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Mental Control and Attributions of Blame for Negligent Wrongdoing

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Third-personal judgments of blame are typically sensitive to what an agent knows and desires. However, when people act negligently, they do not know what they are doing and do not desire the outcomes of their negligence. How, then, do people attribute blame for negligent wrongdoing? We propose that people attribute blame for negligent wrongdoing based on perceived *mental control*, or the degree to which an agent guides their thoughts and attention over time. To acquire information about others' mental control, people self-project their own perceived mental control to anchor third-personal judgments about mental control and concomitant responsibility for negligent wrongdoing. In four experiments (N = 841), we tested whether perceptions of mental control drive third-personal judgments of blame for negligent wrongdoing. Study 1 showed that the ease with which people can counterfactually imagine an individual being non-negligent mediated the relationship between judgments of control and blame. Studies 2a and 2b indicated that perceived mental control has a strong effect on judgments of blame for negligent wrongdoing and that first-personal judgments of mental control are moderately correlated with third-personal judgments of blame for negligent wrongdoing. Finally, we used an autobiographical memory manipulation in Study 3 to make personal episodes of forgetfulness salient. Participants for whom past personal episodes of forgetfulness were made salient judged negligent wrongdoers less harshly compared with a control group for whom past episodes of negligence were not salient. Collectively, these findings suggest that first-personal judgments of mental control drive third-personal judgments of blame for negligent wrongdoing and indicate a novel role for counterfactual thinking in the attribution of responsibility.

Keywords: blame, counterfactual thinking, mental control, negligence, self-projection

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On February 12, 2021, firefighters responded to an explosion at the Amberwood Apartments in Warr Acres, Oklahoma. This fire destroyed several units, leaving many without shelter on a cold winter night. A subsequent investigation revealed that the fire started because one resident forgot to turn off the stove after cooking (Raache, 2021). Although this resident was unaware of his mistake—until it was too late—past research suggests that people would still think that he is blameworthy (Nuñez et al., 2014; Schultz & Wright, 1985), that he should feel guilty (Murray et al., 2019), and that the other residents would justifiably feel angry (Laurent et al., 2016). Unintentionally leaving the stove on after cooking constitutes a clear example of *negligence*. The challenge here, though, as well as with many cases of negligent wrongdoing, is that the usual factors that govern perceptions of culpability—such as the prior knowledge, intention, or desire of the wrongdoer (Alicke et al., 1994)—are not present. The negligent resident did not know the stove was on and did not intend to leave the stove on, and he certainly did not want the apartment to burn down. On what basis, then, do people blame negligent wrongdoers in such cases?

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Samuel Murray and Kristina Krasich designed, conducted, and analyzed data for all experiments. Samuel Murray and Thomas Nadelhoffer designed the manipulation for Study 3. Samuel Murray, Kristina Krasich, and Felipe De Brigard conceptualized and designed Study 2. Samuel Murray wrote the first draft of the article, and all authors contributed to editing. All authors approved the final version of the article. Materials, data, analysis scripts, and supplementary analyses can be found at the OSF repository for the project: https://osf.io/drjx3/.

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Responsibility and Negligence

In the law, negligence refers to actions performed unwittingly that create an unjustifiable risk (model Penal Code §2.02). Lay conceptualizations of negligence characterize it in a way analogous to the legal domain. For example, when asked to define negligence, Nuñez et al. (2014) found that people described being negligent in terms of lacking specific awareness of one's actions while having a general awareness of how kinds of actions might create certain kinds of risks (e.g., knowing in general that leaving the stove on creates a risk of fire). Consistent with this, experimental work has found that negligent actors are judged to have general awareness of how acts might cause different outcomes, but in the circumstances they acted carelessly (Nobes et al., 2009). However, people do not tend to judge that individuals who act negligently desire to bring about harm (Schultz & Wright, 1985).

Thus, people view negligent actors as having three characteristics: (a) lack of awareness about how one's specific actions are likely to cause certain outcomes, (b) lack of desire for bringing about the consequences of one's current actions, and (c) general knowledge of how kinds of actions tend to produce certain outcomes. Consider again the Warr Acres home fire: The resident was not aware of leaving the stove on and did not desire to burn the apartment down. Nevertheless, the resident also (likely) had general awareness that leaving stoves on unattended in an apartment raises the risk of fire. Negligent *wrongdoing*, then, is negligent action that creates a risk of harm. This means that negligent wrongdoers create substantial risks of harm without realizing what they are doing (until it is too late) and without desiring to create such risks (Murray, 2020).

Past research suggests that people attribute blame for negligent wrongdoing (Kneer & Machery, 2019; Schultz & Wright, 1985) and think that negligent wrongdoers should feel guilty (Murray et al., 2019). Moreover, negligent wrongdoing tends to elicit anger from third-party observers (Laurent et al., 2016) and is thought to deserve punishment (Nobes & Martin, 2022). This can seem somewhat surprising. Perceptions of culpability typically track mental states that serve as the proximate causes of action, such as belief, desire, and intention (Alicke et al., 1994). The more an agent knows about what they are doing and desires the consequences of what they are doing, the more they are judged to be responsible for the outcomes of their actions (Schlenker et al., 1994; Weiner, 1995; Young & Tsoi, 2013). But negligent wrongdoers do not know what they are doing and do not desire the outcomes of what they are doing. The resident who caused the apartment fire in Warr Acres illustrates this: He did not realize the stove was on and did not want to burn down the apartments. Thus, it seems that negligent wrongdoers lack the characteristic mental state features that justify attributions of blame.

Even though negligent wrongdoing occurs unintentionally, it seems that people draw on the same social–cognitive processes in attributing blame for intentional and negligent wrongdoing (Malle et al., 2014). As Laurent et al. (2016) note in their study of blame attribution for negligent wrongdoing, the same mental state components that inform attributions of blame for *intentional* wrongdoing also seem to inform attributions of blame for *negligent* wrongdoing. But this raises the question of what mental states serve as the basis for attributing blame for negligent wrongdoing.

According to the Path model of Blame (Malle et al., 2014)—a recently articulated model of the information-processing components underlying attributions of blame—two processes are implicated in judgments of blame for negligent wrongdoing. First, people determine whether the individual was obligated to prevent their negligent action. Second, assuming the negligence violates an obligation, people determine the individual's capacity for preventing negligence. The degree of blame scales with the capacity to prevent negligence. That is, the more easily an individual could have prevented their negligent wrongdoing, the more to blame they are for that negligence. In this way, mental state inferences remain central to attributions of blame for negligent wrongdoing. But how could people prevent negligence?

Negligence and Mental Control

Negligence often results from a deficit of attention or a failure to remain vigilant. The Warr Acres resident was, for example, at one point cooking and attending to the oven but failed to maintain attention on the activity to completion (i.e., turning off the stove). In general, negligence results from inattentiveness, distraction, or carelessness. To prevent negligence, then, people must at least remain vigilant with respect to what they are doing.

This means that preventing negligence requires some degree of *mental control*, where mental control is the process or set of processes whereby people maintain attention toward goal-relevant thoughts and shield their thinking from distraction or mind wandering (Eppinger et al., 2021; Irving, 2021; Kane et al., 2007). Recent research suggests that people generally consider different kinds of mental states to be controllable (Cusimano & Goodwin, 2020) and that this controllability is the basis on which people can be responsible for their mental states (Cusimano & Goodwin, in press). Notably, negligence reflects a failure of mental control. The notion of mental control can be understood by an analogy to physical control. We exert control by coordinating our bodily movements over time in ways that are conducive to achieving our goals in accordance with what we believe is needed to reach those goals. Lack of physical control might stem from a lack of skill (e.g., trying to perform a difficult piano piece that you have not practiced), a lack of resolve (e.g., lighting a cigarette) or a performance mistake (e.g., writing the wrong date on a form just after the new year). Just as physical control refers to coordinating bodily movements over time in goal-relevant ways, mental control refers to coordinating thoughts and attention over time in goal-relevant ways. Lack of mental control might similarly stem from a lack of skill (e.g., failing to see the appropriate steps in a math proof), a lack of resolve (e.g., failing to focus on a difficult passage one needs to study), or a performance mistake (e.g., mixing up digits in a phone number you need to remember).

There are different ways people can fail to exert mental control, and not all of them manifest in negligence. Negligence results from failing to maintain attention on what one is doing. Thus, negligence stems from a failure of mental control related to *persistence* rather than other forms of mental control failure, such as a lack of skill or resolve. Consider again the Warr Acres fire: The resident failed to attend to the oven, thereby leaving it on and causing the fire. Greater mental control would have resulted in the person noticing the oven. Because negligence often results from failures of mental control, it seems that judgments of blame for

negligent wrongdoing should vary as a function of the degree of perceived mental control attributed to the agent while being negligent. More specifically, we predict:

(*Mental control hypothesis*) The degree of blame attribution for negligent wrongdoing varies as a function of the degree of perceived mental control in the negligent agent.

Mental Control and Counterfactual Thinking

The mental control hypothesis provides a specific prediction about how people assess capacity that is consistent with other accounts of blame attribution—namely, that the more mental control an individual is perceived to have, the more blameworthy that individual is for their negligent wrongdoing (Guglielmo & Malle, 2017; Malle et al., 2014; Monroe & Malle, 2019; Schlenker et al., 1994; Weiner, 1995). It also suggests a role for counterfactual thinking in attributing blame for negligence. Counterfactual thinking is the capacity for imagining alternative ways events could have happened but did not (De Brigard & Parikh, 2019). Counterfactual thinking has been shown to play a role in general processes of blame attribution, where imagining how outcomes could have been better (or worse) amplifies (or diminishes) blame (Alicke et al., 2008; Boninger et al., 1994; Gilbert et al., 2015). This applies specifically to attributions of blame for negligent wrongdoing, where individuals who imagine more counterfactuals for bad outcomes tend to attribute more blame for negligent wrongdoing (Petrocelli et al., 2011). Moreover, judgments of blame for negligent wrongdoing scale with the degree to which people consider such outcomes to be mutable (Alicke, 2008).

If judgments of mental control inform judgments of blame for negligent wrongdoing, then this would explain why counterfactual thinking is relevant for attributing blame for negligent wrongdoing. That is, to assess how easily some individual could have prevented their negligence, one considers the occurrence of negligence across different counterfactual scenarios. Thus, counterfactual imagination is used to infer mental control. This also would explain previously identified roles of counterfactual thinking in attributing blame for negligent wrongdoing. Outcomes resulting from negligent wrongdoing are more mutable when individuals have greater mental control (and, hence, are in a better position to preempt potential causes of negligence). Greater mental control is directly related to greater capacity, which the Path model predicts to be an inculpating factor for blame. Thus, we predict that the ease with which people can counterfactually imagine some negligent wrongdoer behaving non-negligently is associated with greater judgments of mental control and, thereby, greater judgments of blame for negligent wrongdoing.

One issue with this proposed relationship between mental control and attributions of blame for negligent wrongdoing is that it leaves open the question of how people acquire information relevant to making inferences about mental control in others. The acquisition question is especially pressing when people (as they sometimes do) attribute blame for negligent wrongdoing to an individual with whom they have little personal experience or know very little about, such as in criminal proceedings. In situations where there is little to no background knowledge, what kinds of situational factors anchor inferences about mental control?

Counterfactual Thinking and Self-Projection

According to the episodic simulation hypothesis, prior experiences are recombined in novel ways to simulate possible scenarios in counterfactual thinking (Schacter & Addis, 2007). Thus, simulations used to infer mental control must have some basis in episodic memories. But, in the absence of personal experiences with the wrongdoer, what serves as the episodic basis of counterfactual thinking?

We propose that people use self-projection as the episodic basis of simulations used to infer mental control. That is, people imagine what they would have done in the circumstances in light of their personal assessment of their own mental control to simulate what would happen. In this way, people use self-projection to acquire information that can be used to infer mental control in others. Self-projection is the process of using self-perception as a standard of evaluation (Dunning, 2003). It is a pervasive feature of social judgment (Alicke et al., 2001). The self can be used as a standard to judge others' behavior (Sedikides, 2003), preferences (Alicke, 1993), or attitudes (Hovland & Sherif, 1952). Moreover, self-perception influences how people construe the actions and motivations of others (Alicke & Weigold, 1990; Markus, 1977; Newman et al., 1997). In the absence of personal experience with the negligent wrongdoer, we predict that first-personal assessments of mental control are used to make inferences about mental control in others:

(*Self-projection hypothesis*) First-personal assessments of mental control drive third-personal judgments of blame for negligent wrongdoing.

Thus, we propose that people attribute blame for negligent wrongdoing by counterfactually imagining how easily the individual could have prevented their negligence. The more easily the individual could have exercised mental control, the more to blame that individual is for their negligence. In the absence of personal experience with the negligent wrongdoer, people use first-personal assessments of mental control to anchor their counterfactual thinking about how easily someone could have prevented their negligence.

The Present Study

We present the results of three experiments and a conceptual replication examining the hypotheses outlined above. In Study 1 we found, consistent with our *mental control hypothesis*, that judgments of mental control are correlated with judgments of blame for negligent wrongdoing. Moreover, this relationship is fully mediated by ease of imagining a counterfactual scenario where the wrongdoer behaves non-negligently. Whereas Study 1 was correlational, Studies 2a and 2b manipulated perceived mental control to evaluate the causal link between counterfactual thinking and blame for negligent wrongdoing. We showed that judgments of blame for negligent wrongdoing vary as a function of perceived mental control, which further supports the *mental control hypothesis*. These studies also identified a significant positive correlation between third-personal judgments of blame for negligent wrongdoing and first-personal assessments of mental control, which provides partial support for the role of self-projection in acquiring information related to attributions of blame for negligent wrongdoing (*self-projection hypothesis*). In Study 3, we manipulated

self-perceived mental control using a novel autobiographical manipulation that successfully modulated first-personal assessments of mental control and resulted in diminished third-personal judgments of blame for negligent wrongdoing in the experimental condition.

Collectively, these experiments extend models of blame attribution to account for attributing blame for negligent wrongdoing. Our results indicate that judgments of mental control are central to attributions of blame for negligent wrongdoing. Our results also suggest that people acquire information about mental control through self-projection in counterfactual thinking.

Study 1

All materials and data are available at the OSF repository for the project: https://osf.io/drjx3/. All studies reported below were approved by the Duke University Institutional Review Board under Protocol E0089. In this study, we test two predictions related to the *mental control hypothesis*: (a) judgments of blame for negligent wrongdoing will be positively correlated with judgments of mental control related to negligent wrongdoing, and (b) counterfactual ease of imagining non-negligent behavior will mediate the relationship between judgments of mental control and judgments of blame.

Method

Participants

We recruited 474 participants through Amazon's Mechanical Turk. Participants had to satisfy three conditions to qualify for the task: (a) they needed to have successfully completed at least 5,000 HITs in the past, (b) they needed a HIT success completion rate of at least 98%, and (c) they needed to be in the United States.[1]

An a priori power analysis (conducted using G*Power) for a linear regression with 6 predictors to detect a minimum effect size of interest ($f^2 = .15$) at 99% power at a standard error threshold ($p = .05$) recommended 194 participants. We used two different vignettes and originally planned to conduct analyses separately for each vignette, so we doubled the recommended sample and overrecruited by 20% to account for exclusions (466 participants). One hundred three participants were removed from the data set prior to analysis for failing either of two attention checks (described below; final $N = 363$; $M_{age} = 37.1$, $SD_{age} = 10.7$, 36% female). However, after collecting data we altered our analytic approach to increase the statistical power of our tests. Instead of running analyses separately for each vignette, we standardized scores and collapsed across vignettes.

Materials and Procedure

After providing informed consent, participants answered a simple attention check question: "January is the first month of the year. What is the fifth month of the year?" Participants were given six options, with the correct option (May) always listed fourth. This question was included to screen for inattentive participants and automated response programs (bots). Participants who failed to answer this question correctly were prompted to exit the survey without receiving a completion code.

After the check, participants were randomly assigned to read a vignette about a parent forgetting ice cream in the car or leaving one of three kids in a cart after shopping at the store:

Ice Cream. Randy usually picks up his kids from elementary school on his way home from work. Today, his wife calls to ask him to pick up some things at the grocery store, including some ice cream for a dessert she's making. The store is on the route to school, so Randy agrees to go to the store. Randy decides to go to the store first. Even though it is hot outside, the pickup has never taken long and it's more efficient for Randy to go to the store before getting the kids. After shopping at the store, Randy heads to the school. Shortly after arriving, a normally routine pickup turns into an extended affair that involves talking to an administrator for nearly 30 minutes. During that time, Randy completely forgets about the ice cream and it melts in the hot car. Randy doesn't realize this until he's already home unloading the groceries from the car. By the time Randy gets home, it's too late to head back to the store.

Shopping. Randy has a weekend tradition of taking his three kids to the grocery store to do shopping for the week. Randy's kids are 9, 6, and 4, so normally Randy only tries to maintain controlled chaos. The youngest rides in the shopping cart, which reduces the number of things Randy needs to keep track of. Today, as Randy is checking out, his oldest is wandering off in the direction of the gumball machine. Randy pays, takes the bags, and drops off the cart before heading to the car. It's not until they're in the parking lot that Randy's oldest asks why they left the youngest in the grocery cart. Randy turns around and races back inside to find the store manager keeping their eye on the kid.

Participants were then prompted to answer a comprehension check about the vignette, either: "True or False? By the time Randy gets home, the ice cream has melted" or "True or False? Randy has three kids."

Participants then completed the following items:

Control:	How much control does Randy have over remembering [the ice cream/his kid]?
Blame:	How much should Randy's wife blame him for forgetting [the ice cream/the kid]?
Ease:	How easy do you think it would have been for Randy to remember [the ice cream/his kid]?
Vividness:	How vividly can you imagine Randy's situation?

The *Control* item provided a measure of perceived mental control. The *Blame* item provided a measure of responsibility. The *Ease* item provided a measure of counterfactual thinking that assesses how easily the individual could have exercised an appropriate degree of mental control.

Participants were provided a 7-pt. Likert scale (1 = *a little*, 4 = *a moderate amount*, 7 = *a lot*) and items were presented in a random order. Afterward, participants answered a question about situational familiarity: "Has this ever happened to you and, if so, how

[1] Participation was restricted to the United States to raise the likelihood that participants were competent English speakers. Because our main research question concerned comprehension of vignette-based materials, we wanted to be confident that judgments reflected an adequate understanding of the stimuli.

often has it happened? Please give your best estimate" with a 7-pt. scale from *Never* to *Almost all the time*. Participants were also asked to provide a justification of their judgment of blame using an open text response box. These responses were not analyzed as part of the current study. Because the production of scenarios in counterfactual thinking is susceptible to individual differences (Jasper et al., 2008; Kasimatis & Wells, 2014), participants also completed the Perspective Taking subscale of the Interpersonal Reactivity Index (Davis, 1983). The subscale has 7 items and participants record responses with a 5-pt. scale (1 = *Does not describe me well*, 5 = *Describes me very well*; midpoint not labelled) with items such as: "I try to look at everybody's side of a disagreement before I make a decision."

Results

Descriptive statistics for all measures are summarized in Table 1.

A Welch's two-sample t test identified significant differences in blame, $t(360.9) = -4.27$, $p < .001$, $d = .45$, 95% CI [.24, .66], control, $t(359.4) = -2.24$, $p = .03$, $d = .24$, 95% CI [.03, .44], ease of imagining, $t(360.7) = -6.12$, $p < .001$, $d = .65$, 95% CI [.43, .86], and situational familiarity, $t(310.5) = 9.26$, $p < .001$, $d = .97$, 95% CI [.76, 1.19], across vignettes. There was no evidence for significant differences in vividness of imagining the vignette, $t(360.3) = 1.50$, $p = .13$, $d = .16$, 95% CI [−.05, .36], or average tendency toward perspective-taking, $t(360.7) = .81$, $p = .42$, $d = .08$, 95% CI [−.12, .29]. Because of these differences, we standardized average scores on all measures across vignette in subsequent analyses.

We then assessed correlations between our dependent measures (summarized in Figure 1).

We found moderate correlations between control and blame, and moderate-to-strong correlations between counterfactual ease of imagining and both blame and control. We also found small but significant negative correlations between situational familiarity and control and ease. A small negative correlation between average scores on the perspective-taking subscale of the IRI and blame was identified, along with a small positive correlation between perspective-taking and reported vividness of imagining the vignette.

To better understand the relationship between blame, counterfactual ease of imagining, and judgments of control, multiple linear regression analyses were used to predict judgments of blame from judgments of mental control and counterfactual ease of imagining. To select the best model, we computed stepwise linear regression and compared four models. Model one contained only intercepts (Null model). Model two had a term for control. Model three had terms for control and ease. Model four had terms for all measures. The third model displayed the best fit, $F(2, 360) = 47.7$, $p < .001$ (adjusted $R^2 = .21$). Whereas ease of imagining had significant partial effects in the model (β = .41, 95% CI [.30, .52], $p < .001$), control did not (β = .08, 95% CI [−.03, .19], $p = .14$; Figure 2A).

To investigate the relationship between counterfactual ease of imagining, control judgments, and blame judgments, we conducted mediation analyses. The analysis examined the average causal mediation effect (ACME) of judgments of counterfactual ease of imagining and the average direct effect (ADE) of control judgments on blame. Confidence intervals were computed using the quasi-Bayesian Monte Carlo simulation method over 1000 simulations (Imai et al., 2010). There was a mediation effect (ACME = .23, $p < .001$, 95% CI [.17, .30], proportion mediated = .72) and no direct effect (ADE = .09, $p = .09$, 95% CI [−.02, .20]), which indicates that participants' ease in imagining Randy not being negligent fully mediated the effect of judgments of control on blame (see Table 2).

Discussion

Study 1 confirms the predictions based on the *mental control hypothesis*. We found that judgments of blame for negligent wrongdoing are positively correlated with judgments of mental control related to negligent wrongdoing. The control that Randy has over his memory is associated with the degree to which Randy is deemed blameworthy for his negligence. We also found that counterfactual ease of imagining non-negligent behavior fully mediates the relationship between judgments of mental control and judgments of blame. This makes sense in light of the general role that counterfactual thinking plays in attributions of responsibility (Boninger et al., 1994; Petrocelli et al., 2011). Here, we show that counterfactual thinking is related to a specific form of mental control that an agent exhibits in negligent wrongdoing.

Our next experiment was designed to address three limitations of Study 1. First, Study 1 observed only correlations between mental control, counterfactual thinking, and blame. To determine whether these relationships are *causal*, we therefore designed an experiment that manipulated the degree of mental control to assess the effect on judgments of blame. Second, Study 1 used only one measure of culpability (blame). Our next experiment used additional measures of culpability to ensure that our results are not driven by idiosyncratic features of blame. Finally, Study 1 did not investigate which factors influence counterfactual thinking about negligent wrongdoing. Specifically, we did not test the *self-projection hypothesis*, which predicts that first-personal assessments of mental control drive third-personal judgments of blame for negligent wrongdoing. To assess this hypothesis, our next experiment included a measure of first-personal mental control.

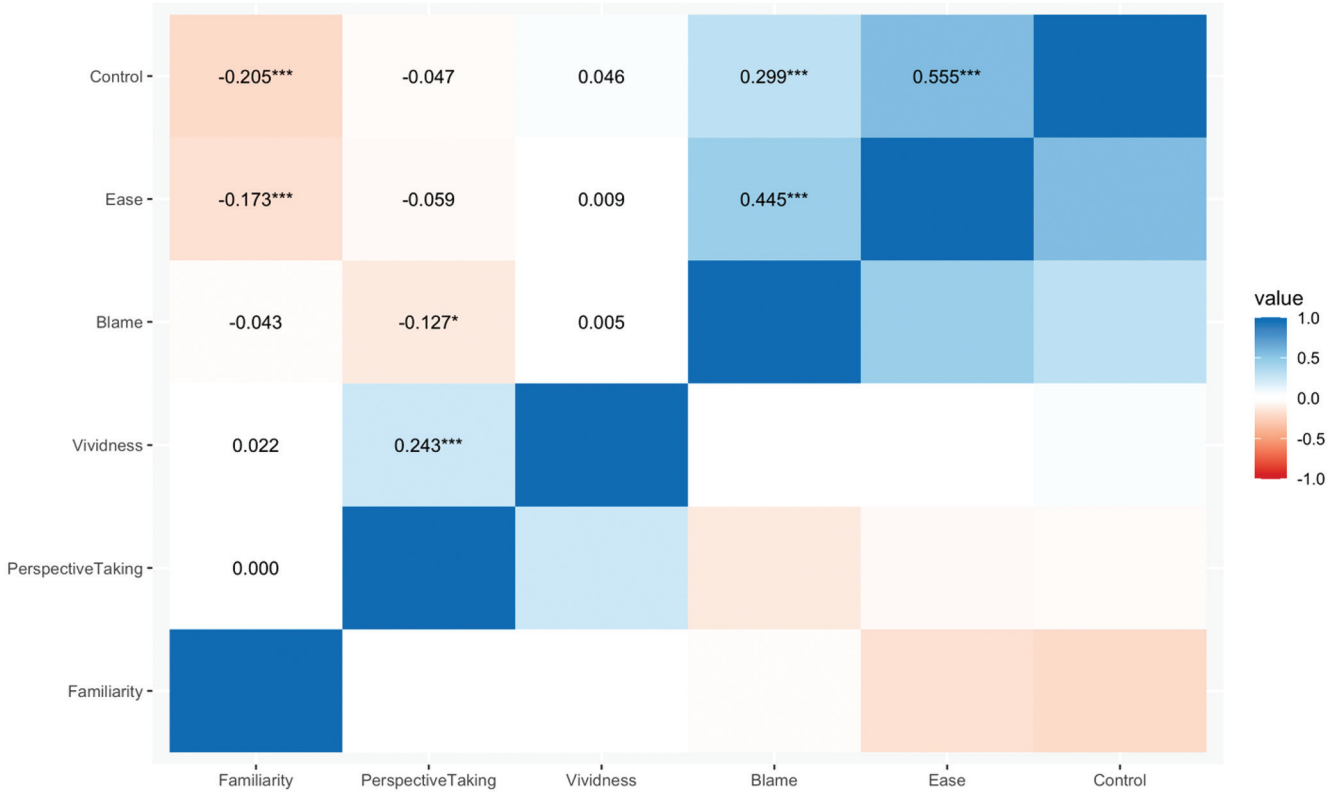
Table 1
Means (and Standard Deviations) for Study 1

Condition	Blame	Control	Ease	Vividness	Familiarity	Perspective-taking
Ice cream	3.72 (2.0)***	5.12 (1.6)*	4.43 (1.5)***	6.23 (1.0)	2.38 (1.3)***	3.90 (0.8)
Shopping	4.6 (2.0)	5.49 (1.5)	5.39 (1.5)	6.07 (1.0)	1.30 (0.9)	3.83 (0.8)

Note. Standard deviations are reported in parentheses. Significant differences in mean scores between conditions are marked with an *.
* $p < .05$. *** $p < .001$.

Figure 1

Pearson Product Moment Correlations Between Standardized Scores of Dependent Measures in Study 1



Note. * $p < .05$. *** $p < .001$. See the online article for the color version of this figure.

Study 2a

To further evaluate the *mental control hypothesis*, and address the limitations of Study 1, Study 2 tested two additional predictions: (a) participants who read about an individual with a high degree of mental control will tend to attribute more blame to that individual for negligent wrongdoing relative to participants who read about an individual with a low degree of mental control; (b) first-personal assessments of mental control will be positively correlated with third-personal judgments of blame for negligent wrongdoing.

Method

Participants

We recruited 115 participants through Prolific Academic. Sample size was determined with an a priori power analysis conducted in G*Power 3.1.9.6. The suggested sample for an independent samples *t* test to detect the predicted effect size ($d = .75$) with 95% power at a standard error threshold ($p < .05$) was 96 participants. Effect sizes were estimated from means and standard deviations taken from Murray et al. (2019) and pilot studies. We over-recruited by 20% to account for exclusions. Six participants were excluded for failing an honesty check, and five participants were excluded for failing an attention check (described below; final $N = 104$, $M_{age} = 33.9$, $SD_{age} = 10.3$, 45% female). Participants were nearly evenly divided between two conditions, described below (*High Control condition:* $n = 53$, $M_{age} = 34.1$, $SD_{age} = 10.0$, 45% female; *Low Control condition:* $n = 51$, $M_{age} = 33.8$, $SD_{age} = 10.8$, 45% female).

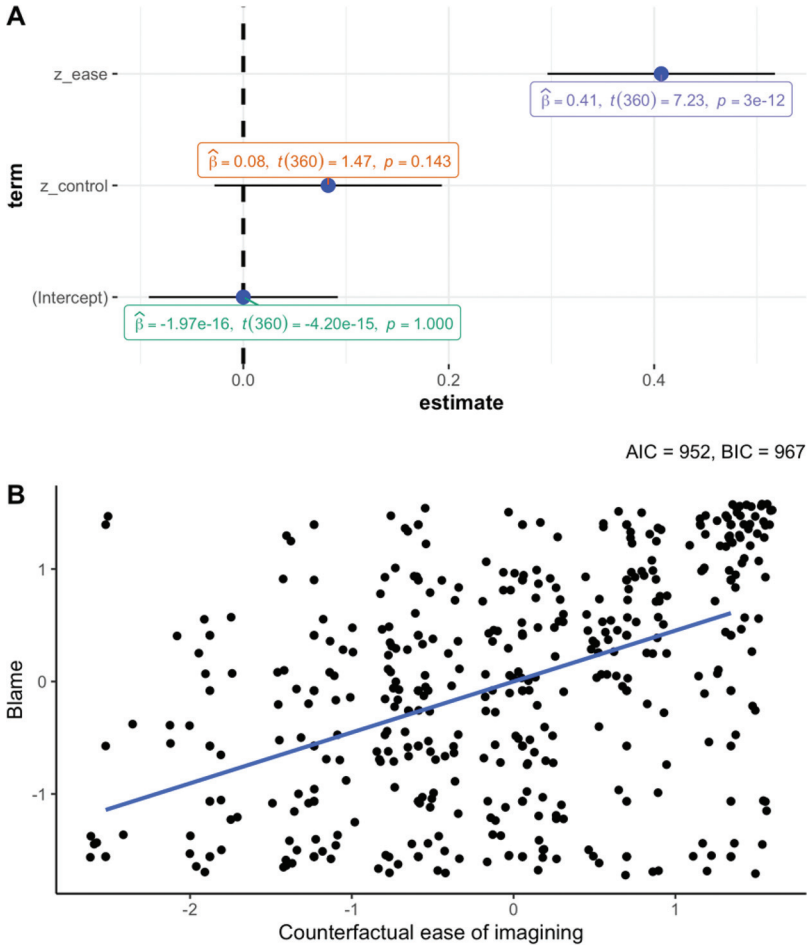
Materials and Procedure

After providing informed consent, participants were randomly assigned to read one of two vignettes that described Randy forgetting to pick up ingredients that he promised to get at the store after work. The vignettes manipulated Randy's degree of mental control using a previously validated text-based method (Murray et al., 2019):

> Randy's wife calls him and asks him to pick up some ingredients from the store on the way home from work. Randy is hosting a birthday party for his close friend today and his wife needs the ingredients to bake the birthday cake. The cake requires special ingredients that are available at only one store in the area. The store is on the route that Randy takes to get home, so he tells his wife that he'll pick up the ingredients on the way home.
>
> As he gets in his car, Randy finds himself leisurely thinking about various things: an upcoming performance review, a presentation for a meeting next week, and a recent conversation with his supervisor. Randy's mind is wandering and he could easily pull himself back to what he's doing. Because Randy's mind is wandering, he doesn't notice that he is approaching the store. [As he gets in his car, Randy

Figure 2

Judgments of Blame by Control and Ease



Note. (A) Values of the regression coefficients for the model predicting judgments of blame (figure produced using ggstatsplot package in R [Patil, 2021]). (B) Relationship between standardized judgments of blame and counterfactual ease of imagining collapsed across both vignettes. See the online article for the color version of this figure.

finds himself repeatedly worrying about various things: an upcoming performance review, a presentation for a meeting next week, and a recent conversation with his supervisor. Randy can't help but fixate on these issues. His mind is racing, and he cannot easily pull himself back to what he's doing. Because Randy's mind is racing, he doesn't notice that he is approaching the store].

He drives right by the store and arrives home without the ingredients. Because the store is a specialty store, it closes early in the evening. By the time Randy gets home, the store has closed and it is too late for him to turn around.

In the *Low Control* condition, Randy is repeatedly worrying, which makes it difficult for him to reorient his thoughts to his task. In the *High Control* condition, Randy's mind is leisurely wandering, which makes it easy for him to reorient his thoughts when they go off topic. These conditions use a previously validated method, which treats stress as a proxy for a lack of mental control (Murray et al., 2019). However, we improve on previous iterations of this method in two ways. First, Murray and colleagues (2019) manipulated stress by changing the *content* of what someone is thinking about (e.g., health problems vs. leisure activities). In contrast, we used a recent method (Irving et al., 2020) to generate vignettes with the same content but different levels of stress. Second, we included a manipulation check from ongoing research (Irving et al., in press) to ensure that our condition alters third-personal beliefs about mental control.

After reading the vignette, participants answered a single reading comprehension check question on a separate page: "Did Randy get the ingredients?" The options *Yes*, *No*, and *Unsure* were provided, and only participants who answered *Yes* were included in analyses. Participants then answered six questions about the vignette:

Control:	While he is driving, how much control does Randy have over his thoughts?
Fault:	How much fault does Randy have for not getting the ingredients?

Table 2
Causal Mediation Analysis Results for Study 1

Effect	Estimate	95% CI Lower	95% CI Upper	*p*
ACME[a]	0.23	0.17	0.30	<.001***
ADE[b]	0.09	−0.02	0.20	.09
Total effect	0.32	0.22	0.42	<.001***
Prop. mediated	0.72	0.49	1.00	<.001***

Note. Sample size used = 357, simulations = 1,000.
[a] Average causal mediation effect of judgments of mental control on judgments of blame mediated by judgments of counterfactual ease of imagining (a × b). [b] Average direct effect of judgments of mental control on judgments of blame (c' path).
*** $p < .001$.

Blame:	How much should Randy's wife blame him for not getting the ingredients?
Guilt:	How guilty should Randy feel about not getting the ingredients?
Moral responsibility:	How morally responsible is Randy for not getting the ingredients?
Focus:	While driving, how much was Randy focused on his thoughts?

Control measured perceived mental control, whereas *Fault*, *Blame*, *Guilt*, and *Moral Responsibility* measured participants' moral judgments about Randy's negligence. We selected these four measures because they have been conceptualized as mapping to the same underlying construct of moral blame (Murray et al., 2019). Finally, *Focus* measured whether differences in control might be explained by perceived differences in Randy's attention to his thoughts. Participants were provided with a 7-pt. scale for each question (1 = *None*, 4 = *Moderate*, 7 = *High*). After this, participants completed two items about themselves:

First-personal mental control:	How much control do you feel you have over your thoughts?
Spontaneous mind wandering:	How frequently do you find your own thoughts wandering spontaneously?

We used measures of *first-personal mental control* to assess the relationship between judgments of blame for negligent wrongdoing and the perceived degree of one's own mental control. The measure of *spontaneous mind wandering* was used to assess the validity of the mental control measure. Because spontaneous mind wandering occurs when there is weak executive control over attention (Kane et al., 2021; McVay & Kane, 2009), measures of spontaneous mind wandering and mental control should be inversely correlated.

At the end of the survey, participants were asked to self-report their level of attentiveness and honest participation. They were informed that their responses would not affect their compensation. Five options were provided, but only the final option indicated attentive and honest responding. Participants who did not select this last option were excluded from analysis.

Data Analysis Approach

Main analyses for Studies 2a and 2b were conducted with linear models fitted using the *lme4* package in R (Bates et al., 2015; R Core Team, 2021). We calculated models for third-personal judgments of control and third-personal judgments of responsibility and sequentially entered Condition, Focus, Mental Control, and Spontaneous Mind Wandering. We limit the report of results to the model that represents the best improvement over the null model that includes only intercepts. Fixed model estimates and pairwise comparisons on them are calculated using the *emmeans* package in R (Lenth, 2020) with *p* values corrected using the Bonferroni method. Complete fit indices and model comparisons are reported in the online supplemental materials.

Results

Descriptive statistics for Study 2a are summarized in Table 3.

Responsibility measures exhibited good internal reliability (α = .74). Because of this, we combined measures of fault, blame, guilt, and moral responsibility into a single responsibility measure by taking the global average of the items.

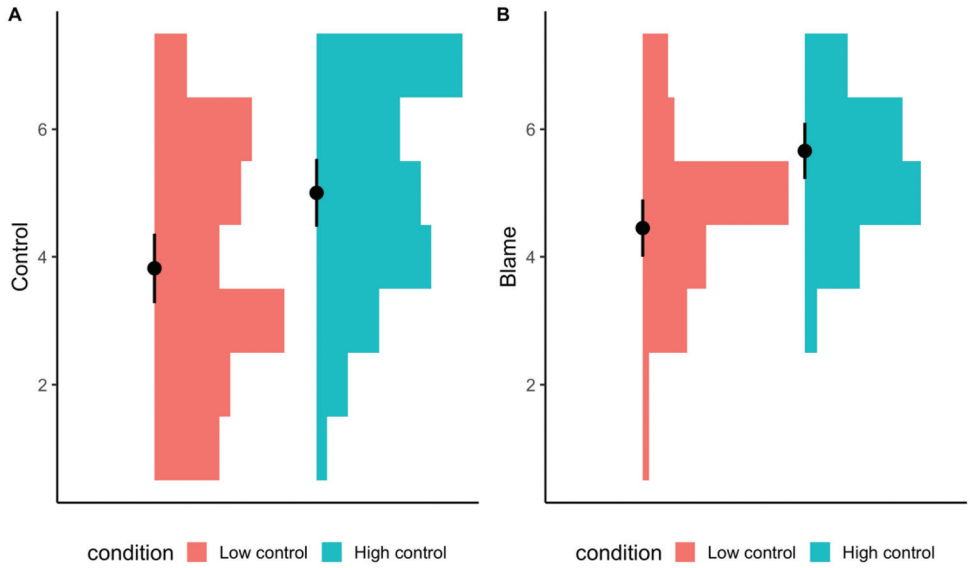
To identify the best model, we conducted stepwise linear regression and calculated model comparisons. We compared five models for each dependent variable of interest (control and responsibility). The first model contained only intercepts (the null model), the second model had a term for condition, the third model had a term for condition and focus, the fourth model had a term for condition, focus, and mental control, and the fifth model contained all terms. For judgments of control, the fourth model (containing terms for condition, focus, and mental control) displayed the best fit ($F(4, 99) = 5.62$, $p < .001$, adjusted $R^2 = .15$). For judgments of blame, the second model (with the term for condition) displayed the best fit, $F(1, 102) = 19.15$, $p < .001$ (adjusted $R^2 = .15$).

To assess the effectiveness of the mental control manipulation, we computed an independent samples *t* test. The manipulation successfully modulated perceptions of Randy's mental control, with participants in the High Control condition attributing significantly higher mental control ($M = 5.00$, 95% CI [4.47, 5.53]) to Randy relative to participants in the Low Control condition ($M = 3.82$, 95% CI [3.28, 4.36]), $t(99) = -3.49$, $d = -.71$, 95% CI [−1.12, −.29], $p < .001$ (Figure 3A).

Table 3
Means (and Standard Deviations) for Study 2a

Measure	High Control (n = 53)	Low Control (n = 51)
Perceived control	5.00 (1.7)	3.82 (1.8)
Fault	6.06 (0.9)	5.25 (1.4)
Blame	5.66 (1.2)	4.45 (1.6)
Guilt	5.45 (1.4)	4.75 (1.7)
Moral responsibility	4.66 (1.7)	4.33 (1.7)
Focus	5.58 (1.7)	6.22 (1.4)
Mental control	5.06 (1.3)	4.86 (1.1)
Spontaneous mind wandering	5.23 (1.2)	5.16 (1.3)

Figure 3
Control and Blame by Condition in Study 2a



Note. (A) Mean ratings of control by condition. (B) Mean ratings of blame by condition. Bars represent 95% confidence intervals on model estimated mean. See the online article for the color version of this figure.

Participants in the High Control condition attributed significantly more blame to Randy for his negligent wrongdoing (M = 5.66, 95% CI [5.22, 6.10]) than participants in the Low Control condition (M = 4.45, 95% CI [4.00, 4.90]), as indicated by a two-sample t test, $t(102) = -4.38$, $d = -.86$, 95% CI [−1.27, −.45], $p < .001$ (Figure 3B). This is likely not explained by a difference in the perceived degree of focus Randy has on his thoughts. The model that includes a term for focus was not a statistically significant improvement over the model that included only a term for condition, and the effect of condition remains significant even when calculating the comparison on the model that includes a term for focus, $t(101) = -4.51$, $d = -.90$, 95% CI [−1.32, −.49], $p < .001$.

We next assessed the relationship between blame and first-personal judgments of mental control. We found moderate, significant correlations between third-personal judgments of blame and first-personal judgments of mental control ($r = .22$, $p = .03$; see Figure 4A) and moderate, significant correlations between first-personal judgments of mental control and first-personal judgments of susceptibility to spontaneous mind wandering ($r = -.35$, $p < .001$; see Figure 4B). These findings indicate that as people perceive themselves to have a greater degree of mental control, they tend to attribute more responsibility to someone else for negligent wrongdoing.

To assess the face validity of our measure of self-assessed mental control, we calculated the correlation between perceived mental control and perceived susceptibility to spontaneous mind wandering. Greater susceptibility to spontaneous (as opposed to deliberate) mind wandering is associated with diminished working memory capacity (Robison & Unsworth, 2018) and lower rates of reading comprehension in classroom environments (McVay & Kane, 2012). Hence, greater susceptibility to spontaneous mind wandering should correlate negatively with perceived mental control, insofar as spontaneous mind wandering seems to exhibit an *absence* of mental control (Murray & Krasich, 2022). Because we found a negative correlation, this suggests that the single-item measure of mental control has some face validity.

Discussion

Study 2a provided additional support for the *mental control hypothesis*. We found that manipulating the perceived mental control of a negligent wrongdoer affected judgments of blame for negligent wrongdoing. We also found preliminary support for the *self-projection hypothesis*. There were significant positive correlations between first-personal assessments of mental control and third-personal judgments of blame for negligent wrongdoing. This result suggests that as people perceive themselves to have a greater level of mental control, they attribute more blame to others for negligent wrongdoing.

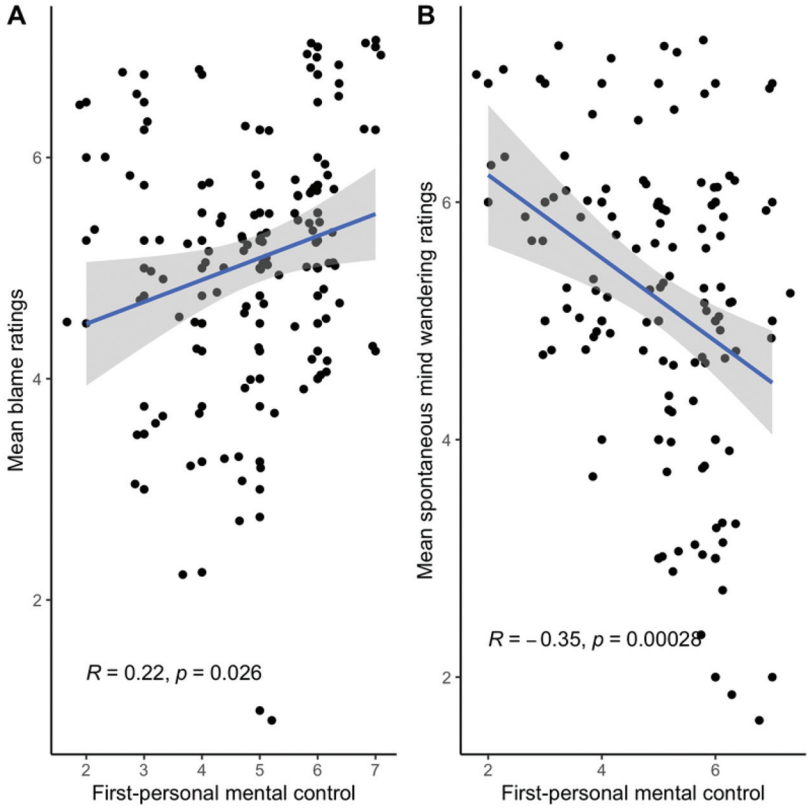
To further verify the generalizability of these results, we sought to replicate them with a different vignette.

Study 2b

The vignette for Study 2a used a family-oriented prospective task and a work-related interference factor. One issue with using a work-related interference task is that participants in the Low Control condition might judge that Randy is less competent relative to participants in the High Control condition. Failing to achieve some goal bears negatively on perceived competence. We altered the vignette in this study to have a work-oriented prospective task and a family-related interference factor.

Figure 4

Correlations of Blame and Spontaneous Mind Wandering Judgments on First-Personal Assessments of Mental Control in Study 2a



Note. (A) Scatter plot of mean blame ratings and mean assessments of first-personal mental control. (B) Scatter plot of mean ratings of susceptibility to spontaneous mind wandering and first-personal assessments of mental control. Error bars represent standard errors. See the online article for the color version of this figure.

Method

Participants

We recruited 130 participants through Prolific Academic. Sample size was determined with an a priori power analysis conducted in G*Power 3.1.9.6. The suggested sample for an independent samples *t* test to detect the predicted effect size ($d = .694$) with 95% power at a standard error threshold ($p < .05$) was 110 participants. Predicted effect size was estimated using results from Study 2a. We over-recruited by 20% to account for exclusions ($N = 131$). Four participants were excluded for failing an honesty check, and nine participants were excluded for failing an attention check (described below; final $N = 118$, $M_{age} = 36.1$, $SD_{age} = 10.9$, 59% female). Participants were divided evenly between the two conditions (*High Control:* $n = 56$, $M_{age} = 37.8$, $SD_{age} = 11.6$, 59% female; *Low Control:* $n = 62$; $M_{age} = 34.5$, $SD_{age} = 10.1$, 59% female).

Materials and Procedure

The new vignette altered the prospective task that Randy fails to complete:

Whenever Randy needs to travel for work, he needs to submit a Travel Request Form online to get the expenses approved. Without the Form, Randy's company cannot authorize reimbursements for work-related travel. Randy needs to submit a form by the end of the day to get approval for traveling to a work conference next week. Randy's supervisor wants him to go to the conference, so Randy plans to attend.

While working, Randy finds himself leisurely thinking about various things: his daughter's travel soccer schedule, taking the dog to the vet next week, and a recent conversation with his wife. Randy's mind is wandering, and he could easily pull himself back to what he's doing. Because Randy's mind is wandering, he forgets about the form. [While working, Randy finds himself repeatedly worrying about various things: his daughter's travel soccer schedule, taking the dog to the vet next week, and a recent conversation with his wife. Randy can't help but fixate on these issues. His mind is racing, and he cannot easily pull himself back to what he's doing. Because Randy's mind is racing, he forgets about the form]. By the time he remembers, it's too late to submit the form. This means that Randy will not be able to travel to the conference, as he cannot afford to pay the travel expenses out of pocket.

The manipulation is the same as Study 2a: in the *High Control* condition, Randy is described as leisurely mind wandering, while in the *Low Control* condition his mind is racing and he is worried. The measures and procedure are identical to Study 2a with one exception. Instead of asking about responsibility for getting ingredients, participants are asked about Randy's responsibility for not completing the form.

Results

Descriptive statistics for Study 2b are summarized in Table 4.

Measures of responsibility exhibited good internal reliability ($\alpha = .73$). As in Study 2a, we combined measures of fault, blame, guilt, and moral responsibility into a single measure of responsibility by taking the global average of these four items.

To identify the best model, we conducted stepwise linear regression and calculated model comparisons as in Study 2a. The fourth model (containing terms for condition, focus, and mental control) displayed the best fit for judgments of control, $F(3, 114) = 13.35$, $p < .001$, adjusted $R^2 = .24$, and blame, $F(3, 114) = 8.35$, $p < .001$, adjusted $R^2 = .16$.

The mental control manipulation successfully altered perceptions of mental control, as participants in the *High Control* condition attributed significantly higher mental control ($M = 5.11$, 95% CI [4.62, 5.60]) to Randy relative to participants in the *Low Control* condition ($M = 3.66$, 95% CI [3.19, 4.12]), $t(114) = -4.84$, $d = -.91$, 95% CI [−1.30, −.52], $p < .001$ (Figure 5A).

Participants in the High Control condition attributed significantly more blame to Randy for his negligent wrongdoing ($M = 6.01$, 95% CI [5.58, 6.43]) than participants in the Low Control condition ($M = 5.20$, 95% CI [4.80, 5.61]), $t(114) = -3.06$, $d = -.58$, 95% CI [−.96, −.20], $p < .001$ (Figure 5B). Because a term for focus was included in the model, the effect of condition obtains even when controlling for differences in Randy's perceived focus on his thoughts. This shows that participants tend to attribute greater blame for negligent wrongdoing in the condition where Randy is perceived to have greater mental control relative to the condition where Randy is perceived to have less mental control.

We next assessed the relationship between blame and first-personal judgments of mental control. We found small but significant correlations between first-personal judgments of mental control and third-personal judgments of responsibility for negligent wrongdoing ($r = .23$, $p = .01$; Figure 6A) and first-personal judgments of susceptibility to spontaneous mind wandering and mental control ($r = -.33$, $p < .001$; Figure 6B).

Table 4
Means (and Standard Deviations) for Study 2b

Measure	High Control ($n = 56$)	Low Control ($n = 62$)
Perceived control	5.14 (1.7)	3.63 (1.7)
Fault	6.45 (0.8)	5.71 (1.3)
Blame	6.00 (1.4)	5.21 (1.6)
Guilt	5.48 (1.7)	4.87 (1.5)
Moral responsibility	5.33 (1.8)	4.60 (1.6)
Focus	5.29 (1.8)	5.76 (1.5)
Mental control	5.00 (1.4)	4.47 (1.5)
Spontaneous mind wandering	5.21 (1.4)	4.77 (1.4)

As in Study 2a, we found a negative correlation between first-personal assessments of mental control and first-personal judgments of susceptibility to spontaneous mind wandering. This provides further evidence that our single-item measure of mental control has face validity.

Discussion

Study 2b replicated the findings of Study 2a. We again found, consistent with the *mental control hypothesis*, that judgments of responsibility for negligent wrongdoing were diminished when Randy is perceived to have a lower degree of mental control. Moreover, our results provide partial support for the *self-projection hypothesis*, as third-personal judgments of blame for negligent wrongdoing were correlated with first-personal judgments of mental control. However, the relationship between first-personal assessments of mental control and third-personal judgments of blame are merely correlational. To assess whether the relationship between these judgments is causal, we conducted another experiment designed to manipulate first-personal assessments of mental control to see whether this modulated third-personal judgments of blame for negligent wrongdoing.

Study 3

Method

Participants

Three hundred forty-five participants were recruited through Amazon Mechanical Turk. We used the same qualifications to screen participants as Study 1. Sample size was determined with an a priori power analysis conducted in G*Power. The analysis suggested that 270 participants were needed for a one-way ANOVA test to detect a predicted effect size ($f = .19$) for three groups at 80% power with a standard error threshold ($p < .05$). Effect sizes were estimated based on pilot results. We overrecruited by 25% to account for exclusions and attrition based on the exclusion rate in Study 1. Eighty-seven participants were excluded for failing a comprehension check, and two participants were excluded for not complying with survey instructions (final $N = 256$; $M_{age} = 36.4$, $SD_{age} = 10.9$, 51% female).

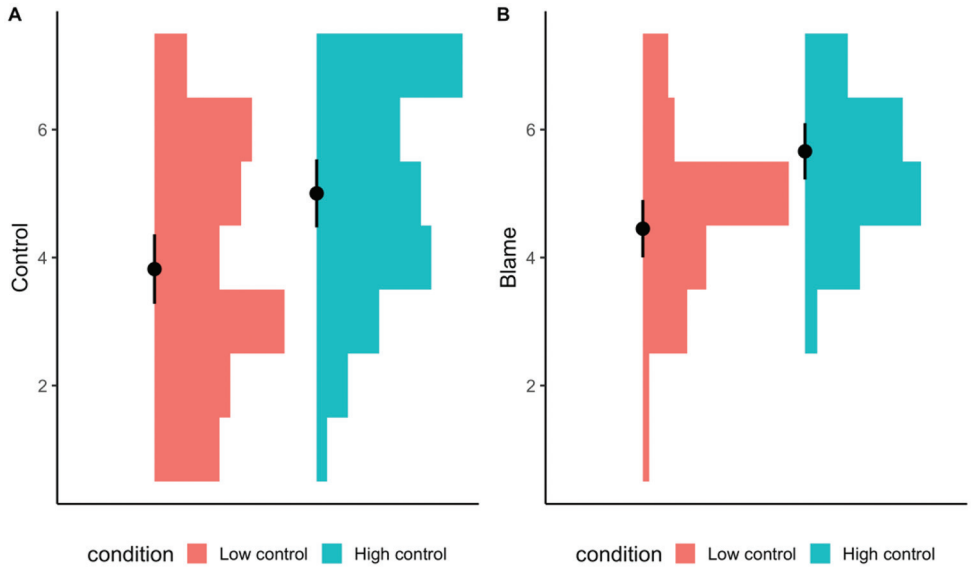
Materials

To manipulate judgments of mental control, we used an autobiographical memory manipulation. Episodic counterfactual thinking draws on autobiographical memories to construct counterfactual simulations (De Brigard et al., 2013; De Brigard & Parikh, 2019). Thus, because counterfactual ease of imagining mediates the relationship between judgments of mental control and blame, we hypothesized that making particular autobiographical memories salient might modulate the content of episodic simulation, thereby providing a means of manipulating inferences about mental control. The effectiveness of the manipulation was measured using responses to the Thought Control Subscale (described below).

The Thought Control Subscale

We adapted the previously validated Free Will subscale (Nadelhoffer et al., 2014) to measure self-perceived mental control. Our modified items consist of the following statements:

Figure 5
Control and Blame by Condition in Study 2b



Note. (A) Mean control ratings and distribution of individual responses. (B) Mean blame ratings and distribution of individual responses. Error bars represent 95% confidence intervals of model estimated mean. See the online article for the color version of this figure.

1. I always have the ability to control my thoughts.
2. I always have control over my thoughts.
3. How my thoughts unfold is completely up to me.
4. I can ultimately have complete control over my thoughts and decision.
5. I have control of my thoughts even when my choices are completely limited by external circumstances.

Participants completed each item using a 7-pt. Likert scale (1 = *strongly disagree*, 4 = *neutral*, 7 = *strongly agree*).

Autobiographical Manipulation

The autobiographical memory manipulation makes past instances of successful or unsuccessful mental control more salient. In the Failure Salience condition, participants were instructed to: "Think about three different times when you wanted to pay attention to something important, but you didn't. Please describe these situations in a few short sentences." In the Success salience condition, participants were instructed to: "Think about three different times when you wanted to pay attention to something important, and you did. Please describe these situations in a few short sentences." In the Control condition, participants were instructed to: "Think about the last three times you went to the grocery store. Please describe these situations in a few short sentences." Participants in each condition were given a text box to record their responses, although these responses were not analyzed for this study (exploratory linguistic analyses are summarized in the online supplemental materials). Participants completed the manipulation at the beginning of the study.

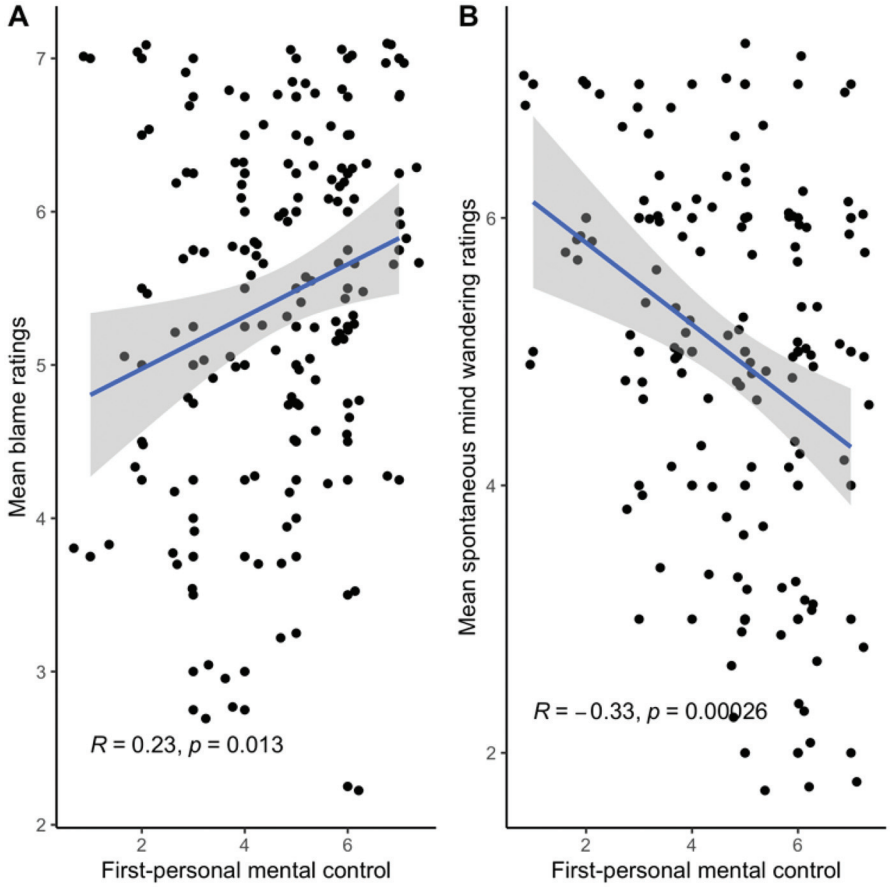
Procedure

After providing informed consent, participants were randomly assigned to complete either the Failure Salience ($n = 81$) manipulation, the Success Salience ($n = 79$) manipulation, or the Control group ($n = 96$). Afterward, they completed the Thought Control subscale. All participants completed a short distractor task counting the number of vehicles in different scenes used to study visual attention. Participants then read the same vignette used in Study 2a and completed the four measures of blame from Study 2a (presented in random order). Participants also completed the MW-S and MW-D trait scales, which measure perceived susceptibility to spontaneous and deliberate mind wandering, respectively (Seli et al., 2015).

Results

Descriptive statistics for Study 3 are summarized in Table 5. Measures of mental control exhibited strong internal reliability ($\alpha = .95$), and measures of blame exhibited good internal reliability ($\alpha = .78$). To assess the structure of blame measures, we used confirmatory factor analysis and compared fit statistics for a single-factor model to two- and four-factor models using the *lavaan* package in R (Rosseel, 2012). The single-factor model mapped each measure to a single latent variable, while the two-factor model mapped fault and blame to one variable and guilt and moral responsibility to a different variable. The four-factor model mapped each measure to a separate latent variable. The two-factor model was drawn from variable correlations, where blame correlated more strongly with fault ($r = .53$) than with either guilt ($r = .44$) or moral responsibility ($r = .41$), whereas moral responsibility correlated more strongly with guilt ($r = .63$) than either fault ($r = .39$) or blame ($r = .41$). A chi-squared difference test indicated that

Figure 6
Correlations of Blame and Spontaneous Mind Wandering Judgments on First-Personal Assessments of Mental Control in Study 2b



Note. (A) Correlation between mean blame ratings and first-personal assessments of mental control. (B) Correlation between susceptibility to spontaneous mind wandering and first-personal assessments of mental control. Error bar represents standard errors. See the online article for the color version of this figure.

the two-factor model displayed significantly better fit than the one-factor model, $\chi^2(1) = 30.28$, $p < .001$. There was no evidence that the four-factor model displayed better fit, $\chi^2(1) = .39$, $p = .53$.

The two-factor model exhibited the lowest AIC and ECVI (see Table 6), both of which are absolute measures of fit. A chi-squared goodness of fit test indicated that the theoretical values predicted by the two-factor model were not significantly different from observed values, $\chi^2(1) = .39$, $p = .53$.

We computed an overall blame score by averaging participant responses to the fault and blame items and an overall moral responsibility score by averaging participant responses to the guilt and moral responsibility items based on the two-factor model and an overall mental control score by averaging participant responses to the items on the Thought Control subscale.

A Shapiro-Wilk test indicated non-normal distributions of mental control and blame responses (all $p < .001$), so we conducted nonparametric tests. A Kruskal-Wallis rank sum test indicated a significant effect of condition on judgments of mental control, $\chi^2(2) = 9.44$, $p = .009$, $\varepsilon^2 = .03$, 95% CI [.01, .09].[2] Confidence intervals were computed using a bootstrapping procedure with 1000 samples. Post hoc comparisons computed using Dunn's test

Table 5
Means and Standard Deviations for Study 3

Measure	Control ($n = 96$)	Success salience ($n = 79$)	Failure salience ($n = 81$)
Mental control	4.86 (1.3)	4.96 (1.4)	4.31 (1.3)
Fault	5.97 (1.2)	6.04 (1.0)	5.64 (1.1)
Blame	5.41 (1.6)	5.48 (1.6)	4.78 (1.8)
Guilt	4.89 (1.6)	4.72 (1.5)	4.77 (1.4)
Moral responsibility	4.71 (2.0)	4.38 (1.7)	4.53 (1.5)
MW: Deliberate	4.37 (1.6)	4.18 (1.4)	4.64 (1.3)
MW: Spontaneous	4.04 (1.5)	4.08 (1.4)	4.50 (1.1)

Note. MW = mind wandering.

[2] When participants who failed attention checks were included in analyses, the effect of condition on judgments of mental control disappears, $\chi^2(2) = 2.23$, $p = .33$, $\varepsilon^2 < .001$, 95% CI [−.001, .04].

Table 6
Model Fit Indices

Model	*df*	AIC	SRMR	CFI	ECVI
One-factor	2	3,474.2	0.07	0.90	0.18
Two-factor	1	3,446.0	0.01	1.00	0.07
Four-factor	0	3,447.6	0.00	1.00	0.08

Note. AIC = Akaike information criterion; SRMR = standard root mean square residual; CFI = comparative fit index; ECVI = expected cross-validation index. Hu and Bentler (1999) suggest the following statistical thresholds for model fit: SRMR $<$ .08, and a CFI $\geq$ .90.

and Bonferroni correction for family-wise error showed that mean ratings of mental control in the failure salience condition (M = 4.31, 95% CI [3.92, 4.71]) were significantly lower than judgments of mental control in either the Control condition (M = 4.86, 95% CI [4.50, 5.23], $z = -2.67$, corrected $p = .02$) and the success salience condition (M = 4.96, 95% CI [4.56, 5.37], $z = -2.68$, corrected $p = .02$). However, the responses in the control condition did not differ significantly from responses in the success salience condition ($z = -.1$, corrected $p = 1.0$; see Figure 7).

To test the effectiveness of the manipulation on judgments of blame, we assessed the effect of condition on blame. A Kruskal-Wallis H test with condition as a factor identified a significant effect of condition on blame, $\chi^2(2) = 9.63$, $p = .008$, $\varepsilon^2 = .03$, 95% CI [.01, .10]. Post hoc comparisons computed with Bonferroni corrections for multiple comparisons showed that mean ratings of blame in the failure salience condition (M = 5.21, 95% CI [4.88, 5.53]) were significantly lower than judgments of blame in either the control condition (M = 5.69, 95% CI [5.39, 5.99], $z = -2.68$, corrected $p = .02$) and the success salience condition (M = 5.76, 95% CI [5.43, 6.09], $z = -2.72$, corrected $p = .02$). However, the responses in the control condition did not differ significantly from responses in the success salience condition ($z = -.2$, corrected $p = 1.0$; see Figure 8).[3]

Discussion

The *self-projection hypothesis* states that first-personal judgments of mental control drive third-personal judgments of blame for negligent wrongdoing. This implies that manipulating judgments of mental control should modulate judgments of blame. Consistent with this, we found that an autobiographical memory manipulation designed to make past instances of mental control success or failure salient, successfully manipulated first-personal judgments of mental control. This was associated with significant differences in judgments of blame for negligent wrongdoing, with individuals who recalled past instances of memory failure attributing less blame for negligent wrongdoing compared with individuals who either recalled past instances of memory success or were placed in a control condition.

General Discussion

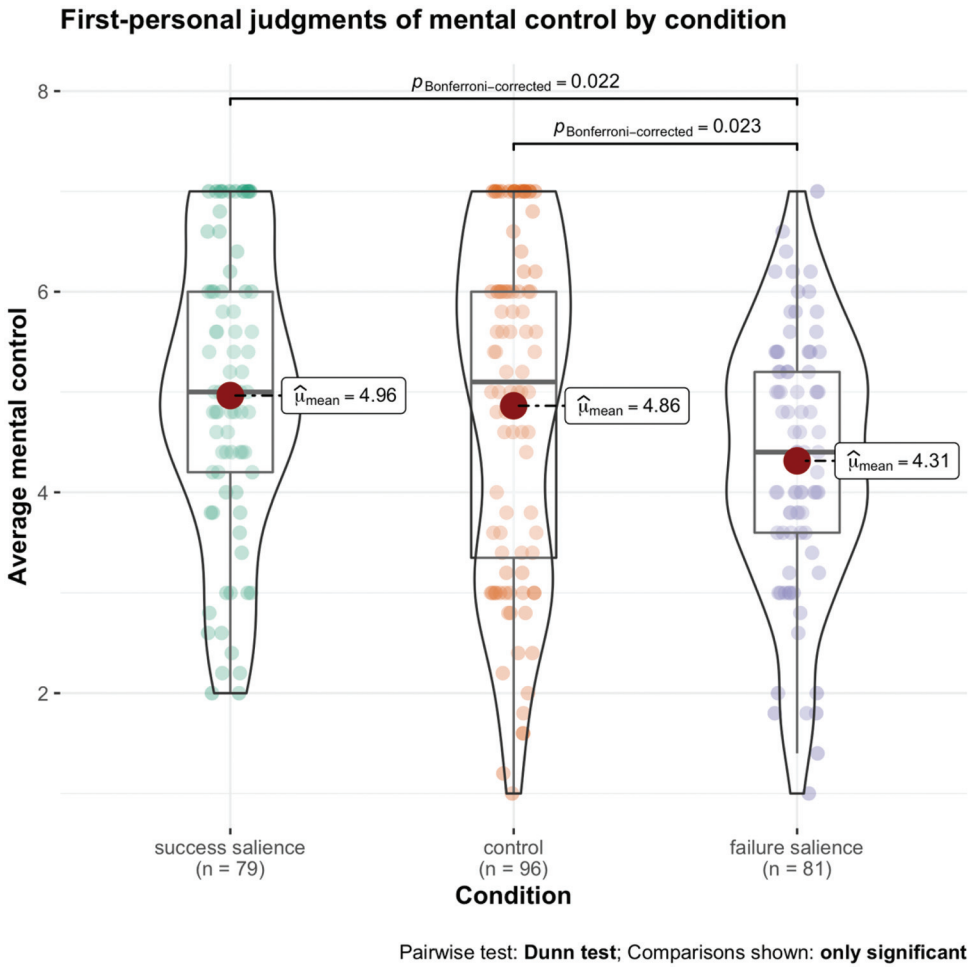
People sometimes act negligently, and they are sometimes blameworthy for being negligent (Amaya, in press; Laurent et al., 2016; Murray et al., 2019; Nobes & Martin, 2022; Nuñez et al., 2014; Schultz & Wright, 1985). The current studies tested several hypotheses about the attributional processes underlying judgments of blame for negligent wrongdoing. We predicted that the degree of blame attribution for negligent wrongdoing varies as a function of the degree of perceived mental control in the negligent agent (*mental control hypothesis*) and that, in the absence of personal experience with the negligent actor, first-personal assessments of mental control drive third-personal judgments of blame for negligent wrongdoing (*self-projection hypothesis*).

Consistent with the *mental control hypothesis*, we found significant positive correlations in Study 1 between judgments of mental control and judgments of blame for negligent wrongdoing. Moreover, counterfactual ease of imagining non-negligent behavior fully mediated the relationship between control and blame. In Studies 2a and 2b, which directly manipulated the extent to which agents had control over their thoughts, we again found that diminished judgments of mental control were associated with diminished judgments of blame for negligent wrongdoing. We also found, in support of the *self-projection hypothesis*, that first-personal assessments of mental control were positively correlated with third-personal judgments of blame for negligent wrongdoing. Finally, in Study 3, we used an autobiographical memory manipulation to modulate first-personal judgments of mental control. This was associated with significant differences in judgments of blame for negligent wrongdoing. Participants who recalled past instances of memory failure made diminished judgments of mental control and more lenient judgments of blame compared with a control group and those who recalled past instances of successful remembering. This supports the *self-projection hypothesis*. As people come to view themselves as having less mental control, they assessed negligent wrongdoers less harshly.

These results point toward a novel role for counterfactual thinking in attributing blame for negligent wrongdoing (Byrne & Timmons, 2018). Whereas previous studies emphasized the degree to which the mutability of the outcome was associated with blame for negligent wrongdoing (Petrocelli et al., 2011), our results suggest that counterfactual thinking is used to construct simulations from which people infer mental control in others. This is useful when trying to acquire information about mental controllability of someone who is unfamiliar or in an unfamiliar situation. Moreover, our results might bear on the asymmetric effect of outcome knowledge on moral judgment. People tend to judge morally good actions as better when they succeed relative to when they fail or the outcome is unknown (Byrne & Timmons, 2018). Some have explained this asymmetry in terms of the differential evidence for causal relationships between action and outcome provided by success or failure (Cushman, 2013; Martin & Cushman, 2016). This

[3] When judgments of fault, blame, guilt, and moral responsibility are combined to create a new global responsibility variable, there is no effect of condition on global responsibility, $\chi^2(2) = 3.80$, $p = .15$, $\varepsilon^2 = .01$, 95% *CI* [−.01, .06]. However, when judgments of blame are analyzed by themselves, there is an effect of condition on judgments of blame, $\chi^2(2) = 8.29$, $p = .02$, $\varepsilon^2 = .02$, 95% CI [.00, .09]. Post hoc comparisons computed with Bonferroni corrections for multiple comparisons showed that mean ratings of just blame judgments in the failure salience condition (M = 4.78, 95% CI [4.33, 5.22]) were significantly lower than judgments of blame in either the control condition (M = 5.41, 95% CI [5.00, 5.81], $z = -2.43$, corrected $p = .04$) and the success salience condition (M = 5.48, 95% CI [5.03, 5.93], $z = -2.58$, corrected $p = .03$). However, the responses in the control condition did not differ significantly from responses in the success salience condition ($z = -0.3$, corrected $p = 1.0$).

Figure 7
Judgments of Mental Control by Condition



Note. Bonferroni-corrected significance values are associated with Kruskal-Wallis rank sum test measuring effect of condition on first-personal judgments of mental control. Figure produced using ggstatsplot package in R (Patil, 2021). See the online article for the color version of this figure.

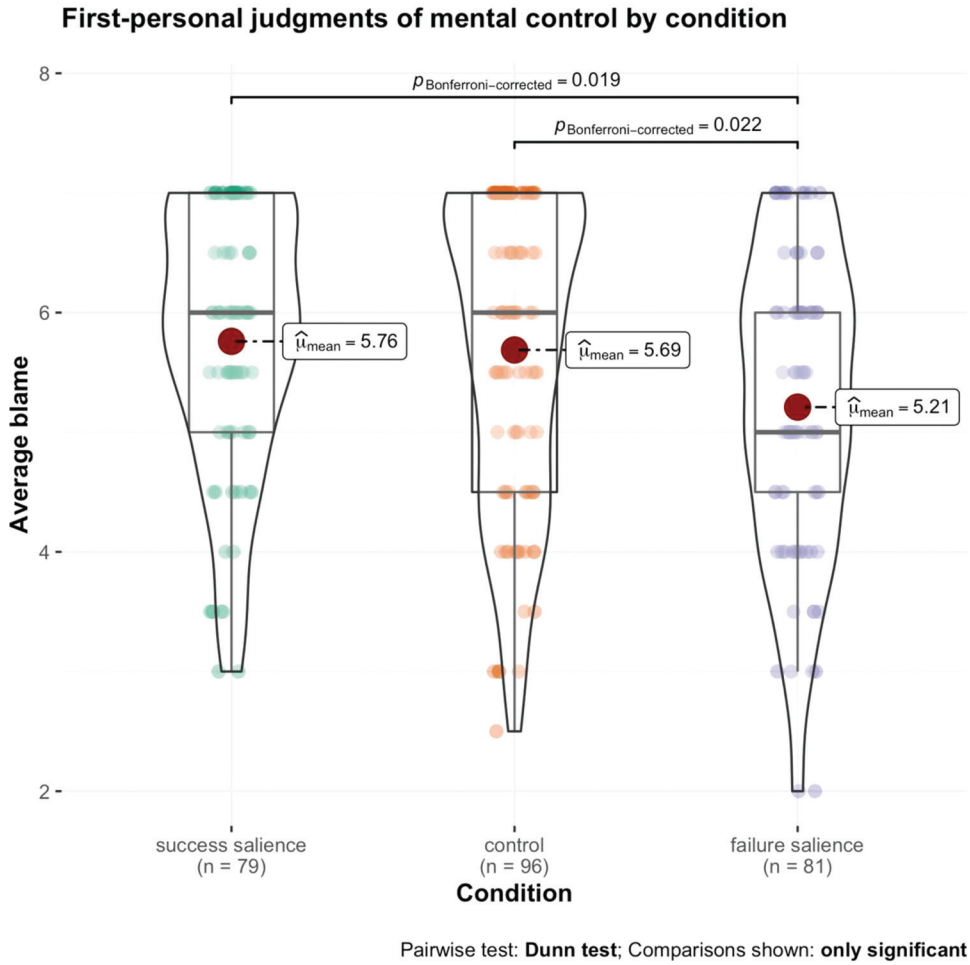
might reflect asymmetries in perceived mental control. When some action is successful, the evidence for mental control is stronger because of the causal link between agent and outcome. Future work is needed to assess the relationship between outcome information and judgments of mental control for both positive and negative outcomes.

Past research has found associations between individual locus of control and judgments of blame (Wang & Anderson, 1994). Locus of control consists in attitudes about how one expects outcomes to result from actions (Lefcourt, 1991). Those with an *internal* locus of control expect outcomes to depend on effort and skill, or other kinds of internalized dispositions, whereas those with an *external* locus of control expect outcomes to depend on situational factors, or other kinds of external forces (Rotter, 1966). Sosis (1974) found an effect of locus on control on judgments of blame for accidental wrongdoing. Participants who exhibited more internal locus of control (as measured by Rotter's Internal-External Control scale) judged accidental wrongdoing more harshly than individuals who exhibited moderate or external locus of control, while individuals who exhibited external locus of control were the most lenient. This aligns with our results that people with greater self-assessed mental control assign more blame to negligent wrongdoing relative to people with lesser self-assessed mental control. Future work should investigate the relationship between mental control and locus of control to see how the two constructs are related.

Attributions of blame for negligent wrongdoing seem sensitive to people's first-personal judgments of mental control. This provides a distinct avenue for experimentally manipulating judgments of control and responsibility. Past research has focused on manipulations using vignette-based materials, changing either situational factors depicted in the vignette or features of the characters described in them (Schooler et al., 2014). Our results suggest that effective manipulations might target self-perceptions, thereby allowing manipulations to proceed without altering research materials and reducing statistical noise associated with variability in research materials (Judd et al., 2012).

Figure 8

Judgments of Blame Across Condition



Note. Bonferroni-corrected significance values are associated with Kruskal-Wallis rank sum test measuring effect of condition on judgments of blame for negligent wrongdoing. Figure produced using ggstatsplot package in R (Patil, 2021). See the online article for the color version of this figure.

Responsibility is closely related to other agential constructs, such as free will. Because our autobiographical manipulation successfully modulated judgments of responsibility, it might be possible to use a similar manipulation to manipulate judgments of free will. The relationship between free will beliefs and prosocial attitudes has not advanced beyond correlational data precisely because manipulations of free will beliefs have proven weak or ineffective (Schooler et al., 2014). However, previous manipulations have attempted to alter free will beliefs by presenting people with claims from journalists or scientists that our current understanding of physics or neuroscience has "debunked" the notion of free will (e.g., Vohs & Schooler, 2008). These manipulations might fail for a variety of reasons, such as participant misunderstanding or disbelief. Our results suggest that researchers might consider the use of autobiographical memory manipulations to target beliefs about free will by making past failures of control more salient. These manipulations directly target processes of mental simulation and episodic counterfactual thinking, which have been shown to play a role in moral judgment (Byrne, 2017), moral behavior (Caruso & Gino, 2011), autobiographical memories of moral actions (Stanley, Cabeza, et al., 2021; Stanley, Henne, et al., 2021), and attributional processes (Spellman & Mandel, 1999).

Some limitations of the current research should be addressed in future work. We manipulated first-personal judgments of mental control and blame by making some autobiographical memories more salient than others. Other kinds of manipulations may be more effective. For example, manipulations of counterfactual thinking that modulate judgments about the plausibility of alternative sequences or the plausibility of an alternative sequence might differentially affect judgments of mental control and blame (De Brigard et al., 2021). These distinct interventions on counterfactual thinking should be tested and compared with the results presented here. Also, the vignettes used in Study 1 elicited low ratings of situational familiarity. It is an open question whether the same

pattern of observed associations would hold for more familiar situations. The underlying capacity for perspective-taking might be more useful (and hence exhibit stronger correlations) when making judgments about familiar situations. Relatedly, the constructs of counterfactual thinking and blame are likely related and could be assessed using additional measures. Given the variable factor structure exhibited by measures of fault, blame, guilt, and moral responsibility, it is possible that distinct but overlapping evaluative constructs are differentially related to counterfactual thinking and self-projection.

Finally, our results raise an interesting question about the role that different clinical conditions might play in attributions of blame for negligent wrongdoing. Individuals with deficits in mental control (e.g., ADHD) might attribute significantly lower blame for negligent wrongdoing compared with nonclinical controls. This would provide further support for the claim that judgments of blame for negligent wrongdoing are extrapolated from first-personal judgments of mental control.

Conclusion

Models of blame attribution predict that judgments of blame for negligent wrongdoing are sensitive to the perceived capacity of the individual to avoid being negligent. In this article, we explored two extensions of these models. The first is that people use perceived degree of mental control to inform judgments of blame for negligent wrongdoing. Information about mental control is acquired through self-projection. These results suggest a novel role for counterfactual thinking in attributing blame, namely that counterfactual thinking is the process whereby people self-project to acquire information that is used to inform judgments of blame.

Context

People are sometimes blameworthy for negligent wrongdoing, or cases where an individual does something wrong without realizing it. According to prominent models of blame attribution, judgments of blame are prompted by perceptions of knowledge, desire, and intention. But negligent wrongdoing occurs without knowledge or intention, and people do not desire to act negligently. Thus, on what basis do people attribute blame? In this article, we suggest that the control an agent exerts over their mind plays an important role in prompting judgments of blame for negligent wrongdoing. To acquire information about mental control, people self-project their own perceived mental control to guide assessments of others' mental control. Using an autobiographical memory manipulation, we show that making past instances of one's own forgetfulness salient diminishes judgments of blame for negligent wrongdoing, thereby providing evidence for our claim that first-personal judgments of mental control drive third-personal judgments of blame for negligent wrongdoing.

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