




# Ostracism threatens certainty: a single-laboratory meta-analysis

Andrew H. Hales 

University of Mississippi

## ABSTRACT

Ostracism is well-known to threaten fundamental needs for belonging, self-esteem, control, and meaningful existence. This article presents theoretical and empirical evidence for an additional, fifth need, threatened by ostracism: the need for certainty. I review the theoretical basis for this need, and meta-analytically summarize evidence from 18 experiments from my research lab that manipulate ostracism and measure the degree to which individuals feel uncertain about themselves and their environment (total  $N = 5,241$ ). Ostracism has a negative effect on one's sense of certainty both immediately,  $d = -.37$ , 95% Confidence Interval  $[-.46, -.27]$ , and also, to a lesser but still significant extent, after a brief delay  $d = -.16$   $[-.24, -.07]$ . I consider the current research landscape and future directions, including the behavioral and long-term effects of ostracism-induced uncertainty, the possible appeal of uncertainty for those who use ostracism, and the potential for other needs threatened by ostracism.

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Ostracism is powerful. The need-threat model of ostracism, developed by Dr. Kipling Williams, explains how ostracism – being ignored and excluded – is not merely an uncomfortable or unpleasant experience (Williams, 1997, 2007, 2009). Rather, it poses a simultaneous threat to several fundamental human needs. People have deep and basic motivations to be connected with others (belonging), to feel good about themselves (self-esteem), to feel that they can affect change in their environment (control), and to feel like their existence matters (meaningful existence). These are recognizable as the “four basic needs” that are threatened by ostracism.

In recent years, evidence has emerged for another, fifth, need that is threatened by ostracism: The need for *certainty*. It is deeply troubling for people to feel as if their perceptions of reality, and of themselves, cannot be trusted. By its nature, ostracism presents a number of ambiguities which can undermine certainty, and Dr. Williams identified this early in his ostracism theorizing as one of its important features:

It is inherently ambiguous—I believe it is chosen by so many people as the initial (or even habitual) response to hurt feelings, anger, or fear precisely because it is ambiguous—it is not clear to the victim *if* it is occurring or *why* it is occurring. There is always the possibility that ostracism is not occurring, but resides only in the mind of the victim. Realizing this possibility undoubtedly causes them to pause, speculate, doubt, worry, and anguish. In other types of punishments (verbal and physical abuse), the aversive behaviors are clearly occurring, and, even though aversive, are unlikely to produce the additional anxiety associated with ostracism's ambiguity. (Williams, 1997, p. 142)

In this article I present the theoretical and empirical basis for certainty as a basic need threatened by ostracism, and a meta-analysis of eighteen studies from my lab demonstrating how ostracism threatens this need.

**CONTACT** Andrew H. Hales  [ahales@olemiss.edu](mailto:ahales@olemiss.edu)  Department of Psychology, Peabody Hall, University, MS 38677, USA

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## Theoretical basis

Certainty here refers to a general sense of predictability and clarity. People appear to not just desire certainty about themselves and their environment – they are actively distressed and encounter serious difficulties without it. This basic observation – that people need some degree of certainty and are distressed by serious amounts of uncertainty – is addressed in several large-scale theories in social psychology (e.g., Gordon, 2003).

For example, according to the Uncertainty Management Model “people have a fundamental need to feel certain about their world and their place within it” (van den Bos, 2009, p. 200). Because of this, people are sensitive and reactive to important reminders of uncertainty, and experience such states as highly aversive, and are motivated to act in ways that reduce this uncertainty. According to this model’s framework, personal uncertainty can be distressing, anxiety provoking, and even psychologically motivating to an extent comparable to the existential dread of mortality. Similar observations are made by the Entropy Model of Uncertainty, with an emphasis on anxiety specifically as an outcome of unmanaged uncertainty (Hirsh et al., 2012), and the Generalized Threat model, with an emphasis on the varied ways in which people respond to uncertainty-related threats (Jonas et al., 2014).

Beyond *self*-uncertainty, theories have also emphasized humans’ fundamental need to feel at least somewhat confident in their understanding of their *social* environment, outlining a general aversion to uncertainty. In classic Social Comparison Theory, people are motivated to know not just what they are like in absolute terms, but also what they are like relative to others (Festinger, 1954). And the social world is replete with uncertainties, both in terms of abstract or difficult judgment calls (e.g., Tversky & Kahneman, 1974), and also in terms of features of the environment that are simply ambiguous or even unknowable (e.g., Haselton & Buss, 2000). Theoretical accounts of information processing suggest that people do not simply learn to accept these ambiguities, but instead are deeply motivated to resolve them (FeldmanHall & Shenhav, 2019; Kruglanski & Webster, 1996).

Finally, uncertainty, and the fundamental motivation to resolve it, has clear implications for group-level identification and processes. Uncertainty Identity Theory articulates how a particularly potent and available means to restore and bolster certainty is to identify with groups (Hogg, 2007). According to this framework, groups provide a prototype not only for others, but for oneself. Self-categorizing and identifying with a group can provide a clear structure to social environment, complete with descriptive and prescriptive norms for how one should behave, and how one can reasonably expect others to behave.

Together these models all converge on the same basic conclusion: some degree of certainty is critical to psychological well-being, and when it is threatened a host of ill-being related consequences follow.

## Uncertainty and ostracism

Early theorizing on ostracism emphasized that, unlike other forms of aversive interpersonal contact, it is inherently ambiguous. It is characterized by the *absence* of attention, the things that are *not* said, and the invitations that are *not* extended. As a result, sources can easily plausibly deny that they are using any intentional ostracism, and targets must constantly wonder whether they are being ignored and excluded on purpose, the reasons for such treatment, and when, if at all, it will end (Williams, 1997). Even when ostracism occurs it may be partial and hard to detect (Dvir, 2025). The ways in which ostracism can trigger uncertainty are summarizable in three questions: *Am I being ostracized? Why am I being ostracized? If I’m being ostracized, what does that say about me?* In 2010, these ideas were further elaborated in a chapter examining how the ambiguity of ostracism is both threatening, and also potentially an opportunity for targets to favorably construe the event in positive terms (for example, by making face-saving external attributions for why it is occurring; Chen et al., 2010).

Beginning in 2011, alongside Dr. Williams I began to conduct direct empirical work involving ostracism and certainty. The initial interest in this aspect of ostracism related to its potential to help understand whether and when ostracism might motivate people to explore affiliating with extreme groups, as implied by Uncertainty Identity Theory (Hogg, 2007). At this point I began to directly consider and measure certainty itself, and found initial evidence that Cyberball-induced ostracism increased people's feelings of uncertainty about themselves and their environment (Hales & Williams, 2018). Theorizing has since articulated and further elaborated the basis for this need (Z. Chen et al., 2024; Hales & Williams, 2021; Williams et al., 2019).

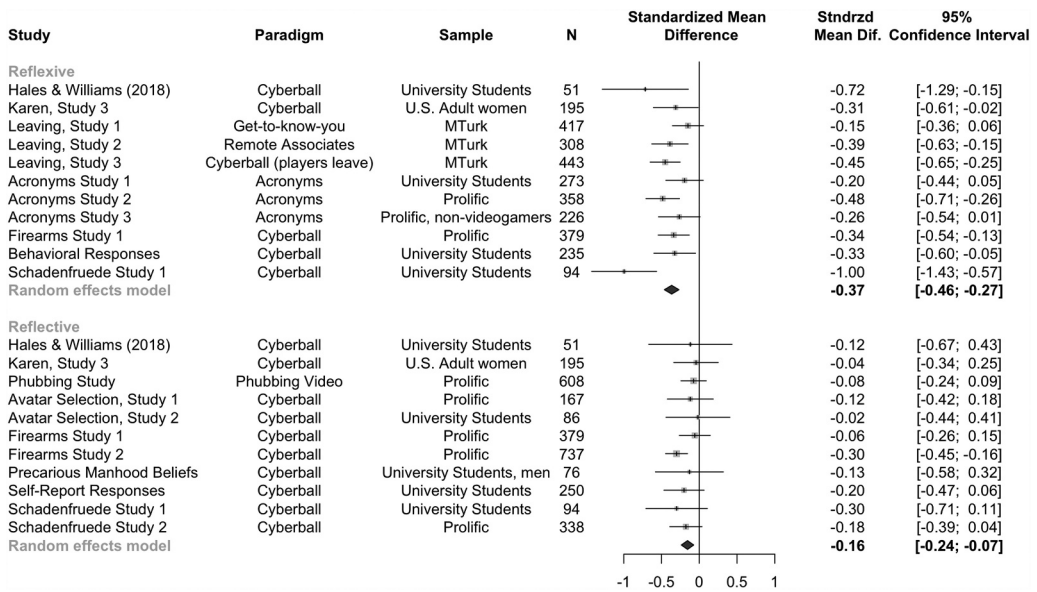
Subsequently, in much of the ostracism related research that I have conducted – whether focused explicitly on certainty or not – I have included direct measures of certainty measured alongside the other four basic needs. In most cases, when analyzing the results, the particular items measuring certainty were collapsed together with the other needs to form a composite needs index scale, as is often done in ostracism research (Williams, 2009). Because this need is a newer addition to the framework, and has not been empirically investigated to the same degree as the other needs (e.g., Hartgerink et al., 2015), there is some catching up to do. Does ostracism actually threaten *certainty* specifically? And if so, do people begin to recover this need quickly as they do for other threatened needs?

## Meta analysis

To answer these questions, the current analysis summarizes and presents the meta-analytic results of 18 experiments conducted in my lab since we began including certainty items in the basic needs scale. To be included in the analysis, a study had to include 1) an experimental manipulation of ostracism, and 2) items measuring *certainty* included in the basic needs scale that is often employed as a key outcome in ostracism experiments. Most studies manipulated ostracism using the common ball-throwing paradigm Cyberball (Williams et al., 2000), but a few used other ostracism or ostracism-type experiences entailing some form of excluding/ignoring such as being ignored by someone using their phone (Hales et al., 2018), or reading a group promotion laden with the sorts unfamiliar acronyms that could be alienating to people (Hales et al., 2017). Most studies compared ostracism to inclusion conditions (as in Cyberball) or similar control/neutral type experiences (for example, in a study of cell-phone ostracism, the comparison condition is a conversation partner who appears to be listening normally (Hales et al., 2024). All studies measured certainty using the following three items, or close variations, with degree of endorsement rated on a Likert scale: “I felt/feel uncertain about myself,” “I felt/feel unsure about what makes me who I am,” and “I did/do not know what I should think or feel.”

Following the temporal need threat model, basic needs can be measured *reflexively*, immediately and with question wording referring the ostracism at the moment it was occurring (i.e., the past-tense version of the items above), or *reflectively* after a (often very brief) delay (i.e., the present-tense version of the items above). Depending on the aims of the particular study, basic needs were measured in either just the reflexive stage ( $k = 7$ ), just the reflective stage ( $k = 7$ ), or both ( $k = 4$ ). For the main analysis, as needed, for studies that had multiple experimental conditions with gradations of ostracism (for example, a partial ostracism condition, and also a complete ostracism condition), these conditions were conservatively averaged together into a single *ostracism* composite condition. Finally, because four studies measured basic needs in both stages, to avoid complications due to non-independence of observations, the analysis was conducted and interpreted as two separate meta-analysis: one for the reflexive stage overall ( $k = 11$ ;  $N = 2,979$ ), and one for the reflective stage overall ( $k = 11$ ;  $N = 2,981$ ). The total number of unique participants across the two analyses was 5,241.

The meta-analysis was performed using the *meta* package in R (Balduzzi et al., 2019); the data and analysis code are openly available at <https://researchbox.org/3440>



**Figure 1.** Meta analyses of the effect of ostracism on certainty in the reflexive and reflective stages. *Note.* In the reflexive stage (top panel,  $N = 2,979$ ) and reflective stage (bottom panel,  $N = 2,981$ ).

## Results

Figure 1 shows the results of the meta-analyses: ostracism causes an immediate threat to certainty, and people begin to recover measurably within the minutes that follow. Specifically, in the reflexive stage, seen in the top panel, ostracism triggers an immediate undermining of one's sense of certainty:  $d = -.37$ , 95% Confidence Interval  $[-.46, -.27]$ . After a brief delay, in the reflective stage, seen in the lower panel, the effect of ostracism is notably smaller, in fact about half the size:  $d = -.16$ ,  $[-.24, -.07]$ . Importantly, even in the reflective stage, the effect, though small, is still distinguishable from zero, indicating that people had not *fully* recovered on average (at least in the minutes following the ostracism episode, which is when these measures were typically completed).

Additional analyses separating partial from full ostracism, in the seven studies where such gradations of ostracism were present, indicated that the effect of ostracism is significant in both cases, but noticeably stronger for full ostracism versus partial ostracism inductions in the reflexive stage: full  $d = -.51$ ,  $[-.66, -.36]$ , partial,  $d = -.26$ ,  $[-.41, -.12]$ . Differences in the reflective stage were minimal as only a single study with a partial ostracism condition included a reflective stage measure (see supplemental analyses on researchbox page for full details).

## Discussion

Together these studies show clear evidence of experimentally-induced ostracism threatening the need for certainty. The effect size may appear small at first, even in the reflexive stage ( $d = .37$ ). However, it is important to note that this effect size is actually quite similar to an empirically derived best estimate of the average effect size for a typical study in social psychology (Lovakov & Agadullina, 2021). Additionally, analyses separating full versus partial variants of ostracism indicated that, not surprisingly, the effect size is larger with stronger manipulations of ostracism, and smaller with weaker manipulations.

These studies also show a clear improvement in one's need for certainty after even a very short delay following ostracism, in line with the temporal need-threat model and the observation that people begin to recover their basic needs very quickly in the seconds and minutes following ostracism

(Wesselmann et al., 2012; Williams, 2009). Most of the studies in the lower panel of the figure measured reflective needs mere minutes after the ostracism had occurred. People probably would have fully recovered on average after a slightly longer delay.

Like all meta-analyses, these conclusions average over many likely important sources of variation. Also likely important are factors such as whether the target knows the reason for ostracism (Bradley, 2025; Chen et al., 2025), or has information about how long it will last (Riva et al., 2025), and even individual differences such as tolerance for uncertainty, need for cognitive closure (Leckfor et al., 2023), and need to belong (Leary et al., 2013).

## Current landscape and future directions

Both existing theory, and the evidence summarized here, strongly indicate that ostracism threatens the need for certainty. Several important future directions remain.

Top among them is identifying the *long-term* consequences of ostracism-induced uncertainty. The studies reviewed here were short-term experimental inductions of ostracism (for the usual ethical and practical reasons). The temporal need-threat model, and existing research on the resignation stage of ostracism outline four long-term and serious consequences of prolonged and chronic ostracism, corresponding in at least some way to the four original basic needs: alienation, unworthiness, helplessness, and depression (Riva et al., 2017; Williams, 2009). So, what are the long-term consequences of prolonged ostracism-induced uncertainty? Existing theories of uncertainty and rejection strongly suggest that the result would be serious degrees of *anxiety*, possibly at clinically relevant levels (Carleton, 2016; Gordon, 2003; Hirsh et al., 2012; Jonas et al., 2014; Leary, 1990). And indeed, this was anticipated in Williams's initial description of the ambiguity of ostracism: "There is always the possibility that ostracism is not occurring, but resides only in the mind of the victim. Realizing this possibility undoubtedly causes them to pause, speculate, doubt, worry, and anguish" (Williams, 1997, p. 142).

A second important theoretical question, whose answer appears less apparent, is *what are the behavioral consequences of ostracism-induced uncertainty*. Ostracism is known to variously instigate aggressive behaviors, prosocial behaviors, or withdrawal behaviors, depending on a variety of factors, including, which needs are most saliently threatened (Ren et al., 2018, 2021; Williams, 2009). If restoring *certainty* is one's primary motivation, what behaviors follow? The answer likely depends on the options available. Because groups can offer certainty (Hogg, 2007), people could affiliate with whichever groups readily offer connection. This will likely lead to prosocial connection in many cases; however, in situations where the available groups are extreme, radical, or exist to promote dubious causes, this responses could produce behaviors with concerning outcomes (Hales & Williams, 2018; Pfundmair, 2019; Poon et al., 2020; Wood & Hales, 2024). Some behaviors are more helpful in promoting recovery than others (Chen, 2025); understanding the unique role of uncertainty may lead to insights about how to effectively promote recovery.

Third, future research should be open to and curious about the possibility of other needs that could be reliably threatened by ostracism. The five current needs appear to be the clearest to identify (especially the original four, early in ostracism theorizing) and likely constitute the most psychologically significant and consequential outcomes of ostracism. But it is not a definitive or finalized list. It is likely that as this research continues, the "basic" element of the needs will become less prominent and the focus may shift to less foundational constructs such as motivations, goals, and desires (though overlooked needs may exist in more fundamental/physical directions as well; e.g., the need for a minimum sense of physical personal safety/security, Dean et al., 2019; Wesselmann et al., 2015). Likewise, certainty itself is multifaceted, and uncertainty may be felt in relation to some targets more than others. One can feel uncertain about themselves, the current environment, future events, and numerous other targets. It is an open and interesting research question if and how these different varieties of uncertainty have different causes and consequences.

And finally, so far the focus has been on uncertainty as an outcome experienced by targets of ostracism. But of course, sources of ostracism are likely aware of its ambiguous properties. Early on, Williams offered some speculation that is the basis of a hypothesis ready for testing: “[ostracism] is chosen by so many people as the initial (or even habitual) response to hurt feelings, anger, or fear precisely because it is ambiguous” (Williams, 1997, p. 142). Is the ambiguity of ostracism part of what accounts for its apparent ubiquity? Experiments can directly manipulate the ambiguity (or the “plausible deniability”) of a potential ostracism act, and test the degree to which it affects the decision to ostracize. The uncertainty of ostracism may enable sources to use it without being required to defend their behavior, because they can easily deny using ostracism. If so, ostracism may be a popular choice, but only in situations where people cannot easily be held accountable for having used it (Tetlock, 1992). Understanding perceived uncertainty would help to further enhance our understanding of source’s motivations for ostracism (Rudert, 2025).

## Conclusion

The present analysis points to a clear effect: ostracism threatens the need for certainty, especially in the immediate moments in which it is occurring. Further research can help clarify the implications and longer-term consequences of this ostracism-induced uncertainty.

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## Notes on contributor

*Andrew Hales* is a Professor of Psychology at the University of Mississippi. He researches the causes and consequences of ostracism, and social influence more generally. He is also interested in research methods and replicability.

## ORCID

Andrew H. Hales  <http://orcid.org/0000-0001-8045-5475>

## Data availability

Data and analysis code are available at: <https://researchbox.org/3440>

## Recommended Readings

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). Guilford Press.

*A review of 8 succinct principles of ostracism theory, embedding (un)certainly in the larger picture.*

Chen, Z., Yunqian Tian, F., Hales, A. H., & Williams, K. D. (2025). The uncertainty surrounding ostracism: Threat amplifier or protector? In *Handbook of the uncertain self* (2nd edition) (pp. 291–302). Psychology Press.

*An in-depth look at how ostracism can cause uncertainty, and the implications this can have.*

Williams, K. D., Hales, A. H., & Michels, C. (2019). Social ostracism as a factor motivating interest in extreme groups. In S. C. Rudert, R. Greifeneder, & K. D. Williams (Eds.), *Current Directions in Ostracism, Social Exclusion and Rejection Research*. Routledge.

*An overview of ostracism, with a focus on uncertainty and how it can instigate extremism.*

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