



Decisions in the face of known risks: Ostracism increases risky decision-making



Melissa T. Buelow ^{*}, James H. Wirth

The Ohio State University at Newark, 1179 University Drive, Newark, OH 43055, USA

HIGHLIGHTS

- Ostracism impairs cognition – we asked if it impairs risky decision making.
- We used three methods to assess unconscious and deliberate risky decision making.
- Ostracism impairs deliberate but not unconscious risky decision making.
- Ostracized participants also reported feeling burdensome.
- Feeling ostracized and burdensome and making risky decisions can be detrimental.

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ABSTRACT

Ostracism (being excluded and ignored) can have a negative effect on basic, fundamental needs as well as on higher-order cognitive processes. Decision-making is one such cognitive process that is composed of both unconscious (Type I) and deliberative (Type II) processes. The present studies utilized multiple assessments of the effect of ostracism on Type I and Type II risky decision-making. In two studies, we manipulated ostracism using different paradigms (i.e., Cyberball and Atimia) and then participants completed multiple behavioral measures of risky decision-making. Results indicated ostracism, compared to inclusion, increased risky decision-making on the Iowa Gambling Task and Game of Dice Task, but not the Balloon Analogue Risk Task. These results indicate ostracism likely affects risky decision-making processes.

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Daily, individuals lose social connections (Nezlek, Wesselmann, Wheeler, & Williams, 2012) that fulfill a fundamental need to belong (Baumeister & Leary, 1995) by being ostracized (excluded and ignored). Ostracized individuals experienced thwarted fundamental needs (Hartgerink, van Beest, Wicherts, & Williams, 2015), increased negative affect (Williams, 2009; Williams & Nida, 2011), and social pain (e.g., Eisenberger, Lieberman, & Williams, 2003; Riva, Wirth, & Williams, 2011). Behaviorally, ostracized individuals' actions are beneficial, such as deciphering the genuineness of smiles (Bernstein, Young, Brown, Sacco, & Claypool, 2008), but also potentially harmful. Harmful behaviors included taking greater risks more generally (Peake, Dishion, Stormshak, Moore, & Pfeifer, 2013; Twenge, Catanese, & Baumeister, 2003), as well as in terms of financial decisions (Duclos, Wan, & Hiang, 2013), dishonesty (Poon, Chen, & DeWall, 2013; Kouchaki &

Wareham, 2015), and unhealthy eating behaviors (Salvy et al., 2011; Hayman, McIntyre, & Abbey, 2015). In the current research, we investigated ostracism's effect on risky decision-making.

Several studies suggest ostracism adversely affects cognition. Specifically, ostracism activates several brain regions, including the ventral and dorsolateral prefrontal cortices (Baird, Silver, & Veague, 2010; Eisenberger et al., 2003), that are linked with executive functions related to higher-order cognitive abilities such as planning, inhibitory control, and decision-making (Lezak, Howieson, & Loring, 2004). Ostracism researchers found detriments on cognitive tasks including word searches (Lustenberger & Jagacinski, 2010) and measures of attention and working memory (Buelow, Okdie, Brunell, & Trost, 2015; Hawes et al., 2012). These findings and others (Twenge, Catanese, & Baumeister, 2003) suggest socially excluded individuals enter a state of cognitive deconstruction resulting in avoiding meaningful thought, emotion, and self-awareness, all of which could influence decision-making.

^{*} Corresponding author.

E-mail addresses: buelow.11@osu.edu (M.T. Buelow), wirth.48@osu.edu (J.H. Wirth).

1. Ostracism and risky decision-making

Individuals engage in risky decision-making when they continue to take risks even after these risks become known to the individual (Bechara, 2007). To assess risky decision-making, an executive function linked to the ventromedial prefrontal cortex (an area affected by ostracism) (Bechara, Damasio, Damasio, & Anderson, 1994), researchers developed well-validated measures, including the Iowa Gambling Task (IGT; Bechara et al., 1994), Balloon Analogue Risk Task (BART; Lejuez et al., 2002), and Game of Dice Task (GDT; Brand et al., 2005). Participants are given varying levels of information at the start of the task with the goal of maximizing winnings. On the IGT, probabilities associated with decisions are learned through trial feedback. On the GDT and BART, information about the decision risks/benefits are explained in the task instructions (i.e., amount of each bet on the GDT; pumps on the BART earn five cents which is lost if the balloon pops). The amount at risk varies: on the IGT and GDT, but not the BART, the entire “bank” is risked on each trial. In addition, tasks vary in terms of their focus on Type I versus Type II decision-making processes (Kahneman, 2011). Type I processes are unconscious, emotional, “gut feeling”-based decisions that may result in less advantageous overall performance. Type II processes, by contrast, are conscious, deliberate, and analytical, often resulting in more thought-through decisions and advantageous long-term outcomes. Although some studies show both Type I and Type II processes are involved in decision-making under risk (i.e., framing effect; De Martino, Kumaran, Seymour, & Dolan, 2006; Kahneman & Frederick, 2007), others argued Type I processes are more involved in earlier IGT trials, with a transition to greater Type II processes in the later trials (Brand, Labudda, & Markowitsch, 2006; Wood & Bechara, 2014). The level of Type I versus Type II processes involved in each task can vary (Brand, Recknor, Grabenhorst, & Bechara, 2007), indicating the need for multiple measurements of risky decision-making.

We know from limited previous research that contextual factors including mood (Buelow, Okdie, & Blaine, 2013; Must et al., 2006; Suhr & Tsanadis, 2007), construal level (Okdie, Buelow, & Bevelhimer-Rangel, 2016), and extra learning trials (Buelow et al., 2013; Buelow, Frakey, Grace, & Friedman, 2014; Lin, Song, Chen, Lee, & Chiu, 2013) affect decision-making. Regarding ostracism, ostracized individuals experienced self-regulation depletion (Oaten, Williams, Jones, & Zadro, 2008) and were riskier on the IGT than included individuals (Buelow et al., 2015). However, Buelow et al. utilized only one behavioral decision-making task, and different behavioral tasks measure potentially non-overlapping components of decision-making (e.g., Aklin, Lejuez, Zvolensky, Kahler, & Gwadz, 2005; Buelow & Blaine, 2015; Lejuez et al., 2003). Multiple measurements of the construct are needed to fully understand the link between ostracism and risky decision-making.

2. The present studies

Across two studies, we tested the hypotheses that ostracized participants will: (1) experience less basic need satisfaction, (2) experience more negative affect, and (3) make riskier decisions compared to included participants. Specifically, in two studies we examined decisions on three common behavioral measures: the IGT, BART, and GDT. The IGT is thought to assess both Type I and Type II processes, although the relative emphasis on one process likely varies across trial blocks (Brand et al., 2006; Wood & Bechara, 2014). The BART assesses risky decision-making in which decisions on each trial do not negatively affect overall winnings on the task, but little learning about the risks occurs as explosions are randomized (Lejuez et al., 2002). The risk-reinforcing component of the BART indicates it likely assesses more Type I than Type II processing (Schiebener & Brand, 2015). The GDT creator (Brand et al., 2006; Schiebener & Brand, 2015) indicated it likely assesses Type II processing due to a focus on the known risks/benefits associated with the decision options.

We also extended previous research (Wesselmann, Wirth, Pryor, Reeder, & Williams, 2013, 2015; Wirth, Bernstein, & LeRoy, 2015) that demonstrated individuals ostracized burdensome group members. An individual may be burdensome to others if the individual perceives he or she fails to contribute to the group and is a liability to a group's well-being or safety (Bryan, Morrow, Anestis, & Joiner, 2010). If individuals are cognizant they are ostracized for being burdensome, an ostracized individual may automatically assume they burdened the group. We explored if ostracized individuals inherently feel they burden the group.

3. Study 1: method

3.1. Participants

To determine the sample size for both studies, we conducted a power analysis utilizing G*Power 3.1 (Faul, Erdfelder, Lang, & Buchner, 2007). The power analysis indicated a total sample size of 44 for a repeated-measures ANOVA with $\alpha = 0.05$, power at 0.95, and a correlation of 0.30 between IGT blocks (based on Buelow & Blaine, 2015) to detect a medium effect. This sample size is consistent with other studies of the IGT (e.g., Steingroever, Wetzels, Horstmann, Neumann, & Wagenmakers, 2013).

A total of 96 undergraduate students completed the study, but 13 participants ($n = 8$ ostracism, $n = 5$ inclusion; $\chi^2(1, N = 96) = 0.54$, $p = 0.463$) reported suspicion that the task was computer-controlled and were removed from all analyses. The final sample included 83 participants (51.8% female; 66.3% Caucasian; ages 18–32, $M_{age} = 18.56$, $SD_{age} = 1.87$).

3.2. Procedure

3.2.1. Manipulation

Participants began the experiment by playing a virtual online ball-tossing game, Cyberball (Williams, Cheung, & Choi, 2000). Participants mentally visualized a ball-toss scenario (e.g., the weather, the other players) played with two other players, who were computer-controlled agents. Participants were randomly assigned to be ostracized ($n = 42$), receiving the ball once from each of the players, or included ($n = 41$), receiving the ball a third of the time throughout the game.

3.2.2. Post-Cyberball measures

For the manipulation checks, participants estimated the percent of total throws they received and indicated, separately, to what extent they felt ignored and excluded (i.e., ostracized) during the game ($r_{sb} = 0.91$). Participants indicated satisfaction on the fundamental needs of belonging, control, meaningful existence, and self-esteem ($\alpha = 0.94$; van Beest & Williams, 2006) during the game, and their negative affect ($\alpha = 0.90$) based on how they felt at that moment on a 1 (*not at all*) to 5 (*extremely*) scale.

To assess how burdensome participants felt during Cyberball, they completed the 9-item burden subscale of the Interpersonal Needs Questionnaire (INQ; Van Orden, Cukrowicz, Witte, & Joiner, 2012) on a 1 (*not at all true for me*) to 7 (*very true for me*) scale ($\alpha = 0.92$).

3.2.3. Risky decision-making tasks

Next, participants completed the IGT and BART¹ in a counterbalanced order. On the computerized IGT (Bechara et al., 1994; Bechara, 2007), participants selected from decks of cards (A, B, C, D) to maximize profit over 100 trials, learning about money won and lost from each deck (and thus risks and benefits) based on trial feedback.

¹ We did not report results from the Columbia Card Task. Initial participants failed to complete this task in the allotted time, so we dropped the task. The Domain-Specific Risk-Taking (DOSPERT) scale was administered, but results did not produce a consistent pattern across manipulations.

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