PREPRINT 2022-02-21

When Positive Feedback Isn't Quite Enough: Benefits of Überball Depend on Type of Social Feedback and Level of Social Insecurity

Rémi Thériault, Flavie Dion-Cliche, & Stéphane Dandeneau*

Department of Psychology, Université du Québec à Montréal, Québec, Canada

Word count: 4137

This work was supported by a Social Sciences and Humanities Research Council of Canada grant (SSHRC) and the Fonds de Recherche du Québec – Société et Culture (FRQSC). The sponsors had no role in the study design; in the collection, analysis and interpretation of data; in the writing of the report; or in the decision to submit the article for publication. The authors report no conflict of interest. A university research ethics board approved this study. We did not preregister this study or corresponding analyses in an independent, institutional registry or otherwise. The data, analysis scripts, and supplemental materials are available on the Open Science Framework at https://osf.io/cmg3z/.

*Correspondence concerning this article should be addressed to Stéphane Dandeneau, Department of Psychology, Université du Québec à Montréal, C.P. 8888, Succursale Centre-Ville, Montréal, Québec, Canada, H3C 3P8. E-mail: dandeneau.stephane@uqam.ca, Phone: 1-514-987-3000 ext. 5631.

Abstract (200/200)

Objective. The current study examines the effects of preferential inclusion on fulfilling fundamental needs after having received ambiguous or positive social feedback and investigates how social insecurity moderates this effect.

Method. 438 participants (58.7% women, mean age 39) either received positive or ambiguous social feedback, then participated either in a social participation (Cyberball/control task) or a preferential social inclusion (Überball/experimental manipulation) task, then finally reported the fulfillment of their fundamental needs. Participants also completed a measure of social insecurity and other personality measures.

Results. The two main results emerging from the current study are: (a) Überball—the preferential social inclusion condition—leads to higher fulfillment of fundamental needs than Cyberball; and (b) socially anxious individuals (those high in fear of negative evaluation) significantly benefit from preferential social inclusion (Überball) when receiving positive feedback but not when receiving ambiguous feedback.

Conclusion. Overall, this research shows that Überball leads to higher fulfillment of fundamental needs than a social participation task like Cyberball Inclusion. This study is a valid and valuable condition to study the protective effects of social inclusion. It also suggests that socially insecure individuals benefit most from being preferentially socially included after receiving positive social feedback than simply being included.

Keywords: social inclusion, social participation, fundamental needs, fear of negative evaluation, Cyberball, Überball

When Positive Feedback Isn't Quite Enough: Benefits of Überball Depend on Type of Social Feedback and Level of Social Insecurity

Interpersonal acceptance and rejection have powerful psychological consequences. Social acceptance is vital to wellbeing, and social exclusion typically leads to an array of negative emotions (Leary, 2010; Leary & Baumeister, 2000; Williams, 2007; Williams et al., 2000; Williams & Nida, 2011). Explicit indications that others dislike or reject us also appear to be among the most powerful contributors to feelings of low self-esteem (Leary & Baumeister, 2000). Being abandoned, romantically rejected, or expulsed from social groups or one's family is highly distressing and usually followed by drops in self-esteem (Leary & Baumeister, 2000). Moreover, social rejection thwarts one's fundamental needs of belonging, meaningful existence, self-esteem, and control, leading to negative emotional, cognitive, behavioural, and neural consequences (Williams, 2007; Williams et al., 2000; Williams & Nida, 2011).

Despite the wealth of knowledge on the effects and consequences of social rejection, little empirical research has looked at the effects and conditions needed to promote and increase feelings of social acceptance. Recently, researchers showed that making participants the target of specific inclusion while another player is excluded (inclusion condition called *Überball*) was more effective than a simple social participation task ("Cyberball inclusion condition") in fortifying fundamental needs (of belongingness, self-esteem, meaningful existence, but not control; Simard & Dandeneau, 2018). In other words, feelings of *acceptance* require more than simply "participating or being included" in a game—it requires explicit and overt cues indicating that we are "chosen" to be included. Furthermore, the positive effects of Überball's preferential inclusion condition were strongest for participants with relatively high fear of negative

evaluation levels, suggesting that specific inclusion may benefit those most socially insecure (Simard & Dandeneau, 2018).

As with most social contexts, one's *perception* and *interpretation* of the available social information is critical. For example, some of the adverse effects of social exclusion, such as reductions in self-esteem, appear to involve one's perceived relational value from others (Leary, 2005). Similarly, socially hypersensitive people tend to react negatively to ambiguous feedback or in the *absence* of positive feedback (Cikara & Girgus, 2010; Yang & Girgus, 2018). Conversely, Simard & Dandeneau (2018) show that individuals with relatively high levels of social insecurity benefit from seeing and feeling like the "special" targets of social inclusion. In other words, providing clear and unambiguous *positive* social inclusion feedback (Überball) fortifies people's fundamental needs. In the current study, we extend this research by integrating positive and ambiguous social feedback (Anthony et al., 2007; Schröder-Abé et al., 2007; Yang & Girgus, 2018) with Überball to test whether fortifying participant's fundamental needs can mitigate the effects of ambiguous social feedback. We reasoned that if ambiguous feedback strongly affects socially insecure individuals, these individuals would be much more likely to benefit from Überball's greater restorative power. We predicted that fostering a situation of preferential inclusion (e.g., through Überball) after receiving ambiguous social feedback would strengthen the fundamental needs of socially insecure people (e.g., those with a high fear of negative evaluation).

Present Study

This study aimed to replicate and extend previous findings regarding the preferential social inclusion condition Überball. We hypothesized that Überball (vs. Cyberball) would lead to higher fulfillment of fundamental needs and perceived relational value based on past research.

Our central objectives were then to test (1) whether experiencing preferential social inclusion (Überball) mitigates the adverse effects of ambiguous social feedback on the fulfillment of fundamental needs and perceived relational value, and (2) whether participants' level of fear of negative evaluation moderates this effect. Specifically, we predicted that those *high* in fear of negative evaluation would benefit more from the Überball condition, relative to the Cyberball condition, after having received *ambiguous* feedback. We did not expect such an effect when the feedback is *positive* or for those with a *low* level of fear of negative evaluation.

Method

Participants and Design

Sample size was determined before any data analysis. Power analyses with an alpha level of .05 and 80% power suggested sample sizes of at least 104 per group (208 total) for *t*-tests (with an expected small-medium Cohen *d* effect size of 0.39 based on Simard & Dandeneau, 2018), and at least 395 for moderation analyses (with an expected small f^2 of 0.02). Five hundred participants were recruited through Amazon Mechanical Turk to participate in the online study, anticipating losing approximately one-third of the data due to incomplete or missing data. We excluded data from 16 participants due to incomplete or invalid data, 10 for failing the attention check, and 36 for knowing the purpose of the Cyberball paradigm before starting the experiment. This left 438 participants (58.7% women) with a mean age of 39.0 years (*SD* = 12.1 years) for the analyses. Sensitivity analyses suggested such a sample size provided sufficient power to detect Cohen's *d* effects greater than 0.26 and f^2 effects greater than 0.017.

The study consisted of a 2 (Feedback condition: Positive vs. Ambiguous) × 2 (Inclusion Type: Überball vs. Cyberball) between-subject design where participants were randomly

assigned to one of the four combinations of conditions. All tasks and measures used in this study are reported and described below.

Conditions

Feedback Conditions. Based on Anthony et al.'s (2007) methodology, we presented either positive or ambiguous feedback relative to participants' involvement in an upcoming group task. Participants were asked to answer (yes/no) to the following questions: "Do you like heavy metal music? Do you tend to give money to homeless people? Are you a sports person? Do you like going to amusement parks?", ostensibly to provide a brief "profile" to their team members. Participants were asked to wait one minute while the system compiled responses from their group members, and during this time, they viewed other team members' "answers" to the same questions.

Participants in the *positive feedback* condition (n = 212) were told that other participants responded to their profile questions with the following responses: "This person seems nice, I hope she will join us", "This person sounds nice, I'm looking forward to working with them", or "I think she'll really gel with the group in no time at all".

Participants in the *ambiguous feedback* condition (n = 226) were told that other group members' responses to their profile were: "We seem pretty different, but I'm willing to give it a try", "I think we'll get along well after we really get to know each other", or "This person sounds like someone I could grow to like".

Social Inclusion Conditions. We manipulated participants' feelings of inclusion with the Cyberball Inclusion and the Überball Inclusion conditions. The *Cyberball Inclusion* condition (n = 232) consisted of the 4-player version of the Cyberball inclusion online ball-tossing game

where all participants are given approximately the same percentage of throws throughout the game (Williams et al., 2000).

The *Überball Inclusion* condition (n = 206) is identical to the Cyberball Inclusion condition; however, after approximately five throws, the preprogrammed players to the left and atop the participant *only start sending throws to the participant* (and stop sending throws to the player to the right of the participant). The participant can send throws to whomever they wish (left, atop, or right). This condition clearly and overtly indicates to the participant that *they* are the target of social inclusion (Simard & Dandeneau, 2018).

The Überball Inclusion and Cyberball Inclusion conditions consisted of 50 throws which lasted for approximately 5 minutes and were programmed using Inquisit Web software (Millisecond Software LLC, 2016).

Measures

Anticipated Acceptance From the Group. Anticipation of being accepted by the group was measured on a scale designed from items used in the study by Anthony and colleagues (2007) as well as from other items created for this study (example item: “How likely is it that the others will like you?”). This 9-point scale ranged from *not at all* to *very much* ($\alpha = .95$). This measure was used as a manipulation check following the ambiguous and positive feedback manipulations.

Fundamental Needs. The fundamental needs of belonging, self-esteem, meaningful existence, and control were assessed using a 5-point scale ranging from *not at all* (1) to *extremely* (5; Jamieson et al., 2010). A total mean score was computed ($\alpha = .94$), where a higher score indicates a higher level for each need, that is, more *fulfilled* needs (example items for *belonging*, “I felt I belonged to a group”; *self-esteem*, “I felt liked and worthy”; *meaningful*

existence, "I felt important"; and *control*, "I felt powerful"). The overall score (mean of 4 subscales) and the four individual subscales were used as our primary dependent measures.

Perceived Relational Value. Perceived relational value was assessed using a 7-point scale ranging from *not agree at all* (1) to *very strongly agree* (7; Simard & Dandeneau, 2018). A total mean score was computed (α = .96; example item: "I felt like others value playing with me"). This measure was used as an additional outcome measure.

Fear of Negative Evaluation. Participants' fear of negative evaluation was assessed using Carleton and colleagues' (2006) 5-point scale ranging from *Not at all characteristic of me* to *Extremely characteristic of me* (Carleton et al., 2006). Higher scores indicate a high fear of negative evaluation (α = .95; example item: "I am frequently afraid of other people noticing my shortcomings"). As was the case in Simard and Dandeneau (2018), this measure was used in our primary moderation analyses.

Other Measures. We also took measures of self-esteem (Rosenberg, 1965), rejection sensitivity (Downey & Feldman, 1996), relational security with friends (Stinson et al., 2011) and mood (Kercher, 1992), for exploratory purposes. All measures used in this study (including exploratory measures) are available in Supplemental Materials[1]. In these studies, we report all measures, manipulations and exclusions.

Procedure

Participants first read the study's description and provided their informed consent and demographic information. They also completed the brief version of the Fear of Negative Evaluation (FNE; Carleton et al., 2006) and other personality measures (e.g. Rosenberg Self-Esteem Scale, Rejection Sensitivity Scale). Participants then read the same experimental vignette

[1] Available on the Open Science Framework at https://osf.io/cmg3z/

asking them to imagine themselves in a first impression context involving three other people (i.e., the other three players in the Cyberball paradigm). As a result, each participant was required to disclose personal information (e.g., hobbies, employment) and then assess others so that everyone received personal feedback. Participants were then randomly assigned to one of the four experimental groups where they first received feedback (e.g., positive or ambiguous), completed the measure of anticipation of their social acceptance of the group, and then completed either the Überball or Cyberball social inclusion conditions. Finally, participants completed measures of fundamental needs, relational value, relational security with friends and mood and were debriefed and thanked for their participation.

Analyses

We performed all statistical analyses in R version 4.0.3 (R Core Team, 2021) using the following packages: *pwr* (power analyses; Champely, 2020), *lsmeans* (contrast analyses; Lenth, 2016), *lmSupport*, *bootES*, and *effsize* (effect sizes and bootstrapped confidence intervals; Curtin, 2018; Kirby & Gerlanc, 2013; Torchiano M, 2020), *interaction* (moderations and figure; Long, 2019), *psych* (internal reliability analyses; Revelle, 2018), *mediation* (mediations; Tingley et al., 2014), *dplyr* (data manipulation; Wickham et al., 2021), *ggplot2* (Wickham, 2016), *rcompanion* (Mangiafico, 2020), *ggsignif* (Ahlmann-Eltze, 2019) and *ggpubr* (Kassambara, 2019) for figures, as well as *rempsyc* (Thériault, 2022) for convenience functions. The data and analysis scripts are available on the Open Science Framework at https://osf.io/cmg3z/.

Results

A manipulation check *t* test revealed a statistically significant effect between the ambiguous and positive feedback groups on anticipation of social acceptance ($M_{\text{Ambiguous}} = 6.57$,

$M_{Positive}$ = 7.18; difference = 0.62, 95% CI [-0.89, -0.34][2]), t(432.83) = -4.41, p < .001; Cohen's d = -0.42, 95% CI [-0.61, -0.23]), suggesting that the feedback manipulation created different levels of anticipated social acceptance.

Replication Analyses

The first analyses consisted of the same analyses reported by Simard and Dandeneau (2018) to see whether: (a) participants in the Überball condition (compared to Cyberball) showed higher levels of fundamental needs fulfillment and perceived relational value; and (b) a moderation of FNE between inclusion condition and fundamental needs. A critical difference between Simard and Dandeneau's (2018) studies and the current study is that participants in the present study underwent the positive/ambiguous feedback manipulation *before* completing the Überball/Cyberball conditions. The following conceptual replication analyses investigate the effects of Überball on needs fulfillment regardless of the impact of the positive/ambiguous feedback manipulation.

Regarding result (a), Überball does lead to higher fulfillment of fundamental needs (overall needs and for individual needs) and perceived relational value than Cyberball, as in previous research and with comparable effect sizes (Table 1; Figure 1). Regarding results (b) FNE did not moderate Überball's effect on fundamental needs (p = .209). Visual assessment of the data revealed that all participants, regardless of levels of FNE, seemed to have benefited from Überball relative to Cyberball. In contrast to Simard and Dandeneau (2018), however, in which participants immediately took part in the social inclusion task, in our study, participants received social feedback beforehand, which could have affected the relationship between FNE and the

[2] Square brackets represent 95% bootstrapped confidence intervals throughout this manuscript.

social inclusion task in unexpected ways. It is possible that creating some social connection with those imagined participants trumped the moderating influence of FNE.

Table 1

Results of Pairwise Comparisons on Fundamental Needs & Relational Value

Dependent Variable	Subdimension	*t*	*df*	*p*	*d*	95% CI
Fundamental Needs	**Total**	**4.57**	**418**	**< .001**	**0.43**	**[0.24, 0.62]**
	Belonging	**4.47**	**424**	**< .001**	**0.42**	**[0.23, 0.61]**
	Self-Esteem	**3.59**	**425**	**< .001**	**0.34**	**[0.15, 0.53]**
	Meaning	**2.96**	**422**	**.003**	**0.28**	**[0.09, 0.47]**
	Control	**5.14**	**432**	**< .001**	**0.49**	**[0.30, 0.68]**
Relational Value	…	**3.97**	**435**	**< .001**	**0.38**	**[0.19, 0.57]**

Note. The comparison is between Cyberball and Überball. *d* = Cohen's *d*; CI = confidence interval.

Figure 1

Violin Plots of Fundamental Needs & Relational Value

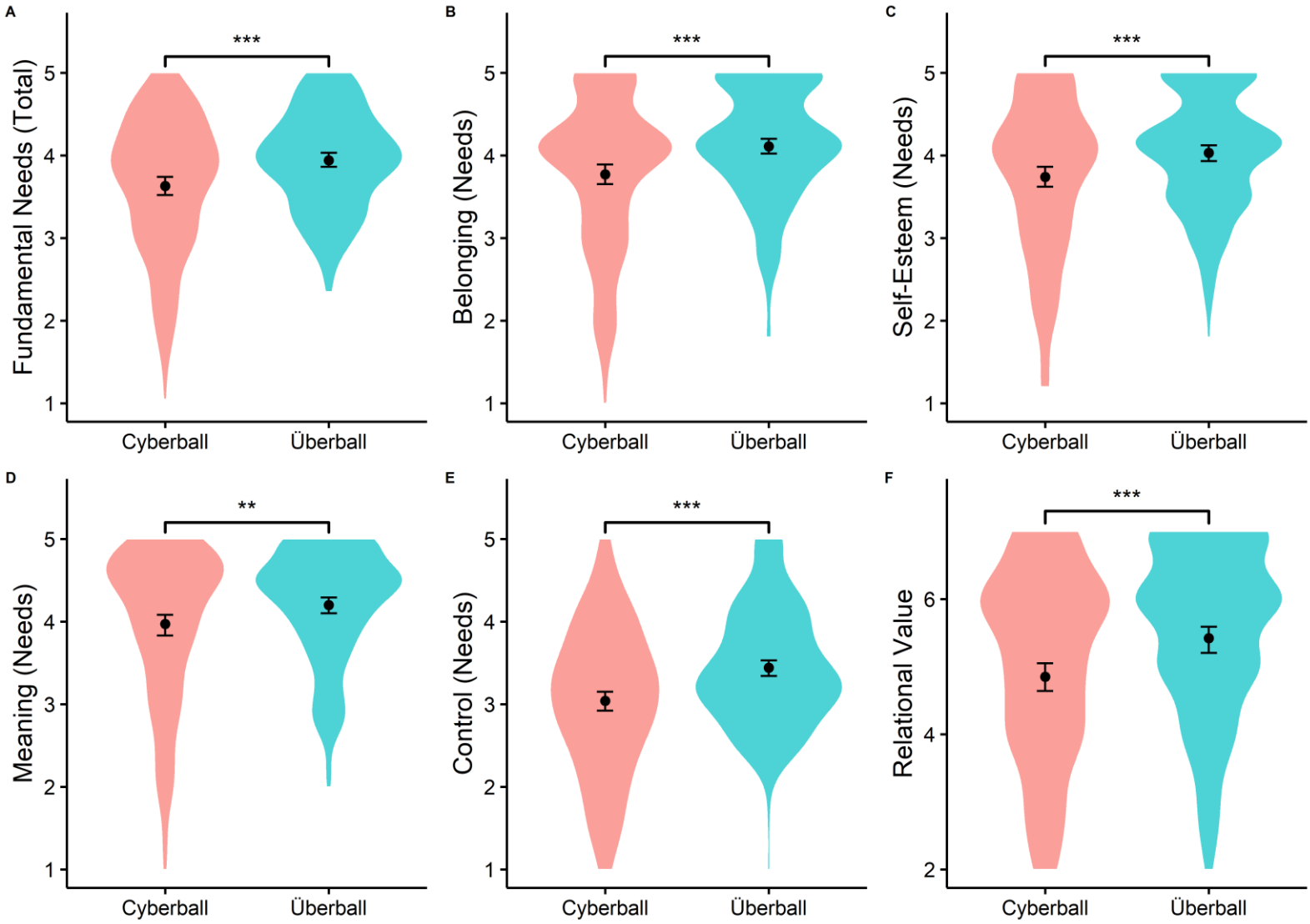

Figure 1. Violin plots comparing Cyberball and Überball on fundamental needs fulfillment and perceived relational value. Dots = means; error bars = bootstrapped 95% confidence intervals; width = distribution density (frequency). *** = $p < .001$; ** = $p < .01$.

Primary Analyses

Our main hypotheses tested the two-way 'feedback × condition' and the three-way 'feedback × condition × FNE' interactions on fundamental needs as the dependant variable. We used general linear and simple linear moderation models to examine these hypotheses.

First, in contrast to our hypotheses, the two-way interaction 'feedback × condition' was not significant (Table 2). However, as predicted, the interaction term 'feedback × condition × FNE' significantly predicts fundamental needs (Table 2). However, the nature of the interaction differs from our predictions. In particular, simple slope tests (with +1/-1 SD; Aiken & West, 1991; Hayes, 2018; Figure 2) revealed that, under *ambiguous* feedback, inclusion condition (Cyberball vs. Überball) predicts fundamental needs, but only for people with low ($\beta = 0.38$, $t(430) = 2.82$, $p = .005$, $sr^2 = .02$)[3] and mean levels of FNE ($\beta = 0.29$, $t(430) = 3.11$, $p = .002$, $sr^2 = .02$), but not for those with high levels of FNE ($p = .127$). In other words, for people at mean and low levels of fear of negative evaluation, those in the Überball condition reported significantly higher levels of fundamental needs fulfillment than their counterparts in the Cyberball Inclusion condition.

Under *positive* feedback, condition predicts fundamental needs, but only for people at mean levels ($\beta = 0.29$, $t(430) = 3.0$, $p = .002$, $sr^2 = .02$), and high levels of FNE ($\beta = 0.58$, $t(430) = 4.17$, $p < .001$, $sr^2 = .03$), and not for those with low levels of FNE ($p = .984$). In other words, for people at mean and high levels of FNE, those in the Überball condition reported significantly higher levels of fundamental needs fulfillment than those in the Cyberball Inclusion condition.

[3] We report the semi-partial correlation squared (sr^2) as an index of the effect size. sr^2 allows us to quantify the unique contribution (proportion of variance explained) of an independent variable on the dependent variable, over and above the other variables in the model. sr^2 is often considered a better indicator of the practical relevance of a variable.

We also tested the 'feedback × condition × FNE' interaction for each of the individual fundamental needs. The three-way interaction term significantly predicted *belongingness* (β = 0.35, $t(430) = 2.23$, $p = .026$, $sr^2 = .01$), *self-esteem* (β = 0.48, $t(430) = 3.10$, $p = .002$, $sr^2 = .02$), and *meaningful existence* (β = 0.46, $t(430) = 2.94$, $p = .003$, $sr^2 = .02$), but was not significant for *control* ($p = .113$).

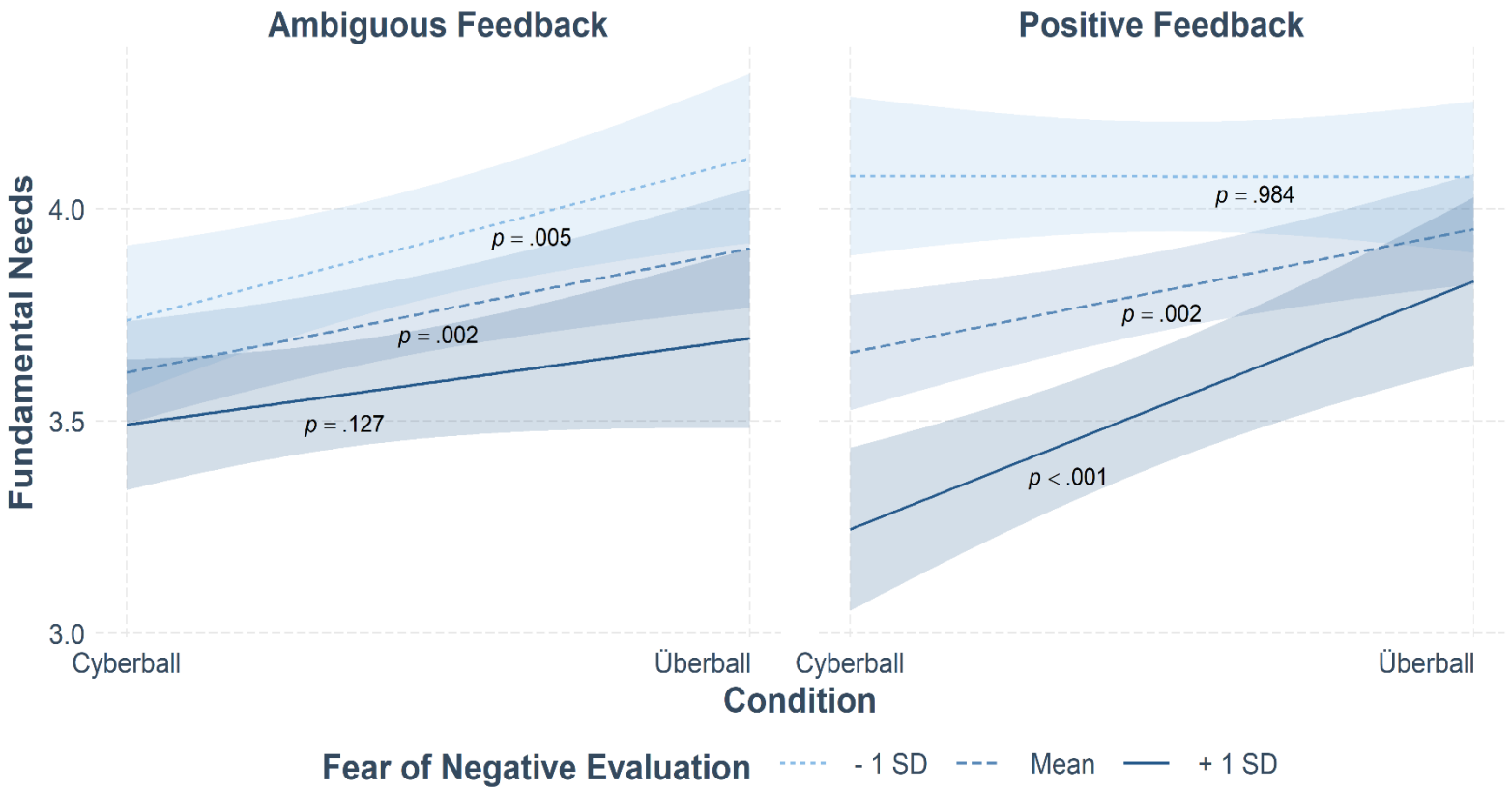

Figure 2. Three-way interaction and simple slopes. Error bands represent 95% confidence bands. *P*-values are for the simple slope analyses for the difference between Cyberball and Überball (x-axis).

Table 2

Results of Multiple Regression Analyses

Dependent Variable	Independent Variables	β	*t*	*p*	sr^2
Fundamental Needs	Feedback	0.05	0.51	.614	< .01
	Condition	**0.29**	**3.11**	**.002**	**.02**
	FNE	**-0.12**	**-2.13**	**.034**	**.01**
	Feedback × Condition	-0.001	-0.01	.992	< .01
	Feedback × FNE	**-0.29**	**-3.30**	**.001**	**.02**
	Condition × FNE	-0.09	-0.93	.354	< .01
	Feedback × Condition × FNE	**0.38**	**2.81**	**.005**	**.02**

Note. β = standardized regression coefficient; sr^2 = semi-partial correlation squared; Feedback = social (group) feedback (Ambiguous vs. Positive); Condition = inclusion condition (Cyberball vs. Überball); FNE = Fear of Negative Evaluation (centered). Degrees of freedom are 430 for this model.

Discussion

This research's central objective was to understand further the effects of the Überball paradigm on fulfilling fundamental needs after having provided either ambiguous or positive feedback to participants. The two key conclusions that stem from the current study are: (1) that Überball strengthens fundamental needs and relational value significantly more than Cyberball; and (2) that, counterintuitively, socially insecure individuals (those with high-FNE) benefit from Überball when receiving *positive* (rather than ambiguous) social feedback. It seems that, for socially insecure individuals, receiving positive social feedback and then being merely "included" during the Cyberball Inclusion leads to relatively low levels of fundamental needs fulfillment, but being the target of preferential inclusion during the Überball condition leads to levels of fundamental needs equivalent to socially secure individuals.

The first conclusion stems from results showing that participants who had been the target of special inclusion (Überball) reported higher levels of fundamental needs fulfillment than those having merely experienced a "social participation" task (Cyberball Inclusion). This result conceptually replicates and extends Simard and Dandeneau (2018) by showing the additional effects on perceived relational value—a potentially important element mediating one's feelings of personal self-esteem and self-worth (Leary, 2005).

Our second conclusion stems from the results showing the three-way interaction between feedback condition, inclusion condition, and level of social insecurity. We wanted to test whether experiencing preferential social inclusion could help restore fundamental needs fulfillment of high-FNE individuals after receiving ambiguous social feedback. Our main hypothesis was that high-FNE individuals would benefit the most from the Überball condition (relative to the Cyberball condition), but only when receiving *ambiguous* feedback (relative to positive

feedback). Our results only partially support this hypothesis. On the one hand, the three-way interaction 'feedback × condition × FNE' does predict fundamental needs. On the other, the nature of the interaction departs from our expectations. Our results suggest that high-FNE individuals benefit the most from the Überball condition, but only when receiving *positive* (rather than ambiguous) feedback. When feedback is ambiguous, to our surprise, low-FNE individuals benefit the most from Überball. In contrast, average-FNE individuals benefit from Überball equally whether they receive ambiguous or positive feedback. Interestingly, the moderating effect of FNE in our study was significant for the same three individual needs as in previous research: belongingness, self-esteem, and meaningful existence, and was not significant for the control subscale (Simard & Dandeneau, 2018).

Ambiguous Feedback. Our results also suggest that, when receiving *ambiguous* feedback, low- and average-FNE individuals benefit more from Überball than Cyberball. It could be that ambiguous feedback first thwarts fundamental needs and that Überball then helps restore to normal levels of fundamental needs[4]. Although the expected tendency of improvement also appears for high-FNE individuals, the effect does not reach significance. This suggests that although Überball is usually more helpful than Cyberball at boosting fundamental needs fulfillment, it might not be sufficient for socially insecure individuals. Social exclusion makes people interpret neutral information as hostile (DeWall et al., 2009), so this tendency may be accentuated in high-FNE people. Indeed, although everyone tends to react negatively to negative feedback, socially hypersensitive people, for example, also tend to respond negatively to ambiguous feedback or even simply to the *absence* of positive feedback (Cikara & Girgus, 2010; Yang & Girgus, 2018). Thus, high-FNE individuals may be so sensitive to ambiguous feedback

[4] However, a *t*-test revealed that regardless of condition and level of FNE, there is no difference between positive and ambiguous feedback on fundamental needs fulfillment, $p = .197$.

that preferential inclusion through Überball does not suffice to overcome its detrimental effects. Because high-FNE individuals acutely fear negative social appraisals, they may interpret ambiguous feedback negatively to confirm their chronic fears, making them relatively unreceptive to follow-up positive social events, à la self-fulfilling prophecy (Stinson et al., 2009; Stinson et al., 2011). On the other hand, relatively secure (i.e., average and low-FNE) individuals who might also interpret ambiguous feedback as relatively negative seem to respond more positively to being the target of preferential inclusion, reporting higher levels of needs fulfillment in the Überball condition.

Positive Feedback. After receiving positive feedback, socially secure (low-FNE individuals) undergoing either the Cyberball or Überball condition show no difference in fulfilling their fundamental needs: it remains relatively high. It may be that after positive feedback, low-FNE individuals highly anticipate social acceptance and that being the target of preferential inclusion does not bring any additive benefit, over and above those already provided by the positive feedback or by the Cyberball Inclusion to their already elevated sense of acceptance.

Surprisingly, the most significant gains from Überball seem to be with high- and average-FNE participants receiving positive feedback. It might be that, for these people, first receiving positive feedback raises expectations or makes them doubt the validity of this initial interaction, and that "simply" being included (Cyberball Inclusion) does not meet their expectations of social acceptance *or* possibly confirms their doubtful perception social acceptance leading them to experience relatively *low* levels of fundamental needs fulfillment. In contrast, when they receive positive feedback and then become the target of explicit and overt preferential inclusion, their expectations are met, *or* their initial doubts are quelled, leading them to experience levels of

fundamental needs comparable to socially secure individuals. On the one hand, it could be that the positive feedback raises one's expectations and that the Überball preferential inclusion meets and confirms these expectations, ultimately leading to a higher sense of needs fulfillment. On the other hand, for socially insecure individuals, positive feedback puts them on the defensive, given their lived or perceived past social experiences, and that experiencing explicit and overt preferential social inclusion quells this defensiveness allowing them to experience higher levels of fundamental needs fulfillment. Interestingly, for those with high-FNE, one benefits more from simply being included in a game (Cyberball Inclusion) after receiving *ambiguous feedback* than positive feedback. In other words, the lowest levels of fundamental needs were reported by high-FNE participants in the Cyberball Inclusion condition after receiving positive feedback.

Limits

This study carries a few limitations. First, the online nature of participation in this study potentially threatens external validity as the sampled population might not represent the general population. Second, because of the online nature of the study, no experimenter monitored or observed participants during the study or was available to answer questions about the tasks and questionnaires. Third, the social feedback participants received consisted of written conversation scripts, which may lack ecological validity and the "realness" of social interactions. Future research would benefit from replicating the current findings using more ecologically valid social interactions (e.g., confederates). Finally, because we did not have a "no feedback" group (i.e. a group that did not receive any feedback) and a "no interaction/inclusion" group (i.e. a group that completed a neutral task alone as in Simard and Dandeneau, 2018), it is difficult to say whether the ambiguous and positive feedback increased or decreased social anticipation (relative to no feedback) and whether participating in any social participation task (i.e. Cyberball or Überball) is

between than *not* participating in a social participation task at all. Thus, although the current data allow us to suggest general conclusions, we can only speculate about the nature of the specific dynamics at play.

Conclusion

This study adds to the evidence suggesting that social participation and preferential social inclusion constitute separate processes that lead to distinct psychological outcomes (e.g., fundamental needs). This study also suggests that socially insecure individuals benefit most from being the explicit and overt targets of preferential social inclusion after receiving positive social feedback than simply participating in a social inclusion task. Indeed, in this scenario, Überball appears to restore fundamental needs fulfillment to levels equivalent to socially secure individuals. Ultimately, Überball constitutes a timely addition to the social scientist's toolbox for further exploring the dynamics of social inclusion.

Open Practices

The data, analysis scripts, and supplemental materials for this study are available on the Open Science Framework at https://osf.io/cmg3z/.

References

Ahlmann-Eltze, C. (2019). ggsignif: Significance brackets for 'ggplot2'. https://CRAN.R-project.org/package=ggsignif Version = 0.6.0.

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Sage Publications, Inc.

Anthony, D. B., Wood, J. V., & Holmes, J. G. (2007). Testing sociometer theory: Self-esteem and the importance of acceptance for social decision-making. *Journal of Experimental Social Psychology, 43*(3), 425–432. https://doi.org/https://doi.org/10.1016/j.jesp.2006.03.002

Carleton, R. N., McCreary, D. R., Norton, P. J., & Asmundson, G. J. (2006). Brief fear of negative evaluation scale-revised. *Depression and Anxiety, 23*(5), 297–303. https://doi.org/10.1002/da.20142

Champely, S. (2020). pwr: Basic functions for power analysis. https://CRAN.R-project.org/package=pwr Version = 1.3-0.

Cikara, M., & Girgus, J. S. (2010). Unpacking social hypersensitivity: Vulnerability to the absence of positive feedback. *Personality & Social Psychology Bulletin, 36*(10), 1409–1423. https://doi.org/10.1177/0146167210383288

Curtin, J. (2018). lmSupport: Support for linear models. https://CRAN.R-project.org/package=lmSupport Version = 2.9.13.

DeWall, C. N., Twenge, J. M., Gitter, S. A., & Baumeister, R. F. (2009). It's the thought that counts: The role of hostile cognition in shaping aggressive responses to social exclusion. *Journal of Personality and Social Psychology, 96*(1), 45–59. https://doi.org/10.1037/a0013196

Downey, G., & Feldman, S. I. (1996). Implications of rejection sensitivity for intimate relationships. *Journal of Personality and Social Psychology, 70*(6), 1327–1343. https://doi.org/10.1037/0022-3514.70.6.1327

Hayes, A. F. (2018). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford Press.

Jamieson, J. P., Harkins, S. G., & Williams, K. D. (2010). Need threat can motivate performance after ostracism. *Personality and Social Psychology Bulletin, 36*(5), 690–702. https://doi.org/10.1177/0146167209358882

Kassambara, A. (2019). ggpubr: "ggplot2" based publication ready plots. https://CRAN.R-project.org/package=ggpubr Version = 0.2.2.

Kercher, K. (1992). Assessing subjective well-being in the old-old: The PANAS as a measure of orthogonal dimensions of positive and negative affect. *Research on Aging, 14*(2), 131–168. https://doi.org/10.1177/0164027592142001

Kirby, K. N., & Gerlanc, D. (2013). BootES: An R package for bootstrap confidence intervals on effect sizes. *Behavior Research Methods, 45*(4), 905–927. https://doi.org/10.3758/s13428-013-0330-5

Leary, M. R. (2005). Sociometer theory and the pursuit of relational value: Getting to the root of self-esteem. *European Review of Social Psychology, 16*(1), 75-111. https://doi.org/10.1080/10463280540000007

Leary, M. R. (2010). Affiliation, acceptance, and belonging: The pursuit of interpersonal connection. In *Handbook of social psychology, vol. 2, 5th ed.* (pp. 864–897). John Wiley & Sons, Inc. https://doi.org/10.1002/9780470561119.socpsy002024

Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In *Advances in experimental social psychology* (Vol. 32, pp. 1–62). Academic Press. https://doi.org/https://doi.org/10.1016/S0065-2601(00)80003-9

Lenth, R. V. (2016). Least-squares means: The R package lsmeans. *Journal of Statistical Software*, *69*(1), 1–33. https://doi.org/10.18637/jss.v069.i01

Long, J. A. (2019). interactions: Comprehensive, user-friendly toolkit for probing interactions. https://CRAN.R-project.org/package=interactions Version = 1.1.0.

Mangiafico, S. (2020). rcompanion: Functions to support extension education program evaluation. https://CRAN.R-project.org/package=rcompanion Version = 2.3.26.

Millisecond Software LLC. (2016). *Inquisit* [Computer software]. https://www.millisecond.com/

R Core Team. (2021). R: A language and environment for statistical computing (version 4.0.5) [Computer software]. *R Foundation for Statistical Computing*, Vienna, Austria. https://www.R-project.org/

Revelle, W. (2018). psych: Procedures for personality and psychological research. Northwestern University, Evanston, Illinois, USA, https://CRAN.R-project.org/package=psych Version = 2.1.6.

Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton University Press. http://www.jstor.org/stable/j.ctt183pjjh

Schröder-Abé, M., Rudolph, A., Wiesner, A., & Schütz, A. (2007). Self-esteem discrepencies and defensive reactions to social feedback. *International Journal of Psychology*, *42*(3), 174–183. https://doi.org/10.1080/00207590601068134

Simard, V., & Dandeneau, S. (2018). Revisiting the Cyberball inclusion condition: Fortifying fundamental needs by making participants the target of specific inclusion. *Journal of Experimental Social Psychology, 74*, 38–42. https://doi.org/10.1016/j.jesp.2017.08.002

Stinson, D. A., Cameron, J. J., Wood, J. V., Gaucher, D., & Holmes, J. G. (2009). Deconstructing the "reign of error": Interpersonal warmth explains the self-fulfilling prophecy of anticipated acceptance. *Personality and Social Psychology Bulletin, 35*(9), 1165–1178. https://doi.org/10.1177/0146167209338629

Stinson, D. A., Logel, C., Shepherd, S., & Zanna, M. P. (2011). Rewriting the self-fulfilling prophecy of social rejection: Self-affirmation improves relational security and social behavior up to 2 months later. *Psychological Science, 22*(9), 1145–1149. https://doi.org/10.1177/0956797611417725

Thériault, R. (2022). rempsyc: Convenience functions for psychology. https://github.com/RemPsyc/rempsyc Version = 0.0.1.

Tingley, D., Yamamoto, T., Hirose, K., Keele, L., & Imai, K. (2014). mediation: R package for causal mediation analysis. *Journal of Statistical Software, 59*(5). https://doi.org/10.18637/jss.v059.i05

Torchiano M. (2020). effsize: Efficient effect size computation. https://CRAN.R-project.org/package=effsize Version = 0.8.1.

Wickham, H. (2016). ggplot2: Elegant graphics for data analysis. Springer-Verlag: New York. https://ggplot2.tidyverse.org Version = 3.3.3.

Wickham, H., François, R., Henry, L., & Müller, K. (2021). dplyr: A grammar of data manipulation. https://CRAN.R-project.org/package=dplyr Version = 1.0.5.

Williams, K. D. (2007). Ostracism. *Annual Review of Psychology*, *58*(1), 425–452. https://doi.org/10.1146/annurev.psych.58.110405.085641

Williams, K. D., Cheung, C. K., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the internet. *Journal of Personality and Social Psychology, 79*(5), 748–762. https://doi.org/10.1037//0022-3514.79.5.748

Williams, K. D., & Nida, S. A. (2011). Ostracism: Consequences and coping. *Current Directions in Psychological Science, 20*(2), 71–75. https://doi.org/10.1177/0963721411402480

Yang, K., & Girgus, J. S. (2018). Individual differences in social hypersensitivity predict the interpretation of ambiguous feedback and self-esteem. *Personality and Individual Differences, 135*, 316–327. https://doi.org/https://doi.org/10.1016/j.paid.2018.07.022