

Structure-Seeking as a Psychological Antecedent of Beliefs About Morality

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People differ in their beliefs about the objectivity of moral claims. We investigated a possible psychological antecedent that might be associated with people's beliefs about the objectivity of moral claims. More specifically, we examined the relationship between the endorsement of moral objectivism and one's need to see the world as structured, ordered, and predictable. By believing that the world comprises objective facts about morality, a simple, rigid, and unambiguous structure is imposed on the moral landscape that is invariant to the whims and preferences of any particular person or group. Our results suggest that those more in need of personal structure and order in their lives are indeed more likely to endorse moral objectivism. We discuss the implications of these results for psychological theories of control and structure-seeking, and for cooperation, prosociality, social orderliness, and social goal pursuit.

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Are moral claims objectively true or false, akin to physical facts about the world? Or are they more like subjective preferences or tastes? For centuries, philosophers have argued about the status of moral claims as objective or subjective, with some contemporary philosophers calling this the central problem in all of ethics (Nagel, 1989). Although philosophers have traditionally assumed that ordinary people adhere to moral objectivism (e.g., Blackburn, 1984; Shafer-Landau, 2003; Smith, 1994), recent empirical research has identified considerable interindividual variability in intuitions about moral objectivism (Beebe & Sackris, 2016; Goodwin & Darley, 2008, 2012; Wright, 2018). Understanding what gives rise to these differences is important, given that beliefs about the objectivity of moral claims underlie the human capacity for cooperation and prosocial behavior.

What explains this variability in the endorsement of moral objectivism? A small proportion of it has been associated with demographic variables (e.g., age) and religious beliefs (e.g., Beebe & Sackris, 2016; Goodwin & Darley, 2008; Heiphetz & Young, 2017; Sarkissian & Phelan, 2019; Yilmaz & Bahcekapili, 2015; although, see Wright, Grandjean, & McWhite, 2013). For exam-

ple, research in moral development suggests that young children tend to act like moral objectivists, more so than older children and young adults (Heiphetz & Young, 2017; Nichols & Folds-Bennett, 2003; Wainryb, Shaw, Langley, Cottam, & Lewis, 2004); however, older adults are more likely to endorse moral objectivism than younger adults (Beebe & Sackris, 2016). Other work suggests that those who believe in a powerful God are more likely to be moral objectivists (Sarkissian & Phelan, 2019; Yilmaz & Bahcekapili, 2015). In contrast to these approaches, we offer an investigation of a possible underlying *psychological antecedent* of moral objectivism. Specifically, we investigate whether the psychological need to see the world as structured, ordered, and predictable predicts the likelihood that people act like moral objectivists.

Converging lines of research indicate that many people find it aversive when the world appears random, unstructured, and chaotic (Kay, Gaucher, Napier, Callan, & Laurin, 2008; Kruglanski, 1989; Lerner, 1980), and that people imbue their worlds with structure and order to help provide a sense of meaning and purpose in their lives (Vess, Routledge, Landau, & Arndt, 2009). There are, however, individual differences in structure-seeking (Neuberg & Newsom, 1993; Thompson, Naccarato, Parker, & Moskowitz, 2001), and these differences in the need for structure predict certain sociocognitive outcomes like social categorization (Moskowitz, 1993; Neuberg & Newsom, 1993). The relationship between the need for structure and moral beliefs, however, has yet to be examined.

Shared moral considerations allow us to successfully navigate our everyday social environments, by underlying our capacity for cooperation, prosociality, social orderliness, and social goal pursuit (Curry, 2016; Curry, Chesters, & Van Lissa, 2019; de Waal, 2006). By believing that there are objective facts about morality, a simple, rigid, and unambiguous structure is imposed on the moral landscape that is invariant to the whims or preferences of any particular person or group. Accordingly, adherence to moral objectivism should reduce uncertainty about whether specific actions are indeed right or wrong across different contexts and situations, should reduce uncertainty about how individuals ought to act, and

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should reduce uncertainty about how individuals ought to be judged, blamed, and punished for their actions. If people were instead to see morality as subjective, then it would be difficult to definitively know whether one stood on the right or wrong side of any moral issue; this would, in turn, make it more difficult to arrive at confident judgments and decisions. Ultimately, when moral beliefs are thought to be objectively true or false, the social world may feel more structured, ordered, and predictable, which, in turn, should make successful cooperation, prosociality, social orderliness, and social goal pursuit more commonplace and attainable. Providing some support for these suppositions, recent empirical evidence shows that priming moral objectivism increases charitable giving (Young & Durwin, 2013), and priming moral subjectivism increases both cheating behavior and the willingness to steal (Rai & Holyoak, 2013).

More recent, and experimental, support for this possible explanation comes from *compensatory control theory* (Kay et al., 2008). According to this theory, impressions of personal control are important, at least in part, because they help people to maintain the belief that the world is orderly and structured. Thus, when beliefs about their own personal control are threatened, people tend to engage in compensatory strategies aimed at buffering perceptions of structure and minimizing randomness (Kay et al., 2008; Landau, Kay, & Whitson, 2015). For example, Kay et al. (2008) found that people tend to compensate for a lack of personal control by increasingly believing in and endorsing powerful external systems—such as an interventionist God or governmental institutions—that can provide structure and order.

More recent iterations of this theory suggest that people can even compensate for reduced control by bypassing these agentic sources of order; instead, they can directly project clear, simple, and reliable structure on the world—regardless of whether that structure objectively exists (Landau et al., 2015). Fascinatingly, such projections of structure and order on the world need not bear in any straightforward way on the domain of the control-reducing condition. In other words, compensating for threats to personal control can be achieved by affirming *nonspecific structure* (Landau et al., 2015). In fact, recent work suggests that situationally reduced impressions of control increase belief in scientific (Rutjens, Van Der Pligt, & Van Harreveld, 2010) and pseudoscientific (Wang, Whitson, & Menon, 2012) theories that depict the natural world as structured and ordered. Reducing feelings of control increases the likelihood that people find structure and order in images of noise, identify illusory correlations in the world, and develop superstitious beliefs (Whitson & Galinsky, 2008).

By leveraging this research on structure-seeking and compensatory control theory, we systematically investigate a possible psychological antecedent of moral objectivism. More specifically, we examine the relationship between the endorsement of moral objectivism and the need to see the world as structured, ordered, and predictable. In Study 1, we operationalize the dispositional need for structure with a well-validated measure—the Personal Need for Structure (PNS) scale (Neuberg & Newsom, 1993). We hypothesize that those higher in PNS will be more likely to believe that (a) there is a correct answer regarding the veracity of moral claims and (b) if two people were to disagree over the veracity of a moral claim, at least one of them must be mistaken. Similar measures have been widely used to probe intuitions about the objectivity of moral claims (e.g., Beebe & Sackris, 2016; Goodwin

& Darley, 2008, 2012); some theorists have argued that moral objectivists hold that there is a correct answer regarding the veracity of moral claims and that, if two people were to disagree over the veracity of a moral claim, at least one of them must be wrong (Goodwin & Darley, 2008, 2012).

In Study 2, we implement an experimental manipulation to situationally reduce impressions of personal control, and therefore, increase structure-seeking tendencies (Kay et al., 2008; Landau et al., 2015). We hypothesize that, as a means of affirming nonspecific structure when feelings of personal control are reduced, people will tend to report that (a) there is a correct answer regarding the veracity of moral claims and (b) if two people were to disagree over the veracity of a moral claim, at least one of them must be mistaken.

Finally, in Study 3, we implement a more direct measure of moral objectivism to further corroborate our hypothesis that those more in need of structure and order will be more likely to endorse moral objectivism. Specifically, participants are presented with many different actions (e.g., torturing another person), and they are explicitly asked whether each action is morally (un)acceptable no matter what any other people think or feel about it, and whether the acceptability of each action is determined independently of any other person's, or their community's, beliefs, attitudes, or feelings about it. As a secondary objective, we also investigate whether the relationship between PNS and objectivist beliefs applies not only to the moral domain but also to the nonmoral conventional domain. Nonmoral conventional issues provide a useful and informative contrast class to the moral issues.

Study 1

In Study 1, we rely on a common strategy for assessing intuitions about moral objectivism (Beebe & Sackris, 2016; Goodwin & Darley, 2008, 2012). This strategy assumes that an objectivist adheres to the following about certain moral claims (e.g., lying on behalf of a friend who is accused of murder is morally permissible): (a) there is indeed a correct answer about whether the moral claim is true or false, and (b) if two people were to disagree about the veracity of the moral claim, at least one of them must be mistaken. Utilizing this strategy, we address our first hypothesis in Study 1: that those higher in PNS will be more likely to believe that (a) there is a correct answer regarding the veracity of moral claims and (b) if two people were to disagree over the veracity of a moral claim, at least one of them must be mistaken.

Method

Participants. One hundred forty-five American residents with an approval rating above 90% voluntarily participated in this study on Amazon's Mechanical Turk (AMT) for monetary compensation.¹ Eleven participants failed an attention check or did not

¹ Our primary analyses are generalized linear mixed-effects models with a binary outcome and crossed random effects. Appropriate statistical methods for a priori power analyses have yet to be developed for such models. To determine our sample size, we sought to match or exceed the sample sizes of recent correlational studies using the PNS scale to predict epistemic beliefs (Cutright, 2012; Friesen et al., 2014). We collected data until a minimum of 145 participants completed the study, and we only analyzed these data after this sample size target was met.

answer all questions in the session, so data were analyzed with the remaining 134 individuals ($M_{\text{age}} = 36$ years, $SD = 10$, $\text{range}_{\text{age}} = 21\text{--}62$, 51 females, 82 males, 1 nonbinary). We report all the measures, manipulations, and exclusions in all studies. All studies reported herein were approved by the Duke Campus IRB. Deidentified data are available at <https://osf.io/a4jf3/>.

Materials and procedure. Participants first completed an 11-item individual difference questionnaire assessing the personal need for structure—the PNS scale (Neuberg & Newsom, 1993). Sample items include, for example, “I enjoy having a clear and structured way of life” and “I don’t like situations that are uncertain.” Participants rated each item on a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Responses were averaged to obtain PNS scores ($M = 4.27$, $SD = .92$, $\alpha = .90$).

To assess beliefs about moral objectivism, there were eight critical moral statements (e.g., “Lying on behalf of a friend who is accused of murder is morally permissible”) as well as 16 filler statements. Filler statements were either facts (e.g., “There are 87 moons in our solar system”) or personal preferences/tastes (e.g., “Frank Sinatra is a better musician than Michael Bolton”). They were included to help conceal the study aims. Most statements were selected from recent studies on moral objectivism (Beebe & Sackris, 2016; Goodwin & Darley, 2008, 2012).² See Appendix A for all items.

The procedure was adapted from several empirical studies on moral objectivism (Beebe & Sackris, 2016; Goodwin & Darley, 2008, 2012). Participants first rated their level of agreement or disagreement (1 = *strongly disagree*, 6 = *strongly agree*) with all 24 statements presented in a random order, and they answered the question “Do you think that there is a correct answer as to whether the statement is true?” by selecting either (a) *There is a correct answer* or (b) *There is no correct answer*. Claiming there is a correct answer indicates that the participant is responding like a moral objectivist; we refer to this measure as *objectivism_{correct}*.

Then, participants were told that prior testing revealed that none of the statements produce 100% agreement or disagreement across people. Participants were asked how they would respond if another person were to disagree with them about the veracity of each of the 24 statements previously shown. For each statement, participants indicated whether (a) *It is possible for both of you to be correct* or (b) *At least one of you must be mistaken*. A moral objectivist would respond with (b), indicating that only one person could be right; we refer to this binary measure as *objectivism_{disagreement}*. Existing studies investigating moral objectivism have drawn on this strategy of probing intuitions about disagreement: If a claim is objectively true, then anyone who denies the claim must be mistaken (Goodwin & Darley, 2008, 2012; Beebe & Sackris, 2016).

Objectivism_{correct} and *objectivism_{disagreement}* provide complementary indices of moral objectivism. If, in fact, those higher on PNS are significantly more likely to provide objectivist responses on both *objectivism_{correct}* and *objectivism_{disagreement}* (relative to only one or none of the objectivism measures), this would provide the strongest support for a relationship between the need for structure and moral objectivism.³

The study ended with an attention check question: “Do you feel that you paid attention, avoided distractions, and took the survey seriously?” Participants selected one of five answers: (a) no, I was distracted; (b) no, I had trouble paying attention; (c) no, I didn’t not take the study seriously; (d) no, something else affected my

participation negatively; or (e) yes. Participants were assured that their responses would not affect their payment or their eligibility for future studies. Only those participants who selected (e) were included in the analyses. Upon completion, participants were monetarily compensated for their efforts.

Statistical analyses. Data were analyzed using R with the *lme4* software package (Bates, Maechler, Bolker, & Walkers, 2014). We computed two generalized linear mixed-effects models (link = *logit*). Significance and 95% CIs around beta-estimates were computed using Wald. Participant and item were included as crossed random effects in both models.⁴

Results and Discussion

To address our first hypothesis, a first generalized linear mixed-effects regression model was computed for which PNS was included as the fixed predictor of moral *objectivism_{correct}* (0 = “There is no correct answer,” 1 = “There is a correct answer”). This analysis yielded a significant relationship between PNS and moral *objectivism_{correct}* ($b = .42$, $SE = .17$, $z = 2.49$, $p = .01$, 95% CI [.09, .74]).

Another generalized linear mixed-effects regression model was computed for which PNS was included as the fixed predictor of moral *objectivism_{disagreement}* (0 = “It is possible for both of you to be correct,” 1 = “At least one of you must be mistaken”). This analysis yielded a significant relationship between PNS and moral *objectivism_{disagreement}* ($b = .44$, $SE = .18$, $z = 2.49$, $p = .01$, 95% CI [.09, .79]). Those higher on PNS were more likely to claim that, if they were to get into a disagreement, at least one of you must be mistaken.

In sum, those higher in personal need for structure were indeed more likely to report the following: (a) that there is a correct answer regarding the veracity of moral claims and (b) that if two people were to disagree over the veracity of a moral claim, at least one of them must be mistaken. These findings corroborate our first hypothesis.

Study 2

In Study 2, we implement an experimental manipulation that situationally reduces impressions of personal control (Kay et al.,

² Note that these filler statements were expected to belong to nonmoral categories of factual claims and taste claims, respectively. However, in this study we did not intend to compare these filler items with the critical moral items on the objectivism measures, and we did not conduct pretesting to ensure that they were considered to be nonmoral claims by participants on AMT. In Study 3, we conduct extensive pretesting to identify nonmoral items for comparison with moral items.

³ To assess the relationship between the two moral objectivism measures, we computed a generalized linear mixed-effects regression model with item and subject as crossed random-effects. *Objectivism_{correct}* was significantly related to *objectivism_{disagreement}* ($b = 2.51$, $p < .001$, 95% CI [2.04, 2.99]).

⁴ Similar statistical modeling approaches have recently been implemented in psycholinguistics research (e.g., Nappa & Arnold, 2014). In our case, it is statistically problematic to average judgments across items to obtain *objectivism_{correct}* and *objectivism_{disagreement}* scores, because the resultant distributions of these averaged variables are severely non-normal. See Baayen, Davidson, and Bates (2008) for a discussion of the benefits of using a mixed-effects modeling approach instead of more traditional approaches.

2008). Several studies have found that situationally reducing impressions of control systematically increases structure-seeking tendencies—even when those structure-seeking tendencies do not directly bear on the domain of the control-reducing condition (Landau et al., 2015). So, if adherence to moral objectivism is a means of affirming nonspecific structure, people should compensate for reduced personal control by acting increasingly like moral objectivists. As a means of affirming nonspecific structure when feelings of personal control are reduced, we hypothesize that people will tend to report that (a) there is a correct answer regarding the veracity of moral claims and (b) if two people were to disagree over the veracity of a moral claim, at least one of them must be mistaken.

Method

Participants. Two hundred seventy American residents with an approval rating above 90% voluntarily participated in this study on AMT for monetary compensation.⁵ Twenty-five participants failed the attention check at the end, provided clearly nonsensical responses to the memory cue (e.g., “NICE” or “good”), or did not answer all questions in the session, so data were analyzed with the remaining 245 individuals ($M_{\text{age}} = 37$ years, $SD = 10$, $\text{range}_{\text{age}} = 20\text{--}72$, 105 females, 136 males, four nonbinary).

Materials and procedure. We experimentally manipulated structure-seeking using a procedure adapted from Kay and colleagues (2008) that has been shown to reduce feelings of personal control without increasing negative mood or decreasing self-esteem (Cutright, Bettman, & Fitzsimons, 2013; Kay et al., 2008). Similar experimental manipulations have been widely used in the literature to increase structure-seeking tendencies (e.g., Cutright et al., 2013; Friesen, Kay, Eibach, & Galinsky, 2014; Kay et al., 2008; Landau et al., 2015; Ma & Kay, 2017; Rutjens et al., 2010; although, see Hoogeveen, Wagenmakers, Kay, & van Elk, 2020). Participants were randomly assigned to one of two conditions. In the *control threatened* condition, participants read: “In 2–5 sentences, please briefly describe a memory of a recent positive event over which you had absolutely no control.” Participants in the *control unthreatened* condition read: “In 2–5 sentences, please briefly describe a memory of a recent positive event over which you had control.” Each memory description was examined, and we excluded participants who provided clearly nonsensical responses (e.g., “NICE” or “good” were provided as the entire response). These exclusions are noted above.

After describing the remembered event, moral objectivism was indexed using the same instructions, items, and questions as Study 1. Participants then answered the same attention check at the end as in Study 1, to allow exclusions for distractions. Upon completion, participants were monetarily compensated for their time.

Statistical analyses. The same statistical methods and software used in Study 1 were used in Study 2.

Results and Discussion

The remembered events in the *control threatened* condition included, for example, experiencing pleasant weather conditions on a trip, winning a raffle prize, the lack of traffic on the way to work, finding cash on the street, receiving extra vacation time from a boss, and so forth. Remembered events in the *control unthreat-*

ened condition included, for example, choosing to purchase a new laptop, cooking a meal that turned out well, throwing a party for a friend, going for a run, and so forth. For each moral statement, Figure 1 depicts the percentage of participants making each response for *objectivism_{correct}* and *objectivism_{disagreement}*.

Our second hypothesis was that, as a means of affirming nonspecific structure when feelings of personal control are reduced, participants will tend to report that (a) there is a correct answer regarding the veracity of moral claims and (b) if two people were to disagree over the veracity of a moral claim, at least one of them must be mistaken. To begin to address this second hypothesis, a first generalized linear mixed-effects regression model was computed for which the control condition (control threatened vs. control unthreatened) was included as a binary fixed predictor of moral *objectivism_{correct}* (0 = “There is no correct answer,” 1 = “There is a correct answer”). This analysis yielded a significant effect of the control condition on moral *objectivism_{correct}* ($b = .57$, $SE = .22$, $z = 2.62$, $p = .009$, 95% CI [.14, 1.00]). Relative to those in the control unthreatened condition, those in the control threatened condition were more likely to claim that there is a correct answer regarding whether a moral statement is true or false.

Another generalized linear mixed-effects regression model was computed for which the control condition (threatened vs. unthreatened) was included as a binary fixed predictor of moral *objectivism_{disagreement}* (0 = “It is possible for both of you to be correct,” 1 = “At least one of you must be mistaken”). This analysis yielded a significant effect of control condition on moral *objectivism_{disagreement}* ($b = .52$, $SE = .24$, $z = 2.14$, $p = .03$, 95% CI [.04, .99]). Relative to those in the control unthreatened condition, those in the control threatened condition were more likely to claim that, if they were to disagree with someone else, at least one of you must be mistaken.

In sum, these findings corroborate our hypothesis that threatening feelings of control—which has been shown to systematically increase structure-seeking tendencies (Landau et al., 2015)—increases the likelihood participants report the following: (a) there is a correct answer regarding the veracity of moral claims and (b) if two people were to disagree over the veracity of some moral claim, at least one of them must be mistaken.

Study 3

The primary purpose of Study 3 is to further investigate whether personal need for structure predicts the endorsement of moral objectivism. The measures of objectivism utilized in Studies 1 and 2 rely on similar strategies to those used in many previous empirical investigations of moral objectivism (e.g., Beebe & Sackris, 2016; Goodwin & Darley, 2008, 2012; Sarkissian, Park, Tien, Wright, & Knobe, 2011). However, some philosophers have recently offered alternative interpretations of what measures like *objectivism_{correct}* and *objectivism_{disagreement}* are indexing (Beebe,

⁵ As in Study 1, our primary analyses are generalized linear mixed-effects models with a binary outcome and crossed random effects. To determine our sample size, we sought to match or exceed the sample sizes of previous studies using the same memory-based control manipulation (Cutright et al., 2013; Friesen et al., 2014; Ma & Kay, 2017; Shepherd, Kay, Landau, & Keefer, 2011). We collected data until a minimum of 270 participants completed the study, and we only analyzed these data after this sample size target was met.

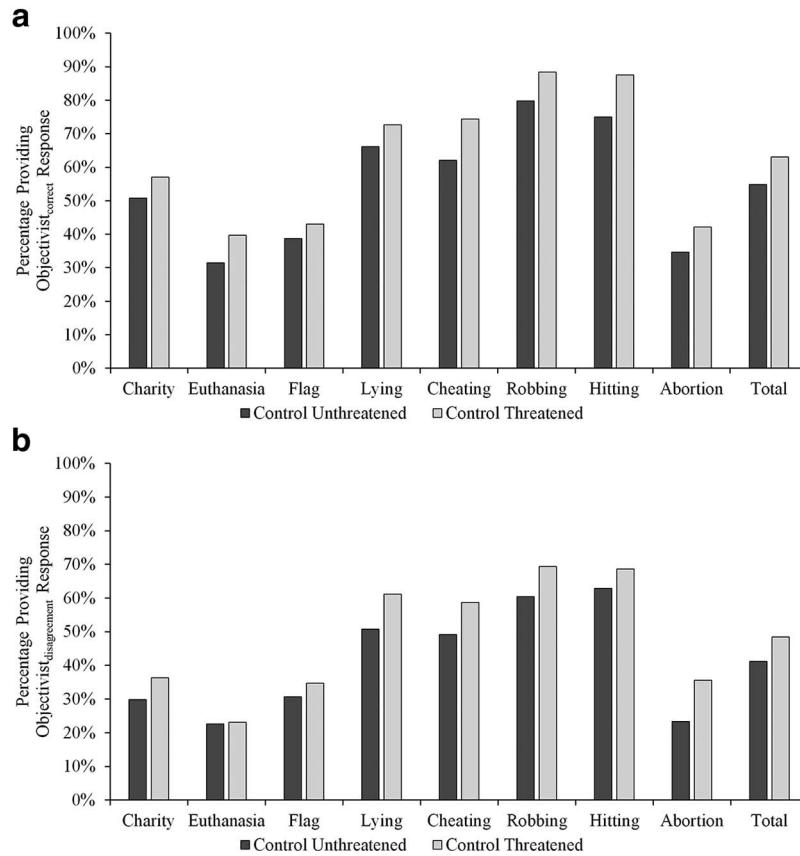


Figure 1. For each moral statement and in total (average across all statements), we depict the percentage of participants making objectivist responses for *objectivism_{correct}* (a) and *objectivism_{disagreement}* (b) as a function of condition (control threatened vs. control unthreatened). The order in which the items are presented in the figure is the same as the order in [Appendix A](#). Note that although we depict the averaged total across all statements and participants, this distribution is severely nonnormal.

2015; Khoo & Knobe, 2018; Pölzler, 2017, 2018). Specifically, Khoo and Knobe (2018) recently argued that measures like *objectivism_{correct}* and *objectivism_{disagreement}* actually offer indices of the degree to which people believe there is *exclusionary content* in the moral judgments of disagreeing parties; exclusionary content refers to the notion that the truth of one judgment excludes, or prevents, the other judgment from also being true. Under this interpretation, our results from Studies 1 and 2 may indicate that those more in need of personal structure and order in their lives are more likely to believe there is exclusionary content in the moral judgments of disagreeing parties. Believing that there is exclusionary content in the moral judgments of disagreeing parties may offer another way to project clear, simple, and reliable structure on the world. However, if *objectivism_{correct}* and *objectivism_{disagreement}* are really indexing beliefs about the presence of exclusionary content instead of beliefs about moral objectivism, then a new measure might be needed to better capture beliefs about moral objectivism.

In Study 3, a new, more direct measure of moral objectivism—adapted from Wright (2018)—is implemented to further investigate the relationship between the personal need for structure and moral objectivism. That is, participants are presented with many

different actions (e.g., torturing another person), and they are explicitly asked whether each action is morally (un)acceptable no matter what any other people think or feel about it, and whether the acceptability of each action is determined independently of any other person's, or their community's, beliefs, attitudes, or feelings about it. We contrast this objectivist position with two different nonobjectivist positions from which participants can also choose when presented with each action. The first variant of nonobjectivism allows participants to report that whether an action is morally (un)acceptable depends on the community in which that person lives. The second variant of nonobjectivism allows participants to report that the (un)acceptability of an action is determined individually, by each person's own beliefs, attitudes, or feelings about the action.

As a secondary objective in Study 3, we also investigate whether the personal need for structure is associated with objectivism for nonmoral conventional issues (or just for moral issues). To this end, we conducted extensive pretesting (described below) to ensure that the set of items used to assess objectivism overwhelmingly belong in moral and nonmoral categories, respectively. Conceivably, the need for structure and order in one's life may not only predict the endorsement of objectivism in the moral domain. We

have argued that when moral beliefs are thought to be objectively true or false, the social world may seem more structured, ordered, and predictable. Similarly, to achieve impressions of structure, order, and predictability, people may even come to believe that certain conventional (nonmoral) beliefs are objectively true or false.⁶ The inclusion of validated nonmoral items provides a useful and informative comparison condition to the moral items.

Method

Participants. One hundred forty-five American residents with an approval rating above 90% voluntarily participated in this study on AMT for monetary compensation.⁷ Three participants failed an attention check, so data were analyzed with the remaining 142 individuals ($M_{\text{age}} = 35$ years, $SD = 10$, $\text{range}_{\text{age}} = 19\text{--}72$, 52 females, 89 males, one nonbinary).

Materials. As in Study 1, participants first completed the 11-item individual difference questionnaire assessing the personal need for structure—the PNS scale (Neuberg & Newsom, 1993). Participants rated each item on a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). Responses were averaged to obtain PNS scores ($M = 4.31$, $SD = 1.02$, $\alpha = .91$).

To assess beliefs about moral objectivism, we adapted a procedure recently developed by Wright (2018). But first, we identified actions that participants believe are *moral* issues and actions that participants believe are *nonmoral* (conventional) issues (for comparison with the moral issues and to help conceal the study aims).⁸ All actions describe norm violations (e.g., cheating on an exam, wearing clothes backward, etc.). Pretesting was conducted with a separate set of participants on AMT ($N = 148$, after excluding two participants for not answering all questions). For each action presented, regardless of whether they believe the action to be acceptable or unacceptable, participants indicated whether they (a) believe it has to do with morality, (b) believe it has *nothing* to do with morality, or (c) do not know whether it has to do with morality. We identified 15 actions depicting moral issues and 15 actions depicting nonmoral issues that fit our criteria (i.e., more than 90% of participants identified them as moral issues or nonmoral issues, respectively). Specifically, for the final set of 15 actions capturing moral issues, participants classified them as having to do with morality in 96.5% of cases; for the final set of 15 actions capturing nonmoral issues, participants classified them as having nothing to do with morality in 97.4% of cases. Examples of actions having to do with morality include “torturing another person” and “cheating on an exam.” Examples of actions having *nothing* to do with morality include “using an old rotary phone to make calls” and “lifting weights in an expensive tuxedo.” All 30 actions are provided in Appendix B.

Procedure. Participants in the actual study were presented with a block of 15 actions classified as having to do with morality and a block of 15 actions classified as having nothing to do with morality (30 actions total). The block that was presented first (i.e., moral or nonmoral actions) was randomized across participants. The actions presented within each block were presented in a random order and one at a time. For each of the actions having to do with morality, participants first indicated whether the action is (a) morally acceptable, (b) morally unacceptable, or (c) neither. Participants who chose (a) or (b) for an action were then asked to consider how they would respond to someone who sincerely took

the opposite stance (i.e., if the participant reported that the action is morally acceptable, they then would consider how they would respond to someone who sincerely reported that the action is morally unacceptable, and vice versa). Participants then indicated what they personally believe to be true about the other person who took the opposite stance, from the following three options:

1. The other person would be correct, too. This is because the acceptability of the action is determined individually, by each person’s unique beliefs, attitudes, or feelings.
2. It may or may not be morally acceptable for this other person to do this action. Whether or not the action is morally acceptable depends on the community in which the person lives.
3. The other person would be incorrect. The action is morally (un)acceptable no matter what this other person or any other people think or feel about it. The acceptability of the action is determined independently of this other person’s, or their community’s, beliefs, attitudes, or feelings about it.

The first two options indicate *subjectivist* responses, because the truth about the acceptability of the action is determined by the individual’s, or their community’s, unique beliefs, attitudes, or feelings about it. The third option is an *objectivist* response, because the truth about the acceptability of the action is determined by action or type of action it is, independently of the individual’s, or their community’s, unique beliefs, attitudes, or feelings about it. Participants who indicated that an action is neither morally acceptable nor morally unacceptable were instructed to explain why they took that position in two to four sentences (participants selected this option in only 1.5% of total cases).

A similar procedure was implemented for the 15 actions classified as having nothing to do with morality. However, instead of asking about *moral* acceptability, participants were asked about *social* acceptability. That is, participants first indicated whether the action is (a) socially acceptable, (b) socially unacceptable, or (c) neither socially acceptable nor socially unacceptable. Then, as with the other items, participants who chose (a) or (b) for an action were then asked to consider how they would respond to someone who sincerely took the opposite stance. Participants then indicated what they personally believe

⁶ Lending indirect support to this possibility, recent neural evidence suggests that both moral and nonmoral conventional claims are represented similarly in the brain and rely on the same neural architecture (Theriault, Waytz, Heiphetz, & Young, 2017). If the personal need for structure predicts objectivist beliefs about moral claims, it might also predict objectivist beliefs about non-moral conventional claims. We thank an anonymous reviewer for this suggestion.

⁷ As in the previous studies, our primary analyses are generalized linear mixed-effects models with a binary outcome and crossed random effects. We sought to obtain a similar number of participants as in Study 1. We collected data until a minimum of 145 participants completed the study, and we only analyzed these data after this sample size target was met.

⁸ We thank an anonymous reviewer for suggesting that we investigate, in this third study, the relationship between the personal need for structure and objectivism for nonmoral actions.

to be true about the other person who took the opposite stance from the same three options presented above, except that the word *morally* was replaced with the word *socially* in the possible response options. Moreover, participants who indicated that an action is neither socially acceptable nor socially unacceptable were instructed to explain why they took that position in two to four sentences (participants selected this option in 7.8% of total cases).

At the end, participants answered the same attention check question in the previous two studies, to allow exclusions for distractions. Upon completion, participants were monetarily compensated for their efforts.

Statistical analyses. The same statistical methods and software used in the previous two studies were also used in Study 3.

Results and Discussion

For the 15 actions classified as having to do with morality, participants provided objectivist responses in 75.0% of cases and subjectivist responses in 23.5% of cases. In the remaining 1.5% of cases, participants reported that the action was neither morally acceptable nor morally unacceptable, and thus, they could not make objectivist or subjectivist responses. Then, for the 15 actions classified as having *nothing* to do with morality, participants provided objectivist responses in 16.8% of cases and subjectivist responses in 75.4% of cases. In the remaining 7.8% of cases, participants reported that the action was neither morally acceptable nor morally unacceptable, and thus, they could not make objectivist or subjectivist responses.

We tested the hypothesis that those higher in PNS will be more likely to endorse moral objectivism. For the actions classified as having to do with morality, a generalized linear mixed-effects regression model was computed for which PNS was included as the fixed predictor of subjectivism/objectivism (0 = subjectivist response, 1 = objectivist response). This analysis yielded a significant relationship between PNS and subjectivism/objectivism ($b = .47$, $SE = .17$, $z = 2.74$, $p = .006$, 95% CI [.13, .81]) such that those more in need of personal structure were more likely to make objectivist responses (relative to subjectivist responses).

Our secondary objective was to assess whether the personal need for structure is associated with objectivism for nonmoral conventional issues in addition to the moral issues. To address this objective, for the actions classified as having *nothing* to do with morality, another generalized linear mixed-effects regression model was computed for which PNS was included as a fixed predictor or subjectivism/objectivism (0 = subjectivist response, 1 = objectivist response). However, the model failed to converge. As an alternative, we computed a different subjectivism/objectivism score by subtracting the proportion of subjectivist responses from the proportion of objectivist responses (across all 15 nonmoral issues) for each participant. These scores could take on values between (and including) -1 and 1 . Negative scores indicate a higher proportion of subjectivist responses to objectivist responses; positive scores indicate a higher proportion of objectivist responses to subjectivist responses. The distribution of these subjectivism/objectivism scores was severely non-normal, so we computed a nonparametric Spearman's rank-order correlation. This revealed no significant relationship between PNS and these subjectivism/objectivism scores, $r_s(140) = .13$, $p = .125$. When

taking the same statistical approach for the moral actions instead of the nonmoral actions, there was a significant and positive relationship between PNS and subjectivism/objectivism scores, $r_s(140) = .21$, $p = .013$.

In sum, the personal need for structure and order was related to the endorsement of moral objectivism, and these findings corroborate our hypothesis that those individuals higher in PNS will be more likely to endorse moral objectivism. For nonmoral actions, participants rarely made objectivist responses, and those higher in PNS were *not* significantly more likely to hold objectivist beliefs about the actions.

General Discussion

Our primary goal was to investigate a possible relationship between the personal need for structure in everyday life and the endorsement of moral objectivism. Our results suggest those with a stronger personal need for structure in their everyday lives are more likely to endorse moral objectivism. Endorsing moral objectivism entails that the veracity of moral claims is not subject to the whims or preferences of any particular person or group, and that the veracity of moral claims remains invariant for everyone in all cultures and in all contextual circumstances. As such, moral objectivists impose a clear, simple, and rigid structure on what is right and wrong. As a secondary goal, we also investigated whether the personal need for structure in everyday life predicts objectivist beliefs about nonmoral conventional issues. Participants rarely made objectivist responses about nonmoral conventional issues, and we found no significant relationship between the personal need for structure and the propensity to make objectivist (relative to subjectivist) responses.

Our findings converge with empirical research suggesting that randomness and threats to personal control trigger a motivation to restore order and impressions of control (Kay et al., 2008; Landau et al., 2015). The notion that one's life circumstances might be random and uncontrollable induces anxiety, and restoring impressions of order and control in one's life alleviates that anxiety (Landau et al., 2015; Laurin, Kay, & Moscovitch, 2008). Disparate but converging lines of research suggest that the process of restoring order and impressions of control can be accomplished in many different ways: by bolstering personal agency, by believing they are capable of obtaining desired outcomes and achieving goals, and by viewing powerful external systems or entities as operating or intervening to control outcomes on their behalf (Kay, Whitson, Gaucher, & Galinsky, 2009). The current results indicate that, by believing that (a) there is, in fact, a correct answer regarding the veracity of moral claims and (b) at least one person must be mistaken in the face of disagreement, people seem to implement a novel strategy for threat compensation—even though the perceived threat does not bear in any straightforward way on the domain of the control-reducing strategy. This is particularly surprising given that our control manipulation asked participants to recall a *positive* event in which they lacked control. That is, participants were motivated to restore their feelings of personal control even though the absence of control in remembered event resulted in a positive experience.

The current findings raise several additional questions about the relationship between belief in moral objectivism and the capacity for cooperation, prosociality, social orderliness, and optimal social

functioning. Theorists have argued that shared moral considerations allow us to successfully navigate our everyday social environments (Curry, 2016; Curry et al., 2019; de Waal, 2006). We suggest that a widespread endorsement of moral objectivism (or even the widespread presence of exclusionary content in the moral judgments of disagreeing parties) may help to provide people with a rigid, unambiguous, and definitive set of rules and expectations that are applicable across diverse social situations and contextual circumstances. These fixed moral rules and expectations, in turn, should reduce uncertainty about whether certain actions are indeed right or wrong across contexts and situational circumstances, should reduce uncertainty about how individuals ought to act, and should reduce uncertainty about how individuals ought to be judged, blamed, and punished for their actions. This should render successful planning and goal-pursuit more tractable. Future research will attempt to more definitively link beliefs about the objectivity of moral claims to successful planning and goal-pursuit.

Our studies provide a first attempt to understand links between the psychological motivation to obtain structure and order in the world and beliefs about morality. Although some interindividual variability in certain metaethical views—like moral objectivism or the belief that there must be exclusionary content in the moral judgments of disagreeing parties—has been associated with demographic variables (e.g., age) and religious beliefs (e.g., Beebe & Sackris, 2016; Goodwin & Darley, 2008; Heiphetz & Young, 2017; Sarkissian & Phelan, 2019; Yilmaz & Bahçekapili, 2015; although, see Wright et al., 2013), our studies offer evidence for a possible underlying *psychological antecedent* of such views. Our findings might even offer motivational (and psychological) explanations for other findings in the literature. For example, age-related differences in the endorsement of moral objectivism (or in beliefs about exclusionary content in the moral judgments of disagreeing parties) might be the product of underlying age-related differences in the need for structure, order, and predictability. In addition, other research suggests and those who believe in a powerful God are more likely to endorse moral objectivism (Sarkissian & Phelan, 2019; Yilmaz & Bahçekapili, 2015). Kay and colleagues (2008) found that people compensate for threats to personal control by believing in the existence of a powerful God; belief in a powerful God offers a means of seeing structure and order in the world. So, it is plausible that the personal need for structure and order in our lives at least partly drives both the belief in a powerful God and the endorsement of metaethical views like moral objectivism. Future research will further explore these possibilities and the relationship between the personal need for structure and other kinds of beliefs about morality.

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(Appendices follow)

Appendix A

Moral, Factual, and Taste Claims Used in Studies 1 and 2

Moral Claims

1. *Charity*. Anonymously donating a significant portion of one's income to charity is morally good.
2. *Euthanasia*. Assisting in the death of a friend who has a disease for which there is no known cure and who is in terrible pain and wants to die is morally permissible.
3. *Flag*. Cutting the American flag into pieces and using it to clean one's bathroom is morally wrong.
4. *Lying*. Lying on behalf of a friend who is accused of murder is morally permissible.
5. *Cheating*. Cheating on an exam that you have to pass to graduate is morally permissible.
6. *Robbing*. Robbing a bank to pay for an expensive vacation is morally wrong.
7. *Hitting*. Hitting someone just because you feel like it is morally wrong.
8. *Abortion*. Before the third month of pregnancy, abortion for any reason is morally permissible.

Factual Claims

1. Frequent exercise usually helps people to lose weight.
2. Julius Caesar did not drink wine on his 21st birthday.

3. There are 87 moons in our solar system.
4. Humans evolved from more primitive primate species.
5. The earth is only 6,000 years old.
6. New York City is further north than San Diego.
7. Mars is the smallest planet in the solar system.
8. The earth is not at the center of the known universe.

Taste Claims

1. Classical music is better than rock music.
2. Chocolate ice cream tastes better than green beans.
3. Brad Pitt is better looking than Drew Carey.
4. Gourmet meals from fancy Italian restaurants taste better than microwaveable frozen dinners.
5. Beethoven was a better musician than Bach.
6. Barack Obama is a better public speaker than George W. Bush.
7. Shakespeare was a better writer than Dan Brown is (author of *The Da Vinci Code*).
8. Frank Sinatra is a better musician than Michael Bolton.

(Appendices continue)

Appendix B

Moral and Nonmoral Actions Used in Study 3

Moral Actions

1. Selling children on the Internet
2. Stealing products that do not belong to you
3. Forcing another person to have sex
4. Cheating on an exam
5. Cheating on one's spouse
6. Intentionally running over a cat in one's car
7. Lying on behalf of a friend accused of murder
8. Blackmailing a family member
9. Punching someone just because you feel like it
10. Torturing another person
11. Stalking someone you used to date
12. Driving while severely intoxicated
13. Cheating in a game with a group of strangers
14. Destroying a neighbor's property for no reason
15. Robbing a bank to pay for a vacation
3. Drinking an entire cup of coffee with a spoon
4. Wearing clothes that are several sizes too big
5. Reading the end of a book before the beginning
6. Wearing a long trench coat on a hot summer day
7. Using an old rotary phone to make calls
8. Watching TV in black-and-white instead of color
9. Lifting weights in an expensive tuxedo
10. Wearing a suit to a fast food restaurant
11. Watching a full season of a TV show in a single day
12. Talking to oneself in public
13. Wearing one's clothes backward
14. Facing the back of the elevator instead of the front
15. Eating a bowl of soup with a fork

Nonmoral Actions

1. Eating dessert before one's main entrée arrives
2. Wearing sunglasses at night

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