

**Ostracism in Everyday Life:  
A Framework of Threat and Behavioral Responses in Real Life**

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### Abstract

Ostracism – being ignored and excluded – is part of many individuals' daily lives. Yet, ostracism is often studied in laboratory settings and rarely in natural settings. Here, we report one of the first investigations into ostracism in everyday life by documenting how often and where ostracism occurs; who the sources of ostracism are; and how ostracism affects targets' feelings and behaviors. Two experience sampling studies using event-contingent ( $N = 323$ ,  $k = 1107$  ostracism experiences in 14 days) and time-signaling sampling approaches ( $N = 272$ ,  $k = 7943$  assessments including 767 ostracism experiences in 7 days) show that ostracism is an aversive experience that takes place in a range of contexts and relationships, as often as 2-3 times per week on average. Reconciling previously mixed findings regarding ostracism's effects on behavior and extending existing theory, we propose a novel framework of behavioral reactions based on need threat levels: When psychological needs are severely threatened, individuals react to everyday ostracism with avoidance (i.e., withdrawal) and antisocial inclinations (i.e., they exhibit significantly stronger antisocial intentions, although they do not engage in antisocial behavior more frequently). Conversely, when psychological needs are threatened to a lesser extent, individuals are more likely to adopt approach behaviors (i.e., prosocial behavior, talking to others, or connecting with them on social media). Our findings considerably extend present theorizing in ostracism research as they allow to understand when and how individuals experience everyday ostracism and how behavioral reactions after ostracism form in real life.

*Keywords:* social exclusion; ostracism; experience sampling; need threat; real-life behavior

Ostracism, the painful experience of being excluded and ignored (e.g., Williams, 2009), may have serious consequences in individuals' everyday lives. Being ostracized has been linked to lower well-being, poorer school performance, deviant workplace behavior, reduced productivity, and being at risk for burnout, mental illness, and suicidal ideation (e.g., Chen et al., 2020; Hawes et al., 2012; Howard et al., 2020; Qian et al., 2019; Rudert, Janke, & Greifeneder, 2021; Williams & Sommer, 1997). So far, ostracism research has been largely confined to laboratory and survey studies. This is problematic because survey designs are likely subject to memory and recall biases, and laboratory experiments do not capture people's experiences in naturalistic settings. Moreover, previous research has generally not investigated real-life behavior subsequent to ostracism episodes, leaving the field largely agnostic about which behaviors follow ostracism, and under which circumstances. Experience sampling<sup>1</sup>, where participants report ostracism experiences, emotions, and behaviors as they happen in their everyday life using smartphones, is a powerful way to mend this gap.

The present contribution utilizes experience sampling in an event-contingent and time-contingent way to address four fundamental questions regarding the experience of ostracism in daily life: (1) How frequent is everyday ostracism and who ostracizes in which contexts? (2) Does ostracism threaten psychological needs in everyday life? (3) How do individuals behave subsequent to being ostracized in real life? (4) How does the threat of fundamental needs relate to behavior after being ostracized?

The first three questions take a more descriptive approach to understanding ostracism as a phenomenon in real life; such research allows to build ground for further theorizing and intervention. For the fourth question, we suggest a novel theoretical framework, distinguishing behavioral reactions into approach, avoidance, and antisocial reactions, and their distinct

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<sup>1</sup> Many terms are used interchangeably to describe this method, such as ambulatory assessment, ecological momentary assessment, or real-time data capture (cf. Trull & Ebner-Priemer, 2013). In this contribution, we use experience sampling as an umbrella term to describe the sampling of ostracism experiences, both event- and time-contingently.

association with threats to fundamental needs. The following sections provide further detail and background to each question.

### **How frequent is everyday ostracism?**

Ostracism research has been largely dominated by laboratory studies (e.g., Hartgerink et al., 2015) that are not well suited for examining how often individuals experience ostracism in daily life. Survey studies provide a remedy and generally find that ostracism is a ubiquitous human experience that almost every human encounters in their life (e.g., Faulkner et al., 1997; Robinson et al., 2013; Rudert, Keller et al., 2020; Saylor et al., 2012). Participants generally report relatively low frequency of ostracism in surveys, although only few participants report never feeling ostracized during the last two months (e.g., Rudert, Janke, & Greifeneder, 2021; Rudert, Keller, et al. 2020, Study 6). However, these reports may be subject to recall biases and participants may selectively sample those ostracism experiences from memory that felt particularly severe to them. Studies using daily diaries paint a more nuanced, but also less coherent picture. For example, Nezelek et al. (2012) estimated that ostracism occurred once a day per participant on average, using event-contingent diary reports (i.e., reporting experiences as soon as they occurred). Other diary studies did not assess frequency directly, but the extent to which individuals feel ostracized at the end of a day. Interestingly, such studies allow for the conclusion that ostracism might be less frequent in daily life. For example, one study observed low levels of everyday ostracism feelings in college students using items such as “Today, people in my chapter treated me as if I was invisible” ( $M = 1.25$ , assessed on a scale from 1 = *completely disagree* to 4 = *completely agree*, Legate et al., 2021). Another study assessed daily feelings of being ostracized via text messages and also allows for the conclusion that ostracism feelings are not frequent in everyday life ( $M = 1.50$ , 1 = *never* to 7 = *very often*; Lutz, 2022). While one may argue that the inconsistency in findings is likely a function of the different items used across

studies, the best way forward appears to gather evidence that allows for a more conclusive answer.

More recent technological developments afford to obtain estimates of ostracism prevalence using experience sampling techniques. These techniques allow to assess participants' thoughts, feelings, and behavior as they happen in real life, for instance, using smartphones (e.g., Trull & Ebner-Priemer, 2013). One specific experience sampling technique are *time-contingent* approaches where participants are alerted at pre-defined time points, asking whether they experienced ostracism in a social interaction since the last time that they had been alerted, or how they feel right now (Bernstein et al., 2021; Pancani et al., 2023). Bernstein et al. (2021) found that participants felt ostracized in approximately 10% of their recent social interactions. However, social cognitive effects of ostracism are extremely time-sensitive (Williams, 2009), and especially the *reflexive* (i.e., immediate) effects of ostracism on psychological need threat may be as short-lived as a few minutes or less (e.g., Büttner et al., 2021; Williams, 2009). Even with multiple assessments per day, ostracism experiences may happen hours before the assessment, risking mis- or under-reporting. In the case of daily diary studies, time from the actual experience until the assessment could be from the start of the day to the end of the day. Moreover, minor incidents of ostracism, such as being ignored in an elevator, or by a bystander, may be forgotten after a few minutes, even though they may have strong momentary impact (e.g., Wesselmann et al., 2012; Zuckerman et al., 1983). Thus, the time-contingent approach risks systematic reporting biases when ostracism incidents and experiences are assessed several hours after ostracism occurred.

A complementing experience sampling technique are *event-contingent* approaches where individuals are instructed to report experiences as soon as they occur in their daily life, that is, individuals control when they respond to the provided questionnaires. So far, to our knowledge,

there are no ostracism studies that rely on event-contingent experience sampling using smartphones.

### **Who ostracizes in which contexts?**

Aside from questions regarding frequency, questions about who ostracizes and in which contexts ostracism occurs have not been comprehensively addressed. Survey, diary, and interview studies suggest that ostracism can occur in many contexts and may originate from many different sources, with strangers (Nezlek et al., 2012) but also romantic partners being a particularly common source (Zadro et al., 2008). In addition, the workplace has been argued to be a frequent source of ostracism, especially as a form of social punishment that is more acceptable and less easy to sanction than other forms of discrimination (Robinson et al., 2013; Rudert, Janke, & Greifeneder, 2020). However, previous diary studies did not differentiate the workplace as a context of ostracism (see e.g., Nezlek et al., 2012), focussed on one context exclusively (e.g., text message ostracism, Lutz, 2022), or did not assess contexts of experienced ostracism at all (e.g., Legate et al., 2021). Moreover, survey, diary, and interview studies might have also been subject to recall biases where individuals may sample from memory the most hurtful experiences of ostracism. As a consequence, unexpected or particularly unfair episodes of ostracism may be over-represented compared to rather expected or more mundane instances of ostracism. Recall biases may thus influence which sources and contexts of ostracism are remembered most often. For instance, being ostracized by one's partner for an extended period of time might be more memorable than being ignored by someone in an elevator or by a service person at a restaurant (e.g., Nezlek et al., 2012; Williams, 2009; Zadro et al., 2008; Zuckerman et al., 1983), even though all three experiences may momentarily lower need satisfaction and may be associated with specific behavioral consequences. Hence, the questions of who the sources and what the contexts of ostracism in daily life are, remain largely unanswered so far.

**Does ostracism threaten psychological needs in everyday life?**

According to the Temporal Need Threat Model of Ostracism (Williams, 2009), ostracism threatens fundamental psychological needs, specifically, the need to belong, the need to maintain high self-esteem, the need for control over one's psychological environment, and the need to lead a meaningful existence. The consequences of being ostracized unfold in a temporal sequence where, in the *reflexive* stage, the initial response to ostracism is a strong threat to the four psychological needs. Followed by that, in the *reflective* stage, needs recover (e.g., Eck et al., 2016; Williams, 2009). Eventually, when ostracism becomes chronic, individuals may enter the so-called *resignation* stage (e.g., Riva et al., 2016; Williams, 2009).

Hundreds of lab studies have corroborated that ostracism threatens fundamental needs (e.g., Gerber & Wheeler, 2009; Hartgerink et al., 2015). In the lab, ostracism is generally inflicted by strangers (e.g., Gerber & Wheeler, 2009; Hartgerink et al., 2015), and reflexive reactions have been shown to be short-lived, but emotionally powerful (e.g., Büttner et al., 2021; Büttner, Jauch, et al., 2024; Williams, 2009). While laboratory settings are particularly well suited to advance our knowledge on the social cognitive underpinnings of ostracism, they likely cannot be translated 1:1 to being ostracized in real life, possibly by close others such as family or friends.

Previous studies document large effects of ostracism on psychological needs in time-contingent reports (e.g., Bernstein et al., 2021; Lutz, 2022). As an advantage, time-contingent experience sampling approaches allow to compare need threat levels after ostracism experiences with situations during which no ostracism occurred. However, because previous surveys relied on retrospective reports, it is not evident that they reflect the in situ reflexive experiences. One way of solving this is to assess need threat following ostracism *event-contingently*, to gain insights on reflexive effects of ostracism in everyday life at the time they occur.

Event-contingent sampling affords further advantages. Laboratory research subjects all individuals to the same objective situation, for instance, a game of ball toss during which



participants are excluded after receiving only two throws (see Williams et al., 2000; Williams & Jarvis, 2006). In real life, however, individuals may experience a range of different ostracism episodes. Event-contingent assessments of ostracism and need threat provide the means to test whether these diverse experiences elicit the same strong threat to psychological needs as highly-controlled experimental manipulations.

### **How do individuals behave subsequent to being ostracized in real life?**

How individuals behave subsequent to being ostracized has been researched for over 25 years (e.g., Williams, 2009; Williams & Sommer, 1997). Laboratory research has identified several behavioral responses that individuals engage in after being ostracized: Broadly speaking, individuals may behave in a prosocial way to seek reconnection (e.g., Balliet & Ferris, 2013), or in an antisocial way to punish or provoke acknowledgment from others in order to regain a sense of control (e.g., Jauch et al., 2022; Ren et al., 2018), or they may withdraw from others to protect themselves from future experiences of ostracism (e.g., Ren et al., 2016, 2020). Recent research identified behavioral alternatives that extend prosocial behavior: Seeking reconnection by talking to others (e.g., Meral et al., 2021) and seeking reconnection on social media (e.g., Lutz et al., 2022).

However, so far, research has not identified how individuals behave after being ostracized *in real life*, where other behavioral alternatives are available than those predefined by researchers. Moreover, previous investigations have rarely looked at different behavioral alternatives within the same study context (e.g., Carter-Sowell et al., 2008; Warburton et al., 2006), thus offering no conclusions on how individuals decide between different behavioral alternatives. Finally, lab studies often create situations that are inconsequential for the participant. For instance, studies offer participants to act in a certain way, for instance, antisocially, without having to fear any consequences for themselves (e.g., giving hot sauce to someone who doesn't like hot sauce, but doing so anonymously, Warburton et al., 2006). In real life, however, aggressing toward others

has consequences and may even invite subsequent ostracism as a punishment for breaking social norms (e.g., Ren et al., 2018; Rudert et al., 2023).

To summarize, to our knowledge, there are no studies investigating different behaviors associated with ostracism in real life. Therefore, we consider it high time to assess different behavioral alternatives as a response to ostracism, in real life, where behavior has real consequences and a range of behavioral alternatives is available.

### **How does need threat relate to behavior after being ostracized in real life?**

But which behavioral response(s) will ostracized targets choose in real life where different alternatives are available to them? Here, we put forth a novel framework, conceptualizing need threat following ostracism as a key determinant of targets' behavioral responses. We detail how need threat is linked with approach, avoidance, or antisocial behavioral responses below.

**Approach behavior.** After ostracism, behaviors such as seeking social connection or cognitive reappraisal may be broadly categorized as approach-oriented, either behaviorally, or cognitively (e.g., Riva, 2016). According to the threat and defense model (Jonas et al., 2014), approach is the response to more distal, less intense psychological threats. This is attributed to a reflexive neural activation of approach reactions that is more distal and therefore suitable to deal with less intense threats (Jonas et al., 2014). Based on these tenets, we propose that the more psychological needs are threatened subsequent to being ostracized, the less likely individuals exhibit approach behaviors (i.e., need threat is negatively associated with approach behaviors). We conceptualize prosocial behavior, talking with others, and using social media as approach behaviors because these behaviors generally aim to facilitate social connection (e.g., Lutz et al., 2022; Maner et al., 2007; Meral et al., 2021). Importantly, we here conceptualize reaffiliation-motivated behaviors that aim to restore individuals' inclusion status as approach behaviors, even if those behaviors may lead to antisocial outcomes in the long term, for example, when ostracized

individuals approach extreme or radicalized groups and act antisocially on their behalf in the future (e.g., Hales & Williams, 2018; Pfundmair et al., 2022).

**Avoidance behavior.** Following ostracism, individuals may withdraw from others to protect themselves from further social pain (e.g., Ren et al., 2016, 2020). In addition to social withdrawal, alcohol and drug use, as well as cognitive distraction may also be categorized as avoidance-oriented coping (e.g., Riva, 2016). Again drawing on the threat and defense model (Jonas et al., 2014), avoidance is the dominant response to intense psychological threats based on the reflexive neural activation of anxiety and avoidance after intense threats. Therefore, we propose that the stronger psychological needs are threatened after being ostracized, the more likely individuals show avoidance behaviors (i.e., need threat is positively associated with withdrawal).

**Antisocial behavior.** Antisocial behavior is common after ostracism and may be aimed at punishing the sources or provoking acknowledgment from others to regain control (e.g., Jauch et al., 2022; Ren et al., 2018). Individuals may be especially prone to antisocial reactions and anger when they experience high levels of pain (Berkowitz, 1993). Put differently, when ostracized targets experience strong social pain related to severe need threat, they are more likely to show antisocial behavior (e.g., Ren et al., 2018; Riva, 2016). Therefore, we propose that the stronger psychological needs are threatened after being ostracized, the more individuals show antisocial behaviors (i.e., need threat is positively associated with antisocial behaviors).

Our suggested framework matches ideas of the multi-motive model of rejection (Smart Richman & Leary, 2009) that predicts behavioral reactions to rejection, discrimination, and ostracism based on different construals of the situation. One such construal, for instance, is how unfair ostracism is perceived (Smart Richman & Leary, 2009). Perceptions of ostracism as unfair are known to elicit stronger anger and, as a result, stronger antisocial reactions (Chow et al., 2008). Relatedly, experiences of ostracism that cause stronger negative emotions are associated

with higher intentions to leave the respective context, an avoidance reaction (Sarfraz et al., 2023). Another construal within the multi-motive model is the expectation of relational repair (Smart Richman & Leary, 2009). That is, ostracism experiences that constitute strong psychological threats may destroy the hope for reconnecting with others (Smart Richman & Leary, 2009), which in turn decreases approach behavior (Cuadrado et al., 2015). In line with arguments from the multi-motive model of rejection (Smart Richman & Leary, 2009), we thus argue that ostracism experiences that elicit higher need threat generally elicit stronger avoidance and antisocial responses compared to approach responses.

Relatedly, it has been argued that exclusion manipulations that constitute severe threats, such as being told that one will likely live one's life alone based on a personality test (i.e., the Future Life Alone paradigm, Twenge et al., 2002), may be accompanied by avoidance and antisocial behavior rather than approach reactions (Bernstein & Claypool, 2012). For instance, after being told that one is likely to live one's life alone, participants behaved less pro-socially (i.e., less approach behavior): they donated less money, volunteered less, and helped others less (Twenge et al., 2007). Consistent with our argument, however, the pattern is different if the threat is less severe. For instance, after playing Cyberball, a brief induction of ostracism that elicits strong need threat, that, yet, fades relatively quickly (e.g., Hartgerink et al., 2015), participants were willing to donate more money (Carter-Sowell et al., 2008), and help more with a collective task (Williams & Sommer, 1997), that is, they showed more approach behavior. The here-suggested framework is thus fit to accommodate findings that appeared to be contradictory so far. In particular, contradictory findings may be explained by differences in threat level elicited by the manipulations, causing individuals to avoid or aggress (severe threat) versus approach (less severe threat).

The existing evidence mainly relied on situationally induced threats. The here suggested framework also affords accommodating that dispositional differences in threat perception may

modulate the effect of ostracism situations. For instance, after being told that someone did not want to work with them, participants low in fear of negative evaluation—but not participants high in fear of negative evaluation—assigned more financial reward to other participants (Studies 5 & 6, Maner et al., 2007). This may be explained as a differential threat response: Participants low in fear of negative evaluation likely felt less threatened by rejection which allowed them to behave in a prosocial, approaching, way.

Finally, it is noteworthy that previous theorizing distinguished two clusters of needs that are typically threatened by ostracism: The inclusionary need cluster, comprising the need to belong and the need for self-esteem, and the power and provocation cluster, comprising the need for control and the need for meaningful existence (Williams, 2009). As theorized based on this distinction, prosocial behavior would be particularly fit to restore inclusionary needs, while antisocial behavior should be especially efficient in restoring needs of the power and provocation cluster. Thus, a following prediction would be, for instance, that stronger threats to inclusionary needs are more likely followed by prosocial behavior, while stronger threats to power and provocation needs should be more likely followed by antisocial behavior. However, previous laboratory research finds very high intercorrelations of the four needs (e.g., Carter-Sowell et al., 2008; Rudert & Greifeneder, 2016; van Beest & Williams, 2006). Moreover, recent experimental findings linking the threat of specific needs (i.e., control) to behavioral inclinations such as intentions to join extreme groups, are mixed (e.g., Hales & Williams, 2018; Pfundmair, 2019). Thus, it seems that, at least in experimental research, differential need threat to specific needs is not an ideal explanation for different behavioral responses subsequent to ostracism. Based on the reviewed evidence, our proposed model therefore relies on overall need threat as a predictor of behavior subsequent to ostracism. However, we also test for the possibility that ostracism in everyday life threatens the four needs differentially, with potentially distinct consequences for behavior subsequent to ostracism.

To summarize, we propose a novel framework to explain behavioral reactions to ostracism based on need threat levels—a theoretical advance that can reconcile contradictory findings in the literature and offer ways of understanding when and why individuals show certain behavioral reactions to ostracism in real life.

### **The present research**

The present contribution addresses four fundamental questions about ostracism in everyday life: (1) How frequent is everyday ostracism, and who ostracizes in which contexts? (2) Does ostracism threaten psychological needs in everyday life? (3) How do individuals behave after being ostracized in real life? And, testing the proposed framework, (4) how does the threat of fundamental needs relate to behavior after being ostracized?

Experience sampling techniques offer a particularly powerful means to address these questions: Study 1 takes an event-contingent sampling approach by asking participants to report any ostracism experiences, need threat, and behavioral intentions as soon as they feel ostracized, over the course of 14 days. Study 2 takes a time-contingent sampling approach by signaling participants 5 times a day over the course of 7 days to inquire about their momentary (i.e., within last hour) ostracism, need threat, and performed behavior.

**Open science statement.** For Study 1, we preregistered all hypotheses, sample size, exclusion criteria, and analysis plans on AsPredicted prior to data collection (Study 1 main procedure: [https://aspredicted.org/THK\\_7DZ](https://aspredicted.org/THK_7DZ), Study 1 research questions 1 and 2: [https://aspredicted.org/4H4\\_HZG](https://aspredicted.org/4H4_HZG), Study 1 research question 3: [https://aspredicted.org/7CR\\_YZC](https://aspredicted.org/7CR_YZC)). For Study 2, we preregistered all research questions and hypotheses, exclusion criteria, and analysis plans on AsPredicted after data collection but before

analyzing the data: [https://aspredicted.org/J64\\_134](https://aspredicted.org/J64_134). All materials, data, and analysis scripts are freely available via <https://osf.io/8h6vb/>.<sup>2</sup>

**Ethical approval.** Both reported studies received ethical approval from the institutional committees at the University of Basel and Tilburg University.

### Study 1

Study 1 takes an *event-contingent* experience sampling approach to assess the frequency of ostracism experiences in everyday life, including where and by whom ostracism occurred, its threat to psychological needs, and subsequent behavioral intentions.

### Methods

#### *Participants and Design*

Considering resource constraints and the anticipated frequency of ostracism incidents, we pre-registered to invite 500 participants to the pre-study. Four-hundred-and-ninety-five Prolific Academic users (US American residents, gender-balanced sample) completed eligibility screening (i.e., owning a suitable cell phone). As pre-registered, we excluded participants if they failed attention checks ( $n = 2$ ), indicated not having participated in a serious manner ( $< 6$  on a 9-point scale,  $n = 2$ ), or withdrew consent to analyze their data ( $n = 1$ ). After the pre-screening, all participants were invited to download the experience sampling study. As pre-registered, only those who completed the entire 14-day sequence, missing less than two evening questionnaires per week (this was also the criterion for being paid in the respective week), were retained in the sample. This left 323 participants in the sample ( $M_{\text{age}} = 38.04$  years,  $SD = 13.15$ , 48.30% women, 48.60% men, 3.10% non-binary; 6.50% Black / African American, 1 American Indian or Alaska Native, 13.62% Asian American, 6.50% Hispanic, 69.04% White, and 4.02% two or more races). We provide a supplementary sample description regarding income and employment status

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<sup>2</sup> The present contribution is part of a more comprehensive project on everyday ostracism experiences (see also Büttner, Rudert, & Kachel, 2024, Study 2; Büttner & Greifeneder, 2024). We here focus on describing everyday ostracism experiences, need threat, and behavior and only report the variables needed for these analyses.

(OSF).

**Power considerations.** Since ostracism prevalence was unknown before data collection, no a priori power calculations were performed. We performed simulation-based sensitivity analyses for multi-level models with the *simr* package (Green & MacLeod, 2016) instead. These analyses showed that Study 1 had 80% power to detect effect sizes of Cohen's  $d = |0.11| - |0.21|$  (depending on the behavioral outcome variable) for the effect of need threat score on behavioral intention (1000 Monte Carlo simulations,  $\alpha = 0.05$ ) All observed effect sizes were larger than the smallest effect detectable with 80% power (see Figure 2), suggesting adequate sample size.

### **Measures**

**Pre-screening.** In the pre-screening, participants first provided informed consent, reported if they own a smartphone and were informed about the procedure of the 14 day-study. Participants completed several questionnaires about their personality, attitudes, and life circumstances that are unrelated to the present contribution. Ending the pre-screening, participants provided demographic information and reported on the seriousness of their participation. Participants had the opportunity to withdraw their answers from data analysis and to leave comments. All participants who completed the pre-screening were thanked and invited to participate in the experience sampling part.

**Experience sampling.** Next, participants downloaded the scientific app Expiwell (<https://www.expiwell.com>). Over the next 14 days, participants indicated in the app whenever they experienced ostracism (i.e., *event-contingent sampling*; “I have just been excluded and/or ignored.”). After each event-contingent report of ostracism, participants completed a questionnaire assessing need satisfaction (Rudert & Greifeneder, 2016, Cronbach's  $\alpha = .86$ ). Participants further provided information on who excluded them (adapted and extended from Nezlek et al., 2012, “The person that excluded and/or ignored me is...”, options: “a stranger”, “an acquaintance”, “an ordinary friend”, “a close friend”, “my partner”, “a close relative”,



*“a distant relative”, “someone from work”, “other”*) and *where* they felt ostracized (*“Where have you felt excluded and/or ignored?”*, five options: *“at work”, “at school / college / University”, “at home”, “online / on social media”,* and *“other”*). We assessed five behavioral intentions after each ostracism report: 1) intentions to behave prosocially (adapted from Caprara et al., 2005), 2) intentions to talk to others, 3) intentions to engage in social media use, 4) intentions to behave aggressively (adapted from Borah et al., 2021), and 5) intentions to withdraw (adapted from Barzeva et al., 2019). See Table 1 for all item texts and descriptive statistics.

In addition to the event-contingent sampling, each evening at 6 pm, participants had the chance to indicate whether they had experienced ostracism situations during the day that they had not already reported. The survey was open until midnight. We introduced this measure to avoid underreporting of ostracism experiences (e.g., when being ostracized during a work meeting, it might not be possible to use the smartphone immediately to report the experience)<sup>3</sup>. While this allowed for a more reliable measure of ostracism frequency, we did not assess need satisfaction, or behavior in the evening questionnaire, considering that these reports were retrospective and did not allow the possibility to assess reflexive effects.

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<sup>3</sup> One participant was omitted from analyses as an extreme outlier because they reported a total of 110 additional ostracism experiences in the evening questionnaires, therefore the total of analyzed ostracism experiences is  $k = 997$ .

**Table 1.** Measures used in Studies 1 and 2, including descriptive statistics for need satisfaction and behavior measures.

		Study 1		Study 2		
		If not stated otherwise, assessed from 1 = <i>not at all</i> to 7 = <i>very much</i> .		If not stated otherwise, assessed from 1 = <i>not at all</i> to 5 = <i>a great deal</i> .		
ostracism assessment		I have just been excluded and/or ignored.		During the last hour, did other people exclude you?		
				During the last hour, did other people ignore you?		
			<i>M (SD)</i>		<i>M<sub>general</sub> (SD)</i>	<i>M<sub>after ostracism</sub> (SD)</i>
belonging		Right now, I feel... 1 = rejected, 7 = accepted	1.89 (1.27)	During the last hour, to what extent have you felt connected?	2.51 (1.10)	2.10 (1.00)
control		Right now, I feel... 1 = powerless, 7 = powerful	1.99 (1.26)	During the last hour, how powerful did you feel? 1 = <i>very powerless</i> , 5 = <i>very powerful</i>	2.89 (0.68)	2.50 (0.88)
self-esteem		Right now, I feel... 1 = devalued, 7 = valued	1.70 (1.36)	During the last hour, to what extent have you felt positively about yourself?	2.62 (1.06)	2.15 (0.97)
meaningful existence		Right now, I feel... 1 = invisible, 7 = recognized	1.72 (1.32)	During the last hour, to what extent have you felt that your life is meaningful?	2.62 (1.09)	2.24 (1.00)
	prosocial behavior	At the moment, I feel like helping someone.	2.76 (1.68)	During the last hour, did you help anybody else?	1.87 (1.03)	2.12 (1.02)
				During the last hour, did you do something nice to another person?	2.03 (1.06)	
approach behavior	talking behavior	At the moment, I feel like talking to someone (in person).	3.14 (1.81)	During the last hour, did you talk to someone in person?	2.66 (1.33)	2.68 (1.22)
				During the last hour, did you post something on your social media page (e.g., Facebook, Instagram)?	1.14 (0.47)	1.34 (0.75)
	social media use	At the moment, I feel like communicating with others on social media.	2.40 (1.74)	During the last hour, did you visit other people's social media pages (e.g., Facebook, Instagram)?	1.54 (0.84)	1.75 (0.94)
antisocial behavior		At the moment, I feel like hurting someone (physically and/or verbally).	1.44 (1.00)	During the last hour, did you do something bad to another person?	1.05 (0.31)	1.30 (0.71)
avoidance behavior		At the moment, I would rather be alone than with others.	4.35 (1.96)	During the last hour, did you withdraw from or avoid others?	1.34 (0.79)	1.96 (1.13)

*Note.* In line with item wording, we report descriptive statistics for need *satisfaction*, but note that all items were reverse-coded to reflect need *threat* before data analysis.

## Results

### *Prevalence of ostracism experiences*

Participants reported 853 event-contingent ostracism experiences, resulting in an average of 2.64 event-contingent experiences of ostracism per participant ( $SD = 3.40$ ,  $Range = 0 - 15$ ). In addition, participants reported 254 ostracism experiences in the evening reports.<sup>4</sup> Combining event-contingent and evening reports of ostracism results in an average of 3.43 ostracism experiences per participant ( $SD = 7.66$ ,  $Range = 0 - 26$ ). Ostracism experiences did not distribute evenly across participants. As shown in Table 2, a considerable portion of participants reported no ostracism ( $n = 90$ , 27.86% of all participants). About a third of the sample reported one or two experiences (one experience:  $n = 55$ , 17.03%; two experiences:  $n = 48$ , 14.86%). Indeed, the upper 14.24% of the most frequently ostracized participants reported nearly half (49.65%) of all ostracism experiences in Study 1. Figure 1 depicts the distribution of number of ostracism experiences reported by participants over the 14 days.

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<sup>4</sup> Completing more than 80% of all evening questionnaires (i.e., 10 or more of the total 14 evenings) was tied to payment and inclusion in data analysis, therefore, compliance with answering evening questionnaires was high: Participants completed  $M = 12.25$  ( $SD = 1.20$ ) of 14 evening questionnaires and only  $n = 26$  (8.05%) of participants missed the maximum allowed 4 of 14 questionnaires. Fifty-six participants (17.34%) missed none.

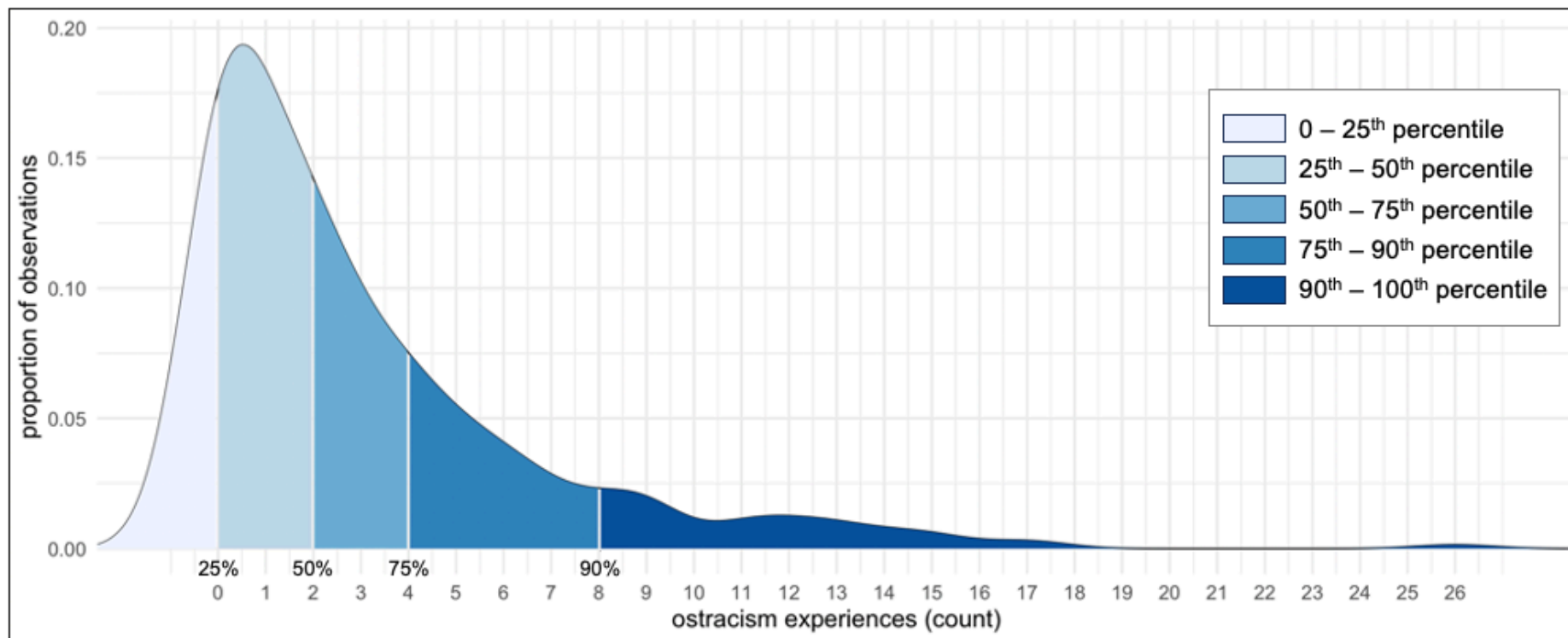
**Table 2.** Distribution of the number of ostracism experiences per participant in Studies 1 and 2, relative to total number of participants and total number of ostracism experiences.

Study 1					Study 2				
<i>n</i>	<i>k</i>	cumulative <i>n</i> / <i>N</i>	<i>n</i> * <i>k</i>	cumulative <i>n</i> * <i>k</i> / <i>K</i>	<i>n</i>	<i>k</i>	cumulative <i>n</i> / <i>N</i>	<i>n</i> * <i>k</i>	cumulative <i>n</i> * <i>k</i> / <i>K</i>
90	0	27.86%	0	0%	102	0	37.50%	0	0%
55	1	44.89%	55	5.52%	39	1	51.84%	39	5.08%
48	2	59.75%	96	15.15%	32	2	63.60%	64	13.43%
29	3	68.73%	87	23.87%	27	3	73.53%	81	23.99%
25	4	76.47%	100	33.90%	23	4	81.99%	92	35.98%
16	5	81.42%	80	41.93%	8	5	84.93%	40	41.20%
14	6	85.76%	84	50.35%	8	6	87.87%	48	47.46%
8	7	88.24%	56	55.97%	5	7	89.71%	35	52.02%
6	8	90.09%	48	60.78%	5	8	91.54%	40	57.24%
10	9	93.19%	90	69.81%	3	9	92.65%	27	60.76%
5	11	94.74%	55	75.33%	4	10	94.12%	40	65.97%
4	12	95.98%	48	80.14%	3	11	95.22%	33	70.27%
5	13	97.52%	65	86.66%	2	13	95.96%	26	73.66%
2	14	98.14%	28	89.47%	1	15	96.32%	15	75.62%
3	15	99.07%	45	93.98%	2	18	97.06%	36	80.31%
2	17	99.69%	34	97.39%	1	19	97.43%	19	82.79%
1	26	100%	26	100%	2	20	98.16%	40	88.01%
					1	21	98.53%	21	90.74%
					2	22	99.26%	44	96.74%
					1	25	100%	25	100%

*Note.* *n* is the number of participants who reported *k* ostracism experiences, cumulative *n* / *N* is the percentage of participants who reported *k* ostracism experiences or less, relative to the total number of participants in the study ( $N_1 = 323$ ,  $N_2 = 272$ ), *n* \* *k* multiplies the number of participants with *k* ostracism experiences by (e.g., if 2 participants reported 14 experiences each,  $n * k = 28$ ), cumulative *n* \* *k* / *K* denotes the percentage of *k* ostracism experiences or less, relative to the total number of ostracism experiences reported in the study ( $K_1 = 997^3$ ,  $K_2 = 767$ ).

**Figure 1**

Distribution of the Number of Ostracism Experiences per Participant in Study 1.



*Note.* The depicted percentiles can be interpreted in the following way: 25% of all participants reported no ostracism, 50% of all participants reported two or fewer experiences, 75% of all participants reported four or fewer ostracism experiences, and 90% reported eight or fewer ostracism experiences.

**Context of everyday ostracism.** Participants reported being most often ostracized at home ( $n = 381$ , 44.56% of experiences), followed by being ostracized at work ( $n = 179$ , 20.94% of experiences), being ostracized at another place ( $n = 144$ , 16.84% of experiences; examples of such places included at a friend's or relative's house, at a store, via text message, at a bar, at the gym, or at a restaurant), being ostracized online or on social media ( $n = 91$ , 13.68%), and being ostracized at school, college, or university ( $n = 88$ , 3.98%).

**Sources of everyday ostracism.** Participants reported being most often ostracized by close relatives ( $n = 194$ , 22.69% of experiences), followed by co-workers ( $n = 168$ , 19.65% of experiences), one's partner ( $n = 139$ , 16.26% of experiences), ordinary friends ( $n = 91$ , 10.64%), and acquaintances ( $n = 88$ , 10.29%). Strangers ( $n = 81$ , 9.47%) and close friends ( $n = 79$ , 9.24%) were less common sources of everyday ostracism, and distant relatives were the least common source of ostracism ( $n = 15$ , 1.75%).

### ***Need threat***

Prior to analysis, we recoded need satisfaction into need *threat* (i.e., higher numbers reflecting higher threat). Repeated measures correlations using the *rmcorr* package in *R* (Bakdash & Marusich, 2017) show that all four needs correlated significantly and positively following ostracism events (see Table 3). In general, participants showed high need threat associated with experiences of ostracism,  $M = 5.18$ ,  $SD = 1.09$ . Following Nezlek et al. (2012), we tested whether the means (see Table 1) were different from the scale midpoint (4). This was the case for all four needs, all  $ps < .001$ .

**Table 3.** Repeated measures correlations of need threat after ostracism, in Study 1.

variable	1	2	3	4	5
1 need threat belonging	-				
2 need threat self-esteem	.59***	-			
3 need threat control	.37***	.34***	-		
4 need threat meaningful existence	.37***	.42***	.37***	-	
5 need threat score	.79***	.79***	.70***	.71***	-

*Note.* All variables were group-mean-centered prior to analyses. Need threat score (5) indicates the averaged threat to belonging, self-esteem, control, and meaningful existence after each event-contingent ostracism report. \*\*\*  $p < .001$ .

### ***Behavioral intentions***

The strongest behavioral intention was withdrawal, followed by intentions to talk to someone, prosocial behavioral intentions, intentions to use social media, and finally, antisocial behavioral intentions (see Table 1 for all descriptive statistics).

We computed multi-level models to assess the effects of need threat on behavioral intentions, adding random effects for participant (see [OSF](#) Supplementary Table 1 for detailed results). Need threat following ostracism was negatively associated with prosocial intentions, intentions to talk to others, and intentions to use social media, but need threat was positively associated with antisocial intentions and with withdrawal intentions. See Figure 2 for a summary of the effect sizes. Importantly, the patterns remained unchanged when analyzing specific needs of belonging, self-esteem, control, and meaningful existence, separately (see [OSF](#) Supplementary Table 1).

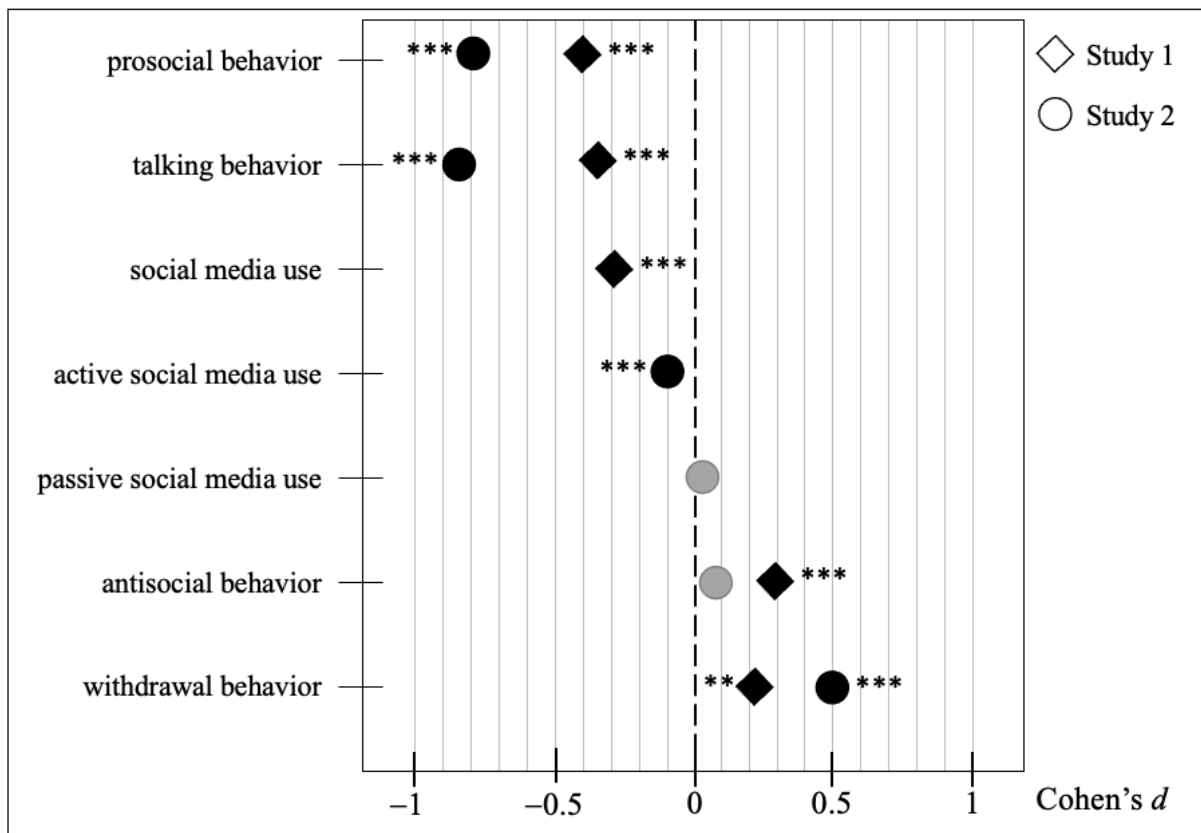
In exploratory fashion, as another potential indicator of withdrawal, we analyzed instances of *not reacting* at all. Specifically, we analyzed whether participants showed *no behavioral intention* after ostracism (i.e., indicating 1 = *not at all* for all behavioral intentions). Of the 853 event-contingently reported ostracism experiences, participants reported a 1 (= *not at all*) for all behavioral intentions except withdrawal (i.e., prosocial, antisocial, talking, and

social media use) for 99 experiences (i.e., 11.61%). For 20 of those events, participants additionally indicated a 1 (= *not at all*) for withdrawal. Based on the proportion of events, we coded the 99 events as *no reaction* (vs. any reaction,  $n = 754$ ). Similarly to the intention to withdraw, need threat was also positively associated with a higher likelihood of *not reacting* at all (coded as 1 vs. any reaction coded as 0),  $b = .77, p = .001$ . Again, this pattern remained unchanged when analyzing specific needs of belonging, self-esteem, control, and meaningful existence, separately (see [OSF](#) Supplementary Table 1).



**Figure 2**

Need Threat Levels Predicting Behavioral Intentions (Study 1) and Behaviors (Study 2).



*Note.* Cohen's *ds* obtained with the *EMAtools* package (Kleiman, 2021) are displayed as effect sizes (x-axis). Effects in Study 1 are indicated with squares. Effects in Study 2 are indicated with circles. Black indicates significant effects ( $p < .05$ ), grey indicates non-significant effects ( $p > .05$ ). In Study 2, logistic multi-level models were computed for active social media use, passive social media use, antisocial behavior, and withdrawal behavior. \*\*  $p < .01$ , \*\*\*  $p < .001$ .

## Discussion

When sampled event-contingently, ostracism happens approximately two times per week (i.e., 3.43 ostracism experiences in 14 days). This estimate includes evening reports of ostracism, therefore, we are confident that our results do not underestimate ostracism experiences. Moreover, participants had the chance to voluntarily leave an open description of

their ostracism experiences.<sup>5</sup> These descriptions illustrate that participants reported a range of minor ostracism experiences, such as, for instance, not getting asked to join for lunch at work or having a phone call ignored by someone else. But participants also reported more emotionally disruptive experiences of ostracism, such as being ignored for longer periods of time by one's romantic partner or a family member. For instance, one participant described a major ostracism episode: "My mother is in the hospital with life threatening problems and is long distance away from where I live. According to other people she is not responding to texts it calls because she is too stressed and tired. I get that, but it does feel like I am being excluded because she is talking to other people [sic]".

Regarding contexts of ostracism, we find that participants' home and workplace were particularly frequent contexts of ostracism (65.50% of all experiences). Being ostracized online or on social media made up 13.68%. Being ostracized at school, college, or university was rather uncommon (3.98%), reflecting that only few participants in our sample self-identified as students (6.50%, see supplementary sample description [OSF](#)). Close relatives, people from work, and romantic partners were the most frequent sources of ostracism. As expected and in line with previous findings on everyday ostracism experiences and feelings (e.g., Lutz, 2022; Nezlek et al., 2012), we find strong threat to psychological needs following event-contingently assessed ostracism experiences. Extending previous research, we find that, in everyday life, the strongest behavioral intention following ostracism was to withdraw from others, followed by intentions to talk to someone, prosocial behavioral intentions, intentions to engage in social media use, and finally, antisocial behavioral intentions. Low intentions to behave aggressively in real life are in line with the idea that aggressive behavior may occur in laboratory settings with assured anonymity (e.g., Warburton et al., 2006), but is less common in real life where antisocial behavior has potentially negative consequences. In line with the proposed framework

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<sup>5</sup> To protect participant anonymity, we do not share open descriptions, but they are available upon request.

of threat and behavioral responses in real life and previous ideas that intense threat are associated with more avoidance and antisocial behavior but less approach behaviors (e.g., Berkowitz, 1993; Jonas et al., 2014; Riva, 2016), need threat is related negatively to prosocial, talking, and social media use intentions, but positively to antisocial and withdrawal intentions. Similarly to the observed higher withdrawal intentions after severely threatening ostracism experiences, we also observed a positive association of need threat and showing *no behavioral reaction* except for withdrawal. While Study 1 offers insights into behavioral *intentions* associated with event-contingent ostracism experiences, we did not assess *actual* behavior, which can only be assessed retrospectively. We address this limitation in Study 2.

## Study 2

We extend Study 1 in several ways: Most importantly, Study 2 samples ostracism time-contingently by signaling participants several times during the day. By taking this approach, need threat levels represent experiences at the reflective stage, instead of the reflexive stage (e.g., Williams, 2009). This approach further allows to assess actual behavior in retrospective report (e.g., “During the last hour, did you help anybody else?”), instead of assessing behavioral intentions (e.g., Study 1: “At the moment, I feel like helping someone.”) that may or may not result in actual behavior (and its real-life consequences). Moreover, previous research showed that active use of social media networks (e.g., posting pictures) re-affords belonging after ostracism more than passive use or use of non-social websites like Wikipedia (e.g., scrolling, Pit et al., 2022). Therefore, we inquire about active social media use (i.e., posting on social media) and passive social media use (i.e., viewing other users’ content), separately, in Study 2. Finally, the design of Study 2 allows to compare need threat and behaviors to baseline measures at time points with no ostracism report.

## Methods

### *Participants*

Two-hundred-and-seventy-two Prolific Academic users (UK residents) participated in a 7-day experience sampling study using the smartphone app *ethicadata.com*. Participants ( $M_{\text{age}} = 34.33$ ,  $SD = 12.47$  years, 72.43% women, 25% men, 2.57% did not disclose their gender) completed an average of 31.26 assessments over the 7-day course ( $SD = 5.17$ ,  $Range = 1 - 41$ ). Notifications were sent to participants five times a day, each within a specific time interval. Each notification was random within its time interval: 9:20 am–11:40 am 11:40 am–2:00 pm, 2:00 pm–4:20 pm, 4:20 pm–6:40 pm, 6:40–9:00 pm. In total, we analyzed 7943 assessments.<sup>6</sup> We provide supplementary sample descriptions regarding income, employment status, and education level [OSF](#).

**Power considerations.** Study 2 was a preregistered analysis of an existing data set, therefore, no a priori power calculations were performed. We pre-registered to include all individuals who responded to at least one momentary assessment. We again performed simulation-based sensitivity analyses for multi-level models with the *simr* package (Green & MacLeod, 2016). These analyses showed that Study 2 had 80% power to detect effect sizes of Cohen's  $d = |0.06| - |0.08|$  (depending on the behavioral outcome variable) for the effect of need threat score on behavior (1000 Monte Carlo simulations,  $\alpha = 0.05$ ). All observed effect sizes (except for the effect on passive social media use,  $d = 0.02$ ) were larger than or equal to (for antisocial behavior,  $d = 0.07$ ) the smallest effect detectable with 80% power (see Figure 2), suggesting adequate sample size.

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<sup>6</sup> This data set has been used to analyze the relationship of loneliness and momentary self-control failures (Stavrova et al., 2022). The present research addresses different measures and research questions.

### *Measures*

**Ostracism.** Ostracism was assessed with two items: "During the last hour, did other people exclude you?" ( $M = 1.06$ ,  $SD = 0.32$ , skewness = 6.58) and "During the last hour, did other people ignore you?" ( $M = 1.12$ ,  $SD = 0.43$ , skewness = 4.84), on scales from 1 = *not at all* to 5 = *a great deal*. As pre-registered, we averaged the two items into one score of ostracism (skewness = 5.29) given their high repeated-measures correlation  $r = .49$ ,  $p < .001$ . As pre-registered, because log-transformation did not alleviate skewness in reports of ostracism (skewness after log-transformation = 3.80), we dichotomized the variable (i.e., 1 was coded as not being ostracized; any values above 1 were coded as being ostracized).

**Need threat.** We assessed need satisfaction with one item per need (see Table 1). Items were reverse-coded to reflect need threat and averaged into one score (Cronbach's  $\alpha = .82$ ).

**Behavior.** We assessed six different behaviors: Prosocial behavior, talking to others, active and passive social media use, antisocial behavior, and withdrawal behavior (Table 1 lists all items and descriptive statistics). As pre-registered, we averaged two items into one score of prosocial behavior ( $M = 1.95$ ,  $SD = 0.95$ , skewness = 0.97) given their high repeated-measures correlation  $r = .58$ ,  $p < .001$ . The two social media use items were analyzed as separate variables (i.e.,  $r = .28$ ,  $p < .001$ ). Because of skewness (active social media use: skewness = 4.24; passive social media use: skewness = 1.71), both social media items were dichotomized. Antisocial (skewness = 7.36) and withdrawal behavior were also dichotomized (skewness = 2.77).

## Results

All continuous variables were mean-centered prior to analysis by subtracting the person's average response from each assessment's value.

### *Prevalence of ostracism experiences*

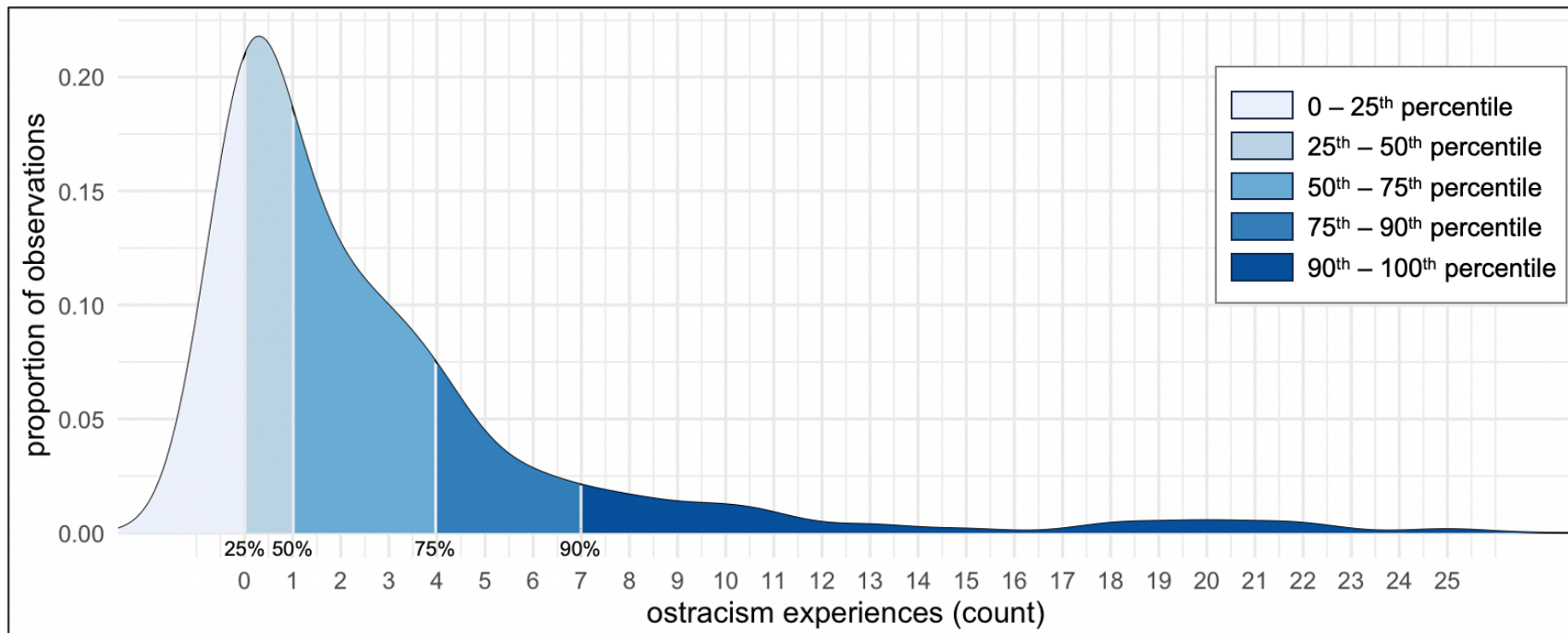
Applying dichotomization as pre-registered, 767 reports contained experiences of ostracism (i.e., 9.66% of all recorded situations). For those reports that were identified as experiences of ostracism, the mean level of ostracism was  $M = 1.92$  ( $SD = 0.62$ ,  $Range = 1.5 - 5$ ).<sup>7</sup> On average, participants reported 2.92 ostracism experiences over 7 days ( $SD = 4.42$ ,  $Range = 0 - 25$ ). As in Study 1, the number of ostracism experiences per participant was skewed in a way that a considerable portion of participants reported no ostracism ( $n = 102$ , 37.50% of all participants), only one experience ( $n = 39$ , 14.34%), or two experiences ( $n = 32$ , 11.76%). Consistent with Study 1, we observed that the upper 10.29% of the most frequently ostracized participants reported nearly half (47.98%) of all ostracism experiences in Study 2 (see Table 2). Figure 3 depicts the distribution of the number of ostracism experiences reported by participants over the 7 days.

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<sup>7</sup> There was no built-in no-signal time in Study 2, therefore, a small portion of signals were sent in close temporal proximity to each other: Of all signals, 522 (6.57% of all 7943 signals) were sent *less* than 60 minutes apart from each other, 300 signals (3.78%) were sent less than 45 minutes apart from each other, 148 signals (1.86%) were sent less than 30 minutes apart from each other, 45 signals (0.57%) were sent less than 15 minutes apart from each other, 25 signals (0.31%) were sent less than 10 minutes apart from each other, and 7 signals (0.09%) were sent less than 5 minutes apart from each other. Technically, participants could have referred to the same ostracism event if two signals were less than 60 minutes apart. To examine this possibility, we conducted a robustness check, removing the second assessment if two signals were sent less than 60 minutes apart (i.e., removing  $n = 522$  signals). This analysis revealed 718 ostracism reports, corresponding to 9.68% of the analyzed remaining 7421 signals. This proportion is very similar to the overall observed prevalence of 767 ostracism reports in 7943 assessments (i.e., 9.66%), showing no evidence that participants reported the same ostracism situation twice when two signals were sent close in time.

**Figure 3**

Distribution of the Number of Ostracism Experiences per Participant in Study 2.



*Note.* The depicted percentiles can be interpreted in the following way: Between 25% and 50% of all participants reported no ostracism or only one experience, 75% reported four or fewer ostracism experiences and 90% reported 7 or fewer ostracism experiences.

***Need threat***

Repeated measures correlations using the *rmcorr* package in *R* (Bakdash & Marusich, 2017) show that all four needs correlated significantly and positively (see Table 4). As pre-registered, we tested whether strength of ostracism was associated with higher levels of need threat in a multi-level regression model, including a random effect for participant to account for the nested data structure, and an error structure allowing for correlation between adjacent time points within the same participant (see Finch et al., 2019). As predicted, need threat levels were higher at time points with ostracism versus no ostracism,  $b = 0.24$ ,  $p < .001$ . The same was true for all specific threats to belonging, self-esteem, control, and meaningful existence ( $bs = 0.18 - 0.28$ , all  $ps < .001$ ).

**Table 4.** Repeated measures correlations of need threat, in Study 2.

variable	1	2	3	4	5
1 need threat belonging	-				
2 need threat self-esteem	.43***	-			
3 need threat control	.27***	.36***	-		
4 need threat meaningful existence	.44***	.50***	.29***	-	
5 need threat score	.76***	.79***	.61***	.76***	-

*Note.* All variables were group-mean-centered prior to analyses. Need threat score (5) indicates the averaged threat to belonging, self-esteem, control, and meaningful existence at each assessment. \*\*\*  $p < .001$ .

***Behavior***

We hypothesized a negative association of ostracism with approach behaviors (i.e., prosocial, talking, and social media behavior) and a positive association of ostracism with avoidance and antisocial behaviors. Using the same multi-level regression model structure as specified above, we tested these hypotheses in six multi-level models with the six behaviors as



the dependent variables, and dichotomized reports of ostracism at the same time point as the independent variable. See Table 1 for all descriptive statistics.

Prosocial behavior,  $b = 0.01$ ,  $p = .708$ , and talking behavior were not significantly different at time points with ostracism versus no ostracism,  $b = -0.07$ ,  $p = .138$ . Active social media use was higher at time points with ostracism versus no ostracism,  $b = 0.44$ ,  $p < .001$ . Passive social media use was not significantly different at time points with ostracism versus no ostracism,  $b = 0.08$ ,  $p = .413$ . As hypothesized, antisocial behavior,  $b = 1.55$ ,  $p < .001$ , and withdrawal behavior were higher at time points with ostracism versus no ostracism,  $b = 1.32$ ,  $p < .001$ .

### ***Associations of need threat and behavior***

We also hypothesized a negative association of need threat level with approach behaviors (i.e., prosocial, talking, and social media behavior) and a positive association of need threat level with avoidance and antisocial behaviors. We used the same multi-level regression model structure again, but with group-mean centered need threat at the same time point as the independent variable. For dichotomized dependent variables (i.e., active and passive social media use, antisocial, and withdrawal behavior), we used multi-level logistic models.

As hypothesized, need threat was negatively associated with prosocial behavior, talking behavior, and active social media behavior. Need threat was positively associated with withdrawal behavior. Need threat was not significantly associated with passive social media use or antisocial behavior. Please see Figure 2 for a summary of the effect sizes (see [OSF Supplementary Table 2](#) for detailed results and analyses of specific needs of belonging, self-esteem, control, and meaningful existence).

As in Study 1, in exploratory fashion, we also analyzed instances of *not reacting* to ostracism at all. Specifically, we analyzed whether participants indicated showing *no behavior* after ostracism (i.e., indicating 1 = *not at all* for all assessed behaviors). Of the 7943 time-

contingent assessments, participants reported a 1 (= *not at all*) for all behaviors except withdrawal (i.e., prosocial, antisocial, talking, active social media use, and passive social media use) for 927 observations (i.e., 11.67%). For 719 of those observations (9.05% of all observations) participants additionally indicated a 1 (= *not at all*) for withdrawal. In line with the procedure for Study 1, we first coded the 927 observations as *no reaction* (= 1, vs. any reaction = 0). As in Study 1, need threat was positively associated with a higher likelihood of *not reacting* at all,  $b = 1.47, p < .001$ . Again, this pattern remained unchanged when analyzing specific needs of belonging, self-esteem, control, and meaningful existence, separately (see [OSF Supplementary Table 2](#)). Considering there was a sufficient number of observations meeting the criterion, we repeated the analyses with the stricter outcome variable that also included those participants who additionally chose 1 (= *not at all*) for withdrawal (i.e., 719 = no reaction, coded as 1 vs. 7224 = any reaction, coded as 0). Analysis of this stricter outcome variable showed that the association between need threat and the likelihood of not reacting to ostracism remained positive but is no longer statistically significant,  $b = 1.30, p = .176$  (see [OSF Supplementary Table 2](#) for analyses of specific needs).

## Discussion

Study 2 complements and extends Study 1's findings in several ways. First, Study 2 observed a frequency of everyday ostracism comparable to that in Study 1, albeit somewhat higher given the shorter sampling time. We also find that ostracism makes up approximately one-tenth of individuals' experiences, dovetailing with earlier research (9.66% vs. 9.70% in Bernstein et al., 2021).

As hypothesized, time points with ostracism (vs. no ostracism) were associated with increased levels of need threat and increased levels of antisocial and withdrawal behaviors. Further, need threat was significantly associated with withdrawal behavior, but not with antisocial behavior. Replicating findings from Study 1, we again found a positive association

of need threat and showing *no behavior* except for withdrawal. However, when *no behavior* included *no withdrawal*, the association with need threat was no longer significant. This may suggest that when none of the behavioral options provided in the survey were selected, participants may have acted in ways that were not specified in the response options. Future research may investigate this possibility by collecting and coding open descriptions of behavior following ostracism in real life.

In line with our hypotheses, need threat was negatively associated with approach behavior (i.e., prosocial behavior, talking behavior, active social media use), however, prosocial behavior and talking behavior were not significantly higher at time points with ostracism versus no ostracism. *Active* social media use was significantly higher at time points with ostracism, which might signal an increase in acknowledgment-seeking in response to ostracism (see Kenntemich et al., 2024). Interestingly, *passive* social media use was neither significantly affected by ostracism nor by need threat levels. This may point to the possibility that passive social media use neither reflects approach nor avoidance behavior. We further situate the results in theorizing and discuss potential differences based on *reflexive* (i.e., Study 1) and *reflective* (i.e., Study 2) effects in the General Discussion.

### **General Discussion**

Ostracism is a pervasively negative yet familiar experience to many individuals across cultural (e.g., Uskul & Over, 2014) and everyday contexts (e.g., Nezelek et al., 2012). The present contribution sought to answer fundamental questions regarding ostracism experiences in everyday life: (1) How frequent is everyday ostracism, and who ostracizes in which contexts? (2) Does ostracism threaten psychological needs in everyday life? (3) How do individuals behave after being ostracized in real life? And (4) how does the threat of fundamental needs relate to behavior after being ostracized? Overall, using a multi-method approach high in ecological validity, we document that ostracism is an experience that occurs in a range of

contexts and relationships, on average 2-3 times per week, and is accompanied by intense need threat. Moreover, the higher individuals' need threat, the more likely will they react with avoidance and antisocial behavior rather than approach behavior, supporting our proposed framework of need threat and behavioral reactions to ostracism in real life.

### **How frequent is everyday ostracism, and who ostracizes in which contexts?**

In both event-contingent (Study 1) and time-contingent (Study 2) assessments of everyday ostracism, ostracism experiences occurred 2-3 times per week (Study 1:  $M = 3.43$  in 14 days, Study 2:  $M = 2.92$  in 7 days). Ostracism was reported in 9.66% of all situations in Study 2. Even though this may not sound very much at first glance, it reflects that 1 out of 10 situations in daily life is related to ostracism. This number is higher than other negative interpersonal experiences, even if assessed in very specific contexts. For instance, romantic couples report an average of 7.25% of situations in which they feel their interests conflict with their partner's interests and an average of 5.05% of situations in which they behaved in a non-cooperative way towards their partner (Columbus et al., 2021, Study 1). From the ostracizers' perspective, because confrontational conflict is more costly than excluding others as a form of punishment (e.g., Molho et al., 2020; Rudert et al., 2023), it appears even rational that ostracism turns out to be a particularly frequent behavior. However, ostracism experience reports were skewed in both studies: Only a small portion of participants (14.24% in Study 1 and 10.29% in Study 2) accounted for almost half of all ostracism experience reported in each study. This suggests significant between-person variance that warrants further examination in future research, for instance, regarding individual trait-level moderators such as personality and dispositional preferences (e.g., Ren & Evans, 2021; Rudert et al., 2023) or differences in demographics such as age, sexual orientation, or employment status that may drive everyday experiences of ostracism (e.g., Albath et al., 2023; Büttner, Rudert & Kachel, 2024; Rudert, Janke, & Greifeneder, 2020). Although between-person variance is large, ostracism frequency

was higher on average in Study 2 relative to Study 1. Differences between the studies (e.g., US vs. UK sample, different gender compositions, different sampling times) make it impossible to attribute the differences in ostracism frequency to one single factor. Moreover, both event-contingent and time-contingent sampling approaches may be conducive to under- *and* over-reporting under certain circumstances.

In event-contingent sampling, *under-reporting* may arise when participants forget to report experiences or do not have the time in their busy everyday lives. This issue was previously discussed in Nezelek et al. (2012), who conducted a pen-and-paper diary study of daily ostracism with a similar conceptual approach as Study 1. As a result, one may need to consider whether a count of zero really means zero experiences in event-contingent sampling of ostracism. To partly mitigate this issue, Study 1 in the present contribution introduced the evening questionnaires as a measure to prevent underreporting.

On the other hand, event-contingent sampling could also render participants overly sensitive to perceiving ostracism, fostering *over-reporting*. Specifically, one could argue that individuals might have over-detected ostracism events in Study 1 because they were explicitly instructed to carefully monitor and report ostracism experiences when they occur (see Bernstein et al., 2021 for a short discussion).

With time-contingent sampling as used in Study 2, within a specified time bracket, signals are distributed randomly across the full range of the time window. Participants need not be on the lookout for ostracism events, thus mitigating some risks associated with event-contingent sampling. For example, the zero-means-zero limitation of Study 1 is partially addressed in Study 2 because participants had the option to report that there was no ostracism. Time-contingent sampling, however, may also be conducive to *over-* or *under-reporting* under certain circumstances. Specifically, while Study 2's design prompted participants during most waking hours, the design did not cover all hours, risking *under-reporting*. In some cases,

experiences of ostracism may not have been captured because the next notification was sent several hours after ostracism happened.

On the other hand, it could also be that repeated time-contingent questions about ostracism led participants to reflect on their social experiences in the past hour, thus lowering the threshold for reporting ostracism, leading to more ostracism reports. Taken together, neither study design is superior to the other. The fact that we found similar frequencies of ostracism in everyday life across both studies speaks to the validity of both designs. A methodologically intriguing experiment for future research would be to manipulate different features in experience sampling approaches to systematically test whether certain features indeed lead to more or less frequent reports of social experiences.

Going beyond earlier evidence, we find that most ostracism experiences occur at home or at work and by close relatives, people from work, and romantic partners, that is, others whom people usually interact with frequently. This is consistent with earlier conceptualization that both close relationships (e.g., Zadro et al., 2008) but also the work context in general (e.g., Robinson et al., 2013; Rudert, Janke, & Greifeneder, 2020) are frequent sources of ostracism. To our knowledge, only the study by Nezlek et al. (2012) also assessed contexts of experienced everyday ostracism. Our finding that close relatives, people from work, and romantic partners are the most frequent sources of ostracism seemingly contradict Nezlek et al. (2012) who observed that strangers and acquaintances made up the majority of sources of ostracism (62% combined, vs. 19.76% in the present data), and relatives and partners made up only 9% (vs. 38.95% in the present data). The different results, however, might align very well if one considers that Nezlek et al. did not specifically ask for the workplace as a source of ostracism. Assuming that a sizeable proportion of the ostracism by strangers or acquaintances in the Nezlek et al. study was ostracism by co-workers, the results across studies provide a much more coherent picture.

Importantly, future studies should take into account how much time each participant spends at various locations throughout the day to figure out which contexts bear higher risks of getting ostracized. For instance, previous research has noted that the workplace may be a particularly risky context for experiencing ostracism frequently (e.g., Rudert, Janke, & Greifeneder, 2020) but just how risky the workplace is may be relative to how much time a person spends at work: For example, if someone works 20 hours a week but gets ostracized at work in 30% of cases reported by this person, then the workplace is a higher-risk location for this person compared to someone who works a 40-hour week and reports 10% of their ostracism experiences at work. Such observations could further be linked to factors such as status at work (e.g., Fiset et al., 2017) or personality traits such as low conscientiousness that drive ostracism in occupational contexts (e.g., Rudert, Hales, & Büttner, 2021).

Of note, we used more diverse samples compared to previous studies with college students (Bernstein et al., 2021; Legate et al., 2021) whose social interactions may considerably differ from those of the rest of the population. Moreover, younger individuals react more strongly to experiences of ostracism (Pharo et al., 2011), and experiences of ostracism may be more frequent for younger compared to older adults (Rudert, Janke, & Greifeneder, 2020). Using adult samples proved important to demonstrate context effects such as the frequency of the workplace as a source of ostracism. However, we note that our findings have not been accrued in a representative sample and that experience sampling studies limit the participant pool to individuals with smartphones.

Our data demonstrate that 7 to 14 days are enough to record ostracism experiences for most participants. However, we acknowledge that this period may have been too short for registering severe ostracism events (e.g., being disowned by a family member, or being ostracized for a long time e.g., Zadro et al., 2003, 2008). Retrospective reports of lifetime ostracism experiences may be better suited for capturing such ultimate ostracism experiences.

**Does ostracism threaten psychological needs in everyday life?**

Ostracism in everyday life elicited strong threat to the psychological needs of belonging, self-esteem, control, and meaningful existence, in line with the Temporal Need Threat Model of Ostracism (Williams, 2009). Study 2 allowed to compare time points with ostracism versus no ostracism and found that need threat was significantly higher at time points with ostracism. Threat to specific needs was highly correlated in both studies. Although need threat is often conceptualized as a consequence of ostracism and other interpersonal aggressive behaviors such as microaggressions (e.g., Wesselmann et al., 2019), experiencing psychological need threat itself also has negative consequences. For instance, experiencing frustration of one's psychological needs can impact psychological functioning during the day (e.g., Bartholomew et al., 2011) and even at night, in the form of recurring dreams (e.g., Weinstein et al., 2018). Therefore, need threat is not only a consequence, but also needs to be understood as an antecedent to further negative consequences for people's everyday lives.

**How do individuals behave after being ostracized in real life?**

To our knowledge, this is the first set of studies to assess behaviors associated with ostracism *in everyday life*. Which behaviors were most common following ostracism? In Study 1, descriptively, from most frequent to least frequent: withdrawal, intentions to talk to someone, prosocial behavioral intentions, intentions to engage in social media use, and finally, antisocial behavioral intentions were reported by participants. Study 2 importantly complements this picture in that the time-contingent sampling approach allowed to compare behavior at time points with versus without ostracism. Prosocial behavior, talking behavior, and passive social media use were not different at time points with versus without ostracism experience. Active social media use, antisocial, and withdrawal behavior were higher at time points with versus without ostracism experience.



**How does the threat of fundamental needs relate to behavior after being ostracized?**

In both studies, we find a distinct association pattern between need threat and behavioral reactions: In line with the here-advanced framework of need threat and behavioral responses in real life, need threat was negatively associated with approach behaviors (i.e., prosocial behavior, talking to others in person, and using social media to connect with others) and positively associated with avoidance and antisocial behaviors. Interestingly, we did not find that threat to specific needs within the inclusionary need cluster (i.e., need to belong and need for self-esteem) versus the power and provocation cluster (i.e., need for control and need for meaningful existence, Williams, 2009) predicted distinct behavioral reactions. Rather, in line with our proposed framework, it was strength of *overall* need threat rather than threat to *specific* needs that predicted approach versus avoidance versus antisocial reactions (but not actual antisocial behavior in Study 2). With that observation, we extend previous theorizing within the Temporal Need Threat Model of Ostracism (Williams, 2009) and offer an explanation of why previous findings on specific needs predicting distinct behavioral reactions are mixed (e.g., Hales & Williams, 2018; Pfundmair, 2019). We discuss findings regarding specific behavioral reactions and further theoretical predictions in the following.

**Prosocial behavior.** In the present studies, prosocial behavior was negatively associated with need threat after ostracism. This finding aligns with our framework's theoretical predictions and reconciles previous contradictory findings that individuals behave more pro-socially in comparably low-threat ostracism situations (e.g., Carter-Sowell et al., 2008), and less pro-socially in comparably high-threat ostracism situations (e.g., Twenge et al., 2007).

**Talking behavior.** Talking to others was also negatively associated with need threat after ostracism. Talking to others may have many benefits but also bears social risks: While approaching others to talk about one's exclusion experience might elicit social support, targets of ostracism may also fear further devaluation when disclosing to others. Consistent with this

fear, evidence suggests that others indeed devalue targets of ostracism when learning about their experience (Meral et al., 2021). In line with our model, in situations of low threat, the benefits of talking to others may outweigh the social risks of further ostracism. Conversely, after severe instances of ostracism, avoiding further devaluation by not approaching others may be important to protect the ostracized target from further psychological harm. Here, future research could further test our framework by examining the role of trait-level moderators such as fear of negative evaluation (e.g., Maner et al., 2007) or rejection sensitivity (e.g., Downey & Feldman, 1996). Personality traits such as extraversion may also influence which behaviors ostracized individuals choose and how beneficial they are to their coping efforts. For instance, it could be that extraverted individuals are more likely to restore their belonging need from talking about their ostracism experiences than introverted individuals (Swickert et al., 2002). Moreover, the specificities of what ostracized participants talk about remain open for future research to address. For instance, while talking to others may often be approach-oriented and prosocial to elicit social support, ostracized individuals may also discuss antisocial topics with others such as retaliation plans against the ostracizers or antisocial fantasies. In addition to discussing antisocial topics, talking to others may serve approach goals while, at the same time, being antisocial in nature: For instance, sharing secrets or gossiping together fosters social connection between individuals (e.g., Jaffé et al., 2023; McAndrew et al., 2007; Tassiello et al., 2018). However, spreading gossip or someone else's secret may be considered antisocial towards the person who is gossiped about or whose secrets are involuntarily shared. Therefore, talking to others may be approach-oriented *and* antisocial at the same time. Similarly, talking to one person can mean avoiding another person, therefore, talking to others may be approach-oriented *and* avoidant at the same time.

**Social media use behaviors.** While social media has been documented as a powerful tool to cope with social exclusion (e.g., Lutz et al., 2022, 2023), Study 1 revealed that

individuals refrain from approaching others on social media after ostracism experiences that severely threaten their psychological needs. Study 2 revealed differences in active and passive social media behavior: Higher need threat was associated with less posting behavior (i.e., less *active* social media use), but was not associated with viewing others' content (i.e., *passive* social media use). At first, the findings on passive social media use may seem contradictory to the above-described pattern that higher need threat is associated with lower approach behaviors. However, it appears that passive social media use may reflect both approach and avoidance behavior (yet passive social media use likely rarely qualifies as antisocial behavior). To illustrate, passively viewing others' content may be a form of psychologically approaching others, for instance, by reminding oneself about past belonging experiences by looking at previous social media postings (e.g., Büttner et al., 2023; Gardner et al., 2005). But passive social media use may also be a form of avoiding others, for instance when scrolling with one's phone on social media is used to detach oneself from the ostracism situation (i.e., phubbing the ostracizers, e.g., Büttner et al., 2022). The present results do not allow to further differentiate passive social media use. Potentially, the here observed null effect reflects that passive social media use assessed a mix of both approach and avoidance behavior.

Delineating further predictions that follow from our framework, future research may test the impact of ostracism experiences based on the severity of elicited need threat on *specific* behaviors on social media (e.g., messaging others, commenting on others' posts, tagging other users, posting pictures with others, e.g., Büttner et al., 2023; Büttner & Rudert, 2022; Lutz et al., 2023). Importantly, social media use was assessed as communication with others in Study 1. However, again, the specificities of what communicating with others on social media means remain open. For instance, it could be that some ostracized individuals turn to social media to connect with extreme groups (e.g., Hales & Williams, 2018; Pfundmair, 2019), a behavior that could gradually isolate them further from others over time (e.g., Hales & Williams, 2020) and

potentially foster antisocial behavior on behalf of extreme groups. In Study 2, social media use was assessed even more openly as posting (active use) versus viewing others' posts (passive use). Thus, specific social media users' behaviors could range from prosocially-oriented acts such as liking others' content to antisocial acts such as cyber-bullying (e.g., Yokotani & Takano, 2021), hate speech (e.g., Castaño-Pulgarín et al., 2021), or spreading false information (e.g., Wicks et al., 2023). Future studies should make use of real-life social media data and text analysis of social media posts and comments after ostracism to gain more insight into these phenomena (see Kenntemich et al., 2024). Moreover, social media use is not the only digital means of communication that is available to ostracized targets. Engaging in other online behaviors such as playing video games after ostracism may also re-afford psychological needs (e.g., Karahanna et al., 2018) and may be approach-oriented (e.g., collaborative group games) or antisocially-oriented (e.g., ego shooter games). Relatedly, research may also focus on social media as a form of avoidance behavior such as withdrawing by using social media less frequently (e.g., Sarfraz et al., 2023) or withdrawing from physically present others by using social media.

**Antisocial behavior.** Regarding antisocial behavior, in line with the proposed framework, Study 1 shows a significant association between higher need threat and antisocial behavior *intention*. Study 2, however, did not demonstrate an association between need threat and antisocial *behavior* during the last hour. This discrepancy between intention and behavior may have several reasons. First, while participants may have the urge to behave in antisocial ways (i.e., intention), they may refrain from enacting it due to possible negative consequences such as social or legal punishment. Second, it could also be that ostracized targets do not have the opportunity to aggress against the ostracizers in all situations. For instance, picture someone being physically left out of a meeting – while they might feel the urge to aggress towards those who excluded them, the ostracizers are physically out of reach. This further dovetails with tenets

of the Theory of Planned Behavior (Ajzen, 1991), which states that a main factor for why behavioral intentions are not always translated into behavior is a lack of behavioral control - which aligns with the Temporal Need Threat Model (Williams, 2009) and the present findings that ostracism deprives targets of control. Finally, it could also be that the effects of ostracism on antisocial inclinations are time-sensitive so that effects are weaker in time-contingent sampling of the last hour compared to event-contingent sampling of behavioral intentions (see e.g., Balliet & Ferris, 2013; Jonas et al., 2014; Wesselmann et al., 2015). In any case, the present findings demonstrate that measuring actual behavior in daily life is important above and beyond the assessment of intentions.

**Withdrawal behavior.** In both studies, higher need threat was associated with withdrawal behavior, dovetailing with experimental research (Ren et al., 2016, 2020). This is alarming because withdrawal may harm ostracized individuals in the long run: Recent findings show that people avoid those who tend to withdraw because they assume that they would make for unpleasant interaction partners and would prefer to be alone anyways (e.g., Ren & Evans, 2021). Future research could thus test cyclic associations of ostracism and withdrawal behavior in everyday life. What is also not known at this point is how long individuals withdraw from others. For instance, in line with tenets that threat responses operate in a temporal sequence where the initial threat is strong (e.g., Williams, 2009) and accompanied by avoidance and antisocial rather than approach reactions (e.g., Jonas et al., 2014; Wesselmann et al., 2015), it could be that individuals first withdraw from others to recover their needs and ponder adequate coping strategies. It may well be the case that individuals who initially withdrew show more approach tendencies after a certain time. These are questions for future research to address.

## **Conclusion**

In two experience sampling studies, we find that ostracism is an emotionally powerful experience that occurs 2-3 times per week, predominantly in close relationships, at work, and

at home. Reconciling previously mixed findings regarding ostracism's effects on behavior and extending existing theory, we propose a novel framework of behavioral reactions based on the strength of experienced need threat: When psychological needs are severely threatened, individuals react with avoidance and antisocial inclinations (i.e., withdrawal and antisocial intentions, but not antisocial behavior) rather than approach behavior (i.e., prosocial behavior, talking to others, or connecting with them on social media), to everyday ostracism.

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