



Contents lists available at ScienceDirect

## Journal of Experimental Social Psychology

journal homepage: [www.elsevier.com/locate/jesp](http://www.elsevier.com/locate/jesp)

# From ostracized to pleased: How fair and unfair social exclusion activates schadenfreude<sup>☆</sup>

Sarah Mohammadi<sup>\*</sup>, Andrew H. Hales

Department of Psychology, University of Mississippi, University, MS, USA

## ARTICLE INFO

## Keywords:

Ostracism  
Schadenfreude  
Fairness perception  
Deservingness  
Social exclusion

## ABSTRACT

People sometimes derive pleasure from the misfortune of others. Here, we investigate social ostracism as a multifaceted trigger of this complex emotion: *schadenfreude*. Building on the theories of fairness perception, ostracism, and justice-based *schadenfreude*, we propose that both experiencing and merely observing ostracism can elicit *schadenfreude* toward an ostracizer. This response is primarily driven by two factors: (1) the (un) fairness of the ostracism itself and (2) the perceived deservingness of an ostracizer to face negative consequences. Four preregistered experiments support these predictions. People who are ostracized (Study 1;  $N = 338$ ) experience *schadenfreude* specifically toward their excluders but not toward uninvolved individuals, indicating that this response is directed rather than generalized. Not just targets but also third-party observers (Study 2;  $N = 82$ ) report *schadenfreude* toward the ostracizer. Supporting the justice-based account, among both targets and observers (Study 3;  $N = 624$ ), ostracism-induced *schadenfreude* is statistically accounted for by the perceived *deservingness* of the ostracizer to experience negative outcomes. Finally, providing direct causal evidence, ostracism elicited *schadenfreude*, but only when experimentally manipulated to be unfair (Study 4;  $N = 479$ ): excluders who unfairly ostracized well-behaved individuals elicited greater *schadenfreude* than those who fairly ostracized provocative norm-violators. This indicates the fairness of exclusion influences perceptions of how much an ostracizer deserves misfortune, and thus the subsequent *schadenfreude*. Together, findings document a previously unexplored consequence of ostracism: the emergence of *schadenfreude* as a moral emotion in response to unfair exclusion.

## 1. Introduction

Consider this scenario: Colleagues gather weekly for after-work drinks, organized by Adam, the team's graphic designer. One member, Tom, is consistently excluded from these events. Over time, Tom begins to think that Adam is perhaps excluding him intentionally for no apparent reason. One day, in the office, the manager harshly criticizes Adam in front of Tom and other employees and at this moment, Tom feels an unexpected twinge of pleasure toward what happened to Adam. This scenario illustrates a key phenomenon in human moral psychology: sometimes we feel understandable justified pleasure at others' misfortunes.

In this research, we propose that ostracism —being ignored and excluded — can serve as a trigger for *schadenfreude*, the pleasure in another's misfortune. Further, we propose that this should be the case particularly when the exclusion appears unjust. This relationship

emerges through unfair ostracism's capacity to make its perpetrators seem like they *deserve* misfortune. This chain of social perceptions and judgments can ultimately result in *schadenfreude* when the ostracizer faces adversity.

Through a series of studies, we examine this relationship from two complementary perspectives: the ostracized individuals (such as Tom) and observers (such as Tom's colleagues). This workplace scenario is just one example of how ostracism might lead to *schadenfreude*, a relationship we explore more broadly throughout this research.

### 1.1. *Schadenfreude* and perceived deservingness of a misfortune

Human responses to others' suffering are not always empathic. People may experience joy in another's misfortunes, especially when the misfortune is perceived as deserved (Feather & Nairn, 2005). *Schadenfreude* can emerge in various contexts, such as benefiting from another's

<sup>☆</sup> This paper has been recommended for acceptance by Rachel Barkan.

<sup>\*</sup> Corresponding author.

E-mail address: [smohamm2@go.olemiss.edu](mailto:smohamm2@go.olemiss.edu) (S. Mohammadi).

<https://doi.org/10.1016/j.jesp.2025.104786>

Received 27 February 2025; Received in revised form 20 June 2025; Accepted 23 June 2025

Available online 5 July 2025

0022-1031/© 2025 Elsevier Inc. All rights are reserved, including those for text and data mining, AI training, and similar technologies.

failure (Smith et al., 2009), self-evaluation processes (Van Dijk et al., 2017), or the downfall of an envied or disliked person (Hareli & Weiner, 2002; Smith et al., 1996; Van Dijk et al., 2006). However, our focus here is on justice-based *schadenfreude*, which emerges from perceptions of deservingness and concerns about justice (Wang et al., 2019).

According to deservingness theory, emotional reactions are shaped by judgments about whether outcomes are perceived as deserved (Feather, 2006). When people believe that someone's misfortunes are a *deserved* consequence of their prior behavior, they are more likely to experience *schadenfreude* (Feather & Sherman, 2002; Van Dijk et al., 2005).

A powerful trigger for these perceptions of deservingness is moral transgression. Individuals experience stronger *schadenfreude* toward those who violate moral norms compared to those who merely lack competence or warmth (Brambilla & Riva, 2017). Both children and adults are less likely to help, and more likely to take pleasure in the misfortunes of those who behave immorally (Schulz et al., 2013; Singer et al., 2006). Similarly, when antisocial individuals face negative outcomes, observers report greater *schadenfreude* and lower sympathy (Rodríguez-Gómez et al., 2020). Because misfortune befalling morally flawed individuals is often seen as deserved, morality plays a key role in shaping perceptions of deservingness and eliciting *schadenfreude*.

Building on this, we extend the concept of justice-based *schadenfreude* to ostracism contexts. Just like immoral individuals in prior studies, unfair ostracizers may be seen as norm violators. Thus, when ostracism appears unfair, both targets and observers are more likely to experience *schadenfreude* when the ostracizer later faces misfortune. This pattern is consistent with findings that *schadenfreude* increases in response to moral deficiencies (Brambilla & Riva, 2017) and antisocial individuals (Rodríguez-Gómez et al., 2020).

### 1.2. Ostracism: experiencing it and observing it

Ostracism—the experience of being ignored and excluded—is a common interpersonal experience that occurs on a daily or near-daily basis (Bernstein et al., 2021; Nezlek et al., 2012) with significant impact on affect and behavior (Williams, 2007, 2009). Humans have developed a highly sensitive ostracism detection system that monitors social exclusion cues (Sporer & Williams, 2011; Williams, 2009). Once detected, ostracism triggers an immediate pain response processed in the same brain regions as physical pain (Eisenberger et al., 2003). This reflexive response threatens psychological needs, increasing negative affect, sadness, and anger (Hales & Williams, 2021; Williams, 2007; Williams, 2009).

Beyond its psychological impacts, ostracism also violates the fundamental need for belonging (Baumeister & Leary, 1995). This violation feels especially unfair because targets have no opportunity to defend themselves, which deepens their sense of powerlessness. People also tend to perceive negative outcomes affecting themselves as more unfair than when the same outcomes affect others (Messick & Sentis, 1979; Thompson & Loewenstein, 1992). Given this self-serving bias in fairness judgments, individuals may see ostracism as inherently unfair, especially when *they themselves* are the target, and, in turn, view the ostracizer as deserving of misfortunes.

However, one doesn't need to be directly ostracized to be affected by it. Witnessing ostracism can also elicit significant emotional and physiological responses in observers (Wesselmann et al., 2009; Wesselmann, Williams, & Hales, 2013) and can be nearly as distressing as experiencing it firsthand (Giesen & Echterhoff, 2018). These effects emerge even when non-human entities, such as robots, are excluded (Marinucci et al., 2025). Observing ostracism also shapes emotional responses toward both the excluded individual and the ostracizer (Beeney et al., 2011; Masten et al., 2011; Wesselmann et al., 2009; Will et al., 2015; Zou et al., 2022). Similar reactions occur in other contexts of witnessed unfair treatment. For example, customers who witnessed the mistreatment of service employees respond empathetically, often tipping them

more (Hershcovis & Bhatnagar, 2017).

Humans, from early ages, are sensitive to issues of justice and fairness in both their own and others' experiences (see Decety & Yoder, 2017, for a review). This sensitivity explains why both targets and observers react strongly to unfair ostracism: targets personally experience the violation of fairness norms, while observers recognize it through moral evaluation. This shared concern for injustice fosters a motivation to uphold fairness and punish wrongdoers. When someone acts unfairly, such as unjust social exclusion, that person's later misfortunes could be seen as a form of deserved punishment, potentially evoking *schadenfreude*. This justice-based perspective suggests that *schadenfreude* intensifies when people believe the person is getting what they deserve (Feather & Nairn, 2005; Wang et al., 2019). Thus, the overarching aim of this investigation is to understand when and why social ostracism can activate feelings of *schadenfreude*.

### 1.3. *Schadenfreude* and perceived fairness of ostracism

A key step in understanding the link between ostracism and *schadenfreude* is answering the question: what exactly constitutes unfair ostracism? In most social contexts, inclusion is the default expectation (Rudert & Greifeneder, 2016; Wesselmann et al., 2009), and exclusion without justification is often seen as morally unacceptable because it violates social norms of inclusion, thereby leading to perceptions of unfairness. Exclusion that lacks a clear reason, such as ostracizing someone based purely on personal preference, is considered malicious ostracism and perceived as unfair (Rudert & Greifeneder, 2019). In contrast, punitive ostracism occurs in response to norm violations, such as excluding a consistently disruptive colleague (Hales et al., 2016; Rudert et al., 2021; Rudert et al., 2023) and is viewed as more justified.

When observing ostracism, individuals engage in an attribution process to understand the motives behind the exclusion (Rudert & Greifeneder, 2019; Yaakobi, 2021). If exclusion appears punitive, observers are more likely to side with the ostracizers and exhibit reduced negative reactions (Rudert et al., 2018; Rudert & Greifeneder, 2016). However, when ostracism seems malicious and unjustified, observers feel anger toward the ostracizers, sympathize with the target, and are less willing to cooperate with the excluders (Arpin et al., 2017; Rudert et al., 2018; Will et al., 2013). This suggests that the perception of fairness or unfairness can influence the emotional response to ostracism (Mikula et al., 1998; Weiss et al., 1999). Witnessing unfair exclusion activates empathy-related brain regions (Masten et al., 2011), and observers may even sacrifice their own resources to support unfairly ostracized individuals (Will et al., 2013).

However, beyond empathic responses, individuals may also experience counter-empathic reactions like *schadenfreude* when the exclusion is perceived as unfair. Moral evaluations occur rapidly, within 150 milliseconds of encountering a morally relevant event, and shape subsequent emotional reactions (Cusimano et al., 2017; Gui et al., 2016). In ostracism contexts, this suggests that when ostracism is perceived as unfair, this quick moral judgment may lead to pleasure when misfortune befalls the ostracizer. Because malicious ostracizers violate inclusion norms without justification, their subsequent misfortunes may be perceived as a deserved consequence of their unfair behavior, potentially eliciting *schadenfreude*.

The proposed mechanism underlying this process involves both distal and proximal causes of *schadenfreude*. Perceived unfairness functions as the distal cause, an essential precondition that sets the stage for judgments of deservingness to emerge. In turn, perceived deservingness acts as the proximal and immediate psychological trigger of *schadenfreude*. Whether experienced firsthand or observed, unfair ostracism shapes perceptions of what the ostracizer deserves. If an ostracizer is viewed as acting unjustly, their later misfortunes may be interpreted as a fitting consequence of their actions, increasing *schadenfreude*. Thus, this research calls on two interconnected yet sequential concepts that shape *schadenfreude* reactions: 1) the perceived fairness of

the ostracism—how the exclusion is judged by the target or observer, which we will call “*perceived fairness*” of the ostracism—and 2) the perceived deservingness of the misfortune—the extent to which an ostracizer is judged to merit negative consequences, which we will call “*perceived deservingness*” of the misfortune. In our opening scenario, consistent exclusion from after-work gatherings without justification appears unfair, whereas exclusion due to, say, prior disruptive behavior may seem entirely justified. This evaluation of fairness directly influences how deserving the ostracizer is perceived to be of any subsequent misfortune, whether these involve negative consequences, setbacks, or punishment. Does the ostracizer deserve a mishap? As in our example, if people view the ostracizer’s behavior as unjust, they may believe the ostracizer deserves mishap, such as being harshly criticized in front of colleagues, and feel some pleasure in witnessing it. Whereas if they view the ostracizer’s behavior as justified, they will not perceive that the mishap is deserved, and will likely not feel pleasure in witnessing it. In this way, the link between ostracism and schadenfreude through the lens of perceived deservingness forms the core of our proposed mechanism to explain this relationship.

#### 1.4. The present research

Our overarching hypothesis is that ostracism can lead to schadenfreude. However, given the theorizing outlined above, we expect this to be a nuanced and contingent causal relationship. Specifically, we hypothesize that schadenfreude arises 1) particularly toward the ostracizer (not uninvolved individuals), and 2) especially when the ostracism is perceived as unfair (but not when the ostracism is seen as fair). Finally, given the role of one’s *perception of fairness* in shaping deservingness judgments, we hypothesized that the *perceived deservingness* mediates the effect of ostracism on schadenfreude. In this framework, ostracism serves as an initiating factor that, when perceived as unfair, prompts deservingness judgments, which in turn elicit schadenfreude. To test these hypotheses, we conducted a series of four experiments:

Experiment 1 examined whether being ostracized leads to schadenfreude and whether this reaction is directed only at the ostracizer or extends to uninvolved individuals. While social exclusion can trigger generalized aggression (Twenge et al., 2001), we investigated whether schadenfreude follows a similar pattern. Experiment 2 investigated whether merely observing ostracism elicits schadenfreude toward ostracizers by having participants watch a recorded ostracism episode. Experiment 3 replicated prior findings and also tested perceived deservingness as a mediator in the relationship between ostracism and schadenfreude across both targets and observers, examining whether this mechanism accounts for schadenfreude responses in both perspectives. In the first three studies, we followed standard Cyberball procedures where exclusion happened without any explanation, making ostracism appear unfair. In Experiment 4, however, we manipulated how fair the ostracism appeared to experimentally test the causal role of perceived deservingness. We created conditions in which ostracism appeared either fair (excluding provocative norm-violators) or unfair (excluding well-behaved individuals). This allowed us to examine whether schadenfreude emerges specifically under unfair ostracism, particularly when the ostracizer is seen as deserving of negative consequences for their unjust behavior. (See Table 1 for an overview of the experiments) Supplemental materials for all studies are available on ResearchBox (<https://researchbox.org/3955>), providing additional details and analyses.

## 2. Study 1

Study 1 investigated the effects of ostracism on schadenfreude. Using the Cyberball paradigm, participants were either included (receiving an equal share of tosses) or excluded in a virtual ball-tossing game to simulate ostracism. Afterward, participants rated their schadenfreude in response to the mishap scenarios involving two targets: (1) a fellow

**Table 1**  
Overview of the Studies.

Study	Primary Manipulation	Secondary Manipulation	Dependent Variable	Sample Size
1	Experiencing ostracism (inclusion vs. ostracism)	Target type (ostracizer vs. uninvolved)	Schadenfreude toward ostracizer & non-ostracizer	338
2	Observing ostracism (inclusion vs. ostracism)	–	Schadenfreude toward ostracizer	82
3	Experiencing or Observing Ostracism (inclusion vs. ostracism)	Participant role (player vs. observer)	Schadenfreude toward ostracizer, Perceived deservingness	624
4	Ostracism fairness (inclusion vs. fair ostracism vs. unfair ostracism)	–	Schadenfreude toward ostracizer	479

*Note.* In Studies 1–3, ostracism was implemented without apparent justification. In Study 4, fairness was manipulated by varying the target’s behavior (norm-violating vs. norm-following).

Cyberball player and (2) a new individual uninvolved in the game. We hypothesized that ostracized participants would experience greater schadenfreude, particularly toward the ostracizing player (rather than uninvolved target).<sup>1</sup>

### 2.1. Method

#### 2.1.1. Participants and design

Participants were recruited via Prolific. We requested a total sample size of 350 participants. A total of 387 accessed the survey. Following preregistered criteria, forty-nine participants were excluded (1 declined to release data, 36 didn’t complete the study, and 12 failed an attention check), leaving a final sample of 338 participants (167 Females,  $M_{age} = 40.58$ ,  $SD = 12.95$ , 66 % White). Participants were randomly assigned to either inclusion ( $n = 168$ ) or ostracism ( $n = 170$ ).

An a priori power analysis informed by the effect size observed in a supplemental study indicated that we would need 158 participants per condition to detect an effect size of  $d = 0.33$  (the key simple effect observed in supplemental study) with 90 % power. Anticipating exclusions, we recruited 350 participants and achieved a final sample of 338. Sensitivity analysis indicate this provides approximately 80 % power to detect simple effects  $d = 0.28$  or greater, and interaction effects of  $\eta_p^2 = 0.02$  or greater ( $\alpha = 0.05$ ; one-tailed).

Data were analyzed using a 2 (Inclusion Status: ostracism vs. inclusion; between-subjects)  $\times$  2 (Target Type: fellow player vs. new target; within-subjects) mixed ANOVA ( $\alpha = 0.05$ ). As preregistered, given our directional hypotheses, the hypothesis tests were one-tailed (Hales, 2024; as preregistered, to do this, the Fs which have just one model degree of freedom, have been converted to their equivalent expression as *t*-statistics and reported as directional tests where relevant throughout the results).

#### 2.1.2. Materials and procedure

After providing informed consent, participants were told they would interact with other players online. To increase believability, participants were requested to introduce themselves in a manner similar to the other players, by sharing their hobbies, interests, and recent experiences, and

<sup>1</sup> We also conducted a preliminary study with a smaller sample ( $N = 96$ ), which showed directional effects consistent with those reported here. See supplemental materials on the ResearchBox page for full details.

were told they would read similar introductions from others.

Participants then read five brief, friendly, neutrally-toned introductions from ostensibly other participants (three men and two women) and learned they would play Cyberball with two of them, Adam and Emily (programmed virtual players). In the inclusion condition, participants received equal ball passes throughout the game. In the ostracism condition, participants received only two initial passes.

Following the Cyberball game, participants read weekend updates from both Cyberball players and other people from the introduction phase. Instructions specified whether updates came from “players you engaged with in Cyberball” or “participants you became acquainted with in the introduction section.” Updates described two mishap scenarios:

“Over the weekend, I had a stomach-churning experience when I found a long, curly hair in my sandwich while eating a large bite. What a ‘hairy’ meal!”

“I had an unexpected mishap this weekend. I was all dressed up for a special occasion, and as I stepped out of the house, a passing bird decided to leave a ‘gift’ on my freshly styled hair. Talk about a bad day that got even worse!”

After reading each scenario, participants rated their *schadenfreude* toward Adam (the fellow player) and Jack (the non-player target) using a scale adapted from Van Dijk et al., 2011. The scale consisted of five items: “I enjoyed learning what happened to this person”, “I couldn’t resist a little smile”, “What happened to this person amuses me”, “I feel happy about what happened to this person”, and “I feel bad but this actually makes me a little happy” (the last item was created custom to capture the complex and often conflicting emotions associated with *schadenfreude*;  $\alpha = 0.89$ ). Responses were recorded on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree).

These mishap scenarios were counterbalanced for each target (fellow player and the new target) to control for potential scenario effects. Each participant saw both mishaps in a randomized order, with half the participants seeing the ostracizer (Adam) experiencing the hair scenario and the non-player target (Jack) experiencing the bird scenario, and vice versa for the other half.

To assess the effectiveness of the ostracism manipulation, participants responded to two items: “I was ignored” and “I was excluded” on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree) which were averaged together ( $r = 0.98$ ). Additionally, participants rated the estimated percentage of ball tosses they received during the game. After completing the demographic questions, participants were fully debriefed.<sup>2</sup>

## 2.2. Results

### 2.2.1. Manipulation check

The ostracism manipulation was successful. Ostracized participants reported feeling more ignored and excluded ( $M = 6.05$ ,  $SD = 1.17$ ) than included participants ( $M = 1.40$ ,  $SD = 0.89$ ),  $t(313.36) = -41.07$ ,  $p < .001$ ,  $d = -4.47$ , 95 % CI [-4.87, -4.07]. They also reported receiving a smaller percentage of ball tosses ( $M = 9.97$ ,  $SD = 8.15$ ) than included participants ( $M = 35.33$ ,  $SD = 11.31$ ),  $t(303.57) = 23.58$ ,  $p < .001$ ,  $d = 2.57$ , 95 % CI [2.28, 2.86].

<sup>2</sup> Participants also rated their emotional responses to a positive scenario involving the other player (Emily) using the same *schadenfreude* scale, and completed the reflective need satisfaction questionnaire. Full details of the exploratory analyses examining *glückschmerz* (displeasure at another’s good fortune) and whether *schadenfreude* may help restore basic psychological needs following ostracism are provided in the supplementary materials.

### 2.2.2. Schadenfreude

To examine whether ostracism leads to increased *schadenfreude* toward the ostracizer, we conducted a 2 (inclusion status: ostracism vs. inclusion)  $\times$  2 (target: fellow player vs. new target) mixed analysis of variance (ANOVA). The analysis revealed a significant main effect of inclusion status,  $F(1, 336) = 8.27$ ,  $t = 2.88$ ,  $p_{\text{one-tailed}} = 0.002$ ,  $\eta_p^2 = 0.02$ , and a significant main effect of target,  $F(1, 336) = 23.04$ ,  $t = 4.80$ ,  $p_{\text{one-tailed}} < 0.001$ ,  $\eta_p^2 = 0.06$ . Importantly, and confirming our hypothesis, there was a significant interaction between inclusion status and target,  $F(1, 336) = 5.78$ ,  $t = 2.41$ ,  $p_{\text{one-tailed}} = 0.008$ ,  $\eta_p^2 = 0.02$  (see Fig. 1).

To further examine our main prediction, we conducted simple effects tests for each type of target. For the fellow player (ostracizer), participants in the ostracism condition ( $M = 3.19$ ,  $SE = 0.11$ ) reported significantly higher levels of *schadenfreude* compared to those in the inclusion condition ( $M = 2.6$ ,  $SE = 0.11$ ),  $t(336) = -3.60$ ,  $p_{\text{one-tailed}} < 0.001$ ,  $d = -0.39$ , 95 % CI [-0.61, -0.18]. For the uninvolved individual (non-ostracizer), there was no significant difference in *schadenfreude* between the ostracism condition ( $M = 2.52$ ,  $SE = 0.11$ ) and the inclusion condition ( $M = 2.38$ ,  $SE = 0.11$ ),  $t(336) = -0.95$ ,  $p_{\text{one-tailed}} = 0.171$ ,  $d = -0.11$ , 95 % CI [-0.31, 0.11].

## 2.3. Discussion

Study 1 provided strong support for our hypothesis that ostracized individuals experience higher *schadenfreude*, particularly toward those who ostracized them. Beyond direct targets, ostracism also affects observers, who often find witnessing exclusion nearly as distressing as experiencing it (Giesen & Echterhoff, 2018; Wesselmann et al., 2009). Observers assess whether ostracism is malicious or justified (Rudert & Greifeneder, 2019) and when it appears unjustified, they respond with anger toward ostracizers and sympathy for the target (Arpin et al., 2017). Given observers’ engagement with ostracism and their fairness evaluations, we conducted Study 2 to answer this question: could simply observing ostracism elicit *schadenfreude* responses in observers?

## 3. Study 2

Study 2 examined whether observing ostracism elicits *schadenfreude* toward the ostracizer. Instead of playing Cyberball, participants watched a recorded video of the game and then read about mishaps befalling the ostracizers.

### 3.1. Method

#### 3.1.1. Participants and design

Participants were recruited from the university subject pool for course credit. Following the preregistered stopping rule, we collected data until the subject pool closed for the semester, resulting in 89 total participants. Following preregistered criteria, seven participants were excluded (2 declined post-consent, 5 failed the attention check), resulting in a final sample of 82 participants (55 females,  $M_{\text{age}} = 19.01$ ,  $SD = 1.11$ ). Participants were randomly assigned to one of two conditions in a between-subjects design: watching either an inclusion or ostracism Cyberball video) with 42 in the inclusion condition and 40 in the ostracism condition.<sup>3</sup>

We conducted a sensitivity power analysis using Superpower (Lakens & Caldwell, 2021). The results indicated that our obtained sample size ( $N = 82$ ) provides approximately 80 % power to detect the key hypothesized ostracism main effect, sensitive to effect sizes of  $d = 0.4$  or

<sup>3</sup> We preregistered a  $2 \times 2$  design with an exploratory perspective-taking manipulation. This moderation was severely underpowered, and the manipulation of perspective-taking was unsuccessful. We therefore focus on the primary hypothesized ostracism effect. Full planned analyses details are in supplementary materials (conclusions match main results reported here).

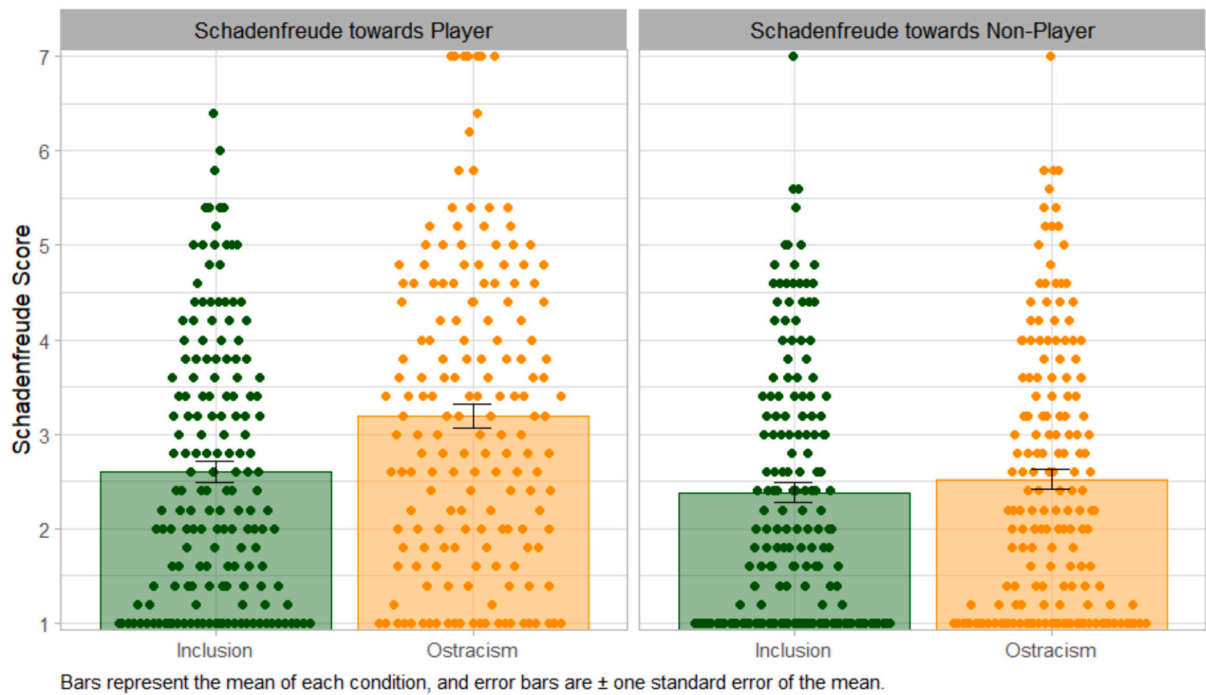


Fig. 1. Schadenfreude Scores for Fellow Players (Ostracizer) and New Targets (Uninvolved Individuals).

greater. This study was explicitly not well-powered to detect an interaction effect (see preregistration), however power analysis indicated approximately 80 % sensitivity to effect sizes of  $\eta_p^2 = 0.04$  or greater ( $\alpha = 0.05$ ; one-tailed).

### 3.1.2. Materials and procedure

The procedure was similar to Study 1, with key differences in the participant's role and task sequence. Participants first read the same introductions for Adam, Emily, and Alex, as in the prior study. Participants then watched a recorded Cyberball video rather than playing the game themselves. In the inclusion video, all three players received equal ball passes. In the ostracism video, Alex (the target) initially received two passes before Adam and Emily stopped passing to Alex, replicating the exclusion pattern from the previous study.

After watching the video, participants read weekend updates only from Cyberball players (since Study 1 showed that schadenfreude was specific to ostracizers). Participants read about Adam's mishap (identical scenarios from Study 1) and rated their schadenfreude toward Adam using the same five-item scale ( $\alpha = 0.86$ ). The mishap scenarios were counterbalanced—half read about Adam finding a hair in his sandwich, while the other half read about a bird leaving a gift on his hair.

## 3.2. Results

### 3.2.1. Manipulation check

The ostracism manipulation was successful. Observers of ostracism reported Alex was more ignored and excluded ( $M = 5.52$ ,  $SD = 1.47$ ) compared to observers of inclusion ( $M = 2.87$ ,  $SD = 1.54$ ),  $t(79.99) = -7.99$ ,  $p < .001$ ,  $d = -1.76$ , 95 % CI  $[-2.28, -1.25]$ . Additionally, observers of ostracism estimated that Alex received a smaller percentage of ball passes ( $M = 14.1$ ,  $SD = 13$ ) than those in the inclusion condition ( $M = 30.6$ ,  $SD = 12.61$ ),  $t(79.52) = 5.83$ ,  $p < .001$ ,  $d = 1.29$ , 95 % CI  $[0.80, 1.77]$ .

### 3.2.2. Schadenfreude

To examine whether observing ostracism leads to an increase in

schadenfreude toward the ostracizers, we conducted an independent samples *t*-test comparing observers of ostracism versus inclusion. The analysis revealed that observers of ostracism reported higher schadenfreude ( $M = 3.20$ ,  $SD = 1.44$ ) than those who observed inclusion ( $M = 2.31$ ,  $SD = 1.23$ ),  $t(76.86) = -3.01$ ,  $p_{one-tailed} = 0.001$ ,  $d = -0.67$ , 95 % CI  $[-1.12, -0.22]$ . This finding supports our primary hypothesis that observing ostracism increases feelings of schadenfreude toward the ostracizers.<sup>4</sup>

## 3.3. Discussion

Study 2 demonstrated that merely observing ostracism increases schadenfreude toward the ostracizers, extending our findings beyond direct experiences of ostracism to vicarious observations.

## 4. Study 3

Study 3 integrated both experienced and observed ostracism into a single experimental design to replicate previous findings and test perceived deservingness as a potential mediator of the relationship between ostracism and schadenfreude. Participants were randomly assigned to a 2 (Role: player vs. observer)  $\times$  2 (Condition: ostracism vs. inclusion) between-subjects design, and we measured their perceptions of whether the ostracizer deserved negative consequences.

### 4.1. Method

#### 4.1.1. Participants and design

We conducted an a priori power analysis for our 2  $\times$  2 between-subjects design to determine the appropriate sample size. The target N of 600 provides approximately 99 % power to detect an ostracism main effect of  $d = 0.36$  or greater (which is a typical effect size in social psychology and comparable to effects observed in earlier studies;

<sup>4</sup> This same result was also observed using the originally planned (i.e., pre-registered) analysis: 2  $\times$  2 ANOVA, main effect of ostracism,  $F(1, 78) = 9.25$ ,  $p_{one-tailed} = 0.001$ ,  $\eta_p^2 = 0.11$ .

Lovakov & Agadullina, 2021), and 80 % sensitivity to detect interaction effects of  $\eta_p^2 = .01$  or greater ( $\alpha = 0.05$ ; one-tailed). To account for exclusions, we aimed to recruit 650 participants on Prolific.

Participants were recruited via Prolific for a U.S. nationally representative sample of 682 participants who started the survey. Following preregistered exclusions, 58 were excluded (32 did not complete the study, 1 declined data release, and 25 failed the attention check), resulting in a final sample of 624 participants (313 females,  $M_{age} = 46.21$ ,  $SD = 15.98$ ). Participants were distributed across the four conditions ( $n_{observe\ inclusion} = 155$ ,  $n_{observe\ ostracism} = 156$ ,  $n_{play\ inclusion} = 162$ ,  $n_{play\ ostracism} = 151$ ).

#### 4.1.2. Materials and procedure

We manipulated *Role* by varying task instructions at the study outset. Participants assigned to the “player” role were told they would participate in an online ball-tossing game called Cyberball with two other players, while those in the “observer” role were told they would watch a video recording of Cyberball. We manipulated *Inclusion Status* through ball-passing patterns. In the inclusion conditions, the target (either the participant or the observed player Alex) received an equal share of passes. In the ostracism conditions, the target received only two initial passes before Adam and Emily stopped passing to them.

After Cyberball, participants read one of the two counterbalanced mishap scenarios used in earlier studies and rated their schadenfreude toward Adam (the ostracizer) using an expanded 10-item scale ( $\alpha = 0.94$ ). This scale included the five original items from prior studies plus five additional items designed to help address potential floor effects observed in earlier studies (the newly added items: “When I think about what happened to Adam, I feel a sense of satisfaction”, “I’m at least a little amused by Adam’s situation”, “Adam’s little misfortune gives me a slight feeling of relief”, “I can’t help but feel a bit pleased about how things turned out for Adam”, and “Part of me enjoys seeing this person face difficulties.”).

To test our proposed mechanism, participants were asked to retrospectively rate three items assessing the ostracizer’s perceived deservingness of negative consequences ( $\alpha = 0.94$ ): “Adam deserves to be punished for his behavior in the game”, “If things were fair, there would be retribution for Adam’s behavior”, and “Adam should be knocked down a peg for what he did”. Finally, manipulation checks assessed role identification (selecting between two choices: *observer* or *player*), ostracism perception (“I/Alex was ignored” and “I/Alex was excluded”;  $r = 0.97$ ), and estimated percentage of ball tosses.

## 4.2. Results

### 4.2.1. The Manipulation checks

To assess the effectiveness of our manipulations, we first examined whether participants correctly identified their assigned role (player vs. observer). The vast majority did, with 97.1 % (303/312) of players and 96.8 % (301/311) of observers accurately reporting their assigned condition. We then conducted two 2 (inclusion status: ostracism vs. inclusion)  $\times$  2 (role: player vs. observer) between-subjects ANOVAs to evaluate the ostracism manipulation.

The first ANOVA, assessing feelings of being ignored and excluded, revealed a significant main effect of inclusion status,  $F(1, 620) = 808.49$ ,  $p < .001$ ,  $\eta_p^2 = 0.57$ . Participants in the ostracism condition reported feeling more ignored and excluded ( $M = 5.36$ ,  $SE = 0.09$ ) compared to those in the inclusion condition ( $M = 1.90$ ,  $SE = 0.07$ ). There was no significant main effect of role,  $F(1, 620) = 0.08$ ,  $p = .779$ ,  $\eta_p^2 < 0.001$ , and no significant interaction between inclusion status and role,  $F(1, 620) = 1.87$ ,  $p = .172$ ,  $\eta_p^2 = 0.003$ .

The second ANOVA, assessing perceived percentage of ball tosses, also showed a significant main effect of inclusion status,  $F(1, 620) = 184.05$ ,  $p < .001$ ,  $\eta_p^2 = 0.23$ . Participants in the ostracism condition estimated receiving fewer passes ( $M = 15.4$ ,  $SE = 1.02$ ) compared to those in the inclusion condition ( $M = 32.3$ ,  $SE = 0.75$ ). There was also a

significant main effect of role,  $F(1, 620) = 10.63$ ,  $p = .001$ ,  $\eta_p^2 = 0.02$ , and a significant interaction between inclusion status and role,  $F(1, 620) = 6.67$ ,  $p = .010$ ,  $\eta_p^2 = 0.01$ . The interaction revealed that the difference in perceived ball tosses between the inclusion and ostracism conditions was larger for players ( $d = 1.71$ , 95 % CI [1.45, 1.97];  $M_{difference} = 20.2$ ) than for observers ( $d = 0.74$ , 95 % CI [0.51, 0.97];  $M_{difference} = 13.70$ ), suggesting that when people directly experience ostracism, they are more engaged and attentive to the situation.

### 4.2.2. Schadenfreude

To examine whether ostracism increases schadenfreude and whether this effect differs between those who experience or observe the interaction, we conducted a 2 (inclusion status: ostracism vs. inclusion)  $\times$  2 (role: player vs. observer) between-subjects ANOVA. The analysis revealed a significant main effect of inclusion status,  $F(1, 620) = 49.30$ ,  $t = 7.02$ ,  $p_{one-tailed} < 0.001$ ,  $\eta_p^2 = 0.07$ . Participants in the ostracism condition reported higher levels of schadenfreude ( $M = 2.85$ ,  $SE = 0.09$ ) compared to those in the inclusion condition ( $M = 2.09$ ,  $SE = 0.06$ ),  $t(620) = 7.02$ ,  $p_{one-tailed} < 0.001$ ,  $d = -0.56$ , 95 % CI [-0.72, -0.40]. This finding supports our primary hypothesis that ostracism increases feelings of schadenfreude toward the ostracizers (see Fig. 2).

There was no significant main effect of role,  $F(1, 620) = 0.64$ ,  $p = .425$ ,  $\eta_p^2 < 0.001$ , and no significant interaction between inclusion status and role (as stated in the pre-registration, the study was not sufficiently powered to detect an interaction),  $F(1, 620) = 2.26$ ,  $p = .134$ ,  $\eta_p^2 = 0.004$ .

To further examine our predictions, we conducted simple effects tests for each role condition. Among players, those in the ostracism condition ( $M = 2.97$ ,  $SE = 0.11$ ) reported significantly higher levels of schadenfreude compared to those in the inclusion condition ( $M = 2.05$ ,  $SE = 0.11$ ),  $t(620) = -6.03$ ,  $p_{one-tailed} < 0.001$ ,  $d = -0.68$ , 95 % CI [-0.91, -0.45]. Similarly, among observers, those in the ostracism condition ( $M = 2.72$ ,  $SE = 0.11$ ) reported significantly higher levels of schadenfreude compared to those in the inclusion condition ( $M = 2.12$ ,  $SE = 0.11$ ),  $t(620) = -3.90$ ,  $p_{one-tailed} < 0.001$ ,  $d = -0.44$ , 95 % CI [-0.67, -0.22].

These results provide strong support for our hypothesis that ostracism increases schadenfreude, regardless of whether individuals directly experience or merely observe the ostracism. Importantly, these findings replicate and extend previous studies, demonstrating the robustness of the ostracism-schadenfreude link across both direct experience and observation of ostracism within a single experimental design.

### 4.2.3. Moderated mediation analysis

As preregistered, to test our hypothesis that perceptions of deservingness would mediate the relationship between ostracism and schadenfreude, we conducted a moderated mediation analysis using PROCESS Model 59 (Hayes, 2022) with 5000 bootstrap samples. This model tested whether deservingness mediated the relationship between ostracism and schadenfreude, with participant role (player vs. observer) as a potential moderator. Inclusion status (ostracism = 1, inclusion = 0) was the independent variable, perceived deservingness was the mediator, and schadenfreude was the dependent variable. To test whether participant role moderates this mediation, we conducted a moderated mediation analysis with role (player = 1, observer = 0) as the moderator.

Simple effects analyses revealed that ostracism was positively associated with perceived deservingness for both players ( $b = 1.46$ ,  $SE = 0.16$ ,  $p < .001$ , 95 % CI [1.14, 1.77]) and observers ( $b = 1.42$ ,  $SE = 0.16$ ,  $p < .001$ , 95 % CI [1.11, 1.74]). Similarly, perceived deservingness was positively associated with schadenfreude for both players ( $b = 0.49$ ,  $SE = 0.04$ ,  $p < .001$ , 95 % CI [0.40, 0.58]) and observers ( $b = 0.51$ ,  $SE = 0.05$ ,  $p < .001$ , 95 % CI [0.42, 0.61]).

The direct effect of ostracism on schadenfreude, after accounting for deservingness, was not significant for either players ( $b = -0.11$ ,  $SE = 0.15$ ,  $p = .445$ , 95 % CI [-0.40, 0.18]) or observers ( $b = 0.19$ ,  $SE = 0.15$ ,  $p = .206$ , 95 % CI [-0.10, 0.48]), suggesting that the relationship

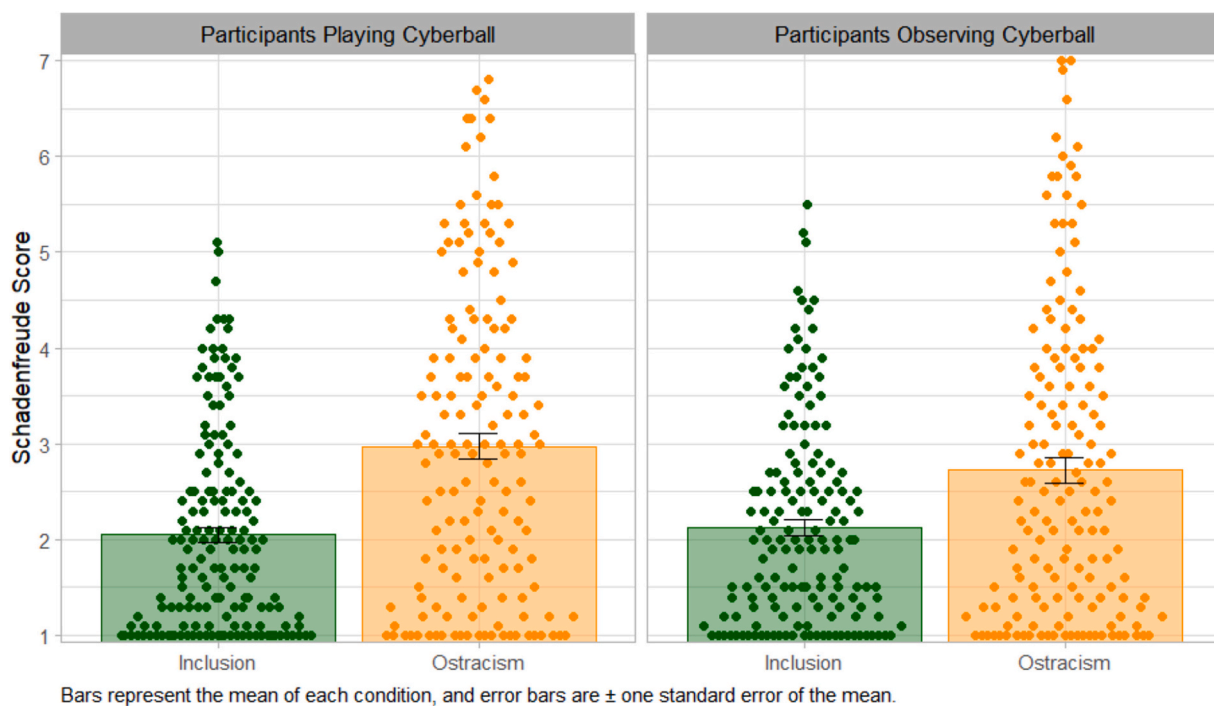


Fig. 2. Schadenfreude Scores by Inclusion Status and Role.

between ostracism and schadenfreude operates through perceptions of deservingness.

The conditional indirect effect of ostracism on schadenfreude through perceived deservingness was significant for both players ( $b = 0.71$ ,  $SE = 0.12$ , 95 % CI [0.49, 0.96]) and observers ( $b = 0.73$ ,  $SE = 0.11$ , 95 % CI [0.52, 0.96]). The index of moderated mediation was not significant (Index = 0.02,  $SE = 0.16$ , 95 % CI [-0.31, 0.34]), indicating that the strength of the indirect effect did not differ significantly between players and observers. These results confirm that perceived deservingness statistically mediates the ostracism–schadenfreude relationship similarly for players and observers.

#### 4.3. Discussion

Study 3 provides two key findings. First, we replicated the effect that ostracism increases schadenfreude toward ostracizers, whether directly experienced or merely observed, with both targets and observers showing comparable increases in schadenfreude. Second, it supported the hypothesis that perception of deservingness mediates the relationship between ostracism and schadenfreude, with this mediation effect remaining consistent across both direct targets and observers. However, statistical mediation alone cannot establish causality (e.g., Kline, 2015). To test deservingness as a causal mechanism, Study 4 experimentally manipulated the fairness of ostracism, allowing us to examine whether schadenfreude toward ostracizers depends on how much they are perceived to deserve misfortune based on their fair or unfair exclusion behavior.

### 5. Study 4

Study 4 directly tests our theoretical model by manipulating the perceived fairness of ostracism. While the first three studies followed standard Cyberball procedures where exclusion happened without explanation, likely appearing unfair due to violated social norms of inclusion, Study 4 manipulates the perceived fairness of ostracism to establish its causal role in driving schadenfreude.

We used a between-subjects design with three conditions: inclusion

(control), fair ostracism, and unfair ostracism. This fairness manipulation was specifically designed to create differences in deservingness perceptions in order to test our sequential pathway hypothesis: that ostracism leads to schadenfreude through perceived unfairness and subsequent deservingness judgments. Since people are more likely to see exclusion as acceptable when it responds to a norm violation (Ditrich & Sassenberg, 2016), we manipulated whether the target of ostracism (Alex) broke a social norm during the game. In the justified ostracism condition, Alex committed a gendered insult, which violated social norms and made his later exclusion seem fair. Thus, this design directly tests our hypothesis: if schadenfreude is driven by perceptions of deservingness, it should only occur after unfair ostracism (when the ostracizer is seen as deserving of misfortune for treating someone unjustly) and not after fair ostracism (where the exclusionary behavior was seen as justified).

To implement this manipulation, we added a message dialogue box to the Cyberball game that allowed participants to observe players' conversations during the game. Dave (replacing Adam from prior studies) was the primary ostracizer, with Emily as the other player.

#### 5.1. Method

##### 5.1.1. Participants and design

Power analyses assuming effect sizes comparable to earlier studies indicated that our target sample of 450 (150 per condition) provides nearly 100 % power for an omnibus ANOVA effect, and 80 % sensitivity to follow-up contrast tests of effect sizes of  $d = 0.28$  or greater (alpha = 0.05, one-tailed). We aimed to recruit 500 participants to account for potential data loss.

Participants were recruited via Prolific for a U.S. nationally representative sample. Of 535 participants who started the survey, as pre-registered, 56 were excluded (36 did not complete the survey, 2 chose not to release their data, and 18 failed the attention check), resulting in a final sample of 479 participants (241 females,  $M_{age} = 45.73$ ,  $SD = 15.51$ ). Participants were randomly assigned to one of three conditions: Inclusion ( $n = 158$ ), Fair ostracism ( $n = 156$ ), or Unfair ostracism ( $n = 165$ ).

### 5.1.2. Materials and procedure

Participants observed a recorded Cyberball game including a dialogue box (see Fig. 3) between three players: Dave, Alex, and Emily. Dave was the ostracizer; Alex was the target, and Emily was the other player. After six initial ball passes, Dave initiated conversation about the game. The chat interaction varied by condition: In the inclusion condition, Alex responded, “This is good,” Emily said, “It’s fine,” and all players continued passing the ball equally throughout the game. In the fair ostracism condition, Alex responded with a gendered insult (“You guys are throwing the ball like a girl”), violating interaction norms of politeness and respectful behavior (Kerr & Levine, 2008). In response, Dave and Emily stopped passing the ball to Alex. In the unfair ostracism condition, despite Alex’s same positive response as in the inclusion condition (“This is good”), Dave and Emily subsequently excluded Alex from the game without provocation.

After watching the Cyberball video, participants read the same mishap scenarios used in all previous studies, with Dave as the target. We measured *schadenfreude* using the 10-item scale from Study 3 ( $\alpha = 0.95$ ). As manipulation checks, perceived deservingness was measured using the same scale from Study 3 ( $\alpha = 0.94$ ), and ostracism fairness was assessed by rating the perceived fairness of Dave and Emily’s treatment of Alex on a 7-point scale (1 = very unfair, 7 = very fair).

## 5.2. Results

### 5.2.1. Manipulation checks

To assess the effectiveness of our manipulations, we conducted one-way ANOVAs followed by Tukey post hoc tests for the perception of ostracism, perceived fairness of the ostracism’s situation, and the deservingness of ostracizer to receive negative consequences across the three conditions (inclusion, fair ostracism, and unfair ostracism).

**Perception of ostracism.** A one-way ANOVA on participants’ perception of ostracism (feelings of being ignored and excluded, averaged according to Williams, 2009) revealed a significant effect of inclusion status,  $F(2, 476) = 367.4, p < .001, \eta_p^2 = 0.61$ . Participants in the inclusion condition reported Alex was less ignored and excluded ( $M = 2.12, SD = 1.41$ ) compared to both fair ostracism ( $M = 5.88, SD = 1.42; p < .001, d = 2.64, 95\% \text{ CI } [2.33, 2.94]$ ) and unfair ostracism ( $M = 5.91, SD = 1.43; p < .001, d = -2.59, 95\% \text{ CI } [-2.29, -2.88]$ ). There was no significant difference between fair and unfair ostracism conditions ( $p = .980, d = -0.02, 95\% \text{ CI } [-0.24, 0.20]$ ), suggesting that participants perceived them equally ostracizing. Analysis of ball toss percentages further confirmed the manipulation’s effectiveness,  $F(2, 476) = 186, p < .001$ . Included participants reported a significantly higher percentage compared to both fair ostracism ( $M_{\text{diff}} = 19.36, p < .001$ ) and unfair ostracism conditions ( $M_{\text{diff}} = 20.49, p < .001$ ), while the two ostracism conditions did not differ ( $M_{\text{diff}} = -1.13, p = .610$ ).

**Perceived fairness of ostracism situation.** A one-way ANOVA on perceived fairness revealed a significant effect of inclusion status,  $F(2,$

$476) = 204.71, p < .001, \eta_p^2 = 0.46$ . Participants in the inclusion condition rated the situation as more fair ( $M = 5.56, SD = 1.31$ ) compared to both fair ostracism ( $M = 4.42, SD = 1.91; p < .001, d = -0.70, 95\% \text{ CI } [-0.93, -0.47]$ ) and unfair ostracism conditions ( $M = 2.01, SD = 1.57; p < .001, d = 2.45, 95\% \text{ CI } [2.16, 2.74]$ ). As expected, fair ostracism was rated as more fair than unfair ostracism ( $p < .001, d = 1.38, 95\% \text{ CI } [1.14, 1.63]$ ).

**Deservingness of ostracizer to receive negative consequences.** To assess how the fairness of ostracism influenced perceptions of the ostracizer’s (Dave) deservingness to receive negative consequences like punishment, we conducted a one-way ANOVA using the three-item deservingness scale ( $\alpha = 0.94$ ). The analysis revealed a significant effect of inclusion status,  $F(2, 476) = 33.88, p < .001, \eta_p^2 = 0.12$ . Participants in the unfair ostracism condition rated Dave as more deserving of negative consequences ( $M = 2.90, SD = 1.84$ ) than those in both the inclusion condition ( $M = 1.53, SD = 1.08; p < .001, d = -0.91, 95\% \text{ CI } [-1.14, -0.68]$ ), and the fair ostracism condition ( $M = 2.13, SD = 1.49; p < .001, d = -0.46, 95\% \text{ CI } [-0.68, -0.24]$ ). Additionally, those in the fair ostracism condition rated Dave as more deserving of negative consequences than those in the inclusion condition ( $p = .001, d = 0.46, 95\% \text{ CI } [0.24, 0.69]$ ). These results confirm that fairness perceptions significantly influence judgments of the ostracizer’s deservingness of punishment.

These results further support the effectiveness of our fairness manipulation, demonstrating that participants’ perceptions of the ostracizer’s deservingness varied in accordance with the intended fairness of the ostracism situation.

### 5.2.2. Schadenfreude

To test our primary hypothesis, we conducted a one-way between-subjects ANOVA examining the impact of experimental condition (inclusion, fair/justified ostracism, unfair ostracism) on *schadenfreude* levels. The analysis revealed a significant main effect of inclusion status on *schadenfreude*,  $F(2, 476) = 10.04, p < .001, \eta_p^2 = 0.04$ . (see Fig. 4).

As pre-registered, we tested two planned contrasts to examine our hypotheses. The contrast between inclusion and fair ostracism (two-tailed) was not significant,  $t(311.84) = -0.78, p = .447, d = -0.08, 95\% \text{ CI } [-0.31, 0.14]$ . As expected, participants in the inclusion condition ( $M = 2.24, SD = 0.11$ ) and the fair ostracism condition ( $M = 2.13, SD = 0.11$ ) reported similar levels of *schadenfreude*, suggesting that fair ostracism was perceived as comparable to inclusion in terms of fairness, leading to no increase in *schadenfreude*.

Consistent with our hypothesis, the contrast between unfair and fair ostracism was significant in the predicted direction,  $t(311.05) = -4.02, p_{\text{one-tailed}} < 0.001, d = -0.44, 95\% \text{ CI } [-0.66, -0.22]$ . Participants in the unfair ostracism condition reported higher *schadenfreude* ( $M = 2.77, SD = 0.11$ ) than those in the fair ostracism condition ( $M = 2.13, SD = 0.11$ ).

The omnibus ANOVA results indicate significant differences among

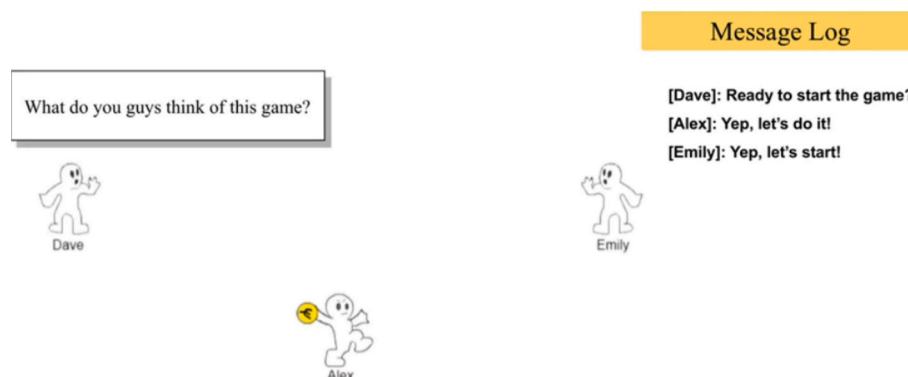


Fig. 3. Screenshot of the Cyberball game interface, including the gameplay and the message log between the players.

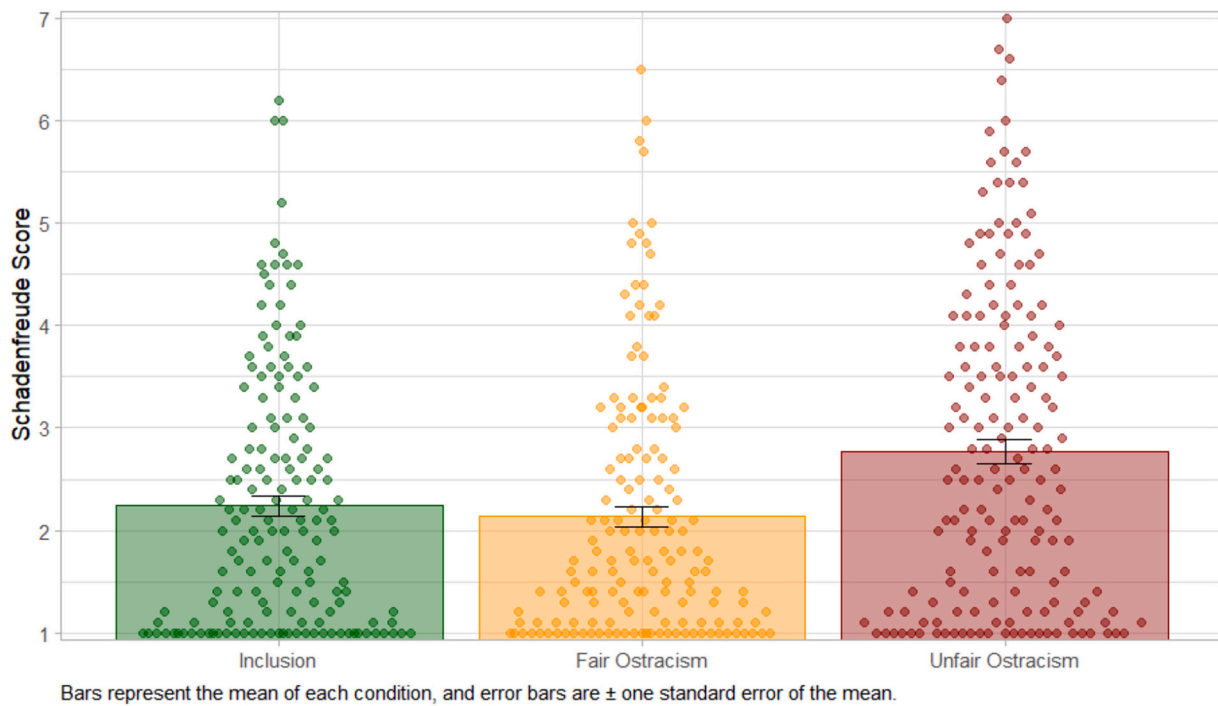


Fig. 4. Schadenfreude Scores by Inclusion Status.

the conditions, with the highest schadenfreude scores observed in the unfair ostracism condition. While our planned contrasts did not directly compare unfair ostracism to inclusion, the overall main effect suggests a difference between these conditions as well.

## 6. Additional analysis

### 6.1. Serial mediation analysis

To address whether perceived unfairness is caused by ostracism and whether the relationship among ostracism, perceived unfairness, ostracizer's deservingness of negative outcomes, and schadenfreude represents a sequential causal chain, we conducted an additional, unplanned, serial mediation analysis using PROCESS macro Model 6 (Hayes, 2022) with 5000 bootstrap samples and 95 % bias-corrected confidence intervals. This analysis examined the sequential chain: ostracism  $\rightarrow$  perceived unfairness  $\rightarrow$  ostracizer's deservingness of negative outcomes  $\rightarrow$  schadenfreude. The analysis included participants in the unfair ostracism condition ( $n = 165$ ) and inclusion condition ( $n = 158$ ), with unfair ostracism dummy coded (1 = unfair ostracism, 0 = inclusion).

The total effect of ostracism on schadenfreude was significant,  $b = 0.53$ ,  $SE = 0.16$ ,  $t(321) = 3.35$ ,  $p < .001$ . When both mediators were included in the model, the direct effect of ostracism on schadenfreude was not significant,  $b = 0.05$ ,  $SE = 0.21$ ,  $t(319) = 0.26$ ,  $p = .796$ , 95 % CI  $[-0.36, 0.48]$ , indicating complete mediation through the proposed sequential pathway.

The first stage of the serial mediation showed that ostracism significantly caused perceived unfairness ( $b = 3.55$ ,  $SE = 0.16$ ,  $p < .001$ , 95 % CI  $[3.23, 3.87]$ ), with the model explaining 60 % of the variance in perceived unfairness,  $R^2 = 0.60$ ,  $F(1,321) = 484.15$ ,  $p < .001$ .

In the second stage, perceived unfairness significantly predicted perceptions of the ostracizer's deservingness of negative outcomes while controlling for ostracism ( $b = 0.28$ ,  $SE = 0.05$ ,  $p < .001$ , 95 % CI  $[0.17, 0.39]$ ). Additionally, ostracism didn't predict perceptions of the ostracizer's deservingness while controlling for perceived unfairness of ostracism ( $b = 0.38$ ,  $SE = 0.25$ ,  $p = .141$ , 95 % CI  $[-0.13, 0.89]$ ).

In the final stage, perceived deservingness of the ostracizer

significantly predicted schadenfreude toward them while controlling for both ostracism and perceived unfairness ( $b = 0.50$ ,  $SE = 0.04$ ,  $p < .001$ , 95 % CI  $[0.41, 0.60]$ ). Additionally, perceived unfairness of the ostracism did not significantly predict schadenfreude toward ostracizer when controlling for the other variables ( $b = -0.06$ ,  $SE = 0.04$ ,  $p = .197$ , 95 % CI  $[-0.16, 0.03]$ ).

Most importantly for our hypothesis, the serial indirect effect through perceived unfairness and then perceived deservingness was significant ( $b = 0.50$ ,  $SE = 0.12$ , 95 % CI  $[0.28, 0.75]$ ). This finding is consistent with unfair ostracism initiating a sequential psychological process in which social exclusion leads to perceived unfairness, increasing ostracizer's deservingness of punishment and ultimately resulting in greater schadenfreude.

### 6.2. Discussion

Study 4 provides causal evidence that unfair ostracism elicits schadenfreude through a sequential pathway involving perceived unfairness and deservingness judgments. As predicted, participants experienced elevated schadenfreude toward the ostracizer only when ostracism was perceived as unfair; specifically, when it occurred without provocation. In contrast, when ostracism followed a norm-violating behavior by the target (e.g., a gendered insult), schadenfreude levels were comparable to those in the inclusion condition. The results clarify a key theoretical point: ostracism acts as an initiating event, but only when it is interpreted as unfair does it prompt deservingness judgments that ultimately lead to schadenfreude. This pathway was supported by the serial mediation analysis, which showed that unfair ostracism increased perceptions of unfairness, which in turn heightened judgments that the ostracizer deserved negative outcomes, ultimately leading to schadenfreude. Importantly, manipulation check results confirmed that both ostracism conditions involved the same exclusionary behavior in terms of ball-passing, yet only the unfair ostracism condition led participants to see the ostracizer as deserving of punishment. These findings clarify and build on the results of Studies 1–3, supporting the idea that the link between ostracism and schadenfreude depends on whether the exclusion is perceived as unfair, because it violates social norms about including

others.

## 7. General discussion

Ostracism, whether directly experienced or merely observed, presents individuals with a complex emotional challenge toward the ostracizer. Across four preregistered experiments, we demonstrate that ostracism elicits *schadenfreude* toward ostracizers, but only when they are perceived as deserving negative consequences for unfairly excluding someone.

Experiment 1 showed that ostracized participants experience targeted—not generalized—*schadenfreude* toward their ostracizers. Experiment 2 indicated that not only targets but also mere observers of unfair ostracism experience *schadenfreude* toward the ostracizer. Experiment 3 identified that this *schadenfreude* response, among both targets and observers, is statistically mediated by perceived deservingness, suggesting that individuals feel *schadenfreude* when they believe the ostracizer deserves negative consequences. Finally, Experiment 4 provided direct causal evidence for this mechanism by manipulating the fairness of ostracism. When ostracizers unfairly excluded well-behaved individuals, they were viewed as more deserving of negative consequences, and, in turn, elicited stronger *schadenfreude* than when they fairly excluded norm violators. This is consistent with a causal chain in which ostracism, when perceived as unfair, enhances deservingness judgments, ultimately triggering *schadenfreude*. Together, these findings reveal a previously unexplored consequence of ostracism: the emergence of *schadenfreude* as a moral emotion that serves as a psychological response to unfair social exclusion.

### 7.1. Theoretical implications

Our study contributes to the literature by showing that ostracism, a common experience in everyday life (Nezlek et al., 2012), can elicit not only empathy but also *schadenfreude*, a moral emotion that arises when people believe others are being justly punished or getting what they deserve. While previous research showed that observers often feel empathy for ostracized targets (Bernstein et al., 2018; Wessellmann et al., 2009), the current research introduces a distinct counter-empathic response: *schadenfreude* toward ostracizers. This shift in focus from the observer-target interaction to the observer-ostracizer relationship shows observers are not merely passive empathizers but active moral evaluators.

The findings offer causal evidence that reactions toward ostracizers are shaped by how fair their exclusionary behavior is perceived to be. This extends Rudert et al.'s (2020) work, which showed that while targets of ostracism are judged based on their behavior, ostracizers are evaluated based on the fairness of their exclusion. Perceptions of fairness are central to the experience of *schadenfreude* toward the ostracizer, and this can be better understood through the deservingness theory (i.e., people take satisfaction in others' misfortunes when they believe those outcomes are deserved). When negative actions (such as unfair exclusion) are followed by negative outcomes (misfortune), people experience satisfaction or pleasure because they may feel that "justice has been done" (Feather, 2006, p. 46). This process involves both distal and proximal causes. Specifically, perceived unfairness acts as the distal cause—a necessary precondition that creates the context for moral evaluation—while perceived deservingness functions as the proximal psychological mechanism that directly drives *schadenfreude*. In this framework, perceptions of unfairness set the stage for individuals to assess whether the ostracizer deserves negative consequences, and these deservingness judgments, in turn, give rise to *schadenfreude*. These justice-based emotional responses help to maintain a sense of moral balance in social interactions (Pietraszkiewicz & Wojciszke, 2014).

### 7.2. Practical implications

While various social situations can elicit perceived unfairness and subsequent *schadenfreude*, we focus on ostracism because it's a common and painful experience in everyday interactions that, when unprovoked, can activate fairness-based emotional responses. This is particularly relevant given that many real-world instances of ostracism often occurs without clear justification, as in our Cyberball paradigm, making ostracism a powerful context for examining the role of fairness perceptions in the emergence of *schadenfreude*.

Studies 1–3 established a clear connection between ostracism and *schadenfreude*. Using the Cyberball game, we created a situation in which participants were unfairly excluded—that is, left out without explanation despite expecting equal treatment (Wessellmann, Williams, & Hales, 2013; Wessellmann, Wirth, et al., 2013). Importantly, participants perceived this exclusion as unfair not because we labeled it as such, but because the lack of justification naturally violated their expectations of fair treatment (Arpin et al., 2017; Wessellmann, Williams, & Hales, 2013; Wessellmann, Wirth, et al., 2013). This perception reflects a violation of the social norm of inclusion, the shared belief that everyone should be included in social interactions (Rudert & Greifeneder, 2016). Study 4 empirically provided direct evidence that ostracism without justification was perceived as unfair, supporting our assumption from the earlier studies.

In such unclear situations, individuals tend to attribute exclusion to external factors related to the ostracizer, such as unfair biases or malicious intent, rather than to the excluded person (Peretz-Lange et al., 2024). These external attributions are consistent with prior work showing that observers typically assign responsibility to ostracizers in ambiguous contexts (Arpin et al., 2017). As a result, the ostracizer's actions may be seen as intentional or unjust, thereby increasing the likelihood of moral emotions such as *schadenfreude*. Although we did not directly assess this attributional reasoning, future research could explore this mechanism by measuring or manipulating participants' attributions for exclusion.

### 7.3. Individual and contextual factors

The experience of *schadenfreude* in response to perceived unfairness can vary depending on individual differences in justice-related characteristics. Future research should explore how such traits moderate the relationship between ostracism and *schadenfreude*. Justice motive theory suggests that people have a fundamental need to perceive the world as fair (Lerner & Lerner, 1980), and when this belief is threatened, individuals may be more likely to view others' misfortunes as deserved, which can, in turn, heighten feelings of *schadenfreude* (Pietraszkiewicz, 2013). More specifically, individuals who are high in justice sensitivity react strongly to unfair ostracism and experience moral outrage (Rudert & Speckert, 2023). As a result, these individuals may feel more *schadenfreude* toward ostracizers, seeing their misfortunes as a form of justified retribution.

Another factor that may influence *schadenfreude* is the observers' connection or identification with the ostracized person. People are especially sensitive to injustices that affect those with whom they share a meaningful identity. These situations feel more personally significant and are more likely to elicit emotional responses (Clayton, 2008; Clayton-Warner, 2001; Yzerbyt & Demoulin, 2010). When the excluded individual is seen as part of the observer's ingroup or as someone with a personal connection, the emotional stakes are higher, which can intensify *schadenfreude* toward the ostracizer. Future research could explore how social bonds and group identity shape the intensity of *schadenfreude* when someone we care about is unfairly excluded.

### 7.4. Limitations and future directions

While our findings suggest that *schadenfreude* can emerge in

response to unfair ostracism, several methodological considerations should be noted. First, we used Cyberball, which, though effective for experimental manipulation of ostracism, does not fully capture the emotional intensity and complexity of real-life social exclusion. Similarly, the mishap scenarios we used—such as finding hair in food or being targeted by a bird—were useful for our experimental purposes but may not reflect the full range or severity of real-world misfortunes. Future research could explore more naturalistic ostracism experiences and a broader range of mishap scenarios. Furthermore, while our studies focused on ostracism as the initiating context, other forms of perceived unfairness may similarly lead to schadenfreude. Future research could examine how different types of social injustices trigger this emotion through similar deservingness-based mechanisms.

Another important area for future research is how schadenfreude and other moral emotions differ between targets of ostracism and observers. Although Study 3 provided initial insights into this distinction, it lacked sufficient power for direct comparisons. Since targets and observers have different levels of involvement in the experience, their emotional reactions may also diverge. For example, targets may perceive exclusion more intensely due to egocentric biases and self-serving fairness judgments. Additionally, people tend to focus more on negative experiences than positive or neutral ones (Unkelbach et al., 2020), suggesting that those directly affected by ostracism may be more attuned to its negative aspects than distant observers.

### 7.5. Constraints on Generalizability

This research was conducted with U.S. participants, and thus our findings should be interpreted within this cultural context. Cross-cultural variability in both the ostracism experiences and schadenfreude reactions may affect the generalizability of these results. From an early age, cultural norms shape how individuals process and respond to social exclusion (Over & Uskul, 2016). Eastern and Western cultures differ in their emotional reactions to rejection—anger versus sadness—as well as in their perceptions of its fairness and inevitability (Kimmel et al., 2017). Similarly, cultural differences influence how people perceive justice (Morris & Leung, 2000) and react to others' misfortunes (Phillips et al., 2022), potentially affecting the relationship between fairness perceptions and schadenfreude. Expressions of schadenfreude may also depend on cultural communication styles; in cultures where direct confrontation is discouraged, schadenfreude may be less overt, while in those where confrontation is more acceptable, it may be more openly expressed. Additionally, language itself could play a role in shaping emotional responses, as terms like schadenfreude in German explicitly capture this emotion, potentially making them more socially recognized and acknowledged.

### 7.6. Conclusion

This research identifies schadenfreude as a moral emotional response to unfair ostracism, shaped by perceptions of deservingness. Across four experiments, we show that when exclusion lacks justification, both targets and observers judge ostracizers as deserving of negative consequences and respond with schadenfreude. These findings highlight the central role of fairness perceptions in how people evaluate exclusion and suggest that schadenfreude can serve as a psychological mechanism for processing unjust social exclusion. Understanding these emotional dynamics advances our knowledge of how people respond to and evaluate the morality of social exclusion.

### Open science practices

All studies were preregistered, and we provide detailed information on sample size determinations, exclusions, manipulations, and measures. Preregistrations, study materials, datasets, and analysis code are available on ResearchBox (<https://researchbox.org/3955>). Data were

analyzed using R version 4.4.2 (2024-10-31) with the tidyverse package (Wickham et al., 2019).

### Author note

All data, analysis code, and research materials used in this research have been made publicly available at ResearchBox (<https://researchbox.org/3955>). The studies were preregistered, and the preregistration documents are available at the same link.

### CRediT authorship contribution statement

**Sarah Mohammadi:** Writing – review & editing, Writing – original draft, Visualization, Validation, Resources, Project administration, Methodology, Formal analysis, Data curation, Conceptualization. **Andrew H. Hales:** Writing – review & editing, Validation, Supervision, Software, Resources, Project administration, Methodology, Formal analysis, Data curation, Conceptualization.

### Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the author(s) used [CHATGPT4.0] for text editing and proofreading. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

### Declaration of competing interest

The author(s) declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

### References

- Arpin, S. N., Froehlich, L., Lantian, A., Rudert, S. C., & Stelter, M. (2017). When “we” or “they” exclude others: Attributing and evaluating ostracism observed in in-groups and out-groups. *Comprehensive Results in Social Psychology*, 2(2–3), 143–165. <https://doi.org/10.1080/23743603.2017.1358477>
- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117(3), 497–529. <https://doi.org/10.1037/0033-2909.117.3.497>
- Beeny, J. E., Franklin, R. G., Jr., Levy, K. N., & Adams, R. B., Jr. (2011). I feel your pain: Emotional closeness modulates neural responses to empathically experienced rejection. *Social Neuroscience*, 6(4), 369–376. <https://doi.org/10.1080/17470919.2011.557245>
- Bernstein, M. J., Chen, Z., Poon, K. T., Benfield, J. A., & Ng, H. K. (2018). Ostracized but why? Effects of attributions and empathy on connecting with the socially excluded. *PLoS One*, 13(8), Article e0201183. <https://doi.org/10.1371/journal.pone.0201183>
- Bernstein, M. J., Neubauer, A. B., Benfield, J. A., Potter, L., & Smyth, J. M. (2021). Within-person effects of inclusion and exclusion on well-being in daily life. *Personal Relationships*, 28(4), 940–960. <https://doi.org/10.1111/per.12399>
- Brambilla, M., & Riva, P. (2017). Predicting pleasure at others' misfortune: Morality trumps sociability and competence in driving deservingness and schadenfreude. *Motivation and Emotion*, 41, 243–253. <https://doi.org/10.1007/s11031-016-9594-2>
- Clayton, S. (2008). *Attending to identities: Ideology, group memberships, and perceptions of justice*. Justice, 241–266. ISBN: 978-1-84855-104-6.
- Clay-Warner, J. (2001). Perceiving procedural injustice: The effects of group membership and status. *Social Psychology Quarterly*, 224–238. <https://doi.org/10.2307/3090113>
- Cusimano, C. J., Magar, S. T., & Malle, B. F. (2017, July). Judgment before emotion: People access moral evaluations faster than affective states. *Proceedings of the Annual Meeting of the Cognitive Science Society*, 39, 1848–1853. <https://escholarship.org/uc/item/76j7j4mm>.
- Decety, J., & Yoder, K. J. (2017). The emerging social neuroscience of justice motivation. *Trends in Cognitive Sciences*, 21(1), 6–14. <https://doi.org/10.1016/j.tics.2016.10.008>
- Ditrich, L., & Sassenberg, K. (2016). It's either you or me! Impact of deviations on social exclusion and leaving. *Group Processes & Intergroup Relations*, 19(5), 630–652. <https://doi.org/10.1177/1368430216638533>
- Eisenberger, N. I., Lieberman, M. D., & Williams, K. D. (2003). Does rejection hurt? An fMRI study of social exclusion. *Science*, 302(5643), 290–292. <https://doi.org/10.1126/science.1089134>
- Feather, N. T. (2006). Deservingness and emotions: Applying the structural model of deservingness to the analysis of affective reactions to outcomes. *European Review of Social Psychology*, 17(1), 38–73. <https://doi.org/10.1080/10463280600662321>

- Feather, N. T., & Nairn, K. (2005). Resentment, envy, schadenfreude, and sympathy: Effects of own and other's deserved or undeserved status. *Australian Journal of Psychology*, 57(2), 87–102. <https://doi.org/10.1080/00049530500048672>
- Feather, N. T., & Sherman, R. (2002). Envy, resentment, schadenfreude, and sympathy: Reactions to deserved and undeserved achievement and subsequent failure. *Personality and Social Psychology Bulletin*, 28(7), 953–961. <https://doi.org/10.1177/014616720202800708>
- Giesen, A., & Echterhoff, G. (2018). Do I really feel your pain? Comparing the effects of observed and personal ostracism. *Personality and Social Psychology Bulletin*, 44(4), 550–561. <https://doi.org/10.1177/0146167217744524>
- Gui, D. Y., Gan, T., & Liu, C. (2016). Neural evidence for moral intuition and the temporal dynamics of interactions between emotional processes and moral cognition. *Social Neuroscience*, 11(4), 380–394. <https://doi.org/10.1080/17470919.2015.1081401>
- Hales, A. H. (2024). One-tailed tests: Let's do this (responsibly). *Psychological Methods*, 29(6), 1209–1218. <https://doi.org/10.1037/met0000610>
- Hales, A. H., Kassner, M. P., Williams, K. D., & Graziano, W. G. (2016). Disagreeableness as a cause and consequence of ostracism. *Personality and Social Psychology Bulletin*, 42(6), 782–797. <https://doi.org/10.1177/0146167216643933>
- Hales, A. H., & Williams, K. D. (2021). Social ostracism: Theoretical foundations and basic principles. In P. A. M. Van Lange, E. T. Higgins, & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (3rd ed., pp. 337–349). The Guilford Press.
- Hareli, S., & Weiner, B. (2002). Dislike and envy as antecedents of pleasure at another's misfortune. *Motivation and Emotion*, 26, 257–277. <https://doi.org/10.1023/A:1022818803399>
- Hayes, A. F. (2022). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (3rd ed.). The Guilford Press.
- Hershcovis, M. S., & Bhatnagar, N. (2017). When fellow customers behave badly: Witness reactions to employee mistreatment by customers. *Journal of Applied Psychology*, 102(11), 1528.
- Kerr, N. L., & Levine, J. M. (2008). The detection of social exclusion: Evolution and beyond. *Group Dynamics: Theory, Research, and Practice*, 12(1), 39. <https://doi.org/10.1037/1089-2699.12.1.39>
- Kimel, S. Y., Mischkowski, D., Kitayama, S., & Uchida, Y. (2017). Culture, emotions, and the cold shoulder: Cultural differences in the anger and sadness response to ostracism. *Journal of Cross-Cultural Psychology*, 48(9), 1307–1319. <https://doi.org/10.1177/0022022117724900>
- Kline, R. B. (2015). The mediation myth. *Basic and Applied Social Psychology*, 37(4), 202–213. <https://doi.org/10.1080/01973533.2015.1049349>
- Lakens, D., & Caldwell, A. R. (2021). Simulation-based power analysis for factorial analysis of variance designs. *Advances in Methods and Practices in Psychological Science*, 4(1). <https://doi.org/10.1177/2515245920951503>, 2515245920951503.
- Lerner, M. J., & Lerner, M. J. (1980). *The belief in a just world* (pp. 9–30). Springer US. [https://doi.org/10.1007/978-1-4899-0448-5\\_2](https://doi.org/10.1007/978-1-4899-0448-5_2)
- Lovakov, A., & Agadullina, E. R. (2021). Empirically derived guidelines for effect size interpretation in social psychology. *European Journal of Social Psychology*, 51(3), 485–504. <https://doi.org/10.1002/ejsp.2752>
- Marinucci, M., Pagliaro, S., Teresi, M., Ballone, C., & Riva, P. (2025). How low can you still go? Observing an ostracized robot is sufficient to hurt humans' feelings. *Group Processes & Intergroup Relations*, 0(0). <https://doi.org/10.1177/13684302241309578>
- Masten, C. L., Morelli, S. A., & Eisenberger, N. I. (2011). An fMRI investigation of empathy for 'social pain' and subsequent prosocial behavior. *Neuroimage*, 55(1), 381–388. <https://doi.org/10.1016/j.neuroimage.2010.11.060>
- Messick, D. M., & Sentic, K. P. (1979). Fairness and preference. *Journal of Experimental Social Psychology*, 15(4), 418–434. [https://doi.org/10.1016/0022-1031\(79\)90047-7](https://doi.org/10.1016/0022-1031(79)90047-7)
- Mikula, G., Scherer, K. R., & Athenstaedt, U. (1998). The role of injustice in the elicitation of differential emotional reactions. *Personality and Social Psychology Bulletin*, 24(7), 769–783. <https://doi.org/10.1177/0146167298247009>
- Morris, M., & Leung, K. (2000). Justice for all? Progress in research on cultural variation in the psychology of distributive and procedural justice. *Applied Psychology*, 49(1), 100–132. <https://doi.org/10.1111/1464-0597.00007>
- Nezlek, J. B., Wesselmann, E. D., Wheeler, L., & Williams, K. D. (2012). Ostracism in everyday life. *Group Dynamics: Theory, Research, and Practice*, 16(2), 91. <https://doi.org/10.1037/a0028029>
- Over, H., & Uskul, A. K. (2016). Culture moderates children's responses to ostracism situations. *Journal of Personality and Social Psychology*, 110(5), 710. <https://doi.org/10.1037/pspi0000050>
- Peretz-Lange, R., Gonzalez, G. D., & Hess, Y. D. (2024). My circumstances, their circumstances: An actor-observer distinction in the consequences of external attributions. *Social and Personality Psychology Compass*, 18(8), Article e12993. <https://doi.org/10.1111/spc3.12993>
- Phillips, J. G., Landhuis, C. E., Wood, J. K., & Wang, Y. (2022). High achievers, Schadenfreude and Gluckschmerz in New Zealanders and Chinese. *PsyCh Journal*, 11(6), 873–884. <https://doi.org/10.1002/pchj.582>
- Pietraszkiewicz, A. (2013). Schadenfreude and just world belief. *Australian Journal of Psychology*, 65(3), 188–194. <https://doi.org/10.1111/ajpy.12020>
- Pietraszkiewicz, A., & Wojciszke, B. (2014). Joy, schadenfreude, sorrow, and resentment as responses restoring balance in cognitive units. *Social Psychology*. <https://doi.org/10.1027/1864-9335/a000174>
- Rodríguez-Gómez, P., Martín-Loeches, M., Colmenares, F., Romero Ferreiro, M. V., & Moreno, E. M. (2020). He had it comin': ERPs reveal a facilitation for the processing of misfortunes to antisocial characters. *Cognitive, Affective, & Behavioral Neuroscience*, 20, 356–370. <https://doi.org/10.3758/s13415-020-00773-w>
- Rudert, S. C., & Greifeneder, R. (2016). When it's okay that I don't play: Social norms and the situated construal of social exclusion. *Personality and Social Psychology Bulletin*, 42(7), 955–969. <https://doi.org/10.1177/0146167216649606>
- Rudert, S. C., & Greifeneder, R. (2019). Observing ostracism: How observers interpret and respond to ostracism situations. In *Current directions in ostracism, social exclusion and rejection research* (pp. 136–154). Routledge (ISBN: 9781351255912).
- Rudert, S. C., Hales, A. H., & Büttner, C. M. (2021). Stay out of our office (vs. our pub): Target personality and situational context affect ostracism intentions. *Journal of Experimental Social Psychology*, 95, Article 104142. <https://doi.org/10.1016/j.jesp.2021.104142>
- Rudert, S. C., Möring, J. N., Kenntemich, C., & Büttner, C. M. (2023). When and why we ostracize others: Motivated social exclusion in group contexts. *Journal of Personality and Social Psychology*. <https://doi.org/10.1037/pspi0000423>
- Rudert, S. C., Ruf, S., & Greifeneder, R. (2020). Whom to punish? How observers sanction norm-violating behavior in ostracism situations. *European Journal of Social Psychology*, 50(2), 376–391. <https://doi.org/10.1002/ejsp.2606>
- Rudert, S. C., & Speckert, K. (2023). You shouldn't have shut them out: Justice sensitivity and norm adherence affect moral reactions to observed ostracism. *Personality and Individual Differences*, 201, Article 111929. <https://doi.org/10.1016/j.paid.2022.111929>
- Rudert, S. C., Sutter, D., Corrodi, V. C., & Greifeneder, R. (2018). Who's to blame? Dissimilarity as a cue in moral judgments of observed ostracism episodes. *Journal of Personality and Social Psychology*, 115(1), 31. <https://doi.org/10.1037/pspa0000122>
- Schulz, K., Rudolph, A., Tscharaktschiew, N., & Rudolph, U. (2013). Daniel has fallen into a muddy puddle—schadenfreude or sympathy? *British Journal of Developmental Psychology*, 31(4), 363–378. <https://doi.org/10.1111/bjdp.12013>
- Singer, T., Seymour, B., O'Doherty, J. P., Stephan, K. E., Dolan, R. J., & Frith, C. D. (2006). Empathic neural responses are modulated by the perceived fairness of others. *Nature*, 439(7075), 466–469. <https://doi.org/10.1038/nature04271>
- Smith, R. H., Powell, C. A., Combs, D. J., & Schurtz, D. R. (2009). Exploring the when and why of schadenfreude. *Social and Personality Psychology Compass*, 3(4), 530–546. <https://doi.org/10.1111/j.1751-9004.2009.00181.x>
- Smith, R. H., Turner, T. J., Garonzik, R., Leach, C. W., Urch-Druskat, V., & Weston, C. M. (1996). Envy and schadenfreude. *Personality and Social Psychology Bulletin*, 22(2), 158–168. <https://doi.org/10.1177/0146167296222005>
- Spoor, J. R., & Williams, K. D. (2011). The evolution of an ostracism detection system. In *Evolution and the social mind* (pp. 279–292). Psychology Press. ISBN: 9780203837788.
- Thompson, L., & Loewenstein, G. (1992). Egocentric interpretations of fairness and interpersonal conflict. *Organizational Behavior and Human Decision Processes*, 51(2), 176–197. [https://doi.org/10.1016/0749-5978\(92\)90010-5](https://doi.org/10.1016/0749-5978(92)90010-5)
- 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(6), 1058. <https://doi.org/10.1037/0022-3514.81.6.1058>
- Unkelbach, C., Alves, H., & Koch, A. (2020). Negativity bias, positivity bias, and valence asymmetries: Explaining the differential processing of positive and negative information. In , Vol. 62. *Advances in experimental social psychology* (pp. 115–187). Academic Press. <https://doi.org/10.1016/b.s.aesp.2020.04.005>
- Van Dijk, W., Ouwerkerk, J., Goslinga, S., & Nieweg, M. (2005). Deservingness and schadenfreude. *Cognition and Emotion*, 19(6), 933–939. <https://doi.org/10.1080/02699930541000066>
- Van Dijk, W. W., Ouwerkerk, J. W., Goslinga, S., Nieweg, M., & Gallucci, M. (2006). When people fall from grace: Reconsidering the role of envy in schadenfreude. *Emotion*, 6(1), 156. <https://doi.org/10.1037/1528-3542.6.1.15>
- Van Dijk, W. W., Ouwerkerk, J. W., Smith, R. H., & Cikara, M. (2017). The role of self-evaluation and envy in schadenfreude. *European Review of Social Psychology*, 26, 247–282 (Routledge. ISBN9781315094250).
- Van Dijk, W. W., van Koningsbruggen, G. M., Ouwerkerk, J. W., & Wesseling, Y. M. (2011). Self-esteem, self-affirmation, and schadenfreude. *Emotion*, 11(6), 1445. <https://doi.org/10.1037/a0026331>
- Wang, S., Lilienfeld, S. O., & Roehat, P. (2019). Schadenfreude deconstructed and reconstructed: A tripartite motivational model. *New Ideas in Psychology*, 52, 1–11. <https://doi.org/10.1016/j.newideapsych.2018.09.002>
- Weiss, H. M., Suckow, K., & Cropanzano, R. (1999). Effects of justice conditions on discrete emotions. *Journal of Applied Psychology*, 84(5), 786.
- Wesselmann, E. D., Bagg, D., & Williams, K. D. (2009). "I feel your pain": The effects of observing ostracism on the ostracism detection system. *Journal of Experimental Social Psychology*, 45(6), 1308–1311. <https://doi.org/10.1016/j.jesp.2009.08.003>
- Wesselmann, E. D., Williams, K. D., & Hales, A. H. (2013). Vicarious ostracism. *Frontiers in Human Neuroscience*, 7, 153. <https://doi.org/10.3389/fnhum.2013.00153>
- 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(1), 108–115. <https://doi.org/10.1177/1948550612443386>
- Wickham, H., Averick, M., Bryan, J., Chang, W., McGowan, L. D. A., François, R., & Yutani, H. (2019). Welcome to the Tidyverse. *Journal of Open Source Software*, 4(43), 1686. <https://doi.org/10.21105/joss.01686>
- Will, G. J., Crone, E. A., & Güroğlu, B. (2015). Acting on social exclusion: Neural correlates of punishment and forgiveness of excluders. *Social Cognitive and Affective Neuroscience*, 10(2), 209–218. <https://doi.org/10.1093/scan/nsu045>
- Will, G. J., Crone, E. A., van den Bos, W., & Güroğlu, B. (2013). Acting on observed social exclusion: Developmental perspectives on punishment of excluders and compensation of victims. *Developmental Psychology*, 49(12), 2236. <https://doi.org/10.1037/a0032299>
- Williams, K. D. (2007). Ostracism. *Annual Review of Psychology*, 58(1), 425–452. <https://doi.org/10.1146/annurev.psych.58.110405.085641>

- Williams, K. D. (2009). Ostracism: A temporal need-threat model. *Advances in Experimental Social Psychology*, 41, 275–314. [https://doi.org/10.1016/S0065-2601\(08\)00406-1](https://doi.org/10.1016/S0065-2601(08)00406-1)
- Yaakobi, E. (2021). Avoidant individuals are more affected by ostracism attribution. *Journal of Research in Personality*, 96, Article 104184. <https://doi.org/10.1016/j.jrp.2021.104184>
- Yzerbyt, V., & Demoulin, S. (2010). Intergroup relations. In , 2. *Handbook of social psychology* (pp. 1024–1083).
- Zou, Y., Wang, Y., Yang, X., & Jiang, R. (2022). Observed ostracism and compensatory behavior: A moderated mediation model of empathy and observer justice sensitivity. *Personality and Individual Differences*, 198, Article 111829. <https://doi.org/10.1016/j.paid.2022.111829>