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# "I Hate To Be a Burden!": Experiencing Feelings Associated With Ostracism Due to One's Poor Performance Burdening the Group

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Researchers can access the Atimia program at https://osf.io/qkuxi/ and the Word Creativity Qualtrics program can be obtained at https://osf.io/qwev6/?view_only=bd84adf295d74518988c500d9c34c5ed.

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**Abstract**

We examined if perceiving oneself as burdensome, due to performing poorly in a group, can lead to feelings associated with ostracism (to be excluded and ignored). Participants completed a typing game (Study 1) or solved Remote Associates Test (RAT; Study 2) items where they performed worse, equal, or better than the group. To focus on the influence of burdensomeness, participants were consistently selected by computerized agents to play. In each study, worse performers experienced greater perceptions of being burdensome, less basic need satisfaction, increased negative mood, and greater anticipation of being excluded from a future group task compared to equal or better performers. Combining Study 1 and 2 data, we found despite reporting being included, poor performers experienced social pain. Additionally, mediation analyses demonstrated feeling burdensome, due to one's performance, influenced feelings associated with ostracism. These results suggest, despite being included, feeling burdensome can lead to outcomes related to ostracism.

*Keywords: burden; social exclusion; social pain; ostracism; performance*

"I Hate to be a Burden!": Experiencing Feelings Associated with Ostracism Due to One's Poor Performance Burdening the Group

Whether for a childhood sports team or an important group task at work, being picked last is an unpleasant experience. Specifically, being picked last may indicate to an individual the group believes he or she would be unable to make valuable contributions and, therefore, would hinder the group's chances at success. This feeling of burdensomeness may have negative downstream consequences by increasing thoughts of future ostracism and by prompting the cascade of negative consequences associated with ostracism.

Burdensome group members (e.g., poor performers) are often the target of ostracism (Okdie & Wirth, 2018, Wirth, LeRoy, & Bernstein, 2020) as a means for the group to protect their collective well-being (Gruter & Master, 1986; Kerr & Levine, 2008; Kurzban & Leary, 2001; Williams, 2009). Burdensome group members are often ostracized because they are poor exchange partners whose costs during social exchanges outweigh their benefits (adapted from Kurzban & Leary, 2001; see Okdie & Wirth, 2018). For example, a group may ostracize a burdensome member due to holding onto the ball (costing the group time) during a virtual ball-toss game (i.e., Cyberball; Wesselmann, Wirth, Pryor, Reeder, & Williams, 2013, 2015), performing poorly on a group task (Wirth, Bernstein, & LeRoy, 2015), being an objectionable partner during an introductory game (Gooley, Zadro, Williams, Svetieva, & Gonsalkorale, 2015), or undermining group cohesion (Kerr & Levine, 2008; Scheepers, Branscombe, Spears, & Doosje, 2002). Clearly, groups ostracize burdensome group members. However, it is less clear whether the targets of this ostracism are aware the group might exclude them due to their suboptimal performance and if targets anticipate experiencing feelings associated with ostracism.

**Are Burdensome Individuals Aware of their Impending Ostracism?**

In our research, we questioned if burdensome individuals are alerted to their potential forthcoming exclusion. For instance, are poor-performing individuals (e.g., gawky athletes), aware: 1) that they are burdensome to the group and, consequently, 2) do they infer their ultimate exclusion from that group (e.g., picked last)? To investigate the link between perceiving oneself as burdensome and experiencing effects consistent with ostracism, we reviewed the literature on perceived burdensomeness — the unmet need to contribute to other's welfare (Van Orden, Witte,

Gordon, Bender, & Joiner, 2008) — and existing research that assessed feelings of burden and ostracism.

Individuals perceive themselves to be burdensome in a multitude of circumstances. For instance, 73% of individuals experiencing chronic pain said they burdened others (McPherson, Wilson, Lobchuk, & Brajtman, 2007; Simmons, 2007). Likewise, individuals with advance cancer indicated their greatest social stressor was feeling they burdened others around them (de Faye, Wilson, Chater, Viola, & Hall, 2006). Additional groups reporting feeling burdensome include elderly individuals (Cahill, Lewis, Barg, & Bogner, 2009; Zweibel & Cassel, 1989) and veteran service members as they adapt to civilian life (Selby et al., 2010). Perceiving oneself as burdensome is not restricted to long-term experiences (e.g., chronic pain). Feelings of burdensomeness can also occur in everyday group experiences, including performing poorly on a group task at school or work, not contributing sufficiently to a group goal in an extracurricular activity, being burdensome at a social event, or having an injury that requires care from others (LeRoy, Lu, Zvolensky, Ramirez, & Fagundes, 2017). Individuals even feel burdensome when performing poorly on a brief inconsequential group task in the laboratory (Wirth, Allen, & Zitek, 2020). These studies suggest that individuals are aware of when they burden others. However, these studies did not examine the extent to which perceived burdensomeness leads to feelings of anticipated group ostracism.

The similar reaction to perceiving oneself as burdensome and being ostracized suggest burdensome individuals could anticipate being ostracized from the group. For example, perceiving oneself as burdensome is linked to general feelings of suffering (Ganzini, Johnston, & Hoffman, 1999), clinical depression (Wilson, Curran, & McPherson, 2005), a weakened will to live (Chochinov et al., 2005), and loss of dignity (Chochinov et al., 2002). Likewise, individuals who experience chronic ostracism (i.e., ostracism lasting more than three months) experienced consequences related to feeling burdensome consisting of feelings of alienation, helplessness, depression, and unworthiness (Riva, Montali, Wirth, Curioni, & Williams, 2017). Moreover, burdensome individuals feel unwanted, have lower self-esteem (Van Orden et al., 2010), thwarted belongingness (Bryan, Morrow, Anestis, & Joiner, 2010), and increased negative affect (Van Orden et al., 2010). Importantly, these responses are consistent with the immediate (reflexive) response to being ostracized: thwarted satisfaction of control, belonging, self-esteem, meaningful existences (i.e., the basic needs), and increased negative affect (e.g., Wirth,

Bernstein, Wesselmann, & LeRoy, 2017; Wirth & Williams, 2009; see Hartgerink, van Beest, Wicherts, & Williams, 2015; Williams, 2001, 2009 for reviews). Lastly, examining a potential overlap in behaviors, burdensome (Collins, Best, Stritzke, & Page, 2016) and ostracized individuals (Lustenberger & Jagacinski, 2009) are both less persistent on tasks. Thus, it appears that feeling burdensome and enduring the experience of ostracism produce similar outcomes. However, a rigorous way to understand their relatedness is to review studies that examine perceived burdensomeness and ostracism outcomes concurrently.

When researchers manipulated or assessed burdensomeness and ostracism concurrently, they found a link between the constructs. For instance, there is a significant positive correlation (zero-order correlation coefficient of .58) between burdensomeness and thwarted belong, such that as burdensomeness increased, thwarted feelings of belonging (a proxy for ostracism) also increased (Van Orden et al., 2008). Supporting this correlation, when individuals were ostracized during a Cyberball game (i.e., they stop receiving throws), they subsequently reported feeling burdensome during the game (Buelow & Wirth, 2017). Being ostracized led to feeling burdensome, even though the ball-tossing game did not give them an opportunity to burden the group. Conversely, perceiving oneself as burdensome elicits feelings of ostracism. When individuals recalled an instance where they were burdensome (versus non-burdensome) they reported greater social pain (LeRoy et al., 2017), itself an immediate outcome of ostracism (Eisenberger, Lieberman, & Williams, 2003). Further, when individuals performed poorly on a group task, and therefore felt burdensome, they reported anticipating exclusion from the group on a subsequent task (Wirth et al., 2020). In several studies, participants either recalled past experiences or ostensibly played online games briefly with strangers. Results demonstrated participants whose ostensibly poor performance harmed the group, compared to those whose performance was equal to the group or those whose poor performance did not negatively impact the group (i.e., only the participant had to do more work), expected the group would exclude them to a higher degree.

These studies collectively suggest a burden and ostracism link. However, burdensome participants in these studies could have been ostracized by the group making it difficult to know if the participants' outcomes are due to perceived burdensomeness or the fact participants were actually ostracized. Thus, past work did not isolate feeling burdensome. We designed the current research to separate burdensomeness from ostracism to determine if feelings related to ostracism

can also be triggered by feeling burdensome; that is, do feelings associated with ostracism occur even before one actually experiences ostracism?

**Overview of the Present Studies**

Poor performance from an individual within a group may elicit feelings burdensomeness because these individuals are no longer contributing sufficiently to the group's success (i.e., a poor exchange partner; e.g., Wirth et al., 2020). Failing to contribute sufficiently to the group may lead to feeling burdensome and feelings related to ostracism: anticipated ostracism, thwarted basic needs, negative affect, and social pain. These responses are all part of the social monitoring alert mechanism (Spoor & Williams, 2007), which alerts individuals to any indication one might be ostracized. These alerts allow the individual to take preventative measures to avoid future exclusion; perhaps, minimizing their burdensomeness or acting to fortify their needs. Individuals who are burdensome may fortify their needs by behaving in a prosocial fashion, potentially to seek inclusion (e.g., Maner, DeWall, Baumeister, & Schaller, 2007), or possibly aggressively, potentially as a means of reestablishing the fundamental need for control (e.g., Warburton, Williams, & Cairns, 2006).

We were able to isolate the effects of feeling burdensome by manipulating the participant's performance in a group while still holding constant their experience of social inclusion by the group. Burden and ostracism need to be investigated separately because individuals could experience feelings of ostracism, while still being included in the group. This experience might be akin to lonely individuals who experience feelings of exclusion, even though they may be around others (e.g., Cacioppo & Cacioppo, 2014). Additionally, according to the interpersonal theory of suicide (Van Orden et al., 2010) perceived burdensomeness and thwarted belongingness are related, but distinct constructs. Our research carefully manipulated participants burdening the group through their poor performance (e.g., Wirth et al., 2020), while the group continued to include the participant. Participants being included by the group, and feeling included, were essential to this study so that any feelings of ostracism could be attributed to performing poorly and not any experience of ostracism.

In Study 1, participants played a typing game with others online (ostensibly) wherein they performed better, equal, or worse than the group as a between-participants manipulation. To ensure participants felt included during the game, the group always selected participants throughout the game to complete typing trials. In Study 2, participants completed Remote

Associates Test (RAT) items (Bowden & Jung-Beeman, 2003; Mednick, 1968) and, again, experienced a manipulation leading them to believe they performed better, equal, or worse than the group. To make sure participants felt included by their group, after each of the two rounds of 14 trials, participants received a vote showing that all group members wanted the participant to continue. Thus, in both studies participants were always included by the group.

Across the two studies, we hypothesized poor performance relative to the group would elicit greater feelings of burdensomeness, more anticipated ostracism, worsened basic need satisfaction, increased social pain, and more negative affect compared to an equal or better performance. We examined if these effects occurred while individuals still reported feeling included by the group. We also explored participants' behavior temptations towards the group members given previous research demonstrates both responses after exclusion. Using an integrative data analysis approach (combining the results of Study 1 and 2), we determined if the extent participants felt burdensome mediated the relationship between their performance and outcomes associated with ostracism (e.g., anticipated ostracism, negative affect).

**Power analysis for Studies 1 and 2.** Using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007), we conducted an a priori power analysis to test the adequacy of our sample sizes to detect differences between our three conditions. We specified an alpha level of .05, a 1-β error probability of .90, and an effect size $f$ of .40 (large effect). The power analyses indicated we needed a total sample of 84 participants. Importantly, when we established our final samples for both studies, we removed participants prior to examining the data.

## Study 1

**Sharing materials and data.** The study materials and data are located at

https://osf.io/qwev6/?view_only=bd84adf295d74518988c500d9c34c5ed

**Method**

**Participants.** In a lab study, we originally had 98 participants, but we removed participants due to potentially learning about the study during class ($n=4$), participating in a similar study previously ($n=3$), lab error ($n=2$), believing the players were fake ($n=1$), having a disability that affected typing ($n=1$), and a participant wanting their data discarded ($n=1$). The final sample of participants ($N=86$) were 80.2% female, 22.4 years old ($SD_{age}=5.58$), and predominately White (60.5%).

**Procedure.** Participants began the study by learning they would play Atimia (Buelow & Wirth, 2017; Turchan, 2012; Wirth, Turchan, Zimmerman, & Bernstein, 2014), a typing game, with students in another research lab. We employed a typing version of Atimia because a previous version of this game (using Remote Associates Test items; Wirth et al., 2020) demonstrated it can manipulate the participant's performance and induce feelings of burdensomeness. We did not provide an explicit group goal to avoid constraining participants' experience in a manner that would confirm our hypotheses. However, participants responded in the same way as paradigms that manipulated participants' performance when the group goal was more explicit (Wirth et al., 2020).

Before playing Atimia (Figure 1), participants read detailed instructions describing how to log into the game, how to play the game, what information Atimia displays during the game (i.e., participant and group member's scores, whose turn is it, letters for players to type), and how the game begins. To become familiar with the typing task, participants then completed 20 practice trials typing in letters and punctuation marks as quickly as possible. Participants were told the other students also completed the practice trials.

Participants began playing Atimia by entering a non-identifying screen name which corresponded with their player icon. Although participants saw a "connecting" screen as they were ostensibly logging into Atimia, they actually played with computer agents labeled "Vartib," "Lilday." Participants went first and completed 20 trials (i.e., one round) by typing in the letters and punctuation marks (equally balanced) that appeared on screen as fast and accurately as possible. By utilizing a blend of letters and punctuation marks, we made it plausible that the other group members could perform better or worse on the task. When the participant or the computer agents correctly typed the item, the computer made a ding. Participants were alerted to incorrect responses through on-screen feedback. After each round, participants or computer agents then selected a player to complete the next round; the game lasted 15 rounds.

Participants were then randomly assigned to one of three participant performance conditions: *better*, *equal*, or *worse* relative to the group. To manipulate the participants' performance, we varied the computer avatars' performance relative to the number of correct responses participants recorded. The computer avatars either performed 40% to 70% worse than the participant (*better participant performance condition)*, 20% better/worse than the participant (*equal participant performance condition*), or 40% to 70% better than the participant (*worse*

*participant performance condition*). This approach allowed us to manipulate the participant's performance relative to the group and to generate variability in the computer avatars' responses to enhance the believability that the computer agents were real (see also Buelow & Wirth, 2017).

**Measures.** Immediately following Atimia, participants completed the following measures, in the order they are reported below. Participants responded to all measures based on how they felt while playing Atimia.

*Basic need satisfaction and affect.* To assess participants' basic needs satisfaction while playing Atimia (Buelow & Wirth, 2017; Wirth et al., 2014), participants completed measures of belonging (e.g., "While playing Atimia, I felt I belonged to the group."), self-esteem (e.g., "While playing Atimia, I felt good about myself."), meaningful existence (e.g., "While playing Atimia, I felt non-existent."; reverse-scored) and control (e.g., "While playing Atimia, I felt powerful."). We combined basic need items so that higher scores equal greater satisfaction of basic needs ($\alpha$=.90; e.g., McConnell, Brown, Shoda, Stayton, & Martin, 2011; Sacco, Bernstein, Young, & Hugenberg, 2014). In this block of questions, participants also completed a 16-item measure of negative affect (Buckley, Winkel, & Leary, 2004; e.g., "While playing Atimia, I felt angry," "While playing Atimia, I felt pleased.") scored so that higher values equal greater negative affect ($\alpha$=.92). Participants responded to all items on a 1 (*Not at all*) to 5 (*Extremely*) scale.

*Manipulation checks and measures of ostracism.* As a manipulation check of participant's performance, participants responded to the item, "How well did you perform in comparison to Vartib and Lilday?" (the computer agents) on a -5 (*My performance was significantly worse*) to 0 (*My performance was equal*) to 5 (*My performance was significantly better*) scale. To assess feelings of ostracism, participants indicated how excluded and ignored they felt during Atimia (scale: 1 (*Not at all*) to 5 (*Extremely*)); $r_{\text{Spearman-Brown}}$=.87; Buelow & Wirth, 2017; Wirth et al., 2014, Wirth & Williams, 2009) and what percent of the time the group members chose them.

*Social pain.* Participants completed two measures of social pain: a modified version of the Numeric Rating Scale-11 (NRS-11; Hartrick, Kovan, & Shapiro, 2003) and the Wong-Baker Pain FACES Pain Rating Scale (Wong & Baker, 1988). Similar to previous research using the modified NRS-11 to measure social pain (Riva, Williams, & Gallucci, 2014; Riva, Wirth, & Williams, 2011; Wirth et al., 2014), participants indicated how much social pain they felt while

playing Atimia on a 0 (*No pain sensation*) to 10 (*Most intense pain sensation*) scale. Additionally, participants indicated the unpleasantness of the social pain they felt while playing Atimia on a 0 (*Not at all unpleasant*) to 10 (*Most unpleasant imaginable*) scale ($r_{Spearman-Brown}$ =.79). The Pain FACES Scale is a single-item pain measure, previously used to measure social pain (e.g., Chen, Williams, Fitness, & Newton, 2008; Okdie & Wirth, 2018; Riva et al., 2011), made up of six faces that display a positive smiling face ranging to a negative crying face. Each face aligns with a point on a 0-10 scale: "0-No Hurt," "2-Hurts little bit," "4-Hurts little more," "6-Hurts even more," "8-Hurts whole lot," and "10-Hurts Worse." Higher ratings on both scales indicate more self-reported pain.

   ***Feelings of burdensomeness.*** To assess participants' perceived burdensomeness, participants completed a modified 9-item burden subscale of the Interpersonal Needs Questionnaire (Van Orden, Cukrowicz, Witte, & Joiner, 2012). Participants responded based on their experience playing Atimia (e.g., "While playing Atimia, I thought I was a burden on the group,") using a 1 (*Not at all true for me*) to 7 (*Very true for me*) scale. Higher scores indicated greater feeling of burdensomeness (α=.88).

   ***Anticipated exclusion.*** To assess how much participants anticipated their group would exclude them in upcoming tasks, participants answered the questions, "During a new task with your group, how likely is it that they would include you?" and "How likely would it be that your group would exclude and ignore you in any upcoming tasks?" on a 1 (*Not at all likely*) to 7 (*Very likely*) scale ($r_{Spearman-Brown}$ =.90; Wirth et al., 2020) where higher numbers indicated more anticipated exclusion.

   ***Aggressive behavior temptations towards the group members.*** To evaluate how the participants' performance might affect their behaviors towards the group members, we asked participants to imagine they were able to interact with the group members face-to-face and to, subsequently, indicate how likely they would be to behave in various prosocial and antisocial manners (Buckley et al., 2004; Riva et al., 2011). We asked the questions in a similar way as previous research by instructing participants to indicate how tempted they would be to do the behavior, rather than whether the participant would actually do the behavior. Participants reported how likely they were to perform eight aggressive behaviors (e.g., "Threaten to hit or throw something at the other group members."; α=.84) and eight prosocial behaviors (e.g., "Treat the other group members nicely."; α=.94) on a 1 (*Not at all*) to 9 (*Very tempted*) scale.

***Individual difference measures.*** Given the novelty of this research, following our measures of interest, we included several exploratory personality measures related to our primary dependent measures, which we did not intend to analyze. We included exploratory measures to better understand any potential unexpected outcomes; but given the results supported our hypotheses, we did not analyze these data. These measures are included in the Study 1 dataset available online.

***Suspicion check, demographics, and debriefing.*** Participants responded to the open-ended question, "What did you think this study was about?" to assess if they were suspicious about the other players being computer agents. Participants reported basic demographic information before they were debriefed. In the debriefing, we emphasized participants were not actually playing with others online and they were randomly assigned to their performance condition.

## Results

**Manipulation checks and measures of ostracism.** To establish the effectiveness of our manipulation and levels of feeling ostracized, we conducted one-way ANOVAs with post-hoc tests. Specifically, we conducted Tukey's HSD (honest significant difference) except for when the test of homogeneity of variances was significant; in these cases, we used the Games-Howell post-hoc test to correct for violations of equal variances.

As intended, participants' rating of their performance, relative to the participants' group members, varied significantly based on the participant's assigned performance condition (i.e., better vs. equal vs. worse; $F(2, 83)=50.76$, $p<.001$, $\eta_p^2=.55$). Compared to their group, better performers indicated superior performance compared to equal performers and equal performers reported their performance was superior to poor performers (all $p$s$_{\text{Games-Howell}}<.001$, $d$s$\geq1.17$). See Table 1 for specific means and confidence intervals.

On two different measures, participants reported being included equally for all of the performance conditions. There were no significant differences between the conditions on participants' self-report of what percent of time they received the ball ($F[2, 83]=0.78$, $p=.460$, $\eta_p^2=.02$) and how ostracized they felt ($F[2, 83]=1.32$, $p=.272$, $\eta_p^2=.03$). These results suggest that we manipulated participants' performance (resulting in performing worse than the group) without making participants feel ostracized. This pattern of results allows us to examine how performance influences outcomes associated with ostracism.

**Primary analyses.** We began our primary analyses by conducting a multivariate analysis of variance (MANOVA) to establish the unique effects of our dependent variables when they are analyzed together. The MANOVA indicated a significant multivariate effect for performance conditions on our set of dependent measures ($F[16,152]=1.86$, $p=.028$, Wilk's $\lambda=.70$, $\eta_p^2=.16$). There were significant effects of performance on basic need satisfaction ($F[2, 83]=6.38$, $p=.003$, $\eta_p^2=.13$), negative affect ($F[2, 83]=9.13$, $p<.001$, $\eta_p^2=.18$), social pain assessed by the Pain FACES Scale ($F[2, 83]=6.74$, $p=.002$, $\eta_p^2=.14$), feeling burdensome ($F[2, 83]=8.02$, $p=.001$, $\eta_p^2=.16$), and anticipated exclusion ($F[2, 83]=4.83$, $p=.010$, $\eta_p^2=.10$). In contrast, there were no significant performance effects for social pain assessed using the NRS-11 measure ($F[2, 83]=2.16$, $p=.121$, $\eta_p^2=.05$), aggressive behavior temptations ($F[2, 83]=0.75$, $p=.478$, $\eta_p^2=.02$), or prosocial behavior temptations ($F[2, 83]=0.05$, $p=.956$, $\eta_p^2<.01$).

To analyze the differences between the conditions, we conducted post hoc analyses (Tukey's HSD and Games-Howell [when appropriate]). Participants reported significantly less basic need satisfaction and increased negative affect when they performed worse than the group compared to either performing equal or better than the group (all $p$s$\leq.038$, $d$s$\geq0.59$). Participants reported more social pain, on the Pain FACES Scale, when they performed worse than the group compared to performing better ($p_{\text{Games-Howell}}=.001$; $d=1.05$). However, there was no significant difference between a worse versus equal performance ($p_{\text{Games-Howell}}=.106$), but the effect was in the hypothesized direction. Participants felt more burdensome when they performed worse than the group compared to performing equal or better than the group; all $p$s$_{\text{Games-Howell}}\leq.009$, $d$s$\geq0.79$). Lastly, those who performed worse than the group anticipated being excluded more than those who performed better than the group ($p=.010$, $d=0.81$), but the difference compared to performing equal with the group was not significant ($p=.078$); albeit in the hypothesized direction.

Although we did not have any a priori hypotheses about differences between equal and better performances, to be thorough in our analyses, we compared these conditions and found no significant differences (all $p$s$\geq.178$).

**Discussion**

Study 1 provides initial evidence of a burden-ostracism link as we found the results of being a worse performer, compared to an equal or better performer, include feeling burdensome (e.g., Wirth et al., 2020), but go further to include feeling outcomes consistent with ostracism

(i.e., less basic need satisfaction, increased negative affect) and greater anticipation of being excluded. It is important to keep in mind these ostracism outcomes occurred even though participants indicated the group included them and participants did not feel ostracized by the group; so, ostracism-related outcomes cannot necessarily be attributed to being ostracized during the group interaction.

The goal of Study 2 was to examine further these outcomes in a different group interaction to determine the reliability of worse performance effects on social pain. In Study 1, we saw indications of participants feeling social pain, but the results were inconsistent. In Study 2, we hoped to clarify this finding.

## Study 2

**Participants.** For Study 2, we recruited 120 participants from Mechanical Turk (MTurk) who had HIT approval rate of at least 95%, had greater than 100 hits approved, but were not required to be master workers. MTurk workers were paid $1.00 (US) for participating. Reviews of MTurk workers' performance (for a review see Paolacci & Chandler, 2014) find workers to be reliable, diligent, and the data have the same reliability as data collected through more traditional means (e.g., laboratory experiments; Buhrmester, Kwang, & Gosling, 2011). Because we conducted the study online, there were different criteria for removing participants. Prior to conducting our analyses, we removed participants if they performed in the top or bottom 2.5% (89% or 14.5% correct) on the group task where the false feedback may not be believable ($n$=11), they were suspicious that the other players were not genuine ($n$=5), or for taking an exceptionally long time to complete the study (i.e., $SD$>2; $n$=3; no participants were 2 $SD$s faster). These removals left a final sample of 101 participants who were 52.5% female, 35.8 years old ($SD$=10.19; $range$=19-59), and primarily White (88.1%). The final sample met our power analysis criteria we established above for both Studies 1 and 2 (i.e., $N$>84).

## Method

**Procedure.** In Study 2, we followed a similar procedure Wirth et al., (2020) used to manipulate participants' performance in a group task. Participants began the study by learning they would be playing a word creativity game with three others online (actually computer agents). Participants reviewed detailed instructions on the goal of the word creativity game

which included completing Remote Associates Test (RAT) items (Bowden & Jung-Beeman, 2003; Mednick, 1968). Specifically, they were told they would see three words (e.g., "spoon," "cloth," and "card") and their task was to identify a fourth word, the solution (i.e., "table"), that links the three disparate words together (i.e., tablespoon, tablecloth, card table). Participants were given 15 seconds (displayed on a timer) before the game would auto-advance to the next item; participants were told they should make guesses when necessary. Following completing a practice trial, participants learned they would receive feedback on how they and other group members performed.

As a separate aspect of the experiment, after receiving performance feedback from each round, participants were instructed that each group member would indicate which players they wanted to remain in the group. We incorporated this step to make it explicit that the group was including the participant, regardless of the participant's performance. Instructions indicated to participants that if fewer than two group members prefer that a player remain in the group, the person will no longer be part of the group.

In the last steps, prior to playing the game, we instructed participants that the word creativity game would last for two rounds and they would vote on inclusion of their group members after each round. Additionally, participants were also instructed that the group needed to reach a total of 56 correctly answered problems, otherwise the group would have to repeat the word creativity game (repeating the game did not actually occur). Participants were told, at the end of the game, if their group met the criteria of 56 correctly answered problems — better and equal performers met or exceed this mark, whereas worse performers did not.

To start the first round of the word creativity game, participants waited while the three computer agents, representing the fictitious other players, joined the game ostensibly. Participants then completed 14-word creativity items, waited for other players to finish, and then received feedback on how they and their group members performed. Following the performance feedback, participants voted whether they wanted each player to be included and continue in the group or to reject and exclude a player from the group. We also included delays at this step to make it seem like the other players were making their decisions. In all conditions, all of the group members indicated they wanted the participant to continue to the second round.

Participants then completed a second round, similar to the first. Similar to round one feedback, participants learned that all three group members again indicated they wanted the

participant to continue as part of the group. We included this step to enhance the participant's feelings of being included during the group interaction so that we could focus on performance influencing outcomes associated with anticipated future ostracism.

To manipulate the participant's performance, we held the computer avatar's scores consistent in the first (7, 8, 9) and second rounds (14, 15, 13; cumulative total), but varied the performance feedback we gave to participants. Participants were randomly assigned to the *better*, *equal*, or *worse* participant performance conditions. Participants either received scores of 9 and 16 (*better participant performance*), 7 and 14 (*equal participant performance*), or 5 and 12 (*worse participant performance*), in the first and second rounds, respectively. Participants compared their score to the average of the group's score (e.g., participants with a better performance received a score of 16 compared to the group's average of 14). We used RAT items that are correct about 60% of the time, based on prior testing (Bowden & Jung-Beeman, 2003), so participants would be likely to believe their scores, especially given the correct answer could have some ambiguity. Additionally, to address false-feedback believability concerns, we removed any participants that reported being suspicious of the genuineness of their feedback, as detailed in the participants section.

**Measures.** Participants completed the same measures as Study 1, including answering the questions in the same order. Like Study 1, participants responded based on how they felt while playing the word creativity game. They indicated their basic need satisfaction ($\alpha$=.90) and negative affect ($\alpha$=.94). Participants completed the same assessments of ostracism (i.e., feeling excluded and ignored, $r_{Spearman-brown}$=.74) and, as a manipulation check, how well participants performed compared to the other group members. To assess the percent of time participants felt included, participants answered the question, "Across the two rounds of the word creativity game, what PERCENT of the time did your group members prefer that you continue?" on a slider scale going from 0 to 100. Participants also completed the same measure of social pain (i.e., NRS-11, $r_{Spearman-brown}$=.93; Pain FACES scale), perceived feelings of burdensomeness ($\alpha$=.96), and anticipated exclusion ($r_{Spearman-brown}$=.91) as Study 1. Participants also completed the same measures of prosocial ($\alpha$=.94) and antisocial behavior temptations ($\alpha$=.96) as before.

*Suspicion check, demographics, and debriefing.* Participants completed the same suspicion measures and demographic questions as Study 1. There were no exploratory

personality measures in this study. In the debriefing, we told participants they were not actually playing with others and that we manipulated the participant's performance relative to the group.

**Results**

To analyze the results of Study 2, we again conducted a MANOVA on the dependent measures and followed up with post hoc test to examine individual effects. We conducted one-away ANOVAs for the manipulation checks.

*Manipulation checks and measures of ostracism.* Our performance manipulation was successful as participants varied significantly on how they rated their performance, relative to the group, based on their assigned performance condition (i.e., better vs. equal vs. worse; $F(2, 98)=88.32$, $p<.001$, $\eta_p^2=.64$; all $p$s$<.001$, $d$s$\geq1.48$). Table 2 contains specific post-hoc analyses.

Like Study 1, across two measures, participants reported being included equally by the group, despite being assigned to different performance conditions. Participants self-reported a similar percent of time they were selected by the group to continue to the next round ($F[2, 98]=0.766$, $p=.468$, $\eta^2=.02$) as well as similar feelings of ostracism ($F[2, 98]=1.24$, $p=.295$, $\eta^2=.02$).

*Primary analyses.* Once again, a MANOVA demonstrated unique effects for each outcome when they are analyzed together. We found a significant multivariate effect of performance on our measures ($F[16,182]=6.82$, $p<.001$, Wilk's $\lambda=.39$, $\eta_p^2=.38$). The MANOVA revealed significant effects of performance for basic need satisfaction ($F[2, 98]=20.14$, $p<.001$, $\eta_p^2=.29$), negative affect ($F[2, 98]=14.93$, $p<.001$, $\eta_p^2=.23$), social pain evaluated using the NRS-11 ($F[2, 98]=4.45$, $p=.014$, $\eta_p^2=.08$) and the Pain FACES Scale ($F[2, 98]=14.85$, $p<.001$, $\eta_p^2=.23$), feeling burdensome ($F[2, 98]=42.65$, $p<.001$, $\eta_p^2=.47$), and anticipated exclusion ($F[2, 98]=27.50$, $p<.001$, $\eta_p^2=.36$). However, there were no significant performance effects for either aggressive ($F[2, 98]=1.20$, $p=.306$, $\eta_p^2=.02$) or prosocial ($F[2, 98]=0.35$, $p=.705$, $\eta_p^2<.01$) behavior temptations.

We found, using post-hoc tests, worse performers reported less basic need satisfaction (all $p$s$<.001$, $d$s$\geq1.37$) and increased negative affect (all $p$s$_{\text{Games-Howell}}<.001$, $d$s$\geq1.04$,) compared to equal or better performers. A worse performance, also led to participants reporting greater social pain on the NRS-11($p_{\text{Games-Howell}}=.046$, $d=0.60$,) compared to a better performance, but not significantly so compared to an equal performance ($p_{\text{Games-Howell}}=.061$). For the Pain FACES Scale, worse performing participants reported more social pain compared to the equal and better

performers (all $ps\leq.001$, $ds\geq0.92$). Likewise, participants reported feeling more burdensome (all $ps_{\text{Games-Howell}}<.001$, $ds\geq1.56$) and anticipated more future exclusion ($ps_{\text{Games-Howell}}<.001$; $ds\geq1.33$), when they performed worse compared equal or better performers.

Again, to be complete in our analyses, we compared the equal and better performance conditions. There were no significant differences between participants performing equal versus better than the group (all $ps\geq.296$).

**Discussion**

Results from Study 2 further support an association between feeling burdensome and ostracism. Worse performers felt burdensome, while also feeling less basic need satisfaction, increased negative affect, greater anticipation of exclusion, and greater social pain. We attribute the ostracism-related outcomes to feeling burdensome as a result of a poor performance, rather than ostracism, because after each round of voting on who should stay in the group, the group wanted the participant to continue (to be included). Further, participants reported being included by their group members, as well as, feeling included. We again did not see significant effects of performance on behavior temptations.

To follow-up on these studies, we conducted an integrative data analysis to have a more sensitive assessment of our outcomes and to test if feeling burdensome mediates the relationship between participants' performance and ostracism-related outcomes.

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**Integrative Data Analysis**

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To conduct the integrative data analysis, we followed the recommendations of researchers (e.g., Curran & Hussong, 2009; Hussong, Curran, & Bauer, 2013) and integrated the two studies into one data set — made possible by using the same dependent measures in each study. We then analyzed this dataset by conducting a 3 (Performance: better vs. equal vs. worse) × 2 (Study: Study 1 vs. Study 2) between-participants ANOVA.

***Performance main effect.*** A MANOVA demonstrated, again, unique effects for the outcomes when they were analyzed together as indicated by a significant multivariate effect of performance on our measures ($F[16, 348]=6.89$, $p<.001$, Wilk's $\lambda=.58$, $\eta_p^2=.24$). The MANOVA indicated significant performance effects for basic need satisfaction ($F[2, 181]=22.99$, $p<.001$, $\eta_p^2=.20$), negative affect ($F[2, 181]=22.89$, $p<.001$, $\eta_p^2=.20$), social pain evaluated using the NRS-11 ($F[2, 181]=6.10$, $p=.003$, $\eta_p^2=.06$) and the Pain FACES Scale ($F[2, 181]=20.48$, $p<.001$, $\eta_p^2=.19$), feeling burdensome ($F[2, 181]=42.61$, $p<.001$, $\eta_p^2=.32$), and anticipated exclusion

($F$[2, 118]=23.51, $p$<.001, $\eta_p^2$=.21). However, there were no significant performance effects for either aggressive ($F$[2, 181]=0.16, $p$=.851, $\eta_p^2$<.01) or prosocial ($F$[2, 181]=0.08, $p$=.927, $\eta_p^2$<.01) behavior temptations. See Table 3 for means and confidence intervals.

With the exception of behavior temptations (aggressive and prosocial), post-hoc analyses indicated worse performers experienced more aversive outcomes compared to both equal and better performers (all $p$s≤.016, $d$s≥0.43).

*Study main effects and interactions.* In our supplemental analyses, we report the main effects of Study and Performance × Study interactions. We found a significant main effect of Study on basic needs satisfaction, the NRS-11, Pain Faces Scale, and future ostracism (all $F$s(2,181)≥6.23, $p$s≤.013, $\eta_p^2$s≥.03), and a significant interaction for feeling burdensome ($F$[2,181]=5.88, $p$=.003, $\eta_p^2$=.06). These results suggest there was variability in how participants responded based on the type of group interaction, but overall, the integrative data analysis corroborates Study 1 and 2 findings.

*Mediation analyses.* We conducted Structural Equation Modeling (SEM) to examine if participants' feelings of burdensomeness mediated the relationship between performance on the outcomes (e.g., basic need satisfaction; see Figure 2). We conducted SEM (rather than using PROCESS) because we examined if burden mediated the effect of performance on multiple outcomes (PROCESS is limited to one outcome).[1] Specifically, we used a bias correction and conducted 5,000 bootstrapped iterations. Based on this mediation analysis, feeling burdensome mediated the relationship between performance and basic needs satisfaction (95%CI [-0.65, -0.35]), negative mood (95%CI [0.32, 0.67]) social pain (NRS-11: 95%CI [0.68, 1.83]; Pain Faces: 95%CI [0.63, 1.67]), and future exclusion (95%CI [0.82, 1.61]) as none of the 95% confidence intervals included zero. Additionally, we found significant mediation occurred in both studies (see supplemental materials). This pattern of mediation suggests that feeling burdensome is, at least, partially responsible for participant's feelings related to ostracism.

### General Discussion

Being a poor-performer, whether as part of a team or work group, could be a daily experience of being burdensome to a group. We found, based on just a brief, temporary group task with others online (ostensibly), when individuals performed poorly, they perceived themselves as burdensome, while also experiencing thwarted basic need satisfaction, increased negative mood, greater social pain (as assessed by the NRS-11 and Pain Faces scale), and

anticipated future exclusion. These latter effects, associated with ostracism, occurred due solely to one's poor performance given participants reported feeling included and they were selected equally by the group to participate, whether they were burdensome or not. Further, outcomes of the integrative data analysis suggest it was feeling burdensome, resulting from their poor performance, which contributed to the feelings associated with ostracism. The current results add to an intensifying and emerging area of research on perceived burdensomeness (Hill, Hunt, Oosterhoff, Yegeuz, & Pettit, 2019). The results also potentially identify a pre-ostracism stage, when burdensome individuals are still part of the group, but aware their inclusionary status in the group is in peril, as signaled by experiencing feelings associated with ostracism (e.g., thwarted needs satisfaction).

### Implications

*Social monitoring theory.* Our research provides a unique assessment of social monitoring theory (Leary, 1999; Pickett & Gardner, 2005; Spoor & Williams, 2007) considering we assessed processes leading up to being ostracized. To maintain one's fundamental need to belong (Baumeister & Leary, 1995), humans may have developed a highly sensitive monitoring system designed to alert an individual to any cues indicating rejection or ostracism (Leary, 1999; Pickett & Gardner, 2005). The sociometer model (Leary, 1999; Leary & Baumeister, 2000; Leary & Downs, 1995) contends the sociometer is an omniscient monitor that gauges one's social environment for current levels of acceptance and rejection. The sociometer specifically is attuned to changes in relational evaluation: how valuable, close, and important one believes others find their relationship (Leary, 1999). When one's relational evaluation falls below a desired set-point, that individual may experience negative outcomes (e.g., Buckley et al., 2004; Leary, Cottrell, & Phillips, 2001), such as the feelings associated with ostracism.

Our findings may provide unique evidence for the sociometer model as they are capturing how individuals react to feeling low value (i.e., burdensome), one of the components of relational evaluation, prior to actual exclusion occurring (as participants across conditions were socially included throughout the task). Evidence for the sociometer, to this point, has been garnered either during or following the exclusion experience (e.g., Eisenberger et al., 2003; Wirth, Lynam, & Williams, 2010; Riva et al., 2011). Our study examines how individuals feel while still be included, prior to an exclusion experience. One's sociometer may set off an alarm when their poor performance causes others to devalue the relationships, prompting the poor-

performer to feel burdensome, which then prompts feelings associated with ostracism. This is consistent with the idea the social monitoring system is set to over-detect instances of possible exclusion, such as burdening the group, and to cause immediate distress as an alert mechanism (Haselton & Buss, 2000; Kerr & Levine, 2008; Spoor & Williams, 2007; Williams, 2009; Williams & Nida, 2011). Feelings consistent with ostracism may be a means to motivate the individual to correct his or her poor performance, therefore, maintain inclusion in the group.

*Potential for moderation.* The findings of our research, in conjunction with previous research (LeRoy et al., 2017; Wirth et al., 2020), suggest experiences in the pre-ostracism stage may be moderated, in contrast to the immediate results of ostracism (reflexive stage) which often are not (see Williams, 2009). Ostracism's reflexive effects are not moderated by factors that affect most situations, such as gender, age, or participant's country (see Hartgerink et al., 2015). Unlike ostracism's reflexive responses, several studies suggest outcomes of the pre-ostracism stage *may* be moderated.

Even though researchers are only beginning to examine the response to being burdensome, in contrast to the lengthy investigation for moderators of ostracism's reflexive effects (see Hartgerink et al., 2015), evidence suggests moderation may occur readily at this stage. When we examined social pain, we found significant, yet weaker effects on social pain (Study 1, $d=.27$; Study 2, $d=.57$), than what individuals experience during an ostracism episode ($d$s > 0.91; Riva, Romero Lauro, DeWall, & Bushman, 2012; Riva et al., 2011). Social pain in the pre-ostracism stage may not be at its peak compared to when an individual is being ostracized, which may make the moderation of social pain more likely in the pre-ostracism stage (compared to during or immediately following an ostracism episode). This postulate is supported as being burdensome (performing poorly) was less harmful (Wirth et al., 2020) when individuals were increasingly self-compassionate. As individual increasingly practiced self-kindness they experienced less aversive outcomes. Likewise showing the effects of an individual difference, the social and physical pain individuals felt when they recalled being burdensome increased as individuals were progressively higher in anxiety sensitivity (LeRoy et al., 2017). When the effects of ostracism are not maximal, in a pre-ostracism stage or reflective stage (after time for recovery; e.g., Wirth & Williams, 2009), individual and situational factors may play important roles.

**Limitations**

Several limitations warrant consideration when evaluating our efforts to establish that feeling burdensome is linked to feelings associated with ostracism. To have a high degree of control to establish causality, we reduced the strength of our conclusions by relying on groups created over the internet, rather than in-person interactions. However, many studies that examine ostracism's effects use an online ball toss paradigm (Cyberball) in which participants purportedly interact with others online. Studies that use Cyberball show strong reliable effects (see Hartgerink et al., 2015) and these effects persist even when participants are aware they are playing with computer controlled players (Zadro, Williams, & Richardson, 2004). Additionally, our results will likely replicate in everyday group interactions as online interactions are meaningful (Guadagno, Okdie, & Muscanell, 2013; Okdie et al., 2014; see special issue by Okdie & Ewoldsen, 2018), people act similarly online as they do in offline (Guadagno, Muscanell, Okdie, Burk, & Ward, 2011), and our effects are likely to be stronger when others are more immediate (i.e., Social Impact Theory; Latané, 1981).

The current research also included assessment limitations and a performance manipulation limitation. We were limited by the choice to use behavioral temptations, rather than actual behaviors, as intentions and actual behaviors do not always align (Ajzen, 1991; Wicker, 1969). We were also limited in our assessment of the participant's sociometer. While we believe we captured the sociometer functioning, in response to being burdensome, we did not make any direct assessment of how the participant's sociometer responded to the situation. We could have asked participants to assess their sociometer during this pre-ostracism stage (Wesselmann, Butler, Williams, & Pickett, 2010; Wirth et al., 2017). Additionally, we relied on a self-report of social pain, but previous research finds a strong correlation between self-report and physiological measure of pain (NRS-11: e.g., Jensen, 2003; Pain Faces Scale: e.g., Gharaibeh & Abu-Saad, 2002), suggesting our self-report measure may be a useful proxy for the more traditional measures of social pain. Lastly, related to the performance manipulation, our study relied on deception, which means participants may have not been entirely convinced by the false feedback on their performance. However, we removed participants who indicated suspicion to reduce this concern. Even with these limitations, these studies may act as a cornerstone for future research on the relationship between burden and ostracism.

**Future Directions**

***The impact of the moments before ostracism***. In most social exclusion research to date, there is little preamble before an individual is excluded. That is, individuals are generally ostracized or excluded without having much of an explanation for why this is the case — potentially creating a cognitive response to the expectancy violation (Weschke & Niedeggen, 2015). Participants suddenly stop receiving the ball during Cyberball (e.g., Carter-Sowell, Chen, & Williams, 2008; Ren, Wesselmann, & Williams, 2016; Williams, Cheung, & Choi, 2000; Wirth & Williams, 2009), a group begins to reject the participant suddenly during (e.g., Wesselmann et al., 2010) or after a face-to-face interaction (e.g., Twenge, Baumeister, Tice, & Stucke, 2001), or a partner no longer wants to work with the participant (e.g., DeWall, Twenge, Gitter, & Baumeister, 2009; Maner et al., 2007). Each of these scenarios might not mimic real-world experiences where there is likely some indication exclusion may occur.

The limited research shows the moments before rejection make a difference and, therefore, warrant future investigation. For instance, when individuals received social exclusion cues (e.g., averted eye gaze), the exclusion experience was not as painful compared to those who were blindsided by the exclusion because they received inclusionary cues initially (Wirth et al., 2017). Additionally, individuals' belief that their ostracism was justified or fair moderated their reaction (Tuscherer et al., 2015). Unfair exclusion harmed efficacy needs (i.e., control and meaningful existence) to a greater degree than fair exclusion. Because participants in the Tuscherer et al. (2015) study considered fairness of the exclusion in the writing prompt before the exclusion itself, this suggests events leading up to being excluded matter. Our results suggest how burdensome individuals feel is an important factor to consider in the build-up to being excluded. In fact, factors that might influence how burdensome individuals feel may then affect the response to being ostracized.

The social exclusion literature is replete with attempts to eliminate the impact of being ostracized. Previously, ostracism researchers searched for a panacea for ostracism's effects by examining situational factors that would eliminate the effects of ostracism. Researchers examined if ostracism's impact could be subverted by making participants' aware they are playing with computer controlled players (Zadro et al., 2004), by engaging with members of a despised outgroup (i.e., the KKK; Gonsalkorale & Williams, 2007), or playing Cyberbomb, where the ball is a replaced with a bomb that could end the participants turn at any point (van Beest, Williams, & van Dijk, 2011). However, these manipulated factors occurred during the

ostracism event. Introducing these factors prior to ostracism occurring, when individuals are assessing how burdensome they are, may lead to the reduction in the ostracism's effects researchers were anticipating in their previous studies.

When individuals feel burdensome, they appear to have affective experiences that overlap with the experience of actual exclusion. However, due to not feeling social pain to the same extent as ostracized individuals, those who feel burdensome may still have their cognitive abilities intact to rationally evaluate the situation and realize they can discount the ostracism experience. This is compared to the cognitive deconstruction researchers argue occurs following an exclusion experience (Twenge, Catanese, & Baumeister, 2003) which may limit rationalization and minimize factors that could discount the impact of being excluded. For example, because burdensome individuals may have their cognitive abilities intact, they may be better able to realize they are playing with non-social agents (computer controlled players), therefore they are not burdening others, or that they might be burdening a group they do not actually want to be part of (e.g., the KKK). Participants realizing that they are playing with non-social agents or members of a despised group should minimize their concerns with harming the group. In making these types of realizations, burdensome individuals may then realize any ostracism they experience from the group should not be meaningful.

***The corrective function of feeling burdensome***. Future research is also needed to determine whether responding to being burdensome, prior to ostracism, has a functional, corrective role — to allow burdensome individuals to avoid being ostracized. Because a burdensome individual is aware of their pending exclusion, it may be possible to implement corrective measures to reduce burdensomeness, through enhanced performance in the threatened domain or by increased performance in a different domain the group values. A burdensome individual, knowing why they might be ostracized (e.g., failing to communicate clearly), may then know how to shift resources to address their performance in order to enhance the ability to remain with the group, which may be their best option for satisfying their needs. Supporting the idea that burdensome individuals would realign their resources to remain in the group, Shilling and Brown (2016) argued ostracized individuals shift resources from goal-irrelevant processes to goal-relevant process in order to maximize finding sources of need satisfaction. Ultimately, demonstrating burdensome individuals have different behavioral responses than ostracized

individuals, caused by using their resources differently, would demonstrate the unique temporal components of the full ostracism experience.

Future research can build from previous exclusion findings to demonstrate a temporal nature of feeling burdensome versus being ostracized. This temporal nature can be marked by shifts in resources; a strategy that may work when feeling burdensome may be abandoned (or reversed) when an individual is ostracized. Burdensome individuals may improve their decision making because better decisions may reduce an individual's burden on the group. Better decision making when feeling burdensome, would contrast to worsened decision-making following ostracism (Buelow & Wirth, 2017). Burdensome individuals may focus more on their self-regulation as it is critical towards completing a task successfully (for a review see Baumeister, Schmeichel, & Vohs, 2007) and, potentially, improving their standing in the group. This response is also in contrast to ostracized and excluded individuals who show an inability to self-regulate successfully (Baumeister, DeWall, Ciarocco, & Twenge, 2005; Twenge, Catanese, & Baumeister, 2002). Additionally, we may see a burdensome individual is willing to make amends by helping the group more — to demonstrate one's value to the group. This prosocial behavior does not necessarily occur once individuals are excluded as they are less likely to help an experimenter or volunteer for future experiments (Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007). Burdensome individuals may employ several strategies to regain inclusion in the group, but when these strategies are not fruitful, burdensome individuals may redirect their efforts toward novel means of fulfilling fundamental needs (e.g., new social groups).

**Conclusion**

Ultimately, the current research establishes a link between feeling burdensome and outcomes associated with ostracism. We found when participants performed worse than the group, compared to performing equally as well or better than the group, participants anticipated future exclusion and experienced feelings associated with ostracism. Feelings of burdensomeness contributed to these outcomes, linking burden with ostracism. However, there are a multitude of factors to investigate in future research that may influence the strength of this link.

**Footnotes**

[1]Typically, researchers report model fit indices when conducting SEM analyses. We did not report these indices for two reasons: 1) our model was predetermined and we did not compare it to other models where researchers often use fit indices to determine the best model. 2) We have a just-identified (or saturated model) where there is an equal number of variances and covariances as there are parameters to be estimated. Given we have a just-identified model, researchers (e.g., Tomarken & Waller, 2003) argue general fit indices are not meaningful for assessing the adequacy of the model.

The authors confirm they have no conflict of interest to declare.

We conduct this research in compliance with the ethical principles put forth in the Belmont Report (Respect for Persons, Beneficence, and Justice). All studies were approved by an Institutional Review Board. We also complied with appropriate ethical guidelines when preparing the manuscript.

References

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*, 179–211. doi: 10.1016/0749-5978(91) 90020-T

Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Twenge, J. M. (2005). Social exclusion impairs self-regulation. *Journal of Personality and Social Psychology, 88,* 589 – 604. doi: 10.1037/0022-3514.88.4.589

Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin, 117,* 497–529. doi:10.1037/0033–2909.117.3.497

Baumeister, R. F., Schmeichel, B. J., & Vohs, K. D. (2007). Self-regulation and the executive function: The self as controlling agent. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles.* (2nd ed., pp. 516 –539). New York: Guilford Press.

Bowden, E. M., & Jung-Beeman, M. (2003). Normative data for 144 compound remote associate problems. *Behavior Research Methods, Instruments, & Computers, 35,* 634–639. doi:10.3758/BF03195543

Bryan, C. J., Morrow, C. E., Anestis, M. D., & Joiner, T. E. (2010). A preliminary test of the interpersonal-psychological theory of suicidal behavior in a military sample. *Personality and Individual Differences, 48,* 347-350. doi:10.1016/j.paid.2009.10.023

Buckley, K. E., Winkel, R. E., & Leary, M. R. (2004). Reactions to acceptance and rejection: Effect of level and sequence of relational evaluation. *Journal of Experimental Social Psychology, 40,* 14-28. doi: 10.1016/S0022-1031(03)00064-7

Buelow, M. T., & Wirth, J. H. (2017). Decisions in the face of known risks: Ostracism increases risky decision-making. *Journal of Experimental Social Psychology, 69,* 210-217. doi: 10.1016/j.jesp.2016.07.006

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk: A new source of inexpensive, yet high quality, data? *Perspectives on Psychological Science, 6,* 3–5. doi: 10.1177/1745691610393980

Cacioppo, J. T., & Cacioppo, S. (2014). Social relationships and health: The toxic effects of perceived social isolation. *Social and Personality Psychology Compass, 8/2,* 58-72, doi: 10.1111/spc3.12087

Cahill, E., Lewis, L. M., Barg, F. K., & Bogner, H. R. (2009). You don't want to burden them: Older adults' views on family involvement in care. *Journal of Family Nursing, 15,* 295-317. doi: 10.1177/1074840709337247

Carter-Sowell, A. R., Chen, Z., & Williams, K. D. (2008). Ostracism increases social susceptibility. *Social Influence, 3,* 143–153. doi: 10.1080/15534510802204868

Chen, Z., Williams, K. D., Fitness, J., & Newton, N. C. (2008). When hurt will not heal: Exploring the capacity to relive social and physical pain. *Psychological Science, 19,* 789–795. doi: 10.1111/j.1467-9280.2008.02158.x

Chochinov, H. M., Hack, T., Hassard, T., Kristjanson, L. J., McClement, S., & Harlos, M. (2002). Dignity in the terminally ill: A cross-sectional cohort study. *Lancet, 360,* 2026-2030. doi: 10.1016/S0140-6736(02)12022-8

Chochinov, H. M., Hack, T., Hassard, T., Kristjanson, L. J., McClement, S., & Harlos, M. (2005). Understanding the will to live in patients nearing death. *Psychosomatics, 46,* 7-10. doi: 10.1176/appi.psy.46.1.7

Collins, K. R., Best, I., Stritzke, W. G. K., & Page, A. C. (2016). Mindfulness and zest for life buffer the negative effects of experimentally-induced perceived burdensomeness and thwarted belongingness: Implications for theories of suicide. *Journal of Abnormal Psychology, 125,* 704–714. doi:10.1037/abn0000167.

Curran, P. J., & Hussong, A. M. (2009). Integrative data analysis: The simultaneous analysis of multiple data sets. *Psychological Methods, 14,* 81–100. doi: 10.1037/a0015914

de Faye, B. J., Wilson, K. G., Chater, S., Viola, R. A., & Hall, P. (2006). Stress and coping with advanced cancer. *Palliative & Supportive Care, 4,* 239-248. doi: 10.1017/S1478951506060317

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*, 45-59. doi: 10.1037/a0013196

Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science, 302,* 290–292. doi: 10.1126/science.1089134

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175-191. doi: 10.3758/BF03193146

Ganzini, L., Johnston, W. S., & Hoffman, W. F. (1999). Correlates of suffering in amyotrophic lateral sclerosis. *Neurology, 52,* 1434-1440. doi: 10.1212/WNL.52.7.1434

Gharaibeh M. & Abu-Saad H. (2002). Cultural validation of pediatric pain assessment tools: Jordanian perspective. *Journal of Transcultural Nursing, 13*, 12–18. doi: 10.1177/104365960201300103

Gonsalkorale, K., & Williams, K.D. (2007). The KKK won't let me play: Ostracism even by a despised outgroup hurts. *European Journal of Social Psychology, 37,* 1176-1186. doi: 10.1002/ejsp.392

Gooley, S. L., Zadro, L., Williams, L. A., Svetieva, E., & Gonsalkorale, K. (2015). Ostracizing for a reason: A novel source paradigm for examining the nature and consequences of motivated ostracism. *The Journal of Social Psychology, 155,* 410–431. doi:10.1080/00224545.2015.1060933

Gruter, M., & Masters, R. (1986). Ostracism as a social and biological phenomenon: An introduction. *Ethology and Sociobiology, 7,* 149-158. doi: 10.1016/0162-3095(86)90043-9

Guadagno, R. E., Muscanell, N. L., Okdie, B. M., Burke, N. M., & Ward, T. B. (2011). Even in virtual environments women shop and men build: A social role perspective in second life. *Computers in Human Behavior, 27,* 304–308. doi: 10.1016/j.chb.2010.08.008

Guadagno, R. E., Okdie, B. M., & Muscanell, N. L. (2013). Have we all just become "Robo-Sapiens"? Reflections on social influence processes in the internet age. *Psychological Inquiry, 24,* 301–309. doi: 10.1080/1047840X.2013.846207

Hartgerink, C. H. J., van Beest, I., Wicherts, J. M., & Williams, K. D. (2015). The ordinal effects of ostracism: A meta-analysis of 120 Cyberball studies. *PLoS One, 10,* e0127002. doi: 10.1371/journal.pone.0127002

Hartrick, C. T., Kovan, J. P., & Shapiro, S. (2003). The numeric rating scale for clinical pain measurement: A ratio measure? *Pain Practice, 3,* 310–316. doi: 10.1111/j.1530-7085.2003.03034.x

Haselton, M. G., & Buss, D. M. (2000). Error management theory: A new perspective on biases in cross-sex mind reading. *Journal of Personality and Social Psychology, 78,* 81-91. doi: 10.1037/0022-3514.78.1.81

Hill, R. M., Hunt, Q. A., Oosterhoff, B., Yeguez, C. E., & Pettit, J. W. (2019). Perceived burdensomeness among adolescents: A mixed-methods analysis of the contexts in which perceptions of burdensomeness occur. *Journal of Social and Clinical Psychology, 38,* 585-604. doi: 10.1521/jscp.2019.38.7.585

Hussong, A. M., Curran, P. J., & Bauer, D. J. (2013). Integrative data analysis in clinical psychology research. *Annual Review of Clinical Psychology, 9,* 61–89. doi: 10.1146/annurev-clinpsy-050212-185522

Jensen, M. P. (2003). The validity and reliability of pain measures in adults with cancer. *Journal of Pain, 4*, 2-21. doi:10.1054/jpai.2003.1

Kerr, N. L., & Levine, J. M. (2008). The detection of social exclusion: Evolution and beyond. *Group Dynamics: Theory, Research, and Practice, 12,* 39–52. doi:10.1037/1089-2699.12.1.39

Kurzban, R., & Leary, M. R. (2001). Evolutionary origins of stigmatization: The functions of social exclusion. *Psychological Bulletin, 127,* 187–208. doi:10.1037/0033-2909.127.2.187

Latané, B. (1981). The psychology of social impact. *American Psychologist, 36,* 343–356. doi:10.1037/0003-066X.36.4.343

Leary, M. R. (1999). Making sense of self-esteem. *Current Directions in Psychological Science, 8,* 32–35. doi: 10.1111/1467-8721.00008

Leary, M. R., & Baumeister, R. F. (2000). The nature and function of self-esteem: Sociometer theory. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 32, pp. 1–62). San Diego, CA: Academic Press.

Leary, M. R., Cottrell, C. A., & Phillips, M. (2001). Deconfounding the effects of dominance and social acceptance on self-esteem. *Journal of Personality and Social Psychology, 81*, 898-909. doi:10.1037/0022-3514.81.5.898

Leary, M. R., & Downs, D. L. (1995). Interpersonal functions of the self-esteem motive: The self-esteem system as a sociometer. In M. H. Kernis (Ed.), *Efficacy, agency, and self-esteem* (pp.123–144). New York, NY: Plenum.

LeRoy, A. S., Lu, Q., Zvolensky, M. J., Ramirez, J., & Fagundes, C. P. (2017). Anxiety sensitivity moderates the painful effects of feeling burdensome to others. *Cognitive Behaviour Therapy, 47,* 126–138. doi: 10.1080/16506073.2017.1357749

Lustenberger, D. E., & Jagacinski, C. M. (2009). Exploring the effects of ostracism on performance and intrinsic motivation. *Journal of Human Performance, 23,* 283-304. doi: 10.1080/08959285.2010.501046

Maner, J. K., DeWall, C. N., Baumeister, R. F., & Schaller, M. (2007). Does social exclusion motivate interpersonal reconnection? Resolving the "porcupine problem." *Journal of Personality and Social Psychology, 92,* 42–55. doi: 10.1037/0022-3514.92.1.42

McConnell, A. R., Brown, C. M., Shoda, T. M., Stayton, L. E., & Martin, C. E. (2011). Friends with benefits: On the positive consequences of pet ownership. *Journal of Personality and Social Psychology, 101*, 1239 –1252. doi:10.1037/a0024506

McPherson, C. J., Wilson, K. G., Lobchuk, M. M., & Brajtman S. (2007). Self-perceived burden to others: patient and family caregiver correlates. *Journal of Palliative Care, 23*(3)*, 135- 142.

Mednick, S. A. (1968). The remote associates test. *The Journal of Creative Behavior, 2,* 213– 214. doi:10.1002/j.2162-6057.1968.tb00104.x

Okdie, B. M., & Ewoldsen, D. R. (Eds.). (2018). Interpersonal relationships in the digital age [special issue]. *The Journal of Social Psychology*.

Okdie, B. M., Ewoldsen, D. R., Muscanell, N. L., Guadagno, R. E., Eno, C. A., Velez, J., Dunn, R. A., O'Mally, J., & Smith, R. L. (2014). Missed programs (There is no TiVo for this one): Why psychologists should study the media. *Perspectives on Psychological Science*, *9,* 180-195. doi: 10.1177/1745691614521243

Okdie, B. M., & Wirth, J. H. (2018). Can burdensome Facebook "friends" cause you pain? Self-reported pain as a motivation for exclusion. *Journal of Computer-Mediated Communication, 23,* 313–331. doi: 10.1093/jcmc/zmy017

Paolacci, G., & Chandler, J. (2014). Inside the Turk: Understanding Mechanical Turk as a participant pool. *Current Directions in Psychological Science, 23,* 184–188. doi: 10.1177/0963721414531598

Pickett, C. L., & Gardner, W. L. (2005). The social monitoring system: Enhanced sensitivity to social cues as an adaptive response to social exclusion. In K. D. Williams, J. P. Forgas &

W. von Hippel (Eds.), *The social outcast: Ostracism, social exclusion, rejection, and bullying* (pp. 213–226). New York, NY: Psychology Press.

Ren, D., Wesselmann, E. D., & Williams, K. D. (2016). Evidence for another response to ostracism: Solitude seeking. *Social Psychological and Personality Science, 7,* 204–212. doi: 10.1177/1948550615616169

Riva, P., Montali, L., Wirth, J. H., Curioni, S., & Williams, K. D. (2017). Chronic social exclusion and evidence for the resignation stage: An empirical investigation. *Journal of Social and Personal Relationships, 34,* 541-564. doi: 10.1177/0265407516644348

Riva, P., Romero Lauro, L. J., DeWall, C. N., & Bushman, B. J. (2012). Buffer the pain away: Stimulating the right ventrolateral prefrontal cortex reduces pain following social exclusion. *Psychological Science, 23,* 1473–1475. doi: 10.1177/0956797612450894

Riva, P., Williams, K. D., & Gallucci, M. (2014). The relationship between fear of social and physical threat and its effect on social distress and physical pain perception. *Pain, 155,* 485-493. doi: 10.1016/j.pain.2013.11.006

Riva, P., Wirth, J., & Williams, K. D. (2011). The consequences of pain: The social and physical pain overlap on psychological responses. *European Journal of Social Psychology, 41,* 681–687. doi: 10.1002/ejsp.837

Sacco, D. F., Bernstein, M. J., Young, S. G., & Hugenberg, K. (2014). Reactions to social inclusion and ostracism as a function of perceived in-group similarity. *Group Dynamics: Theory, Research, and Practice, 18,* 129-137. doi: 10.1037/gdn0000002

Scheepers, D., Branscombe, N. R., Spears, R., & Doosje, B. (2002). The emergence and effects of deviants in low and high status groups. *Journal of Experimental Social Psychology, 38,* 611-617. doi: 10.1016/S0022-1031(02)00506-1

Selby, E. A., Anestis, M. D., Bender, T. W., Ribeiro, J. D., Nock, M. K., Rudd, M. D., … Joiner, T. E. (2010). Overcoming the fear of lethal injury: Evaluating suicidal behavior in the military through the lens of the interpersonal–psychological theory of suicide. *Clinical Psychology Review, 30,* 298-307. doi: 10.1016/j.cpr.2009.12.004

Shilling, A. A., & Brown, C. M. (2016). Goal-driven resource redistribution: An adaptive response to social exclusion. *Evolutionary Behavioral Sciences, 10*, 149–167. doi: 10.1037/ebs0000062

Simmons, L. A. (2007). Self-perceived burden in cancer patients. *Cancer Nursing, 30,* 405–411. doi: 10.1097/01.NCC.0000290816.37442.af

Spoor, J., & Williams, K. D. (2007). The evolution of an ostracism detection system. In J. P. Forgas, M. Haselton, & W. von Hippel (Eds.), *The evolution of the social mind: Evolutionary psychology and social cognition* (pp. 279-292). New York: Psychology Press.

Tomarken, A. J., & Waller, N. G. (2003). Potential problems with "well fitting" models. *Journal of Abnormal Psychology, 4,* 578-598. doi: 10.1037/0021-843X.112.4.578

Turchan, P. J. (2012). Atimia 2.0 [Computer software]. Retrieved from https://osf.io/yp5ci/.

Tuscherer, T., Sacco, D. F., Wirth, J. H., Claypool, H. M., Hugenberg, K., & Wesselmann, E. D. (2015). Responses to exclusion are moderated by its perceived fairness. *European Journal of Social Psychology, 46,* 280–293. doi: 10.1002/ejsp.2152

Twenge, J. M., Baumeister, R. F., DeWall, C. N., Ciarocco, N. J., & Bartels, J. M. (2007). Social exclusion decreases prosocial behavior. *Journal of Personality and Social Psychology, 92, 56*–66. doi: 10.1037/0022-3514.92.1.56

Twenge, J. M., Baumeister, R. F., Tice, D. M., & Stucke, T. S. (2001). If you can't join them, beat them: Effects of social exclusion on aggressive behavior. *Journal of Personality and Social Psychology, 81,* 1058–1069. doi: 10.1037/0022– 3514.81.6.1058

Twenge, J. M., Catanese, K. R., & Baumeister, R. F. (2002). Social exclusion causes self-defeating behavior. *Journal of Personality and Social Psychology, 83*, 606-615. doi:10.1037/0022-3514.83.3.606

Twenge, J. M., Catanese, K. R., & Baumeister, R. F. (2003). Social exclusion and the deconstructed state: Time perception, meaninglessness, lethargy, lack of emotion, and self-awareness. *Journal of Personality and Social Psychology, 85,* 409–423. doi: 10.1037/0022-3514.85.3.409

van Beest, I., Williams, K. D., & van Dijk, E. (2011). Cyberbomb: Effects of being ostracized from a death game. *Group Processes and Intergroup Relations, 14,* 581–596. doi: 10.1177/1368430210389084

Van Orden, K. A., Cukrowicz, K. C., Witte, T. K., & Joiner Jr., T. E. (2012). Thwarted belongingness and perceived burdensomeness: Construct validity and psychometric

properties of the Interpersonal Needs Questionnaire. *Psychological Assessment, 24,* 197-215. doi: 10.1037/a0025358

Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S., Selby, E. A., & Joiner Jr., T. E. (2010). The interpersonal theory of suicide. *Psychological Review, 117,* 575-600. doi: 10.1037/a0018697

Van Orden, K. A., Witte, T. K., Gordon, K. H., Bender, T. W., & Joiner, T. E., Jr. (2008). Suicidal desire and the capability for suicide: Tests of the interpersonal-psychological theory of suicidal behavior among adults. *Journal of Consulting and Clinical Psychology, 76*, 72-83. doi: 10.1037/0022-006X.76.1.72

Warburton, W. A., Williams, K. D., & Cairns, D. R. (2006). When ostracism leads to aggression: The moderating effects of control deprivation. *Journal of Experimental Social Psychology, 42,* 213–220. doi: 10.1016/j.jesp.2005.03.005

Weschke, S., & Niedeggen, M. (2015). ERP effects and perceived exclusion in the Cyberball paradigm: Correlates of expectancy violation? *Brain Research, 22,* 265-274. doi: 10.1016/j.brainres.2015.07.038

Wesselmann, E. D., Butler, F. A., Williams, K. D., & Pickett, C. L. (2010). Adding injury to insult: Unexpected rejection leads to more aggressive responses. *Aggressive Behavior, 36,* 232–237. doi:10.1002/ab.20347

Wesselmann, E. D., Wirth, J. H., Pryor, J. B., Reeder, G. D., & Williams, K. D. (2013). When do we ostracize? *Social Psychological and Personality Science, 4,* 108–115. doi:10.1177/1948550612443386

Wesselmann, E. D., Wirth, J. H., Pryor, J. B., Reeder, G. D., & Williams, K. D. (2015). The role of burden and deviation in ostracizing others. *The Journal of Social Psychology, 155,* 483–496. doi:10.1080/00224545.2015.1060935

Wicker, A. W. (1969). Attitudes versus actions: The relationship of verbal and overt behavioral responses to attitude objects. *Journal of Social Issues, 25,* 41-78. doi: 10.1111/j.1540-4560.1969.tb00619.x

Williams, K. D. (2001). *Ostracism: The power of silence.* New York: Guilford Press.

Williams, K. D. (2009). Ostracism: A temporal need-threat model. In M. Zanna (Ed.). A*dvances in experimental social psychology* (Vol. 41; pp. 279-314). New York: Academic Press.

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

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

Wilson, K. G., Curran, D., & McPherson, C. J. (2005). A burden to others: A common source of distress for the terminally ill. *Cognitive Behaviour Therapy, 34,* 115-123. doi: 10.1080/16506070510008461

Wirth, J. H., Allen, A. B., & Zitek, E. M. "I'm not that bad!": Self-compassion buffers against the negative effects of being burdensome. *Social Psychology.* Advance online publication. https://doi.org/10.1027/1864-9335/a000411

Wirth, J. H., Bernstein, M. J., & LeRoy, A. S. (2015). Atimia: A new paradigm for investigating how individuals feel when ostracizing others. *The Journal of Social Psychology, 155,* 497–514. doi:10.1080/00224545.2015.1060934

Wirth, J. H., Bernstein, M. J., Wesselmann, E. D., & LeRoy, A. S. (2017). Social cues establish expectations of rejection and affect the response to being rejected. *Group Processes and Intergroup Relations, 20,* 32-51. doi: 10.1177/1368430215596073

Wirth, J. H., LeRoy, A. S. & Bernstein, M. J. (2020). "You're such a pain!": Investigating how psychological pain influences the ostracism of a burdensome group member. *Group Processes and Intergroup Relations, 23,* 519-545. doi: 10.1177/1368430219844312

Wirth, J. H., Lynam, D. R., & Williams, K. D. (2010). When social pain is not automatic: Personality disorder traits buffer ostracism's immediate negative impact. *Journal of Research in Personality, 44,* 397–401. doi: 10.1016/j.jrp.2010.03.001

Wirth, J. H., Turchan, P. J., Zimmerman, A. G., & Bernstein, M. J. (2014). Atimia: A novel group-based paradigm for manipulating ostracism and group members' performance. *Group Dynamics: Theory, Research, and Practice, 18,* 251-266. doi:10.1037/gdn0000006

Wirth, J. H., & Williams, K. D. (2009). "They don't like our kind": Consequences of being ostracized while possessing a group membership. *Group Processes and Intergroup Relations, 12,* 111-127. doi: 10.1177/1368430208098780

Wong, D. L., & Baker, C. M. (1988). Pain in children: comparison of assessment scales. *Pediatric Nursing, 14*(1), 9-17.

Zadro, L. Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer is sufficient to lower self-reported levels of belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology, 40,* 560-567. doi: 10.1016/j.jesp.2003.11.006

Zweibel, N. R., & Cassel, C. K. (1989). Treatment choices at the end of-life: a comparison of decisions by older patients and their physician-selected proxies. *The Gerontological Society of America, 29*(5), 615-621.
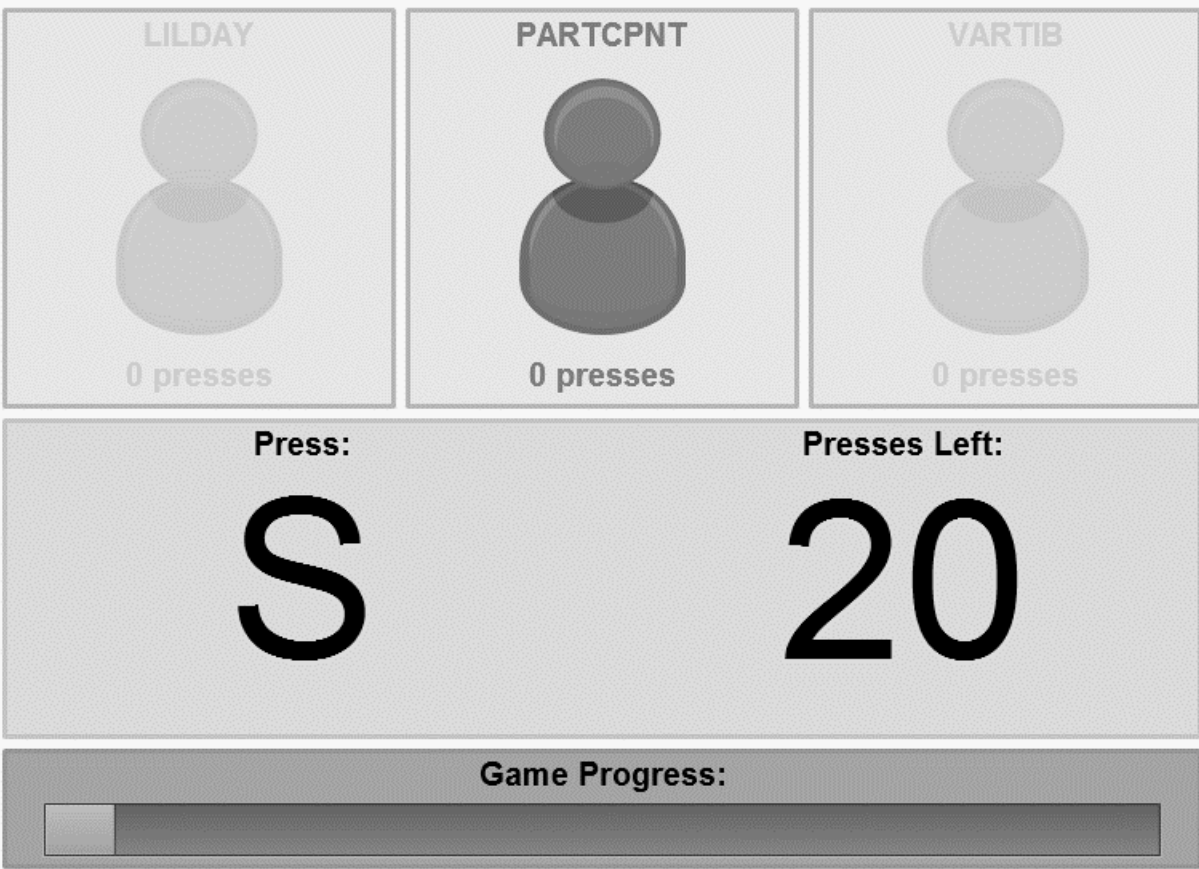
**Figure 1.** Screenshot of Atimia. The opaque avatar indicates who is currently completing the round; in this case, the participant is typing in letters or punctuation marks. After completing each round, the player chooses who will go next.

Direct Paths
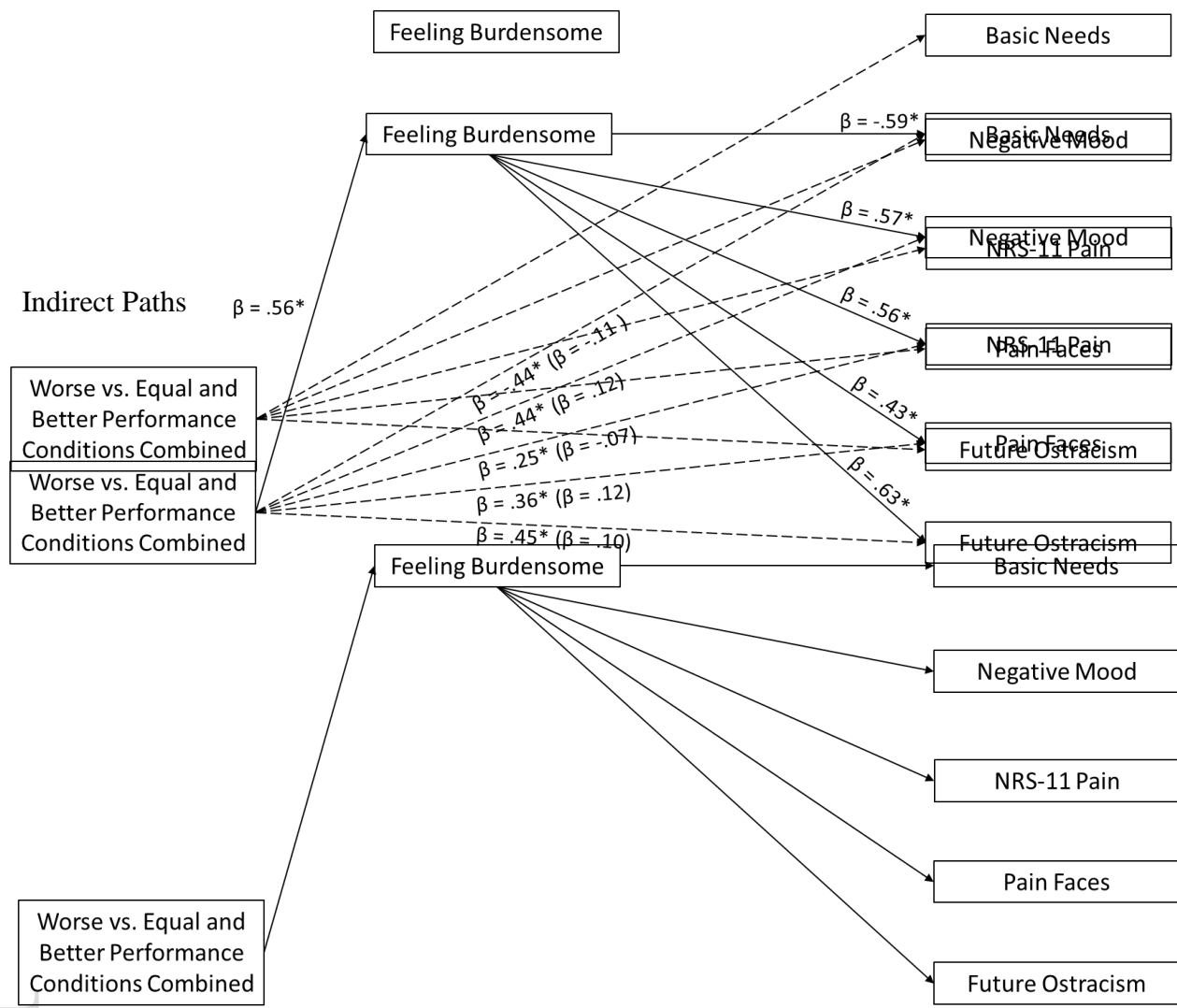


Standardize Betas for Direct and Indirect Paths

**Figure 2.** Mediation analyses for the integrative data analysis. Feeling burdensome significantly mediated the relationship between the participant's performance and feelings related to ostracism (e.g., basic needs). *$p \leq .001$

**Table 1**

*Study 1 Means, Standard Deviations, and 95% Confidence Intervals for the Dependent Variables*

| | Performance Conditions | | | | | | 95% Confidence Intervals | | |
|---|---|---|---|---|---|---|---|---|---|
| | Worse (n = 30) | | Equal (n = 31) | | Better (n = 25) | | Worse vs. Better | Worse vs. Equal | Better vs. Equal |
| Variable | M | SD | M | SD | M | SD | | | |
| Manipulation Checks | | | | | | | | | |
| Participant's performance | -1.37[a] | 2.44 | 2.13[b] | 2.45 | 4.28[c] | 0.84 | -6.811, -4.483 | -5.001, -1.991 | 1.004, 3.298 |
| Percent of time participants reported being selected by others | 41.50[a] | 20.16 | 48.52[a] | 24.52 | 46.80[a] | 23.02 | -19.932, 9.332 | -20.854, 6.822 | -16.240, 12.808 |
| Feeling ostracized | 1.90[a] | 0.97 | 1.63[a] | 1.22 | 1.44[a] | 0.94 | -0.224, 1.144 | -0.376, 0.917 | -0.868, 0.489 |
| Basic Need Satisfaction | 3.11[a] | 0.65 | 3.54[b] | 0.79 | 3.74[b] | 0.53 | -1.062, -0.192 | -0.841, -0.019 | -0.235, 0.629 |
| Negative Affect | 2.48[a] | 0.67 | 2.05[b] | 0.73 | 1.73[b] | 0.51 | 0.325, 1.167 | 0.033, 0.830 | -0.733, 0.104 |
| Social Pain | | | | | | | | | |
| NRS-11 | 1.17[a] | 2.08 | 0.68[a] | 1.46 | 0.30[a] | 0.68 | -0.118, 1.851 | -0.623, 1.601 | -1.092, 0.338 |
| Pain Faces Scale | 1.87[a] | 2.10 | 0.84[a,c] | 1.77 | 0.24[b,c] | 0.66 | 0.636, 2.617 | -0.170, 2.226 | -1.438, 0.241 |
| Feelings of burdensomeness | 2.98[a] | 1.31 | 2.04[b] | 1.06 | 1.95[b] | 0.78 | 0.340, 1.721 | 0.206, 1.678 | -0.680, 0.504 |
| Anticipated exclusion | 3.67[a] | 1.58 | 2.76[a,c] | 1.61 | 2.36[b,c] | 1.66 | 0.262, 2.351 | -0.079, 1.897 | -1.435, 0.639 |
| Behavior temptations towards the group members | | | | | | | | | |
| Aggressive behaviors | 1.40[a] | 0.97 | 1.23[a] | 0.49 | 1.19[a] | 0.54 | -0.242, 0.670 | -0.257, 0.606 | -0.493, 0.413 |
| Prosocial behaviors | 6.57[a] | 1.79 | 6.72[a] | 2.17 | 6.63[a] | 2.00 | -1.342, 1.234 | -1.369, 1.067 | -1.376, 1.182 |

*Note*. Different superscripts denote significant differences between conditions, $p < .05$. Confidence intervals are calculated based on the mean differences.

**Table 2**

*Study 2 Means, Standard Deviations, and 95% Confidence Intervals for the Dependent Variables*

| | Performance Conditions | | | | | | 95% Confidence Intervals | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Worse (*n* = 33) | | Equal (*n* = 34) | | Better (*n* = 34) | | Worse vs. Better | Worse vs. Equal | Better vs. Equal |
| Variable | *M* | *SD* | *M* | *SD* | *M* | *SD* | | | |
| Manipulation Checks | | | | | | | | | |
| Participant's performance | -1.85[a] | 1.66 | 0.88[b] | 1.27 | 2.88[c] | 1.43 | -5.601, -3.861 | -3.601, -1.861 | 1.137, 2.863 |
| Percent of time participants reported being selected by others | 98.03[a] | 8.10 | 97.32[a] | 8.91 | 99.40[a] | 2.39 | -5.591, 2.829 | -3.503, 4.917 | -2.090, 6.267 |
| Feeling ostracized | 1.47[a] | 0.66 | 1.35[a] | 0.69 | 1.22[a] | 0.59 | -0.129, 0.627 | -0.261, -0.494 | -0.507, 0.243 |
| Basic Need Satisfaction | 3.21[a] | 0.55 | 3.86[b] | 0.45 | 4.02[b] | 0.63 | -1.129, -0.489 | -0.964, -0.324 | -0.153, 0.483 |
| Negative Affect | 2.41[a] | 0.77 | 1.72[b] | 0.53 | 1.67[b] | 0.52 | 0.352, 1.128 | 0.296, 1.075 | -0.361, 0.252 |
| Social Pain | | | | | | | | | |
| NRS-11 | 1.88[a] | 2.49 | 0.66[a,c] | 1.73 | 0.66[b,c] | 1.41 | 0.018, 2.417 | -0.047, 2.481 | -0.918, 0.918 |
| Pain Faces Scale | 4.24[a] | 1.79 | 2.59[b] | 1.81 | 1.94[b] | 1.74 | 1.267, 3.336 | 0.620, 2.689 | -1.674, 0.380 |
| Feelings of burdensomeness | 3.81[a] | 1.55 | 1.81[b] | 0.93 | 1.52[b] | 0.64 | 1.580, 2.996 | 1.244, 2.757 | -0.752, 0.177 |
| Anticipated exclusion | 3.56[a] | 1.50 | 1.85[b] | 1.01 | 1.63[b] | 0.89 | 1.197, 2.660 | 0.952, 2.464 | -0.775, 0.334 |
| Behavior temptations towards the group members | | | | | | | | | |
| Aggressive behaviors | 1.16[a] | 0.30 | 1.42[a] | 1.14 | 1.57[a] | 1.46 | -1.033, 0.218 | -0.754, 0.234 | -0.616, 0.910 |
| Prosocial behaviors | 7.29[a] | 1.22 | 7.05[a] | 1.67 | 6.99[a] | 1.72 | -0.624, 1.229 | -0.687, 1.167 | -0.982, 0.857 |

*Note*. Different superscripts denote significant differences between conditions, $p < .05$. Confidence intervals are calculated based on the mean differences.

**Table 3**

*Integrative Data Analysis Standard Deviations and 95% Confidence Intervals for the Dependent Variables*

| | Performance Conditions | | | | | | 95% Confidence Intervals | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Worse (n = 63) | | Equal (n = 65) | | Better (n = 59) | | Worse vs. Better | Worse vs. Equal | Better vs. Equal |
| Variable | *M* | *SD* | *M* | *SD* | *M* | *SD* | | | |
| Basic Need Satisfaction | 3.17[a] | 0.60 | 3.71[b] | 0.65 | 3.90[b] | 0.60 | -0.998, -0.476 | -0.797, -0.287 | -0.064, 0.454 |
| Negative Affect | 2.44[a] | 0.72 | 1.88[b] | 0.65 | 1.70[b] | 0.51 | 0.475, 1.017 | 0.300, 0.829 | -0.451, 0.087 |
| Social Pain | | | | | | | | | |
| NRS-11 | 1.54[a] | 2.31 | 0.67[b] | 1.59 | 0.51[b] | 1.17 | 0.276, 1.786 | 0.134, 1.607 | -0.910, 0.589 |
| Pain Faces Scale | 3.11[a] | 2.27 | 1.75[b] | 1.98 | 1.22[b] | 1.62 | 1.150, 2.632 | 0.634, 2.081 | -1.269, 0.202 |
| Feelings of burdensomeness | 3.41[a] | 1.49 | 1.92[b] | 0.99 | 1.70[b] | 0.73 | 1.243, 2.181 | 1.039, 1.954 | -0.681, 0.250 |
| Anticipated exclusion | 3.61[a] | 1.53 | 2.28[b] | 1.40 | 1.94[b] | 1.31 | 1.076, 2.265 | 0.746, 1.907 | -0.934, 0.246 |
| Behavior temptations towards the group members | | | | | | | | | |
| Aggressive behaviors | 1.28[a] | 0.71 | 1.33[a] | 0.89 | 1.41[a] | 1.17 | -0.530, 0.268 | -0.443, 0.337 | -0.318, 0.474 |
| Prosocial behaviors | 6.95[a] | 1.55 | 6.89[a] | 1.92 | 6.83[a] | 1.84 | -0.644, 0.872 | -0.686, 0.794 | -0.812, 0.693 |

*Note*. Different superscripts denote significant differences between conditions, $p < .05$. Confidence intervals are calculated based on the mean differences.