 2, so we were unable to test the role of group identification in risk taking behavior for these individuals.

Comparing the results of Experiment 3 when using the adjusted average pump count of the middle third balloons and when using the overall adjusted average pump count (all 30 balloons) yielded similar findings in that ostracism-inclusion participants increased in risk and the increase was mediated by identification. There was a slight difference when using the overall adjusted average pump count in that participants in the inclusion-ostracism condition showed a

significant increase in risk taking. This finding was not present in the analyses using the middle third balloons but the means were trending in the same direction. The increase in risk taking for this condition is contrary to this experiments' predictions but this finding should be interpreted with caution as it only appears when using the overall adjusted average pump count.

The findings of Experiment 3 are in line with research on unpleasant initiation. Ostracized and then included participants seem to have justified their negative experience of ostracism by highly identifying with the group and showing a greater willingness to take risks to benefit the group. Creating an unpleasant initiation process appears to not only impact perceptions of the group, but also motivates the individual to act for the group because of enhanced group identification.

Results also showed that participants in the ostracized-ostracized group significantly increased in risk taking from Round 1 to Round 2, supporting prior research showing that exclusion generally increases risk taking behavior (e.g., Mead et al., 2010). This finding is interesting as in this study participants were instructed that risk taking would benefit the group, which for ostracized-ostracized individuals, was a group that they were never accepted in to. These participants may have been higher in risk taking to try and gain entry into the group or perhaps as a way to try and harm the group. Conversely however, the lack of significant increase in risk taking for the inclusion-ostracism condition demonstrates that ostracism does not always increase general risk taking. There were also no significant differences in risk-taking found for included-included condition. Future work should more closely examine risk taking by ostracized individuals and specifically participants who are ostracized twice by the same group to determine why these participants show an increase in risk taking for the group.

While the BART was originally designed as a measure of individual risk taking, the current work highlights that the BART can be used as a measure of risk taking on behalf of one's group and is not only a measure of general risk taking. The mediation analysis conducted in this experiment further bolsters our confidence that responses on the BART for the ostracized-included group were explained by changes in group identification rather than changes in temporary risk preference.

Additional Limitations and Future Directions

The current study only focused on the reflexive stage of ostracism (Williams, 2009). That is, measurements of needs fulfillment, mood, identification, and risk that occurs immediately following ostracism. During the reflexive stage, responses are thought to be less controlled and immediate (e.g., pain, Eisenberger, Lieberman, & Williams, 2003). While the immediate responses to situations of inclusion and ostracism inform our understanding of the person's perceptions of the situation, future work may want to focus on the reflective stage following ostracism. In the reflective stage, individuals are more thoughtful and plan their response to ostracism based on which of their needs have been thwarted and need to be fulfilled (Williams, 2009). For example, it is possible that those who were first included and then ostracized would be more prosocial in their responses and behaviors towards their group, given that their behavior is measured following the reflective stage.

Results from our exploratory analysis of self-uncertainty revealed that ostracism did not have an impact on self-uncertainty. However, we believe that, while ostracism may not cause changes in self-uncertainty, self-uncertainty may play a role in the relationship between ostracism and identification/risk-taking. It is likely that uncertainty would moderate the relationship illustrated here between ostracism and group identification, with higher levels of

uncertainty leading to even greater identification for participants who are included after ostracism. Previous research demonstrates that feelings of uncertainty cause even stronger group identification and ingroup bias (Grieve & Hogg, 1999; Hohman & Hogg, 2015a; Mullin & Hogg, 1998) and greater willingness to act for the group (Hogg, Meehan, & Farquharson, 2010; Hohman & Hogg, 2015b). Uncertainty specifically about the *self* is the most motivating of group identification (Mullin & Hog, 1999), so causing ostracized group members to feel self-uncertain during unpleasant initiation may cause the most group identification and commitment when they are later included. Future research should test the moderating effect of uncertainty on the relationship between multiple rounds of ostracism/inclusion and group identification.

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