




Pressure of the Past: Influences of Recalling Ostracism on Risk and Benefit Perception


Joseph Newton, MSc

Department of Psychology, Cardiff University, Cardiff, Wales, United Kingdom

 <https://orcid.org/0009-0005-7117-5486>

Ulrich Von Hecker, PhD

Department of Psychology, Cardiff University, Cardiff, Wales, United Kingdom

 <https://orcid.org/0000-0001-8873-0515>

Contact: newtonjm@cardiff.ac.uk

Abstract

The affect heuristic suggests that emotional responses significantly influence perceptions of risk and benefit. We extend this model to test how recalling ostracism affects these perceptions across financial, health, and social domains and test how time pressure moderates these effects. Participants were randomly assigned to one of two conditions: recalling a time they were either ostracized (ostracism condition) or included (inclusion condition), followed by evaluating risk and benefit scenarios under time pressure or no time pressure. While a growing body of evidence has linked ostracism to increases in risky decision-making, we found that recalling ostracism led to domain-specific, bidirectional changes in risk and benefit perception. Ostracized individuals perceived lower risk in financial and health domains but higher risk in social contexts. Time pressure further intensified these effects, strengthening the inverse relationship between risk and benefit perceptions. Under time pressure, ostracized participants reported greater perceived benefits of financial risks and lower perceived benefits of social risks. These findings support the hypothesis that ostracism shapes risk and benefit perceptions in a domain-specific way, with time pressure amplifying these effects through heightened affective responses.

Keywords: *ostracism, risk-taking, risk-perception, decision-making, affect*

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Data Sharing Statement

The data available in this article are available from the corresponding author on reasonable request.

Author Contributions

JN and UVH contributed to the conceptualization of the study's idea. JN built the experiment, collected and analyzed the data, and wrote the paper. UVH assisted with editing and review.

Introduction

The affect heuristic, a pivotal concept in behavioral decision-making, posits that emotional responses significantly influence perceptions of risk and benefit. Finucane et al. (2000) demonstrated that positive emotions toward an entity lead to the underestimation of its risks and overestimation of its benefits, while negative emotions elicit the opposite effect. This inverse relationship is central to understanding the affect heuristic's mechanism: Affect acts as a mental shortcut that simplifies the complex evaluation of risks and benefits, often at the expense of analytical depth (Slovic et al., 2007). The strength of affective feelings, independent of factual content, has been reported as significantly swaying risk and benefit judgments (Alhakami & Slovic, 1994). This tendency, known as the affect-as-information theory, suggests that individuals take cues from their emotional reactions to evaluate the safety and desirability of a situation or object (Schwarz & Clore, 1983). However, despite extensive research on the affect heuristic, little is known about the effects of recalling specific social experiences, such as ostracism, on perceptions of risk and benefit. This is surprising, given that ostracism, defined here as the process of being ignored and excluded (Williams, 2007), is a ubiquitous phenomenon (Albath et al., 2023) that has been shown to impair essential executive functions involved in decision-making and risk assessment (Buelow & Wirth, 2017; Fuhrmann et al., 2019; Hawes et al., 2012). Given the significant impact that ostracism can have on individual behavior and the societal costs associated with chronic exclusion (Weatherby et al., 2010), knowing how ostracism influences risk and benefit perceptions across different domains is crucial to our understanding of its effects.

Recognizing the distinction between risk perception and benefit perception is essential for understanding how individuals make decisions, particularly in risk-related contexts (Kassass et al., 2021). Risk perception involves the subjective assessment of the likelihood and severity of potential harm, including evaluations of how dangerous a situation might be (Fischhoff et al., 1993). In contrast, benefit perception refers to the subjective evaluation of the potential positive outcomes associated with an action, such as the rewards or gains that may result (Siegrist et al., 2004). These perceptions are shaped by various factors, including individual differences, situational contexts, and emotional states (Fischhoff et al., 1993).

We conducted an experiment to investigate how recalling contrasting social memories (ostracism and inclusion) influences risk and benefit perceptions across distinct domains: financial, health, and social. We hypothesized a bidirectional effect in which ostracized individuals would perceive lower risks in financial and health contexts but higher risks in social contexts. We also hypothesized that benefit perceptions would be the inverse of this pattern, that ostracized individuals would perceive greater benefits in financial and health domains but lower benefits in social contexts.

Past research suggests that ostracized individuals engage in financial risk-taking as a compensatory strategy to regain control, seek pleasure, enhance self-worth, and improve social status, thereby alleviating psychological distress (Duclos et al., 2013). Additionally, due to lowered self-esteem and associated psychological distress, ostracism is linked in the literature to self-defeating behaviors, including taking risks with health (Twenge et al., 2002).

In contrast, within the social domain, we hypothesized that ostracized individuals would become more averse to social risks—defined as actions that could jeopardize social standing or relationships, such as voicing unpopular opinions or engaging in behaviors that might lead to further exclusion (Andrews et al., 2020). This prediction was strengthened through complementary research that shows that ostracized individuals have an increased sensitivity to social information, such as improved accuracy in recognizing emotions in others (Mermier et al., 2023), and show a greater desire for social withdrawal and solitude (Ren et al., 2016). Therefore, we hypothesized that this sensitivity would result in a greater social-risk perception, leading ostracized individuals to avoid behaviors that could contribute to additional social isolation or negative social evaluation, which historically came with severe consequences and even death (Buss, 1990).

To test this hypothesis, we adapted a time-pressure manipulation originally used by Finucane et al. (2000), which demonstrated that affective responses are heightened under time pressure. Empirical evidence suggests that time pressure leads to greater reliance on immediate emotional reactions over analytical thinking (Maule, 1990). In the time-pressure condition, participants were given a strict time limit, requiring them to make decisions rapidly. In the non-time-pressure condition, participants had time to deliberate on their choices. This design allowed us to examine whether time constraints increase reliance on emotional responses rather than careful reasoning during decision-making. Comparing the time-pressure and non-time-pressure conditions allowed us to test whether time constraints differentially affect risk and benefit perceptions across domains (financial, health, and social) after recalling ostracism versus inclusion. In sum, this research seeks to advance our understanding of how domain-specific risk and benefit perceptions are shaped by recalling experiences of ostracism and social inclusion and, further, whether these effects are moderated by time pressure.

Ostracism

The fundamental human need for social connection and belonging is well documented, with extensive evidence showing that social relationships are crucial for psychological well-being (Baumeister & Leary, 2017). Ostracism disrupts fundamental psychological needs for belonging, self-esteem, and control, resulting in a variety of behavioral responses, such as aggression, withdrawal, and compliance (Williams, 2007). The social reconnection hypothesis (Maner et al., 2007) states that individuals who experience ostracism show increased motivation to seek new social bonds. Across a series of studies, Maner et al. (2007) demonstrated that ostracized individuals showed a stronger desire to form new social connections, which included greater interest in making new friends, forming positive impressions of novel social targets, and assigning higher rewards to new interaction partners; these suggest a heightened desire to regain social acceptance and avoid risking further exclusion. Other experimental studies have found that ostracized participants were more obedient (Riva et al., 2014) and more compliant with charitable donations (Carter-Sowell et al., 2008). Taken together, these studies illustrate complex social responses after ostracism that reflect a desire for reconnection and motivation to avoid further exclusion. These findings have also been shown in animal model data, in which healthy adult rodents have been documented as showing increased motivation to pursue social connection after a period of acute isolation (Niesink & Van Ree, 1982). This enhanced motivation to reconnect leads to a general hypothesis that, following an experience of ostracism, individuals will become less likely to take a social risk that could increase the likelihood of further exclusion.

On the other hand, while ostracized individuals may perceive more risk in the social domain, empirical evidence has suggested that ostracism will lead to decreased risk perception in other domains. For instance, in the financial domain, Duclos et al. (2013) found, over five experiments, that participants who were excluded were more likely to pursue riskier yet potentially more lucrative financial opportunities. Additionally, in the health domain, Twenge et al. (2002) found that ostracized individuals took more health risks, such as consuming unhealthy foods and showing decreased motivation to exercise. These bidirectional differences suggest that ostracized individuals exhibit increased social risk perception but decreased financial and health risk perception. Subjects' explanations for these behaviors include financial risks being seen as opportunities to restore control, gain pleasure, and improve self-esteem and social status (Zaleskiewicz, 2001), whereas social risks can be seen as opportunities for further ostracism (Ren et al., 2016). This is consistent with compensatory control theory, which posits that individuals seek to restore a sense of order and control in their lives by focusing on regulation in other domains (Kay et al., 2009; Landau et al., 2015).

Time Pressure

A working hypothesis, based on previous research, suggests that recollections of ostracism affect risk and benefit perceptions differently across financial, health, and social domains, but, to our knowledge, no prior experimental research has tested how time pressure interacts with recalling positive or negative social

experiences, such as ostracism. Dual-process theories of cognition propose that, especially under time constraints, intuitive, affect-driven processes often guide behavior more so than slower, deliberative reasoning (Evans & Stanovich, 2013). Research has shown that time pressure increases reliance on heuristic processing, leading to faster but often poorer decisions. Behavioral experiments have found that time pressure reduces information search, heightens dependence on initial impressions, and increases the use of cognitive shortcuts (Kruglanski & Freund, 1983; Svenson et al., 1990). Additionally, time pressure has been shown to exacerbate stress effects, resulting in greater reliance on intuitive judgments than on analytical reasoning (Maule, 1990). For instance, decision-making under time constraints tends to increase functional fixedness, reduce creativity, and generally lower decision quality (Payne, 1993). It is also associated with more decision errors, as individuals often overlook critical information or fail to consider alternative solutions (Olshavsky, 1979; Svenson, 1979). In the context of ostracism, the affective responses elicited by recalling exclusion may become particularly pronounced under time pressure, leading to significant changes in perceptions of risk and benefit.

Domain-Specific Risk

Different domains of risk, such as financial, health, and social domains, exhibit unique characteristics that shape how risks and benefits are evaluated. Financial risks involve tangible outcomes, such as monetary loss or gain (Weber et al., 2002), while health risks pertain to physical well-being and longevity (Weinstein, 1989). Social risks, by contrast, concern potential damage to one's social standing or relationships (Blakemore, 2018). The Domain-Specific Risk-Taking (DOSPERT) scale, developed by Weber et al. (2002), measures risk-taking behavior, risk perception, and attitudes across five domains: ethical, financial, health/safety, social, and recreational. This scale has demonstrated that individuals exhibit different risk behaviors and perceptions depending on the area of risk. For example, a person might be risk-averse in financial matters yet risk-seeking in health-related behaviors, which demonstrates that risk-taking is not a uniform trait but varies by domain (Blais & Weber, 2006). This variation underscores the need for a domain-specific approach when examining how ostracism influences risk perception. A meta-analysis by Shou and Olney (2023) confirmed the reliability and validity of the DOSPERT scale across domains, reinforcing its effectiveness in assessing domain-specific risk attitudes.

The Present Study

Building upon seminal work on risk and benefit perception, we adapted Finucane et al.'s (2000) paradigm to investigate the effect of recalling ostracism versus inclusion on risk and benefit perception across distinct domains. Our experimental design involved participants recalling either a time of being ostracized or a time of being socially included, followed by evaluating risk and benefit under conditions of time pressure or no time pressure. We hypothesized that ostracized individuals would exhibit decreased perceptions of risk in financial and health contexts but increased perceptions of risk in social domains relative to those who recalled inclusion. Additionally, we hypothesized that recalling ostracism would heighten the perceived benefits of financial risks and lower the perceived benefits of social risks. Importantly, we predicted that the presence of time pressure would amplify these effects, reflecting the impact of affective responses on rapid judgment formation.

Methods

Participants

To determine the sample size for this study, we conducted a power analysis using G*Power 3.1 (Faul et al., 2007). For a between-subjects ANOVA, the power analysis indicated a total sample size of 220 participants, with $\alpha = 0.05$, effect size of 0.25 and power at 0.8. We aimed to over-recruit by roughly 5–10% in case of loss of data. As such, a total of 238 participants were recruited from the Cardiff University School of Psychology. The sample consisted of 193 participants identifying themselves as female, 37 identifying as male, six

identifying as non-binary, and two who preferred not to disclose their gender. The mean age of the participants was 19.59 years ($SD = 1.68$). Of the participants, 68.07% ($N = 162$) identified as White British. All participants received course credit for their involvement in the study.

Manipulation

Participants were welcomed to the lab, handed a piece of A4 paper and a ballpoint pen, and directed to a private booth. Participants opened Qualtrics and entered basic details, such as age, gender, and ethnicity. Participants were then randomly assigned to one of two conditions: recall a time of being ostracized ($N = 121$) or a time of being socially included ($N = 116$). Participants were then instructed to write (up to 150 words) about a memory that fit the description as clearly and accurately as possible. In the ostracism condition, participants were asked to write about experiences such as “receiving the silent treatment” or “being left out and ignored by a person or group.” In the inclusion condition, participants were asked to write about a time in which they felt a deep connection to others, such as a cherished moment with family or a friend. This methodological approach was chosen because it had been used previously to generate feelings of ostracism and inclusion in risk research (Duclos et al., 2013). After the experiment was finished, participants shredded their paper in a paper shredder. No individual accounts were read by researchers or retained.

Manipulation Check

Following the recall task, participants were asked to state which type of memory they were asked to recall. Participants were then asked two questions as part of a manipulation check: 1) How excluded did you feel during the recall? and 2) How excluded do you feel right now? Participants were given a 5-point scale to answer these, which ranged from very excluded to very included.

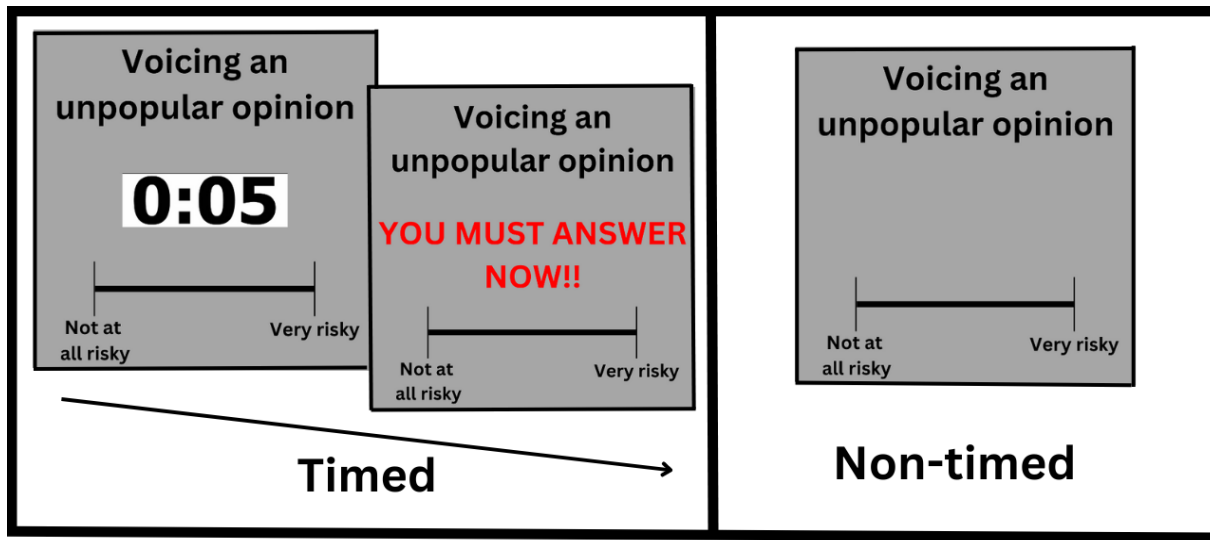
Risk and Benefit Perception Under Time Pressure

To assess risk and benefit perceptions, we presented participants with common risk and benefit scenarios (derived from various sources that are identified below) across financial, health, and social domains. We distinguished between financial, health, and social risk scenarios commonly associated with negative outcomes (e.g., respectively, gambling a week’s wages on a bet you think could win, taking an illegal drug at a social event, and defending an unpopular opinion) and pro-financial, pro-health, and prosocial behaviors commonly associated with positive outcomes (e.g., respectively, meeting with a financial advisor, doing at least moderate exercise 3 times per week, and helping a friend or colleague with a task). Participants rated how much risk and benefit they saw in each scenario. Each participant evaluated the same statements twice—once for risk and once for benefit—in a randomized order to avoid anchoring effects.

To induce time pressure, we modified Finucane et al.’s (2000) paradigm to test risk and benefit perceptions. Participants were presented with scenarios via PsychoPy, Version 2022.2.4, and asked to make judgments that ranged from 1 (not at all risky) to 5 (very risky) for risk judgments and from 1 (not at all beneficial) to 5 (very beneficial) for benefit judgments. The sequence of risk and benefit judgments and the order of category and statement were randomized. To mitigate anchoring bias, the mouse cursor was automatically repositioned to the top of the screen at the start of each trial, preventing rapid, repetitive clicking. Each participant evaluated 36 statements twice, with the same statements used to assess both risk and benefit, a total of 72 evaluations. The task breakdown is depicted in Figure 1. In the non-timed condition, we emphasized the importance of careful and considered reasoning, informing participants that accuracy was paramount. In contrast, the time-pressure condition required participants to respond within a limited timeframe. In the timed condition, a timer counting down from 5 seconds was displayed on the top of the screen, followed by a flashing red text box with the prompt, “You MUST give a rating NOW,” at the end of the countdown. Simultaneously, a moderate beeping sound was played to signal the need for an immediate response.

Figure 1 shows a schematic representation of the two experimental conditions. Participants were first randomly assigned and asked to recall a time when they were either ostracized or included and to write about it. They were then randomly assigned to either the time-pressure condition (five seconds per response) or the no-time-pressure condition. Participants rated a series of 36 statements twice (once for risk and once for benefit), covering financial, health, and social domains. In the time-pressure condition, participants saw a five-second countdown timer and received auditory and visual prompts to expedite their responses. In contrast, in the no-time-pressure condition, participants were given no time constraints.

Figure 1. Schematic Representation of the Two Experimental Conditions



Measures

To assess the dimensions of risk and benefit perception across financial, health, and social domains, we used six psychometrically validated scales. We adapted six questions from each scale, resulting in a total of 36 items, which are provided in the Appendix.

To measure health and social risk perception, we used the Health and Social Risk-Taking Questionnaire (HSRQ) by Andrews et al. (2020), which assesses participants' willingness to engage in health and social risk-taking behaviors. Examples of health risk items include "picking up broken glass with bare hands" and "eating food past its sell-by date," while social risk items include "voicing an unpopular opinion" and "wearing clothes that your friends don't approve of."

To measure financial risk perception, we used the financial scale of the Domain-Specific Risk-Taking (DOSPERT) scale by Weber et al. (2002), which includes items such as "investing 10% of your annual income in a new business venture."

To measure prosocial behaviors, we used the Prosociality Scale by Kanacri et al. (2021) to assess individuals' perceptions of helping others with items such as "helping those in need."

To measure pro-health behaviors, we used the Healthy Behavior Scale by Isozaki and Tadaka (2021) to assess participants' perceptions relating to common health-promoting practices, with items such as "eating 5 or more servings of fruits and vegetables per day" and "taking some time for relaxation."

Lastly, to measure pro-financial behaviors, we used the Financial Management Behavior Scale by Dew & Xiao (2011) to assess attitudes toward behaviors aimed at attaining financial prosperity with items such as “attending a course on investing” and “meeting with a financial advisor.”

Table 1 presents a breakdown of the internal consistency measures for each scale.

Table 1. Cronbach’s Alphas Measured Across Scales for Risk and Benefit Perception

Subscale	Dimension	Cronbach’s alpha
Social risk	Risk	0.860
Social risk	Benefit	0.836
Financial risk	Risk	0.800
Financial risk	Benefit	0.817
Health risk	Risk	0.774
Health risk	Benefit	0.618
Pro-financial	Risk	0.816
Pro-financial	Benefit	0.878
Pro-health	Risk	0.653
Pro-health	Benefit	0.843
Prosocial	Risk	0.678
Prosocial	Benefit	0.775

Note: The health risk subscale exhibited moderate internal consistency, particularly for the benefit dimension (Cronbach’s alpha = 0.618). While generally considered low, this is consistent with other risk research that involves short scales (Dai et al., 2014; Zou et al., 2018).

Data Analysis

All data were analyzed using R (R Core Team, 2021; Version 4.1.2). Two-way ANOVAs were conducted to examine the effects of recalling ostracism versus inclusion and the presence or absence of time pressure on risk and benefit perceptions. When the ANOVAs showed significant results, we performed effect size calculations and Tukey’s post-hoc tests for further analysis. Data visualization was done using GGPlot2.

Results

Manipulation Check

To check the effectiveness of our manipulations, we ran two manipulation checks. First, we tested to see whether there was a significant difference in the effect of recalling ostracism versus inclusion on the following factors: 1) how excluded the participant felt during the memory being recalled and 2) how excluded the participant felt after completing the manipulation. Participants responded to how excluded they felt before and after the manipulation on a scale from 1 (very excluded) to 5 (very included), where lower scores indicated stronger feelings of exclusion.

An independent *t*-test confirmed that participants reported feeling significantly more excluded during the memory recall when assigned to the ostracism condition ($M = 1.54$, $SD = 0.56$) than when assigned to the inclusion condition ($M = 4.95$, $SD = 0.26$), ($t(169.98) = 60.31$, $p < .001$, $d = 7.72$, 95% $CI [6.98, 8.47]$). This confirms a large difference in how excluded participants felt during the memory being recalled. Additionally, when testing to see how excluded participants felt after recalling the memory, an independent *t*-test also

confirmed a significant difference between those recalling ostracism ($M = 2.88, SD = 1.10$) and inclusion ($M = 3.62, SD = 1.18$), ($t(232.46) = 5.09, p < .001, d = 0.66, CI [0.40, 0.93]$), confirming that participants assigned to the ostracism condition felt more excluded after the manipulation.

To test whether our time-pressure manipulation was effective, we analyzed response times between participants in timed and non-timed conditions. There was a significant difference in response times (seconds) in that participants in the non-timed condition ($M = 4.34, SD = 1.42$) took longer to respond than did those in the timed condition ($M = 3.00, SD = 0.73$), ($T(174.2) = 9.12, p < .001, d = 1.19 [0.91, 1.47]$). This finding suggests that the time-pressure manipulation had a large effect on how quickly participants responded during our study.

Risk and Benefit Perception

We calculated descriptive statistics for risk perception across the six categories (financial risk, health risk, social risk, pro-financial behavior, prosocial behavior, and pro-health behavior) under different conditions (recalling ostracism versus inclusion and timed versus non-timed). Tables 2 and 3 below present the means and standard deviations for each category and condition.

Table 2 shows the means and standard deviations for risk and benefit perception across the six categories in the non-timed condition. All participants rated the same statements for both risk and benefit in a randomized order.

Table 2. Means and Standard Deviations for Risk and Benefit Perceptions Across Six Categories in Untimed Condition

Category	Condition	Rating type	Mean	SD
Financial risk	Inclusion	Risk	4.13	1.00
		Benefit	2.15	1.06
	Ostracism	Risk	3.93	1.15
		Benefit	2.67	1.24
Health risk	Inclusion	Risk	3.73	1.09
		Benefit	1.57	0.78
	Ostracism	Risk	3.32	1.17
		Benefit	1.68	0.87
Social risk	Inclusion	Risk	2.04	1.07
		Benefit	3.22	1.15
	Ostracism	Risk	2.37	1.20
		Benefit	2.86	1.23
Pro-financial	Inclusion	Risk	1.72	1.04
		Benefit	4.19	1.07
	Ostracism	Risk	1.31	0.59
		Benefit	4.69	0.72
Prosocial	Inclusion	Risk	1.75	0.93
		Benefit	3.98	0.97
	Ostracism	Risk	1.87	0.97
		Benefit	3.70	1.11
Pro-health	Inclusion	Risk	1.29	0.58
		Benefit	4.76	0.55
	Ostracism	Risk	1.38	0.74
		Benefit	4.60	0.87

Table 3 shows the means and standard deviations for risk and benefit perception across the six categories when participants were under time pressure. All participants rated the same statements for both risk and benefit.

Table 3. Means and Standard Deviations for Risk and Benefit Perceptions Across Six Categories in Timed Condition

Category	Condition	Rating type	Mean	SD
Financial risk	Inclusion	Risk	4.25	1.02
		Benefit	1.97	1.10
	Ostracism	Risk	3.74	1.25
		Benefit	2.54	1.24
Health risk	Inclusion	Risk	3.85	1.07
		Benefit	1.59	0.87
	Ostracism	Risk	3.39	1.19
		Benefit	1.64	0.82
Social risk	Inclusion	Risk	2.25	1.18
		Benefit	3.29	1.26
	Ostracism	Risk	2.56	1.20
		Benefit	2.84	1.17
Pro-financial	Inclusion	Risk	1.88	1.07
		Benefit	4.08	1.11
	Ostracism	Risk	1.70	0.96
		Benefit	4.37	0.80
Prosocial	Inclusion	Risk	1.96	1.10
		Benefit	3.87	1.07
	Ostracism	Risk	2.07	1.07
		Benefit	3.77	0.99
Pro-health	Inclusion	Risk	1.43	0.85
		Benefit	4.61	0.88
	Ostracism	Risk	1.60	1.01
		Benefit	4.47	0.89

Risk Perception

A series of two-way ANOVAs were conducted to examine how the type of memory recalled (ostracism versus inclusion) and the presence of time pressure (timed versus non-timed) influenced participants' perceptions of risk and benefit across six distinct categories: financial risk, social risk, health risk, pro-financial behaviors, prosocial behaviors, and pro-health behaviors. Here, risk perception refers to participants' assessment of potential negative outcomes associated with a behavior, such as the likelihood of losing money when gambling a day's wages. In contrast, benefit perception involves evaluating the potential positive outcomes, such as the gains associated with taking an investment course to enhance financial knowledge. We further distinguished between risks and benefits related to harmful behaviors (e.g., gambling or taking illegal drugs) and beneficial behaviors (e.g., investing or helping others), allowing us to assess how the experimental conditions influenced participants' evaluations of different types of actions. These distinctions help differentiate between the perceived risks of harmful actions and actions intended to achieve beneficial outcomes. Bar graphs demonstrating the results across conditions are depicted in Figure 2 for risk perception and Figure 3 for benefit perception.

Financial Risk Perception

Participants who recalled ostracism showed significantly lower financial risk perception ($M = 3.93, SD = 1.15$) when compared to those recalling inclusion ($M = 4.13, SD = 1.00$), ($F(1, 1424) = 35.925, p < .001, \eta p^2 = .02$). The main effect of time pressure was not significant ($F(1, 1424) = .581, p = .446$). However, there was a significant interaction between time pressure and the recall condition ($F(1, 1424) = 6.880, p = .009, \eta p^2 < .01$), indicating that time pressure further reduces financial risk perception in those recalling ostracism, while it increases it in those recalling inclusion. These results suggest that ostracism decreases perceived financial risks, and time pressure amplifies this effect, whereas the reverse occurs for those who recall social inclusion.

Health Risk Perception

Participants who recalled ostracism showed significantly lower health risk perception ($M = 3.32, SD = 1.17$) when compared to those recalling inclusion ($M = 3.72, SD = 1.09$), ($F(1, 1424) = 51.779, p < .001, \eta p^2 = .04$). The main effect of time pressure was not significant ($F(1, 1424) = 1.974, p = .160$), and there was no significant interaction between time pressure and recall condition ($F(1, 1424) = 0.215, p = .643$). This suggests that recalling ostracism generally lowers health risk perception, irrespective of time pressure.

Social Risk Perception

Participants who recalled ostracism showed significantly higher social risk perception ($M = 2.37, SD = 1.20$) when compared to those recalling inclusion ($M = 2.04, SD = 1.07$), ($F(1, 1424) = 27.239, p < .001, \eta p^2 = .02$). Time pressure significantly increased social risk perception for both groups (ostracism: $M = 2.57, SD = 1.20$; inclusion: $M = 2.25, SD = 1.8, F(1, 1424) = 11.691, p < .001, \eta p^2 < .01$). The interaction effect was not significant ($F(1, 1424) = 0.015, p = .903$). This indicates that ostracism increases perceived social risks, and time pressure further heightens this perception.

Risk Perception of Pro-Financial Behaviors

Participants who recalled ostracism showed significantly lower risk perception of pro-financial behaviors ($M = 1.31, SD = 0.59$) when compared to those recalling inclusion ($M = 1.72, SD = 1.04$), ($F(1, 1423) = 36.519, p < .001, \eta p^2 = .03$). Time pressure significantly increased these perceptions in both groups (ostracism: $M = 1.69, SD = 0.96$; inclusion: $M = 1.88, SD = 1.07, F(1, 1423) = 28.558, p < .001, \eta p^2 = .02$). There was a significant interaction between time pressure and recall condition ($F(1, 1423) = 4.877, p = .027, \eta p^2 < .01$). This suggests that ostracism significantly decreases the risk perception of pro-financial behaviors, and time pressure amplifies this effect.

Risk Perception of Prosocial Behaviors

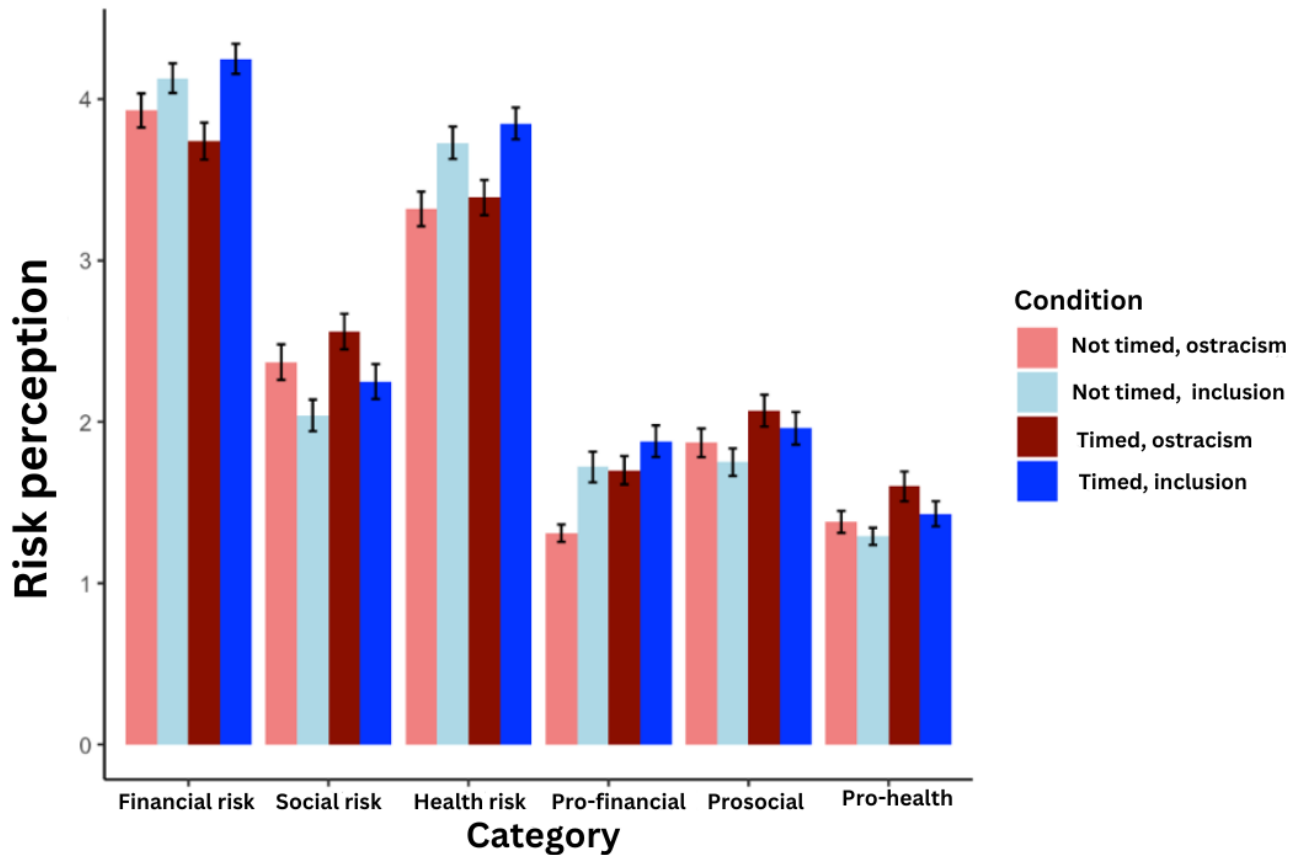
Participants who recalled ostracism showed significantly higher risk perception of prosocial behaviors ($M = 1.87, SD = 0.97$) when compared to those recalling inclusion ($M = 1.75, SD = 0.92$), ($F(1, 1424) = 4.804, p < .029, \eta p^2 < .01$). Time pressure significantly increased these perceptions in both groups (ostracism: $M = 2.07, SD = 1.07$; inclusion: $M = 1.96, SD = 1.09, F(1, 1424) = 14.786, p < .001, \eta p^2 = .01$). No significant interaction was found between time pressure and the recall condition ($F(1, 1424) = 0.008, p = .931$). These results suggest that both ostracism and time pressure independently increase the perceived risks of prosocial behaviors, but these effects do not depend on each other.

Risk Perception of Pro-Health Behaviors

Participants who recalled ostracism showed significantly higher risk perception of pro-health behaviors ($M = 1.37, SD = 0.74$) when compared to those recalling inclusion ($M = 1.29, SD = 0.58$), ($F(1, 1424) = 9.065, p < .003, \eta p^2 < .01$). Time pressure significantly increased these perceptions in both groups (ostracism: $M = 1.60, SD = 1.01$; inclusion: $M = 1.43, SD = 0.85, F(1, 1424) = 19.047, p < .001, \eta p^2 = .01$). No significant interaction was observed between recall condition and time pressure ($F(1, 1424) = 0.746, p = .388$). These results suggest that both ostracism and time pressure independently increase the perceived risks of pro-health behaviors, but these effects do not depend on each other.

Figure 2 displays risk perception across six categories: financial risk, social risk, health risk, pro-financial behaviors, prosocial behaviors, and pro-health behaviors. The conditions are displayed left to right as follows: non-timed ostracism, non-timed inclusion, timed ostracism, and timed inclusion. Error bars represent the standard error of the mean (*SE*).

Figure 2. Risk Perception Across Six Categories



Benefit Perception

Perceived Benefits of Financial Risk-Taking

Participants who recalled ostracism perceived greater benefits in financial risks ($M = 2.67$, $SD = 1.24$) when compared to those recalling inclusion ($M = 2.15$, $SD = 1.06$) ($F(1, 1424) = 78.874$, $p < .001$, $\eta^2 = .05$). Additionally, there was a significant main effect of time pressure ($F(1, 1424) = 5.511$, $p = .019$, $\eta^2 < .01$). For both groups, ostracism ($M = 2.54$, $SD = 1.23$) and inclusion ($M = 1.97$, $SD = 1.10$), participants perceived less benefit when under time pressure. However, the interaction between time pressure and the recall condition (ostracism versus inclusion) was not significant ($F(1, 1424) = 0.185$, $p = .667$). These results suggest that recalling ostracism increases the perceived benefits of taking financial risks, and time pressure reduces this perception.

Perceived Benefits of Health Risk-Taking

No significant main effects were found for recalling ostracism versus inclusion ($F(1, 1424) = 3.557$, $p = .060$) or for time pressure ($F(1, 1424) = 0.036$, $p = .849$) on the perceived benefits of health risk-taking. The interaction between time pressure and recall condition was also not significant ($F(1, 1424) = 0.413$, $p = .521$).

These results indicate that neither recalling ostracism nor time pressure significantly affects the perceived benefits of health risk-taking.

Perceived Benefits of Social Risk-Taking

Participants who recalled ostracism perceived significantly fewer benefits in social risk-taking ($M = 2.86$, $SD = 1.23$) when compared to those recalling inclusion ($M = 3.22$, $SD = 1.15$), ($F(1, 1424) = 40.980$, $p < .001$, $\eta p^2 = .03$). Time pressure did not have a significant main effect ($F(1, 1424) = 0.039$, $p = .843$), and no significant interaction effect was observed between time pressure and recall condition ($F(1, 1424) = 0.471$, $p = .493$). These results suggest that recalling ostracism reduces the perceived benefits of social risk-taking, irrespective of time pressure.

Perceived Benefits of Pro-Financial Behaviors

Participants who recalled ostracism perceived significantly greater benefits in pro-financial behaviors ($M = 4.60$, $SD = 0.72$) compared to those recalling inclusion ($M = 4.19$, $SD = 1.07$), ($F(1, 1424) = 50.988$, $p < .001$, $\eta p^2 = .03$). Time pressure had a significant main effect ($F(1, 1424) = 10.573$, $p = .001$, $\eta p^2 < .01$), with both groups perceiving less benefit under time pressure (ostracism: $M = 4.37$, $SD = 0.80$; inclusion: $M = 4.07$, $SD = 1.11$). No significant interaction effect was found ($F(1, 1424) = 1.285$, $p = .257$). These results suggest that recalling ostracism enhances the perceived benefits of pro-financial behaviors, but time pressure diminishes this perception.

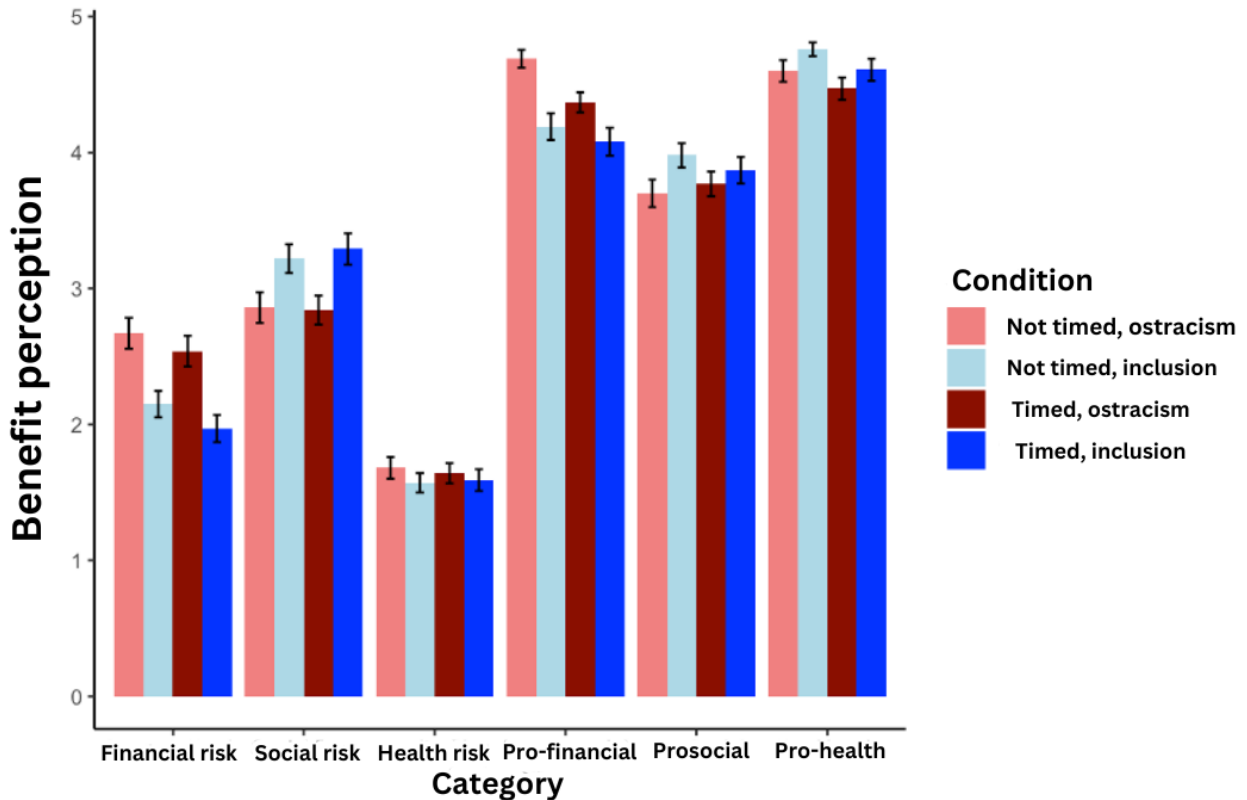
Perceived Benefits of Prosocial Behaviors

Participants who recalled ostracism perceived significantly greater benefits of prosocial behaviors ($M = 1.87$, $SD = 0.97$) compared to those recalling inclusion ($M = 1.75$, $SD = 0.92$), ($F(1, 1424) = 4.804$, $p = .029$, $\eta p^2 < .01$). Time pressure significantly increased perceived benefits in both groups (ostracism: $M = 2.07$, $SD = 1.07$; inclusion: $M = 1.96$, $SD = 1.09$, $F(1, 1424) = 14.786$, $p < .001$, $\eta p^2 = .01$). No significant interaction effect was observed between time pressure and recall condition ($F(1, 1424) = 0.008$, $p = .931$). These results suggest that recalling ostracism increases the perceived benefits of prosocial behaviors, and time pressure amplifies this perception.

Perceived Benefits of Pro-Health Behaviors

Participants who recalled ostracism perceived significantly fewer benefits in pro-health behaviors ($M = 4.59$, $SD = 0.87$) compared to those recalling inclusion ($M = 4.76$, $SD = 0.55$), ($F(1, 1424) = 13.142$, $p < .001$, $\eta p^2 < .01$). Time pressure had a significant main effect ($F(1, 1424) = 10.430$, $p = .001$, $\eta p^2 < .01$), reducing the perceived benefits in both groups (ostracism: $M = 4.47$, $SD = 0.89$; inclusion: $M = 4.61$, $SD = 0.88$). No significant interaction effect was observed between time pressure and recall condition ($F(1, 1424) = 0.048$, $p = .827$). These results suggest that recalling ostracism reduces the perceived benefits of pro-health behaviors, while time pressure similarly diminishes these perceptions, independent of participants' assigned experimental condition.

Figure 3 displays benefit perception across six categories: financial risk, social risk, health risk, pro-financial behaviors, prosocial behaviors, and pro-health behaviors. The conditions are displayed left to right as follows: non-timed ostracism, non-timed inclusion, timed ostracism, and timed inclusion. Error bars represent the standard error of the mean (*SE*).

Figure 3: Benefit Perception Across Six Categories

Risk and Benefit Correlation

In our study, we tested the effect of recalling two contrasting social experiences (ostracism versus inclusion), as well as a time pressure manipulation (timed versus non-timed), on risk and benefit perception across distinct categories. To quantify the relationship between risk and benefit, we calculated Kendall's tau-b correlations for each participant, providing a measure of the strength and direction of the association between their risk and benefit ratings. The results confirm a consistently negative correlation between risk and benefit perceptions, suggesting that as the perception of risk increases, the perception of benefit decreases, and vice versa. Participants who recalled ostracism showed a mean tau of -0.699 ($SD = 0.191$) in the non-timed condition and -0.663 ($SD = 0.207$) in the timed condition. In contrast, participants who recalled inclusion demonstrated a stronger negative tau between risk and benefit perceptions, with a mean of -0.784 ($SD = 0.149$) in the non-timed condition and -0.761 ($SD = 0.182$) in the timed condition. To further investigate these differences, we conducted a two-way ANOVA with the time-pressure manipulation (timed versus non-timed) and recalled experience (ostracism versus inclusion) as factors on the taus. The ANOVA results showed a significant main effect of the type of memory being recalled (ostracism versus inclusion) ($F(1, 233) = 14.244$, $p < .001$, $\eta p^2 = .06$), indicating that the type of social memory recalled influenced the correlation between risk and benefit perceptions. However, the effect of time pressure was not significant ($F(1, 233) = 1.694$, $p = .194$), and there was no significant interaction effect between time pressure and condition (recalling ostracism or inclusion) ($F(1, 233) = 0.090$, $p = .764$).

Discussion

In this study, we tested the effect of recalling ostracism versus recalling inclusion on risk and benefit perceptions across financial, health, and social domains, under conditions of time pressure or no time pressure. Our findings confirm that recalling ostracism significantly impacts risk and benefit perceptions across distinct domains, leading to differences in how participants evaluated both risky behaviors (e.g., taking a social risk) and behaviors commonly associated with positive outcomes (e.g., being prosocial).

The results of our study provide support for our bidirectional risk and benefit perception hypothesis. We found that recalling ostracism led to a decreased perception of risk in financial and health domains but an increased perception of risk in social domains when compared to recalling inclusion. In addition, we found that the inverse relationship between risk and benefit perception was further strengthened in response to the social condition that participants recalled. This aligns with prior research suggesting that negative social interactions, such as ostracism, disrupt cognitive-emotional processes involved in decision-making (Buelow & Wirth, 2017; Fuhrmann et al., 2019; Twenge et al., 2002; Williams, 2007) and increased sensitivity to social information (Mermier et al., 2023), including a heightened vigilance to the prospect of further exclusion, by making individuals perceive more risk in social contexts (Ren et al., 2016).

The differential impact of ostracism across domains underscores the complex interplay between emotional experiences and decision-making processes. Ostracism, by impairing fundamental human needs, such as belonging, self-esteem, and control, leads to varied behavioral responses, depending on the context. Our findings support dual-process theories of cognition (Evans & Stanovich, 2013), which suggest that affective responses, such as recalling an experience of being ostracized, can dominate and significantly influence decision-making processes differently, dependent upon the domain. We show that this dominance of affect over deliberate reasoning may be particularly pronounced in distinct domains, such as financial and social areas, when individuals recall emotionally charged experiences, such as ostracism.

Ostracism has been shown to engender feelings of worthlessness and social disconnection (Williams, 2007). It has been hypothesized that, in response to ostracism, individuals will seek out opportunities to regain their sense of belonging, control, and self-worth in non-social domains (Duclos et al., 2013). This hypothesis may explain why ostracized individuals in our study demonstrated a decreased perception of financial and health risks. Risky financial behaviors have been understood as compensatory responses to the distress caused by social exclusion, where the potential for financial gain helps restore a sense of control, well-being, and social status, thereby boosting self-worth and social standing (Duclos et al., 2013; Zaleskiewicz, 2001). In contrast, a decreased perception of health risks following the recollection of an ostracism experience may reflect mechanisms such as lowered self-esteem and a shift in focus to more immediate needs. This effect can be attributed to thwarted psychological needs and a heightened emphasis on addressing the immediate distress caused by ostracism (Leary, 1990; Twenge et al., 2002; Wesselmann et al., 2024).

In line with our hypothesis, we showed that recalling ostracism led to a significant increase in social risk perception. This finding supports the idea that recalling ostracism heightens sensitivity to social information and motivates individuals to avoid further ostracism. It has been previously shown that ostracized individuals become hyper-vigilant to social cues (Mermier et al., 2023), leading to cautious behaviors, such as social withdrawal aimed at avoiding further rejection (Kip et al., 2025). This heightened sensitivity likely exaggerates perceptions of social risks, such as expressing unpopular opinions or engaging in behaviors that might jeopardize social reintegration (Pfundmair & Lermer, 2023; Ren et al., 2016). At a broader level, ostracism previously came with substantial evolutionary risks, including death (Buss, 1990). The importance of social relationships is supported by a substantial body of scholarly work, demonstrating that humans have an evolutionarily ingrained need to belong and that achieving social inclusion is a fundamental human motivation vital to psychological well-being and overall health. Failure to meet these needs can lead to

increased conformity and social anxiety, suggesting that after experiencing ostracism, individuals will present with an increased desire to avoid further exclusion (Baumeister & Leary, 2017; Leary, 2001; Williams, 2007).

Comparison With Prior Research

Previous research has suggested that ostracism can lead to increased risk-taking (Buelow & Wirth, 2017; Duclos et al., 2013; Svetieva et al., 2016; Twenge et al., 2002). The results of our study support these findings while adding that the effects are domain-specific: ostracism decreases risk perception in financial and health contexts but increases it in social contexts. This nuanced understanding extends the literature by demonstrating that the impact of ostracism on risky decision-making is not uniform but varies across different domains. Additionally, our study's inclusion of time pressure as a moderating factor provides novel insights into the cognitive processes underlying risk perception. While Finucane et al. (2000) emphasized the role of affect in heuristic processing under time constraints, our findings suggest that the emotional salience of ostracism can either amplify or mitigate the effect of time pressure, depending on the domain. This interplay between affective memory recall and cognitive load highlights the complexity of decision-making processes and underscores the importance of considering both emotional and situational factors in risk research. The integration of these findings with theories of social pain and cognitive load (Eisenberger et al., 2003; Sweller, 1988) highlights the broader implications of our study. Social pain induced by ostracism can have profound effects on cognitive functions and decision-making processes. Our research aligns with the notion that ostracism can lead to immediate cognitive and emotional repercussions (Buelow & Wirth, 2017), influencing how risks and benefits are perceived and acted upon (MacDonald & Leary, 2005). Drawing on insights from affect heuristic theory and dual-process models of cognition, our study deepens the understanding of how social experiences shape risk and benefit perceptions. The findings underscore the need for targeted and nuanced interventions to counter the negative effects of ostracism, especially in situations where decision-making involves domain-specific risks.

Limitations and Future Research

This research had several limitations. The sample was predominantly adolescent and drawn from a university setting, which limits the generalizability of the findings to the broader population (Henrich et al., 2010). Furthermore, there was a significant gender imbalance, with more female participants than males. These factors are important, given that adolescence is a period of heightened risk-taking (Gardner & Steinberg, 2005; Steinberg, 2004; Steinberg et al., 2008), and males generally take more risks than females (Byrnes et al., 1999; Harris et al., 2006). Future research should aim to address these limitations. Another limitation was the absence of a neutral condition and the inclusion of nonsocial positive and negative memories, making it difficult to isolate the specific effects of ostracism or inclusion from the general effects of positive or negative emotional experiences. Additionally, this study did not account for individual differences, such as social anxiety, sensitivity to rejection, or personal propensity for risk-taking—factors that could be important in various domains of risk-taking (Downey et al., 1999; Leary, 2001; London et al., 2007). Future studies could incorporate measures that consider these individual differences and explore the real-world applicability of the link between ostracism and risk-taking. For example, using diary-like measures could help identify correlations between experiences of ostracism and risky decision-making.

Conclusion

Ostracism is a profoundly painful social experience. A body of research has suggested that being ignored and excluded can significantly affect behavior; however, limited prior studies have linked ostracism to changes in risky decision-making. This study enhances our understanding of how ostracism influences risk and benefit perceptions by demonstrating that recalling ostracism leads to distinct changes in these perceptions across financial, health, and social domains. Specifically, we present evidence of a bidirectional effect, with ostracism

resulting in a heightened perception of social risks but a decreased perception of financial and health risks. The interplay between ostracism and time pressure—particularly regarding social and financial risk-taking—suggests that time pressure amplifies these effects, leading to a greater reliance on affective processes. This study contributes to the growing literature on risk and benefit perception and opens avenues for exploring the broader implications of ostracism on everyday decision-making.

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Appendix

Social Risk Statements

Admitting that your tastes are very different from those of your friends
Defending an unpopular opinion that you believe in
Admitting that you listen to a singer or band that none of your friends like
Wearing clothes that are really different from those of your friends
Standing up for someone being mocked by your friends
Missing a popular friend's party that a lot of people are attending

Prosocial Statements

Helping a friend or colleague with a task
Sharing things that you have with your friends
Helping a stranger who is in need
Making your knowledge or opportunities available to those who need it
Helping others avoid getting into trouble
Spending time with someone who feels lonely

Health Risk Statements

Riding a bicycle without a helmet
Picking up broken glass with your bare hands
Eating unhealthy (high fat/sugar content) food
Taking an illegal drug at a social event
Spending an afternoon in the sun without any sun cream
Drinking tap water in a foreign country

Pro-health Statements

Eating 5 or more servings of fruits and vegetables per week
Doing at least moderate exercise 3 or more times per week
Not smoking cigarettes
Getting enough sleep
Taking some time for relaxation
Reporting an unusual sign or symptom to a physician or health professional

Financial Risk Statements

Investing in a high-risk stocks and shares portfolio
Betting a substantial amount of money at a casino
Gambling a week's wages on a bet you think could win
Taking part in an illegal activity for a significant sum of money
Investing 10% of your money into a new business venture
Taking a job in which you get paid exclusively on a commission basis

Pro-financial Statements

Completing a course that enhances employability

Attending a course on investing

Creating a monthly budget

Meeting with a financial advisor

Working hard to attain a significant amount of material wealth

Working hard to attain a strong sense of financial security



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