

# Determinants of Norm Compliance: Moral Similarity and Group Identification\*

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## Abstract

What determines whether someone complies with a social norm? The social identity approach offers a mechanism for norm compliance: a person who feels similar to a group identifies more with that group and, in turn, complies with the group's norms. We used an economics experiment to test this mechanism. We manipulated the similarity between an individual and a social group by exogenously changing their similarity in moral values. Moral values were identified using a survey developed in conjunction with moral foundations theory. In one treatment, the subject and social group's moral values were similar, and in another, they were dissimilar. Subsequently, we measured group identification and behavior. To measure behavior, we used a modified rule-following task in which the social group expressed a normative expectation that subjects follow "the rule". We found that moral similarity increased group identification, and group identification increased rule compliance. We show that this behavior change was due to increased group norm sensitivity rather than changes in the group norms. We advance the study of social identity by establishing a causal pathway between group identification and behavior change.

**Keywords:** Moral Similarity, Moral Foundations Theory, Group Identification, Group Norm Sensitivity

**JEL Classification Numbers:** *C91, D01*

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## 1 Introduction

In today’s workplaces, group work is ubiquitous (Lazear & Shaw, 2007). However, for it to be effective, it often requires group members to suppress their selfish desires and follow their group’s implicit and explicit rules. To model the behavior of individuals in social groups, such as these, the social identity approach (Hornsey, 2008; Tajfel & Turner, 1979; Turner, Hogg, Oakes, Reicher, & Wetherell, 1987; Turner & Reynolds, 2012) has received significant attention in economics and management science. The basic idea is that individuals are members of social groups<sup>1</sup> and gain utility from complying with, or disutility from violating, group-specific social norms (Akerlof & Kranton, 2000; Chang, Chen, & Krupka, 2019; Krupka, Leider, & Jiang, 2017). This framework provides explanations for many organizational behaviors that traditional economic theories can not easily explain (Akerlof & Kranton, 2000, 2002, 2005, 2008).<sup>2</sup> However, most empirical studies identified the average effect of social identities on behavior, even though many theories assume (Akerlof & Kranton, 2000) and some empirical evidence shows (Kimbrough & Vostroknutov, 2016, 2018) that individuals vary in how strongly social identities impact their behavior. One source of this individual heterogeneity may be the extent to which an actor identifies with the social group (Hornsey, 2008; Tajfel & Turner, 1979; Turner et al., 1987; Turner & Reynolds, 2012).<sup>3</sup>

In this study, we experimentally test whether higher group identification influences behavior *through* increased group norm sensitivity. The term “(group) norm sensitivity” is used here to refer to the weight individuals place on their (group-specific) norm-dependent utility.<sup>4</sup> We manipulated group identification by exogenously varying the similarity in moral preferences between an individual and an unknown social group.<sup>5</sup> To char-

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<sup>1</sup>According to Tajfel and Turner (1979), “*We can conceptualize a group ... as a collection of individuals who perceive themselves to be members of the same social category, share some emotional involvement in this common definition of themselves, and achieve some degree of social consensus about the evaluation of their group and of their membership of it.*”

<sup>2</sup>Others have also suggested that social identity might explain social preferences (Kimbrough & Vostroknutov, 2016; Krupka & Weber, 2013), peer effects (Gächter, Gerhards, & Nosenzo, 2017), and framing (Chang et al., 2019).

<sup>3</sup>Tropp and Wright (2001) defined identification as “*the degree to which the ingroup is included in the self.*”

<sup>4</sup>In other words, norm sensitivity describes an individual’s preference to comply with the normative expectations of the general population (e.g., the entire subject pool). In contrast, group norm sensitivity describes an individual’s preference to comply with the normative expectations of a specific subset of it (e.g., democrats or republicans in the subject pool). Both are distinct from norm compliance, which describes a behavior that other incentives might have influenced.

<sup>5</sup>According to research in social psychology, morality rather than competence or sociability is most important for a positive

acterize the morality of individuals, we used moral foundations theory (Graham et al., 2013; Graham et al., 2011; Haidt & Joseph, 2004) and the “progressivism” scale (Clark et al., 2017). Progressivism measures the degree to which individuals endorse moral values that focus on the individual over moral values that bind people into larger groups. In one treatment, the subjects’ and the social group’s progressivism scores were similar, and in another, they were dissimilar. Subsequently, we measured participants’ group identification and costly compliance with a rule created by the social group. We tested whether higher moral similarity between an individual and a social group increases group identification and subsequent compliance with that group’s normative expectations.

We found that moral similarity in progressivism increased group identification, and group identification increased compliance with rules from the social group. We show that this behavior change was due to increased group norm sensitivity rather than differences in the group norms.

Our contribution to the economics literature on social identity is to establish a causal mechanism from identification to group norm sensitivity. Prior work in economics examined how group identification affected behavior (Chen & Chen, 2011; Chen & Li, 2009; Goette, Huffman, & Meier, 2006), but this work could not disentangle whether the behavioral effect was due to a change in group norm sensitivity or the group norms themselves. We overcome this limitation by manipulating group identification without affecting the relevant group norms. In doing so, we shed light on why there is heterogeneity in norm compliance and when a social identity is likely to impact behavior. We also contribute to the management literature on adherence to organizational norms. Organizations need effective ways to create groups with which individual workers feel connected (or bonded with) to create productive workgroups. We show that creating groups based on shared common values, like those described in moral foundations theory, is a viable and implementable mechanism for doing so.

## 2 Related Literature

Our work is closely related to the social-psychological research on self-categorization theory (Turner et al., 1987).<sup>6</sup> According to self-categorization theory, individuals segment, classify and order their social environment in a process called categorization. In this process, they put themselves and others into different categories. Which categorization is chosen depends, among other things, on the comparative fit of the categorization. Categories form in such a way that they maximize intraclass similarities and interclass differences

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evaluation of the own ingroup (Leach, Ellemers, & Barreto, 2007).

<sup>6</sup>The social-psychological social identity approach (Hornsey, 2008; Turner & Reynolds, 2012) consists of social identity theory (Tajfel & Turner, 1979) and self-categorization theory (Turner et al., 1987). While social identity theory mainly describes intergroup processes (e.g., why do individuals display ingroup favoritism), self-categorization theory focuses on intragroup processes (e.g., what are the processes that lead to categorization and why does categorization change behavior).

(This is referred to as the meta-contrast principle). Subsequently, the chosen categorization influences self-perception<sup>7</sup> and behavior. In particular, individuals who define themselves via a social identity engage in depersonalization and self-stereotypization. They no longer see themselves and others in the category as individuals but as exemplars of the group prototype. This perceptual shift leads to behavior that is compliant with the normative expectations of a group. In our experiments, self-categorization theory predicts that individuals are more likely to self-categorize into similar rather than dissimilar social groups. This categorization creates group identification and causes individuals to comply with behaviors that are seen as prototypical of the social group (i.e., group norms).

There also exists some empirical evidence about the heterogeneity and moderators of norm sensitivity. Kimbrough and Vostroknutov (2016, 2018) introduced an incentivized experimental task, the rule-following task, that allows researchers to approximate an individual’s norm sensitivity. They show that heterogeneity in norm sensitivity exists and that the measure predicts norm compliance in public goods, trust, dictator, and ultimatum games. To our knowledge, there has been only one study that identified a variable that influences norm sensitivity. Krysovski and Tremewan (2021) found that anonymity reduces the norm sensitivity of dictators in dictator games. It should be noted that the authors used statistical estimation techniques to determine norm sensitivity. In contrast, we modify the task of Kimbrough and Vostroknutov to measure group norm sensitivity and are therefore less reliant on distributional assumptions.

Prior empirical research also suggests that group identification can influence behavior. Eckel and Grossman (2005) showed that group identification increases cooperation with groups in repeated public goods games. Goette et al. (2006) showed that individuals are more likely to cooperate with ingroup members in simultaneous prisoner’s dilemmas and that third parties are more likely to punish individuals that harmed an ingroup member in a prisoner’s dilemma with third-party punishment. Bernhard, Fehr, and Fischbacher (2006) examined how group identity in small tribes affects behavior in dictator games with third-party punishment. They found that third parties are more likely to punish dictators that harmed an ingroup recipient, that third parties are less likely to punish ingroup dictators that harmed an ingroup recipient, and that dictators transfer more to ingroup recipients. Shang, Reed, and Croson (2008) showed that peer effects are stronger if the peer is an ingroup member rather than an outgroup member. Chen and Li (2009) found that ingroup identification increases ingroup favoritism in other-other allocation tasks. Chen and Chen (2011) show that ingroup identification influences equilibrium selection in minimum-effort games. Lastly, Jiang and Li (2019) examined how identity affects behavior in principle agent games. They found that principals make more generous offers to ingroup rather than outgroup agents, that ingroup rather than outgroup agents are less tolerant of principal’s low offers, and that ingroup rather than outgroup agents are more responsive to

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<sup>7</sup>Self-categorization may occur at various levels of abstraction: Individuals might define themselves on a subordinate level based on interpersonal comparisons (personal identity), on an intermediate level based on intergroup comparisons (social identity), or on a superordinate level as a human being (human identity).

generous offers.

However, in the prior work, group identification could influence behavior either by changing group norm sensitivity or group norms. Recent research accounts for the effect mostly through changes in group norms. For example, Harris, Herrmann, Kontoleon, and Newton (2015) showed that third parties punish ingroup dictators less for displays of ingroup favoritism compared to outgroup dictators. The authors interpreted the lack of punishment for ingroup dictators as evidence that ingroup favoritism in itself is prescribed by group norms. More recently, Dimant (2020) used an incentivized group norm elicitation to empirically show that ingroup favoring allocations in dictator and public good games are more socially appropriate. Lastly, Kimbrough and Vostroknutov (2020) showed that their theoretical model is able to account for ingroup favoritism through changes in the group norms. We argue that while group identification might influence behavior through changes in group norms, the explanation is incomplete and ignores an important psychological mechanism. Therefore we examine if group identification can influence behavior in an experimental task where the group norms are held constant.

To conceptualize morality, we used moral foundations theory (Graham et al., 2013; Graham et al., 2011; Haidt & Joseph, 2004). The theory draws on evolutionary psychology and anthropology to identify five dimensions or “foundations” of morality with which societies construct their moral values. For this reason, moral foundations theory is particularly suitable to measure and describe differences in moral concerns across individuals, social groups, and cultures. The five moral foundations are harm/care, fairness/reciprocity, ingroup/loyalty, authority/respect, and purity/sanctity (in the following, we will only call them harm, fairness, ingroup, authority, and purity).<sup>8</sup> The first two foundations (harm and fairness) are often called the “individualizing” foundations since they describe moral values concerned with protecting the rights and liberties of individuals. In contrast, the last three foundations (authority, ingroup, and purity) are often called the “binding” foundations since they describe moral values that bind individuals into larger groups and institutions. In our study, we primarily use the progressivism index. Progressivism describes the degree to which individuals endorse the individualizing moral foundations over the binding moral foundations (Clark et al., 2017).

Moral foundations theory has been used, among others, by Clark et al. (2017) to show that participants’ progressivism is positively correlated with cooperative behavior in prisoner’s dilemmas and trust games. However, other studies examined how moral similarity in moral foundations affects preferences and behavior more directly. Dehghani et al. (2016) showed that higher moral similarity, in particular in the domain of purity, leads to less social distancing in social networks and laboratory experiments. Winterich, Zhang, and Mittal (2012) discovered that moral similarity between an individual and a charity increases donations.

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<sup>8</sup>Iyer, Koleva, Graham, Ditto, and Haidt (2012) have argued for an additional liberty/oppression foundation. For a discussion on the inclusion of this and other foundations, see Graham et al. (2013)

Other researchers showed that similarity in moral foundations between voters and political parties predicts the intention to vote (Johnson et al., 2014) and voting decision (Enke, 2020; Franks & Scherr, 2015; Milesi, 2017).

### 3 Theoretic Framework

In the following, we provide a theoretical framework that motivates our experimental design and empirical strategy. The framework is based on models articulated by Akerlof and Kranton (2000), Kimbrough and Vostroknutov (2016), and Krupka and Weber (2013). In our framework, an individual  $i$  is introduced to a new social group  $g$ . Subsequently, the individual must choose an action  $x \in \mathbb{R}^+$  in a non-strategic decision environment. In our experiment, the action describes an allocation in a modified rule-following task (Kimbrough & Vostroknutov, 2016, 2018). Crucially, while making this decision, the individual is aware of the normative expectation  $\eta$  of the social group and can choose to comply with that expectation. We define the individual’s utility function as follows:

$$U_i(x) = x + \phi_i \eta(x) \tag{1}$$

$$\phi_i = \phi(I_i) \tag{2}$$

$$I_i = I(D(m_i, m_g)) \tag{3}$$

The utility function  $U_i$  (see Equation (1)) consists of two additively separable<sup>9</sup> parts: The standard and the norm-dependent utility component. In our model, the standard utility component contains only the valuation that the individual places on their monetary gain. In doing so, we assume that the individual’s payoff equals the selected action  $x$ , and the individual gets linear consumption utility from money.<sup>10</sup> The norm-dependent utility component potentially creates (dis)utility if the individual (violates) follows the group norm of the social group. In particular, the group norm function  $\eta : \mathbb{R}^+ \rightarrow [-1, 1]$  assigns to each action  $x$  a social appropriateness rating. In doing so, assume that the group norm function  $\eta(x)$  decreases with the selected action  $x$  (see Hypothesis 2). Subsequently, this social appropriateness is weighted by the group norm sensitivity of the individual  $\phi_i \in \mathbb{R}^+$ .

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<sup>9</sup>Several authors have used similar additively separable utility functions to model social identity, including Akerlof and Kranton (2002, 2005), Benjamin, Choi, and Strickland (2010), Chang et al. (2019), Eckel et al. (2021), Kimbrough and Vostroknutov (2016), and Krupka and Weber (2013)

<sup>10</sup>We make the same simplifying assumptions that Kimbrough and Vostroknutov (2018) make to model behavior in the rule-following task: First, we assume linear consumption utility. Second, we assume that monetary gains are zero if the action is zero and increase proportionally to the action. In our and Kimbrough and Vostroknutov’s experiments, the monetary gains were not zero if the action was zero and the monetary gains were not increasing proportionally.

Crucially, we do not assume that the group norm sensitivity is fixed. Instead, we assume that the group norm sensitivity is influenced by the identification of the individual with the respective social group. In particular, we assume that group identification  $I_i \in \mathbb{R}^+$  is mapped via the group norm sensitivity function  $\phi : \mathbb{R}^+ \rightarrow \mathbb{R}^+$  into group norm sensitivity  $\phi_i$  (see Equation (2)). We predict that an increase in group identification leads to increased group norm sensitivity (see Hypotheses 4 and 5).

To test this, we exogenously varied a subject’s group identification by manipulating the moral similarity between the subject and a social group. We exogenously varied moral similarity between treatments by introducing subjects to one of two social groups with distinct moral positions. Consequently, between treatments, we kept the moral position of the individual  $m_i \in \mathbb{R}$  fixed while changing the average moral position of the reference social group  $m_g \in \mathbb{R}$ . We believe that the distance  $D(m_i, m_g)$  between the moral position of the individual and the social group is mapped in the group identification function  $I : \mathbb{R}^+ \rightarrow \mathbb{R}^+$  to group identification  $I_i$  (see Equation (3)). We predict that an increase in moral similarity leads to increased group identification (see Hypothesis 3 and Section 6.4).<sup>11</sup>

In our experiments, we measured the moral position of the individual  $m_i$ , the average moral position of the social group  $m_g$ , the identification of the individual with the social group  $I_i$ , and the selected action of the individual  $x$ . However, we did not directly measure the group norm sensitivity of the individual  $\phi_i$ . Instead, we followed Kimbrough and Vostroknutov (2016, 2018) in using the rule-following task to approximate the group norm sensitivity. According to the authors, the observed action  $x$  of a utility-maximizing individual has a positive monotonic relationship with the group norm sensitivity  $\phi_i$ . However, for this to be true, the norm function  $\eta$  must be a unique norm shared by all members of both treatments. In other words, our treatment manipulation must not affect the group norms. To ensure that this was the case, we measured

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<sup>11</sup>One explanation for why individuals identify with social groups that are (morally) similar to them might be that it is rational to do so. (Other researchers have used similar arguments in the past. For example, Bernard, Hett, and Mechtel [2016] and Shayo [2009] assumed in their models that individuals choose their group identification to maximize utility.) A rational individual identifies with a social group if identification increases utility. If an individual does not identify with the social group ( $I = 0$  and therefore  $\phi_i = 0$ ), the utility function only includes the standard utility component. However, if the individual identifies with the social group ( $I > 0$  and therefore  $\phi_i > 0$ ), the utility function includes both the standard and norm-dependent utility components. This change impacts the utility in two ways: First, identification potentially reduces the utility from the standard utility component since it might change the optimal action. Second, identification potentially increases or decreases the utility from the norm-dependent utility component. A rational individual will identify with a social group if there is at least one action in which the utility gain from the norm-dependent utility component is higher than a potential utility loss from the standard utility component. In other words, the standard and the norm-dependent utility component must be somewhat aligned. Now assume that the individual encounters a social group but is not aware of its normative prescriptions. The similarity between an individual and a social group might signal an alignment of the standard and norm-dependent utility components. Hereby, moral similarity might be perceived as a particularly informative signal. However, other characteristics might also inform the individual. For example, the general similarity in gender, ethnicity, and even art preferences suggests a somewhat related past and might also be used to create expectations about a social group’s normative expectations.

and compared the group norms between treatments (See Hypothesis 1). In our experiments, we were able to clearly distinguish whether group identification ( $I_i$ ) influenced behavior ( $x$ ) via group norm sensitivity ( $\phi_i$ ) or the group norm function ( $\eta(x)$ ).

## 4 Experimental Design

We prescreened potential participants for their moral type, used a survey to create two social groups, and subsequently conducted two experiments: The choice experiment and the norms elicitation experiment. In the experiments, we measured how behavior and group norms change in response to an exogenous variation of group identification. We now describe each part in more detail.

### 4.1 Prescreening Survey

In the **prescreening survey**, we identified the moral type of all participants and, with this, created a subject pool for the rule elicitation survey, the choice experiment, and the norm elicitation experiment. Crucially, each subject in the subject pool at most participated in one of the following components. In the prescreening survey, participants answered the moral foundations questionnaire (Graham et al., 2011).<sup>12</sup> The moral foundations questionnaire measures the harm, fairness, ingroup, authority, and purity foundations described in moral foundations theory (Graham et al., 2013; Graham et al., 2011; Haidt & Joseph, 2004). Each foundation was measured with six items which were scored on a six-point scale ranging from 0 to 5 (see Appendix C.1). Subsequently, we calculated the individualizing and binding indices by averaging the scores of the first two foundations and the last three foundations, respectively. Lastly, we calculated the progressivism index by subtracting the individualizing from the binding index (Clark et al., 2017). This index can take on values ranging from  $-5$  (not at all individualizing & extremely binding) to  $+5$  (extremely individualizing & not at all binding). In the following, we will call individuals with a positive progressivism index *individualizing subjects* and individuals with a negative progressivism index *binding subjects*.

### 4.2 The Rule Elicitation Survey

In the **rule elicitation survey**, we created two social groups with distinct moral positions and asked their members for a statement which we used in the choice experiment.<sup>13</sup> We recruited 10 individualizing subjects and 10 binding subjects from our subject pool. Participants *read* a description of the Kimbrough and Vostroknutov (2018) rule-following task. In the rule-following task, a person must allocate 20 balls into either of two buckets: the yellow bucket or the blue bucket. At the end of the task, the person earns £0.05

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<sup>12</sup>The concluding questionnaire asked the participants about their socio-demographic characteristics (see Appendix C.7) and their user experience during the experiment (see Appendix C.8).

<sup>13</sup>The concluding questionnaire asked the participants about their user experience during the experiment (see Appendix C.8).



for each ball that they place into the blue bucket and £0.10 for each ball that they place into the yellow bucket. While allocating balls into the yellow bucket is payoff dominant, our subjects were told that “*The rule is to put the balls in the blue bucket.*” Our subjects read about this task and were asked to describe “the rule.” They could choose between the following two options: “*The rule is to put the balls in the blue bucket*” and “*The rule is to put the balls in the yellow bucket.*”

This survey may seem odd to administer, but it gives us statements about the rule that we can communicate to other subjects without deception. After collecting the responses, we sorted the participants into individualizing and binding subjects. By partitioning the participants, we could describe the statements as coming from subjects from specific social groups with distinct moral positions. A comparison of the statements between groups found no difference in the modal rule, which always was: “*The rule is to put the balls in the blue bucket.*” We will call the group that consists of only individualizing subjects the individualizing group and its rule the individualizing rule. Analogously we will call the group that consists of only binding subjects the binding group and its rule the binding rule.

### 4.3 The Choice Experiment

In the **choice experiment**, we introduced participants to one of two social groups with distinct moral positions, determined their level of identification with that social group, and measured their compliance with rule statements from that social group. The experiment consisted of three parts.<sup>14</sup> We only recruited individualizing subjects from our subject pool.<sup>15</sup>

In **part one**, we randomly assigned participants to one of two treatments: The individualizing or the binding treatment. Depending on the treatment, subjects either learned about members of the individualizing or the binding group from the rule elicitation survey. Names, such as individualizing or binding, were never used to describe the group. Instead, we used the generic term “Group A.” To learn about Group A’s members, subjects were shown five questions from the moral foundations questionnaire and the corresponding answers of Group A’s members. Each of the five questions represented one of the five dimensions of moral foundations theory.<sup>16</sup> The answers represented the average ratings of Group A’s members rounded to the nearest rating. Table 1 shows the responses in the individualizing (column 3) and binding (column 4) treatment. Subjects were asked to memorize the responses and were subsequently asked to recall one randomly chosen answer. If they chose the correct answer, they received £0.50. Otherwise, they received nothing. We only informed

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<sup>14</sup>The concluding questionnaire asked the participants about their behavior (see Appendix C.9) and their user experience during the experiment (see Appendix C.8).

<sup>15</sup>We only needed one moral type to test our hypotheses. As such, we chose individualizing subjects.

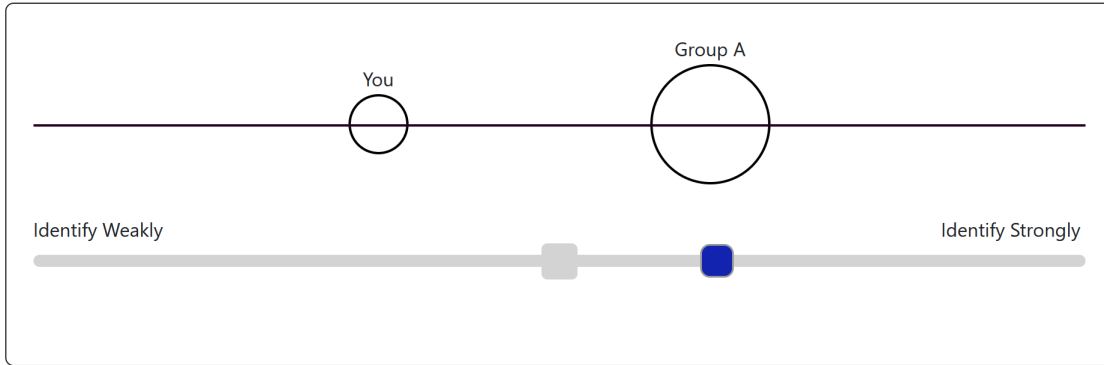
<sup>16</sup>We selected the five questions in the following way: For each of the five moral foundations, we chose one item out of the relevance section of the questionnaire. We always chose the item that had the highest factor loading on the particular moral foundation according to the confirmatory factor analysis of Graham et al. (2011).

**Table 1:** What Subjects Read to Learn about the Moral Position of Group A

Foundation	Question	Individualizing treatment	Binding treatment
Harm	Whether or not someone cared for someone weak or vulnerable?	Very relevant	Somewhat relevant
Fairness	Whether or not some people were treated differently from others?	Very relevant	Somewhat relevant
Ingroup	Whether or not someone’s action showed love for his or her country?	Not very relevant	Somewhat relevant
Authority	Whether or not someone showed a lack of respect for authority?	Slightly relevant	Somewhat relevant
Purity	Whether or not someone violated standards of purity and decency?	Slightly relevant	Somewhat relevant

Note. Participants only saw the five questions and the corresponding answer of their treatment.

participants at the end of the experiment whether their answers were correct.



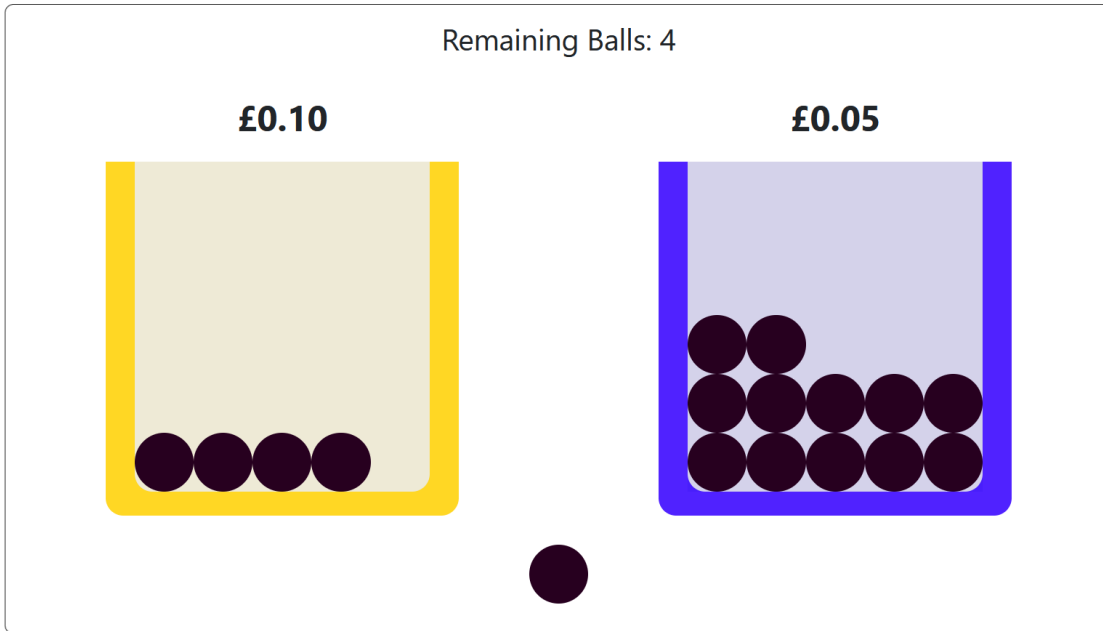
**Figure 1:** Screenshot of the “*Inclusion of Ingroup in the Self Scale*”

In **part two**, we used a continuous version<sup>17</sup> of the “*Inclusion of Ingroup in the Self Scale*”<sup>18</sup> (Tropp &

<sup>17</sup>We used a continuous version of the “Inclusion of the Ingroup in the Self Scale” to allow for higher precision. The change is identical to the modification of the discrete to the continuous “Inclusion of Other in Self Scale” (Aron, Aron, & Smollan, 1992; Le, Moss, & Mashek, 2007).

<sup>18</sup>The “Inclusion of Ingroup in the Self Scale” is a version of the “Inclusion of Other in Self Scale” (Aron et al., 1992). However, instead of indicating the perceived distance to another person, one sets the perceived distance to a social group. The “Inclusion of Other in Self scale” was validated by Gächter, Starmer, and Tufano (2015) and has been used in economics by Bicchieri, Dimant, Gaechter, and Nosenzo (2020) and Gächter, Starmer, and Tufano (2017).

Wright, 2001) to measure the degree to which subjects identify with Group A.<sup>19</sup> Subjects saw a small circle labeled “You” and a big circle labeled “Group A” (see Figure 1). Participants could move a slider below the circles to the left (moving the circles further apart) or to the right (moving the circles closer to each other).<sup>20</sup> Consistent with prior work, we interpret distant circles as weak and adjacent circles as strong, identification with Group A. The distance identification measure can take values from 0 (weak identification / the circles are at opposite ends of the scale) to 1 (strong identification / the circles’ centers are at the scale’s midpoint).



**Figure 2:** Screenshot of the Group Rule-Following Task

In **part three**, participants played a modified version of the rule-following task (Kimbrough & Vostroknutov, 2018), which we call the group rule-following task (see Figure 2).<sup>21</sup> In our version, we replaced the rule Kimbrough and Vostroknutov used with the rule that we obtained from Group A in the rule elicitation survey. The rule read: “*According to the members of Group A, the rule is to put the balls in the blue bucket.*”<sup>22</sup> While the rule from Kimbrough and Vostroknutov had no obvious source except the experimenter, our rule originated from members of Group A.<sup>23</sup> The number of balls in the rule-compliant bucket is our behavioral

<sup>19</sup>We only measured the identification with the ingroup (Trope & Wright, 2001) and not the identification with the ingroup and the outgroup (Schubert & Otten, 2002) since we only had a clearly defined ingroup: Group A.

<sup>20</sup>We asked the participants to “... move the slider to a position in which the distance between the two circles most accurately describes your identification with Group A”.

<sup>21</sup>We randomized the position (left or right) of the blue and the yellow bucket for each subject.

<sup>22</sup>The rule Kimbrough and Vostroknutov read: “*The rule is to put the balls in the blue bucket.*”

<sup>23</sup>Related research demonstrated that individuals respond to such rule statements: Kimbrough and Vostroknutov (2016, 2018)

measure. Furthermore, if the group norms in the group rule-following task did not differ between treatments, the number of balls can also be used to approximate group norm sensitivity (see Section 3). The experiment concluded with a questionnaire that included an alternative group identification measure used by Chen and Li (2009).

#### 4.4 The Norm Elicitation Experiment

In the **norm elicitation experiment**, we introduced participants to one of two social groups with distinct moral positions and measured the group norms about the compliance with rules from that social group. The experiment consisted of two parts.<sup>24</sup> We only recruited individualizing subjects from our subject pool.

**Part one** followed the same process as part one in the choice experiment. In short, we randomly assigned participants to learn of the moral position of the individualizing or the binding group.

In **part two**, we used the Krupka and Weber method (Krupka & Weber, 2013) to elicit the group norms of individualizing subjects for the group rule-following task of the choice experiment. We informed participants that they had to evaluate the potential behavior of participants in another study, that the participants were introduced to the same Group A, and that they subsequently were confronted with the group rule-following task in which we used the rule from Group A.<sup>25</sup> Then, we told them they have to evaluate how socially appropriate it is to put 0, 5, 10, 15, and 20 balls into the blue bucket (while placing the remaining balls into the yellow bucket). In each case, they could choose between the following six ratings: “Very socially appropriate,” “Socially appropriate,” “Somewhat socially appropriate,” “Somewhat socially inappropriate,” “Socially inappropriate,” and “Very socially inappropriate.” After all participants completed their ratings, we randomly chose one allocation of blue and yellow balls (e.g., 0 in the blue bucket and 20 in the yellow bucket) and determined the modal social appropriateness rating for that allocation. If a subject selected the same social appropriateness rating as the modal social appropriateness rating of those subjects assigned to the same treatment,<sup>26</sup> they received an additional payment of £2. Otherwise, they received nothing. Due

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showed that individuals respond to the arbitrary rule of the experimenter, while Pryor, Perfors, and Howe (2019) showed that individuals comply with arbitrary descriptive norms even if they do not reflect the preferences of the group.

<sup>24</sup>The concluding questionnaire asked the participants about their user experience during the experiment (see Appendix C.8).

<sup>25</sup>Though the rule statement was identical, the critical feature was that the rule came from an individualizing or binding group.

<sup>26</sup>We only recruited individualizing subjects in the norm elicitation experiment. To establish common knowledge about who else was in the matching group, we told the participants that each question in the prescreening survey questionnaire belonged to one of two categories (“category 1” and “category 2”). While doing this, we displayed all questions included in either category graphically separated. Unbeknownst to the participants, category 1 contained the questions of the individualizing index, and category 2 contained the questions of the binding index. We told the participants that depending on the individual, the considerations expressed in category 1 can be more (individualizing individuals), equally, or less important (binding individuals) than those expressed in category 2. We informed them that for them and all other participants in their matching group, the questions contained in category 1 were more important than those in category 2.

to this incentive structure, individuals de facto participated in a pure matching coordination game in which they must coordinate on the social appropriateness of the elicited actions. Krupka and Weber argue that in coordination games like this, the only salient focal point is given by the relevant social norm. Consequently, in our experiment individuals have a monetary incentive to reveal their perception of the individualizing group norm about compliance with individualizing and binding rules.

## 5 Experimental Procedure and Payoffs

**Table 2:** Number of Subjects and Average Bonus per Experiment

Experiment	Individualizing	Binding	Bonus (£)
	treatment (n)	treatment (n)	
Choice experiment	160	160	2.01
Norm elicitation experiment	100	100	0.96

We conducted all our surveys and experiments online using the experimental software oTree (Chen, Schonger, & Wickens, 2016) and the online recruitment platform Prolific.co (Palan & Schitter, 2018).<sup>27</sup> Hereby, we only invited subjects to the prescreening survey who fulfilled the following requirements: They were United States nationals who were at that time located in the United States, used a desktop or laptop, had between 10 and 1000 previous submissions, and had an approval rate of at least 90%. Furthermore, we only re-invited individualizing participants to the choice and norm elicitation experiment. In doing so, each subject either participated in the rule elicitation survey, the choice experiment, or the norm elicitation experiment. Within the choice and norm elicitation experiment, participants were randomly assigned to either the individualizing or binding treatment.<sup>28</sup> For their participation in the prescreening survey, subjects received a participation fee of £1.20. For their participation in the choice or norm elicitation experiment, they received £1.60. In addition, participants earned on average £2.01 in the choice experiment and £0.96 in the norm elicitation experiment (see Table 2). We collected data until we obtained 160 observations in each treatment of the choice experiment and 100 observations in each treatment of the norm elicitation experiment.<sup>29</sup>

<sup>27</sup>Peer, Brandimarte, Samat, and Acquisti (2017) examined various crowdsourcing platforms and discovered that the data quality on Prolific.co was comparable with Amazon Mechanical Turk. They also found that participants were more naive, less dishonest, and more diverse.

<sup>28</sup>We did not observe any significant differences in the measured socio-demographic characteristics between the treatments of the choice or norm elicitation experiment (see Appendix B.1).

<sup>29</sup>The sample size in the choice experiment was based on the following power calculation: We used data from Kimbrough and Vostroknutov (2018) to calculate an expected effect size of 0.3. Subsequently, we used G-Power (Faul, Erdfelder, Lang, & Buchner, 2007) to calculate the minimum required sample size for a one-tailed Wilcoxon-Mann-Whitney test with a parent distribution min ARE, an effect size of 0.3, an  $\alpha$ -error probability of 0.05, a power of 0.80, and an even allocation between

## 6 Results

We begin by examining the group norms from the norm elicitation experiment and the behavior from the choice experiment separately. Subsequently, we turn to our main research question and directly examine the effect of group identification on group norm sensitivity. The analysis was preregistered at The American Economic Association’s registry for randomized controlled trials (<https://doi.org/g5qw>).<sup>30</sup>

### 6.1 Results: Group Norms

We followed Krupka and Weber (2013) in converting the categorical social appropriateness ratings obtained from the norms elicitation experiment into numerical ratings. We coded the rating “Very socially inappropriate” as  $-1$ , the rating “Socially inappropriate” as  $-0.6$ , the rating “Somewhat socially inappropriate” as  $-0.2$ , the rating “Somewhat socially appropriate” as  $0.2$ , the rating “Socially appropriate” as  $0.6$ , and finally the rating “Very socially appropriate” as  $1$ .<sup>31</sup>

First, we evaluate whether receiving the individualizing or binding rule statement in the group rule-following task changed the social appropriateness of allocations. We predicted no significant difference in the group norms, which should prescribe to follow the rule and place all the balls in the rule-compliant bucket irrespective of treatment.

**Hypothesis 1** (Comparison of the Group Norms): The group norms in the group rule-following task will not differ significantly between the individualizing and the binding treatment.

In Table 3, we report for each action of the group rule-following task the average social appropriateness rating and the frequency distribution of social appropriateness ratings separated by treatment. To test our hypothesis, we used the same approach as Chang et al. (2019). For each of the five actions that we considered in the norm elicitation experiment (place 0, 5, 10, 15, or 20 balls in the rule-compliant bucket), we used one two-sided Wilcoxon-Mann-Whitney test and one two-sided t-test to compare the norm ratings between the individualizing and the binding treatment. Due to the inflated likelihood of type 1 errors, we applied the Bonferroni correction to our statistical significance threshold of  $p = 0.05$ . The new threshold became  $p = 0.01$ . As in Chang et al., we considered two group norms to be significantly different from one another when the

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treatments. Based on this power calculation, we needed at least 160 subjects per treatment. The sample size of the norm elicitation experiment was based on samples used in related studies (Chang et al., 2019). The reason for this is that we did not expect any treatment effects and thus only used this experiment to obtain the group norms.

<sup>30</sup>In Appendix A, we describe how we deviate from the preregistration.

<sup>31</sup>The same transformation was used among others by Chang et al. (2019), D’Adda, Drouvelis, and Nosenzo (2016), Erkut, Nosenzo, and Sefton (2015), Gächter, Gerhards, and Nosenzo (2017), Gächter, Nosenzo, and Sefton (2013), Kimbrough and Vostroknutov (2016), and Veselý (2015).

majority of their norm ratings (in our case three) were significantly different from each other.

**Result 1** (Comparison of the Group Norms): The group norms in the group rule-following task did not differ significantly between the individualizing and the binding treatment.

**Support:** The p-values of the five t-tests and the five Wilcoxon-Mann-Whitney tests are displayed in Table 3. None of the ten comparisons reached the significance threshold (in all cases  $p > 0.13$ ).

Second, we evaluate the functional form of the group norms. We predicted that the social appropriateness of an action is linearly increasing with the number of balls placed in the rule-compliant bucket. The reason for this prediction was that the rule dictates that individuals should place “the balls” and consequently all balls into the blue bucket. Thus placing less than 20 balls into the bucket constitutes partial rule compliance and should be perceived as proportionally less socially appropriate. Furthermore, Chang et al. (2019) and Krupka and Weber (2013) showed that in dictator games, the equal split is the socially most appropriate action and that norm ratings decrease as the distance to this allocation increases.

**Hypothesis 2** (Functional Form of Group Norms): The social appropriateness will increase linearly with the number of balls in the rule-compliant bucket.

We estimated two Tobit regression models with standard errors clustered at the individual level.<sup>32</sup> In all models, we used the social appropriateness of an action in the group rule-following task as our dependent variable. In the first model, we regressed the dependent variable against the number of balls placed in the rule-compliant blue bucket. In the second model, we added a binding treatment dummy and an interaction term of the two other explanatory variables. We also included a set of control variables, which we labeled “Control Variables 1.” The set included: The subject’s progressivism, the distance in progressivism, one dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one, and two.

**Result 2** (Functional Form of Group Norms): The social appropriateness increased linearly with the number of balls in the rule-compliant bucket.

**Support:** We report the estimated coefficients in Table 4. As can be seen, the coefficient of the number of balls in the rule-compliant bucket is positive and highly significant in all specifications ( $p < 0.001$ ). Furthermore, the insignificant interaction suggests that this relation does not differ by treatment.

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<sup>32</sup>We chose Tobit regression models to handle the censoring at 0 and 1. However, the coefficients of “Balls in the blue bucket” would have been significant and positive in OLS regression models as well.

**Table 3: Elicited Social Appropriateness Ratings for the Group Rule-Following Task in the Individualizing and Binding Treatment**

Action	Individualizing treatment (n = 100)										Binding treatment (n = 100)										P-values <sup>a,b</sup>	
	In blue	Mean <sup>a</sup>	---	--	-	+	++	+++	++++	Mean <sup>a</sup>	---	--	-	+	++	+++	++++	WMW	T			
<i>0 balls</i>	44	-0.35	18	8	8	6	16	16	-0.22	32	20	8	15	10	15	15	0.13	0.20				
<i>5 balls</i>	7	-0.18	42	18	13	13	7	7	-0.10	9	30	19	16	20	6	6	0.25	0.28				
<i>10 balls</i>	5	0.23	5	23	30	19	18	18	0.21	3	9	23	29	20	16	16	0.74	0.79				
<i>15 balls</i>	5	0.26	9	12	23	41	10	10	0.20	0	13	19	30	32	6	6	0.14	0.33				
<i>20 balls</i>	15	0.36	11	6	7	10	51	51	0.35	12	11	6	12	16	43	43	0.65	0.97				

Note. ---, “very socially inappropriate”; --, “socially inappropriate”; -, “somewhat socially inappropriate”; +, “somewhat socially appropriate”; ++, “socially appropriate”; ++++, “very socially appropriate”; WMW, Wilcoxon-Mann-Whitney test; T, t-test.

<sup>a</sup> We converted the categorical ratings in the same order as described above into the following numerical scores: -1, -0.6, -0.2, 0.2, 0.6, 1.

<sup>b</sup> The p-values are based on a two-sided Wilcoxon-Mann-Whitney test and t-test that compared the ratings between treatments.



**Table 4:** The Effect of Rule Compliance on Social Appropriateness

	<i>Social appropriateness</i>			
	(1)		(2)	
	Coef.	Std. err.	Coef.	Std. err.
<i>Balls in the blue bucket</i>	0.048***	(0.007)	0.055***	(0.009)
<i>Binding treatment</i>			0.170	(0.201)
<i>Interaction</i>			-0.014	(0.013)
Constant	-0.373***	(0.080)	-0.531***	(0.150)
Controls		No		Yes
Log-likelihood		-1,213		-1,202
BIC		2,446		2,521
Number of cases		1,000		1,000

Notes. We used Tobit regressions with standard errors clustered at the level of the individual. The controls include the following variables: The subject's progressivism, the distance in progressivism, one dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one and two. Coef., Coefficient; Std. err., Standard error.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

## 6.2 Results: Individuals Choice

In this section, we evaluate whether greater identification with the group issuing the rule statement increased the number of balls in the rule-compliant bucket. First, we tested if our treatment manipulation successfully affected group identification. We compared subjects' group identification between the individualizing treatment (high moral similarity) and the binding treatment (low moral similarity). In line with the psychological social identity approach (Hornsey, 2008; Turner & Reynolds, 2012), we predicted that moral similarity increases group identification.

**Hypothesis 3** (Comparison of Group Identification): Group identification will be significantly higher in the individualizing treatment than the binding treatment.

We compared the responses of the distance group identification measure of the “Inclusion of Ingroup in the Self Scale” between the individualizing and binding treatment.<sup>33</sup>

**Result 3** (Comparison of Group Identification): Group identification was significantly higher in the individualizing treatment than the binding treatment.

**Support:** The average group identification was 0.80 in the individualizing treatment and 0.62 in the binding treatment. The 0.19 point difference was significant using a one-sided t-test ( $p < 0.001$ ).

Second, we examined how our treatment manipulation affected the number of balls placed in the rule-compliant bucket of the group rule-following task. We predicted that more balls would be placed in the rule-compliant bucket in the individualizing than in the binding treatment. This prediction was based on the following observations: First, Result 3 suggests that group identification was higher in the individualizing than in the binding treatment. Second, the psychological social identity approach (Hornsey, 2008; Turner & Reynolds, 2012) suggests that group identification increases the likelihood of prototypical group behavior, and therefore individuals should have acted more in line with the measured group norms. Third, Results 1 and 2 indicate that both group norms were nearly identical and dictated that individuals place all the balls in the blue bucket.

**Hypothesis 4** (Comparison of the Number of Balls in the Rule-Compliant Bucket): The number of balls in the rule-compliant bucket will be significantly higher in the individualizing treatment than the binding treatment.

We compared the number of balls in the rule-compliant bucket between the individualizing and binding treatment. Hereby, we either used all available observations or only those observations who were not randomly

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<sup>33</sup>In Appendix B.4, we also considered other identification measures. We did not find any noticeable difference due to changes in the conceptualization of group identification.

assigned the authority control question (254 out of 320 observations). The reason for the second comparison was that the authority control question unexpectedly primed our participants to act more rule-compliant in the binding treatment (see Appendix B.2). This priming effect ran counter to the treatment effect described in Hypothesis 4. Consequently, including observations assigned to the authority control question potentially obscures a treatment effect.

**Result 4** (Comparison of the Number of Balls in the Rule-Compliant Bucket): If one excludes those observations assigned to the authority control question, the number of balls in the rule-compliant bucket was significantly higher in the individualizing treatment than the binding treatment. However, if one does not exclude those observations, there were no significant differences in the number of balls in the rule-compliant bucket.

**Support:** If we exclude those observations assigned to the authority control question, the average participant placed 8.24 and 6.44 balls in the rule-compliant bucket of the individualizing and the binding treatment, respectively. This difference of 1.79 balls was significant according to a one-sided t-test ( $p = 0.03$ ). However, if we include those observations assigned to the authority control question, the participants placed 8.15 and 7.44 balls in the rule-compliant bucket of the individualizing and the binding treatment, respectively. This difference was not significant according to a one-sided t-test ( $p = 0.21$ ).<sup>34</sup> Where possible, we controlled for the priming effect of the authority control question. In all of the previous and following regressions, we present two models: One model without and one model with control variables. The control variables always include a binding treatment dummy, dummies for the selected control question, and interactions between both.

### 6.3 Results: The Effect of Group Identification on Group Norm Sensitivity

In this section, we examine how group identification influenced group norm sensitivity. Our identification strategy used the exogenous variation in group identification induced by our treatment manipulation and

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<sup>34</sup>An alternative explanation for our findings could be that moral similarity created trust towards Group A (McEvily, Weber, & Bicchieri, 2006). Individuals, therefore, might have been more willing to believe that compliance with Group A's rule statement is beneficial to them. Consequently, we would expect participants to place more balls in the rule-compliant bucket of the individualizing treatment than the binding treatment. We argue that it is unlikely that this has happened in our experiments: First, trust would only influence behavior if the participants believed that Group A has information about their payment that the subjects do not have. This belief would indicate that the instructions were deceptive and did not detail how their actions in the group rule-following task would influence their payment. However, we informed our participants in the invitation of the experiment and the terms of participation that we do not use deception. Furthermore, we highlighted in the terms of participation that the participants' choices do not impact their potential earnings in subsequent stages, and individuals knew that the group rule-following task is the last stage of the experiment. Second, in Result 5, we show that group identification has a major impact on rule compliance in the group rule-following task. Therefore the interpretation that this treatment difference is due to group identification is consistent with Result 5.

the endogenous variation in the propensity to identify with Group A. Since the psychological social identity approach (Hornsey, 2008; Turner & Reynolds, 2012) suggests that group identification increases the likelihood of prototypical group behavior, we predicted that increased group identification increases group norm sensitivity.

**Hypothesis 5** (The Effect of Group Identification on Group Norm Sensitivity): Higher group identification will increase group norm sensitivity.

To evaluate this hypothesis, we made use of Results 1 and 2. According to Result 1, there were no significant differences between the individualizing and binding group norms. According to Result 2, an action’s social appropriateness was linearly increasing in the number of balls in the rule-compliant bucket. Due to these findings, we approximated group norm compliance and group norm sensitivity (see Section 3) in both treatments with the number of balls in the rule-compliant bucket.

To examine the impact of group identification on group norm sensitivity, we estimated two Tobit regression models.<sup>35</sup> In all models, we used the number of balls in the rule-compliant bucket of the group rule-following task as our dependent variable. In the first model, we regressed the dependent variable against the distance measure of the “Inclusion of Ingroup in the Self Scale.”<sup>36</sup> In the second model, we added a binding treatment dummy. We also included a set of control variables, which we labeled “Control Variables 2.” The set included: The subject’s progressivism, the distance in progressivism, one dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one, two, and three. We predicted that group identification would be significant and positive in all specifications.

**Result 5** (The Effect of Group Identification on Group Norm Sensitivity): Higher group identification increased group norm sensitivity.

**Support:** The estimates of the two Tobit regression models can be found in Table 5. As can be seen, the coefficients of group identification is positive and highly significant in both models ( $p < 0.001$ ). Furthermore, the effects is large in magnitude. If group identification increases from 0 to 1 (on a scale from 0 to 1), the number of balls in the rule-compliant bucket, *ceteris paribus*, increases by approximately 14 balls.

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<sup>35</sup>We chose Tobit regression models to handle the censoring at 0 and 20. However, the coefficients of “Identification (distance)” would have been significant and positive in OLS regression models as well.

<sup>36</sup>In Appendix B.5, we also consider other identification measures. We did not find any noticeable difference due to changes in the conceptualization of group identification.

**Table 5:** The Effect of Group Identification on Rule Compliance

	<i>Balls in the blue bucket</i>			
	(1)		(2)	
	Coef.	Std. err.	Coef.	Std. err.
<i>Identification (distance)</i>	14.131***	(4.034)	14.657***	(4.326)
<i>Binding treatment</i>			-5.036	(4.705)
Constant	-4.636	(3.099)	-3.622	(5.942)
Controls		No		Yes
Log-likelihood		-738		-725
BIC		1,493		1,549
Number of cases		320		320

Notes. We used Tobit regressions. The controls include the following variables: The subject’s progressivism, the distance in progressivism, one dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one, two and three. Coef., Coefficient; Std. err., Standard error.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

## 6.4 Results: The Effect of Moral Similarity on Group Identification

Lastly, we examined how moral similarity to a social group affected group identification. In doing so, we exclusively conceptualized morality by progressivism and moral similarity as the absolute difference between the individual’s progressivism and the social group’s implied progressivism.<sup>37</sup> On average, participants had a progressivism score of 1.72 in the individualizing treatment and 1.59 in the binding treatment (on a scale from -5 to 5).<sup>38</sup> The five answers of the moral foundations questionnaire used to introduce Group A implied a progressivism score of 2.33 in the individualizing treatment and 0 in the binding treatment (on a scale from -5 to 5). Finally, the average absolute difference between the individual’s progressivism and the social group’s implied progressivism was 0.97 in the individualizing treatment and 1.59 in the binding treatment (on a scale from 0 to 10).

To examine how moral similarity affected group identification, we estimated two Tobit regression models with

<sup>37</sup>In Appendix B.3, we examined which moral foundations drive the effect of moral similarity on group identification. In Appendix B.6, we examined how robust our results are to changes in the conceptualization of moral similarity. We found that the distance in the individualizing and the binding index both influenced group identification. Furthermore, this effect was mainly driven by the distance in the fairness foundation. We also found that the effect of moral similarity on group identification was robust to changes in the conceptualization of moral similarity.

<sup>38</sup>The difference in the participant’s progressivism between treatments was not significant (see Appendix B.1).

robust standard errors.<sup>39</sup> In all models, we used the distance group identification measure of the “Inclusion of Ingroup in the Self Scale” as our dependent variable. In the first model, we regressed the dependent variable against the subject’s progressivism and the absolute difference between the individual’s progressivism and the social group’s implied progressivism. In the second model, we added a binding treatment dummy. We also included a set of control variables, which we labeled “Control Variables 3.” The set included: One dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one and two.

**Table 6:** The Effect of Moral Similarity on Group Identification

	<i>Identification (distance)</i>			
	(1)		(2)	
	Coef.	Std. err.	Coef.	Std. err.
<i>Progressivism</i>	0.019	(0.015)	0.006	(0.016)
<i>Distance progressivism</i>	-0.118***	(0.017)	-0.081***	(0.020)
<i>Binding treatment</i>			-0.196**	(0.067)
Constant	0.836***	(0.034)	0.890***	(0.062)
Controls		No		Yes
Log-likelihood		-41		-25
BIC		104		136
Number of cases		320		320

Notes. We used Tobit regressions with robust standard errors. The controls include the following variables: One dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one and two. Coef., Coefficient; Std. err., Standard error.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

The results can be found in Table 6. As can be seen, distance progressivism was significant and negative in both specifications ( $p < 0.001$ ).<sup>40</sup> This result suggests that an increase in distance progressivism decreased

<sup>39</sup>We chose Tobit regression models to handle the censoring at 0 and 1. However, the coefficients of “Distance progressivism” would have been significant and negative in OLS regression models as well.

<sup>40</sup>Unexpectedly, the coefficient of the binding treatment dummy was also significant and negative. This result might suggest that distance progressivism influenced group identification in a non-linear way. However, even when we replaced distance progressivism with the logarithm or square of the explanatory variable, the binding treatment dummy remained significant. Another explanation could be that this result was due to an unobserved variable that influenced group identification and that changed between treatments. However, due to our control variables, we could exclude the selected control question or the task’s difficulty (approximated by the time spent in Stages 1 and 2) as potential explanations. Furthermore, we could exclude

group identification. In particular, if distance progressivism increased by the average amount observed in our choice experiment (1.28), group identification decreased, *ceteris paribus*, by 0.10 to 0.15 (on a scale from 0 to 1).<sup>41</sup>

## 7 Discussion

In our study, we show that an increase in group identification can lead to heightened levels of group norm sensitivity. We also show that an increase in moral similarity based on moral foundations theory leads to elevated levels of group identification.

Our findings help understand how group identification affects ingroup favoritism. Kimbrough and Vostroknutov (2020) recently provided a theoretical explanation of why Chen and Li (2009) might have observed ingroup favoritism in their other-other allocation tasks. They argued that two group norms are present if the allocation is between two participants that belong to distinct social identities. Each group norm favors allocating more money to the ingroup member rather than the outgroup member. According to Kimbrough and Vostroknutov, the allocator exclusively considers the group norm of their own social identity while making the allocation decision. This explanation might be incomplete since it assumes an extreme case where individuals only comply with the ingroup norm and ignore the outgroup norm. Our results suggest that the degree to which individuals comply with group norms in itself is a function of group identification. Consequently, an increase in group identification might influence behavior through two channels in other-other allocations tasks: Through an increased group norm sensitivity towards the ingroup norm and a change in the applicable ingroup norm that favors allocations to the ingroup member.

Our findings shed light on why some individuals are prone to ingroup favoritism. Kranton, Pease, Sanders, and Huettel (2020) and Kranton and Sanders (2017) observed that some individuals are “groupy” and engage in ingroup favoritism independent of the considered social group (i.e., minimal groups and political groups). What makes these groupy individuals different? It might be that groupy individuals have high default group norm sensitivity, and the considered social groups have group norms that prescribe ingroup favoritism.

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that the binding treatment dummy was significant due to an imbalanced allocation of subjects to treatments (see Appendix B.1).

<sup>41</sup>In their research, Chen and Li (2009) examined how various manipulations influenced group identification. They found that the including a chat stage (binary) significantly increased group identification by 0.126 (rescaled to a scale from 0 to 1). To compare their results with our results, we estimated an OLS regression model. In this model, we regressed the same group identification measure that Chen and Li used (see Appendix C.9) against the subject’s progressivism and the absolute difference between the individual’s progressivism and the social group’s implied progressivism. We find that increasing the distance progressivism by 1 (on a scale from 0 to 10) significantly decreased group identification by 0.088 (on a scale from 0 to 1). Since the mean distance progressivism was 1.28, the average moral similarity in our experiment had a similar effect on group identification as would be obtained by including a chat stage between the individual and Group A.

Alternatively, groupy individuals might have typical levels of group norm sensitivity, but their perception of group norms might be biased towards ingroup favoritism. Our results suggest that situational factors like moral similarity strongly influence group norm sensitivity. Therefore, our results support an explanation that focuses on a biased perception of group norms.

Our findings suggest that norm sensitivity has limited temporal stability. We experimentally identify a source of variation in (group) norm sensitivity (Kimbrough & Vostroknutov, 2016, 2018). While (group) norm sensitivity might be stable in the short term, the moral position of individuals (and consequently of the social groups) changes in the medium term (Van de Vyver, Houston, Abrams, & Vasiljevic, 2016). Hence, group identification and (group) norm sensitivity may have limited temporal stability.

Lastly, our findings describe how moral similarity might influence voting. Enke (2020) showed with correlational data from U.S. elections that moral similarity, according to moral foundations theory, predicts voting at the individual level. According to Enke, individuals' utility from voting depends directly on the moral similarity between the voter and the politician or the political party. However, how does moral similarity change behavior? It is unlikely that the behavior is influenced by the desire to create a better fit between the individual and the environment. Such a desire would be irrational since the likelihood that the own vote decides the election is very small. One reason why citizens still might vote is due to their social identities (Hasen, 1996). Our study shows that a social identity-based explanation could also explain why the likelihood to vote for a political party is influenced by the moral similarity between a voter and the political party.<sup>42</sup> According to our experiments, an increase in moral similarity between a voter and a political party increases group identification and group norm sensitivity. Thus, an individual is more likely to follow the political party's group norms, which presumably dictate "Vote for us" and "Don't vote for them."

## 8 Conclusion

In this study, we experimentally tested if group identification influences behavior via group norm sensitivity. We also examined how moral similarity between an individual and a social group affects group identification. In our main experiment, participants learned about the moral position of an unknown social group through their answers in the moral foundations questionnaire (Graham et al., 2011). By assigning them to one of two social groups, we exogenously manipulated the moral similarity between our participants and the social group. Subsequently, we tested how this treatment manipulation affected our measures of group identification and compliance with the social group's rules. We found that group identification has a significant positive impact on rule compliance. Due to our design, we isolated that this was due to changes in group norm sensitivity rather than changes in the group norms. Furthermore, we found that moral similarity based on

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<sup>42</sup>Other researchers have used similar arguments in the past. For example, Shayo (2009) proposed a model in which similarity to social groups affects group identification and, subsequently, voting preferences for income redistribution.



moral foundations theory’s progressivism (Clark et al., 2017) has a positive impact on group identification.

Our work makes three important contributions to the study of social behavior in economics: First, we show that group identification can influence behavior via group norm sensitivity. With this, our study identifies one situational variable that determines when social identities are likely to matter. Second, we show that similarity in moral preferences according to moral foundations theory, just like similarity in other preferences Chen and Li (2009), increases group identification. Third, we show how the rule-following task (Kimbrough & Vostroknutov, 2018) can be modified to measure group norm sensitivity rather than general norm sensitivity. In principle, this method can measure the group norm sensitivity towards any communicable social group.<sup>43</sup>

Our work identifies several promising avenues for future research: First, our results suggest that it might be possible to describe and predict how an individual’s set of acquired social identities changes over time. At any point in time, an individual’s set of acquired social identities is (partly) determined by the individual’s and the available social groups’ moral positions. Hereby, previously acquired social identities determine an individual’s moral position<sup>44</sup>, and its members’ moral position determines a social group’s moral position. These connections might prove useful in the creation of dynamic social identity models. Second, it would be fruitful to study how extreme dis-identification (despising another group) affects group norm sensitivity. It might be that individuals’ group norm sensitivity becomes negative, and individuals are willing to incur a cost to violate group norms. Finally, it would be valuable to explore whether similarity in different concepts of morality or specific constructs related to social preferences affects group identification similarly.

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<sup>43</sup>It might even be used to measure “group norm sensitivity” towards atomistic social groups that only consist of one individual.

<sup>44</sup>According to Haidt (2012), “*Moral systems are [...] interlocking sets of values, virtues, norms, practices, identities, institutions, technologies, and evolved psychological mechanisms that work together to suppress or regulate self-interest and make cooperative societies possible*”.

## References

- Akerlof, G. A., & Kranton, R. E. (2000). Economics and identity. *The Quarterly Journal of Economics*, *115*(3), 715–753. doi:[10/fxdw82](https://doi.org/10/fxdw82)
- Akerlof, G. A., & Kranton, R. E. (2002). Identity and schooling: Some lessons for the economics of education. *Journal of Economic Literature*, *40*(4), 1167–1201. doi:[10/gd2x2h](https://doi.org/10/gd2x2h)
- Akerlof, G. A., & Kranton, R. E. (2005). Identity and the economics of organizations. *Journal of Economic Perspectives*, *19*(1), 9–32. doi:[10/dkjmnm](https://doi.org/10/dkjmnm)
- Akerlof, G. A., & Kranton, R. E. (2008). Identity, supervision, and work groups. *American Economic Review*, *98*(2), 212–217. doi:[10/dzq452](https://doi.org/10/dzq452)
- Aron, A., Aron, E. N., & Smollan, D. (1992). Inclusion of other in the self scale and the structure of interpersonal closeness. *Journal of Personality and Social Psychology*, *63*(4), 596–612. doi:[10/ddr983](https://doi.org/10/ddr983)
- Benjamin, D. J., Choi, J. J., & Strickland, A. J. (2010). Social identity and preferences. *American Economic Review*, *100*(4), 1913–1928. doi:[10/fw6f2c](https://doi.org/10/fw6f2c)
- Bernard, M., Hett, F., & Mechtel, M. (2016). Social identity and social free-riding. *European Economic Review*, *90*, 4–17. doi:[f9jcqn](https://doi.org/10/f9jcqn)
- Bernhard, H., Fehr, E., & Fischbacher, U. (2006). Group affiliation and altruistic norm enforcement. *American Economic Review*, *96*(2), 217–221. doi:[10/bfnvc9](https://doi.org/10/bfnvc9)
- Bicchieri, C., Dimant, E., Gaechter, S., & Nosenzo, D. (2020, April). *Observability, social proximity, and the erosion of norm compliance* (CESifo Working Paper No. 8212). CESifo. Munich, Germany. Retrieved from <https://bit.ly/3aVCH5x>
- Chang, D., Chen, R., & Krupka, E. (2019). Rhetoric matters: A social norms explanation for the anomaly of framing. *Games and Economic Behavior*, *116*, 158–178. doi:[10/gm4dc2](https://doi.org/10/gm4dc2)
- Chen, D. L., Schonger, M., & Wickens, C. (2016). oTree—An open-source platform for laboratory, online, and field experiments. *Journal of Behavioral and Experimental Finance*, *9*, 88–97. doi:[10/bj42](https://doi.org/10/bj42)
- Chen, R., & Chen, Y. (2011). The potential of social identity for equilibrium selection. *American Economic Review*, *101*(6), 2562–2589. doi:[10/chd9nt](https://doi.org/10/chd9nt)
- Chen, Y., & Li, S. X. (2009). Group identity and social preferences. *American Economic Review*, *99*(1), 431–457. doi:[10/cm3z39](https://doi.org/10/cm3z39)
- Clark, C. B., Swails, J. A., Pontinen, H. M., Bowerman, S. E., Kriz, K. A., & Hendricks, P. S. (2017). A behavioral economic assessment of individualizing versus binding moral foundations. *Personality and Individual Differences*, *112*, 49–54. doi:[10/gfxk2c](https://doi.org/10/gfxk2c)
- D’Adda, G., Drouvelis, M., & Nosenzo, D. (2016). Norm elicitation in within-subject designs: Testing for order effects. *Journal of Behavioral and Experimental Economics*, *62*, 1–7. doi:[10/gm4dc7](https://doi.org/10/gm4dc7)
- Dehghani, M., Johnson, K., Hoover, J., Sagi, E., Garten, J., Parmar, N. J., . . . Graham, J. (2016). Purity homophily in social networks. *Journal of Experimental Psychology: General*, *145*(3), 366–375. doi:[10/f8bqq8](https://doi.org/10/f8bqq8)

- Dimant, E. (2020, December). *Hate Trumps love: The impact of political polarization on social preferences*. SSRN. doi:10/gh3vjz
- Eckel, C., Hoover, H., Krupka, E., Ojumu, O., Rosenblat, T., Sinha, N., & Wilson, R. K. (2021, March). *Norm and behavior change among college aged republicans and democrats in response to covid-19*. Texas A&M University. College Station. Retrieved from <https://bit.ly/3pnYJ9f>
- Eckel, C. C., & Grossman, P. J. (2005). Managing diversity by creating team identity. *Journal of Economic Behavior & Organization*, 58(3), 371–392. doi:10/dj4wf8
- Enke, B. (2020). Moral values and voting. *Journal of Political Economy*, 128(10), 3679–3729. doi:10/gh7pgg
- Erkut, H., Nosenzo, D., & Sefton, M. (2015). Identifying social norms using coordination games: Spectators vs. stakeholders. *Economics Letters*, 130, 28–31. doi:10/f7ch6q
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\*power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175–191. doi:10/bxjdcg
- Franks, A. S., & Scherr, K. C. (2015). Using moral foundations to predict voting behavior: Regression models from the 2012 U.S. presidential election. *Analyses of Social Issues and Public Policy*, 15(1), 213–232. doi:10/f7489z
- Gächter, S., Gerhards, L., & Nosenzo, D. (2017). The importance of peers for compliance with norms of fair sharing. *European Economic Review*, 97, 72–86. doi:10/gbrzmt
- Gächter, S., Nosenzo, D., & Sefton, M. (2013). Peer effects in pro-social behavior: Social norms or social preferences? *Journal of the European Economic Association*, 11(3), 548–573. doi:10/f4z2qb
- Gächter, S., Starmer, C., & Tufano, F. (2015). Measuring the closeness of relationships: A comprehensive evaluation of the 'inclusion of the other in the self' scale. *PLOS ONE*, 10(6), 1–19. doi:10/cx3d
- Gächter, S., Starmer, C., & Tufano, F. (2017, June). *Revealing the economic consequences of group cohesion* (IZA Discussion Paper No. 10824). IZA. Bonn, Germany. Retrieved from <https://bit.ly/3nws0e7>
- Goette, L., Huffman, D., & Meier, S. (2006). The impact of group membership on cooperation and norm enforcement: Evidence using random assignment to real social groups. *American Economic Review*, 96(2), 212–216. doi:10/cw7355
- Graham, J., Haidt, J., Koleva, S., Motyl, M., Iyer, R., Wojcik, S. P., & Ditto, P. H. (2013). Moral Foundations Theory: The pragmatic validity of moral pluralism. In P. Devine & A. Plant (Eds.), *Advances in experimental social psychology* (Chap. 2, Vol. 47, pp. 55–130). doi:10/gdcfn9
- Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology*, 101(2), 366–385. doi:10/cq64hc
- Haidt, J. (2012). *The righteous mind: Why good people are divided by politics and religion*. New York: Vintage.
- Haidt, J., & Joseph, C. (2004). Intuitive ethics: How innately prepared intuitions generate culturally variable virtues. *Daedalus*, 133(4), 55–66. doi:10/dnwzr8

- Harris, D., Herrmann, B., Kontoleon, A., & Newton, J. (2015). Is it a norm to favour your own group? *Experimental Economics*, *18*(3), 491–521. doi:[10/f7nvfz](https://doi.org/10/f7nvfz)
- Hasen, R. L. (1996). Voting without law? *University of Pennsylvania Law Review*, *144*(5), 2135–2179. doi:[10/b4nvw3](https://doi.org/10/b4nvw3)
- Hornsey, M. J. (2008). Social identity theory and self-categorization theory: A historical review. *Social and Personality Psychology Compass*, *2*(1), 204–222. doi:[10/fshg98](https://doi.org/10/fshg98)
- Iyer, R., Koleva, S., Graham, J., Ditto, P., & Haidt, J. (2012). Understanding libertarian morality: The psychological dispositions of self-identified libertarians. *PLOS ONE*, *7*(8), 1–23. doi:[10/f36mch](https://doi.org/10/f36mch)
- Jiang, J., & Li, S. X. (2019). Group identity and partnership. *Journal of Economic Behavior & Organization*, *160*, 202–213. doi:[10/gm4tjw](https://doi.org/10/gm4tjw)
- Johnson, K. M., Iyer, R., Wojcik, S. P., Vaisey, S., Miles, A., Chu, V., & Graham, J. (2014). Ideology-specific patterns of moral indifference predict intentions not to vote. *Analyses of Social Issues and Public Policy*, *14*(1), 61–77. doi:[10/f6t6t6](https://doi.org/10/f6t6t6)
- Kimbrough, E. O., & Vostroknutov, A. (2016). Norms make preferences social. *Journal of the European Economic Association*, *14*(3), 608–638. doi:[10/f8wj56](https://doi.org/10/f8wj56)
- Kimbrough, E. O., & Vostroknutov, A. (2018). A portable method of eliciting respect for social norms. *Economics Letters*, *168*, 147–150. doi:[10/gdxgtc](https://doi.org/10/gdxgtc)
- Kimbrough, E. O., & Vostroknutov, A. (2020, April). *A theory of injunctive norms*. SSRN. doi:[10/gm4dc8](https://doi.org/10/gm4dc8)
- Kranton, R., Pease, M., Sanders, S., & Huettel, S. (2020). Deconstructing bias in social preferences reveals groupy and not-groupy behavior. *Proceedings of the National Academy of Sciences*, *117*(35), 21185–21193. doi:[10/gg8h75](https://doi.org/10/gg8h75)
- Kranton, R. E., & Sanders, S. G. (2017). Groupy versus non-groupy social preferences: Personality, region, and political party. *American Economic Review*, *107*(5), 65–69. doi:[10/gkq6kg](https://doi.org/10/gkq6kg)
- Krupka, E. L., Leider, S., & Jiang, M. (2017). A meeting of the minds: Informal agreements and social norms. *Management Science*, *63*(6), 1708–1729. doi:[10/gfxxkz4](https://doi.org/10/gfxxkz4)
- Krupka, E. L., & Weber, R. A. (2013). Identifying social norms using coordination games: Why does dictator game sharing vary? *Journal of the European Economic Association*, *11*(3), 495–524. doi:[10/f42c9g](https://doi.org/10/f42c9g)
- Krysowski, E., & Tremewan, J. (2021). Why does anonymity make us misbehave: Different norms or less compliance? *Economic Inquiry*, *59*(2), 776–789. doi:[10/gj8m7b](https://doi.org/10/gj8m7b)
- Lazear, E. P., & Shaw, K. L. (2007). Personnel economics: The economist’s view of human resources. *Journal of Economic Perspectives*, *21*(4), 91–114. doi:[10/fhdq8g](https://doi.org/10/fhdq8g)
- Le, B., Moss, W. B., & Mashek, D. (2007). Assessing relationship closeness online: Moving from an interval-scaled to continuous measure of including others in the self. *Social Science Computer Review*, *25*(3), 405–409. doi:[10/fs4xh9](https://doi.org/10/fs4xh9)

- Leach, C. W., Ellemers, N., & Barreto, M. (2007). Group virtue: The importance of morality (vs. competence and sociability) in the positive evaluation of in-groups. *Journal of Personality and Social Psychology*, *93*(2), 234–249. doi:[10/czjxx2](https://doi.org/10/czjxx2)
- McEvily, B., Weber, R. A., & Bicchieri, C. (2006). Can groups be trusted? an experimental study of trust in collective entities. In R. Bachmann & A. Zaheer (Eds.), *Handbook of trust research* (Chap. 3, pp. 52–67). doi:[10/gm4dc9](https://doi.org/10/gm4dc9)
- Milesi, P. (2017). Moral foundations and voting intention in Italy. *Europe's Journal of Psychology*, *13*(4), 667–687. doi:[10/gm4ddb](https://doi.org/10/gm4ddb)
- Palan, S., & Schitter, C. (2018). Prolific.ac—a subject pool for online experiments. *Journal of Behavioral and Experimental Finance*, *17*, 22–27. doi:[10/gftct9](https://doi.org/10/gftct9)
- Peer, E., Brandimarte, L., Samat, S., & Acquisti, A. (2017). Beyond the Turk: Alternative platforms for crowdsourcing behavioral research. *Journal of Experimental Social Psychology*, *70*, 153–163. doi:[10/f93997](https://doi.org/10/f93997)
- Pryor, C., Perfors, A., & Howe, P. D. L. (2019). Even arbitrary norms influence moral decision-making. *Nature Human Behaviour*, *3*(1), 57–62. doi:[10/gfrf2b](https://doi.org/10/gfrf2b)
- Schubert, T. W., & Otten, S. (2002). Overlap of self, ingroup, and outgroup: Pictorial measures of self-categorization. *Self and Identity*, *1*(4), 353–376. doi:[10/dv3jnp](https://doi.org/10/dv3jnp)
- Shang, J., Reed, A., II, & Croson, R. (2008). Identity congruency effects on donations. *Journal of Marketing Research*, *45*(3), 351–361. doi:[10/drj8dd](https://doi.org/10/drj8dd)
- Shayo, M. (2009). A model of social identity with an application to political economy: Nation, class, and redistribution. *American Political Science Review*, *103*(2), 147–174. doi:[ds97pq](https://doi.org/10/ds97pq)
- Tajfel, H., & Turner, J. C. (1979). An integrative theory of intergroup conflict. In W. G. Austin & S. Worchel (Eds.), *The social psychology of intergroup relations* (pp. 33–47). Monterey, CA: Brooks/Cole Publishing Company.
- Tropp, L. R., & Wright, S. C. (2001). Ingroup identification as the inclusion of ingroup in the self. *Personality and Social Psychology Bulletin*, *27*(5), 585–600. doi:[10/cfmm5m](https://doi.org/10/cfmm5m)
- Turner, J. C., Hogg, M. A., Oakes, P. J., Reicher, S. D., & Wetherell, M. S. (1987). *Rediscovering the social group: Self-categorization theory*. Oxford, UK: Basil Blackwell.
- Turner, J. C., & Reynolds, K. J. (2012). Self-categorization theory. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (Chap. 46, Vol. 2, pp. 399–417). doi:[10/gm4ddc](https://doi.org/10/gm4ddc)
- Van de Vyver, J., Houston, D. M., Abrams, D., & Vasiljevic, M. (2016). Boosting belligerence: How the July 7, 2005, London bombings affected liberals' moral foundations and prejudice. *Psychological Science*, *27*(2), 169–177. doi:[10/gg6hfj](https://doi.org/10/gg6hfj)
- Veselý, Š. (2015). Elicitation of normative and fairness judgments: Do incentives matter? *Judgment and Decision Making*, *10*(2), 191–197.

Winterich, K. P., Zhang, Y., & Mittal, V. (2012). How political identity and charity positioning increase donations: Insights from moral foundations theory. *International Journal of Research in Marketing*, 29(4), 346-354. doi:[10/f4kzmm](https://doi.org/10.1016/j.ijres.2012.05.001)

## Appendix A Deviations from the Pre-Analysis Plan

We preregistered our analysis at the American Economic Association’s registry for randomized controlled trials (<https://doi.org/g5qw>). We deviate from the Pre-Analysis Plan in the following ways:

1. We renamed the behavioral experiment the choice experiment.
2. We renamed the communal index the binding index. This change also applies to words related to the index (e.g., communal treatment was changed to binding treatment).
3. For reasons of clarity, we restated some of our hypotheses without changing their contents.<sup>45</sup>
4. While testing Hypothesis 2, we used a Tobit regression model instead of the preregistered OLS regression model. We did this to take into account the censored nature of the social appropriateness ratings. The coefficient of the number of balls in the rule-compliant bucket would have been positive and significant in the OLS regression model ( $\beta = 0.033$ ,  $p < 0.001$ ).
5. While examining Hypothesis 3, we only report the result of a preregistered one-sided t-test. We do not report the results of a one-sided Wilcoxon-Mann-Whitney test. This is because a one-sided Wilcoxon-Mann-Whitney test requires that the shapes of the distributions in the two samples are identical. This assumption might have been unrealistic in our case. However, a one-sided Wilcoxon-Mann-Whitney test would have been significant ( $p < 0.001$ ).
6. We renamed Hypothesis 4a and 4b into Hypothesis 4 and 5.
7. While examining Hypothesis 4, we only report the results of a preregistered comparison of the number of balls in the rule-compliant bucket between treatments. We do not report the results of a conditional (fixed-effect) logit model (McFadden, 1974). We deviate from the Pre-Analysis plan because the correlation between two explanatory variables made a reliable estimation of coefficients impossible. Since both group norms were identical, an action’s monetary earnings and average social appropriateness were highly correlated.
8. While examining Hypothesis 4, we only report the result of a preregistered one-sided t-test. For the same reason as described in the paragraph on Hypothesis 3, we do not report the results of a one-sided

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<sup>45</sup>For reference, the preregistered hypothesis were: “**Hypothesis 1 (Group Norms)**: According to individualizing subjects, the group norms present in the modified rule following task are identical in the individualizing and the communal treatment”, “**Hypothesis 2 (Group Norms)**: According to the measured group norms, the social appropriateness is linearly increasing in the number of balls placed in the norm compliant bucket”, “**Hypothesis 3 (Group Identification)**: Group identification is significantly higher for individualizing individuals that are assigned to the individualizing treatment compared to those that are assigned to the communal treatment.” and “**Hypothesis 4 (Norm Compliance) / Hypothesis 4a**: Compliance with the group norms is higher in the individualizing treatment compared to the communal treatment. / **Hypothesis 4b**: This treatment effect is mediated by changes in group identification.”

Wilcoxon-Mann-Whitney test. However, both tests provided the same results: If all observations were included, a one-sided Wilcoxon-Mann-Whitney test was insignificant ( $p = 0.17$ ). If the observations assigned to the authority control question were excluded, a one-sided Wilcoxon-Mann-Whitney test was significant ( $p = 0.03$ ).

9. While examining Hypothesis 5, we only report the results of a Tobit regression model. For the same reason as described in the paragraph on Hypothesis 4, we do not report the results of a conditional (fixed-effect) logit model.
10. While examining Hypothesis 5, we do not report the results of the preregistered regression model. Instead, we report the results of two models that either did not include the binding treatment dummy (model 1) or included additional control variables (model 2). The coefficient of group identification was also positive and significant in the preregistered regression model ( $\beta = 14.821$ ,  $p = 0.001$ ).
11. We do not report the results of all preregistered exploratory analyses that examine how robust our results are to variations in the norm compliance measure (e.g., more than 0 balls in the rule-compliant bucket). The reason for this omission is that Results 2 shows that the group norms were linearly increasing in the number of balls in the rule-compliant bucket and did not abruptly change at some cutoff point.
12. We do not report the results of all preregistered exploratory analyses that examine the robustness of the relationship between moral similarity and group identification. We only report those results of the Pre-Analysis Plan that did yield interesting results.



## Appendix B Additional Analysis

### B.1 Comparison of Moral and Socio-Demographic Data between Treatments

**Table 7:** Individual and Aggregated Moral Foundations Scores by Treatment and Experiment

	Choice experiment			Norm elicitation experiment		
	Individualizing	Binding	P-value <sup>a</sup>	Individualizing	Binding	P-value <sup>a</sup>
	treatment	treatment		treatment	treatment	
<i>Progressivism</i>	1.72	1.59	0.25	1.49	1.59	0.60
<i>Individualizing index</i>	3.89	3.83	0.60	3.82	3.85	0.72
<i>Binding index</i>	2.17	2.25	0.46	2.33	2.26	0.47
<i>Harm</i>	3.84	3.79	0.45	3.77	3.81	0.53
<i>Fairness</i>	3.94	3.88	0.41	3.88	3.88	0.96
<i>Ingroup</i>	2.38	2.52	0.29	2.62	2.54	0.63
<i>Authority</i>	2.14	2.10	0.89	2.15	2.18	0.82
<i>Purity</i>	1.98	2.13	0.32	2.22	2.06	0.25

Note. Progressivism could take on values from  $-5$  to  $5$ . All other indices could take on values from  $0$  to  $5$ .

<sup>a</sup> The p-values are based on a two-sided Wilcoxon-Mann-Whitney test that compared the scores between treatments.

This subsection compares the moral foundations and social-demographic data of participants of the choice and norm elicitation experiment between treatments. While participants were assigned randomly to their treatments, randomization might fail. If this happened, we would observe a higher frequency of some characteristics in one treatment than the other. We did not find any evidence for this. Consequently, we attribute any treatment effect to our treatment variation.

To examine this, we report in Table 7, separated by experiment and treatment, the average score of participants in the five individual moral foundations (harm, fairness, ingroup, authority, purity) and the three aggregated indices that we used (individualizing index, binding index, progressivism). Furthermore, in Table 8 and Table 9 we report separated by experiment and treatment the average answer or the frequency distribution of answers to all socio-demographic questions (age, gender, ethnicity, degree, employment, income, community, religion, politics). We compared all moral and socio-demographic characteristics between the individualizing and binding treatment of the choice and norm elicitation experiment. In doing so, we used the appropriate test to either test for differences in mean (two-tailed Wilcoxon-Mann-Whitney test) or frequency distribution (Fisher’s exact test). To account for multiple testing (34 comparisons in total / 17 per experiment), we applied the Bonferroni correction to our statistical significance threshold of  $p = 0.05$ . The new threshold became  $p = 0.001$ . We did not detect any significant differences between treatments in the choice or norm elicitation experiment (in all cases  $p > 0.05$ ).

**Table 8:** Answers to the Socio-Demographic Questions by Treatment and Experiment (Part 1)

	Choice experiment			Norm elicitation experiment		
	Individualizing treatment	Binding treatment	P-value <sup>a</sup>	Individualizing treatment	Binding treatment	P-value <sup>a</sup>
<i>Age</i>						
Mean	35.26	35.07	.	36.04	35.35	.
Total	159	160	0.95	99	100	0.32
<i>Gender</i>						
Female	87	87	.	53	54	.
Male	69	71	.	45	46	.
Other	3	2	.	1	0	.
Total	159	160	0.94	99	100	1.00
<i>Ethnicity</i>						
White	123	118	.	79	69	.
Asian	12	18	.	6	12	.
Hispanic	6	8	.	5	9	.
Black	14	10	.	5	6	.
Other	5	6	.	3	4	.
Total	160	160	0.68	98	100	0.41
<i>Degree</i>						
None	1	0	.	1	0	.
High school diploma	68	50	.	34	45	.
Bachelor degree	65	70	.	45	43	.
Master's degree	20	32	.	11	10	.
Doctorate degree	6	8	.	8	1	.
Total	160	160	0.11	99	99	0.07
<i>Employment</i>						
Full time employed	62	82	.	46	46	.
Part time employed	17	24	.	14	11	.
Unemployed	20	9	.	10	8	.
Self-employed	22	23	.	12	15	.
Student	19	11	.	9	16	.
Housewife / husband	8	5	.	3	2	.
Retired	11	6	.	5	2	.
Total	159	160	0.05	99	100	0.64

Note. Answering the Socio-Demographic Questions was voluntary.

<sup>a</sup> The p-values are based on two-sided Wilcoxon-Mann-Whitney (age) or Fisher's exact tests (all other variables) that compared the answers between treatments.

**Table 9:** Answers to the Socio-Demographic Questions by Treatment and Experiment (Part 2)

	Choice experiment			Norm elicitation experiment		
	Individualizing treatment	Binding treatment	P-value <sup>a</sup>	Individualizing treatment	Binding treatment	P-value <sup>a</sup>
<i>Income</i>						
\$0 - \$10,000	40	25	.	18	23	.
\$10,000 - \$25,000	26	28	.	15	22	.
\$25,000 - \$50,000	39	44	.	30	24	.
\$50,000 - \$75,000	24	31	.	20	18	.
\$75,000 - \$100,000	11	14	.	4	7	.
\$100,000 - \$150,000	14	13	.	5	4	.
More than \$150,000	3	3	.	7	2	.
Total	157	158	0.52	99	100	0.39
<i>Community</i>						
Urban	44	55	.	29	33	.
Suburban	86	85	.	53	54	.
Rural	29	20	.	17	13	.
Total	159	160	0.24	99	100	0.70
<i>Religion</i>						
Christian	49	55	.	43	37	.
Atheist	57	50	.	31	28	.
Jew	1	3	.	3	2	.
Buddhist	3	2	.	2	2	.
Muslim	2	0	.	0	1	.
Other	47	49	.	20	29	.
Total	159	159	0.62	99	99	0.65
<i>Politics</i>						
Very liberal	44	38	.	19	18	.
Liberal	53	60	.	35	38	.
Moderate	45	52	.	29	33	.
Conservative	14	8	.	12	10	.
Very conservative	4	2	.	4	1	.
Total	160	160	0.46	99	100	0.71

Note. Answering the Socio-Demographic Questions was voluntary.

<sup>a</sup> The p-values are based on two-sided Fisher's exact tests that compared the answers between treatments.

## B.2 Effect of the Authority Control Question on Rule Compliance

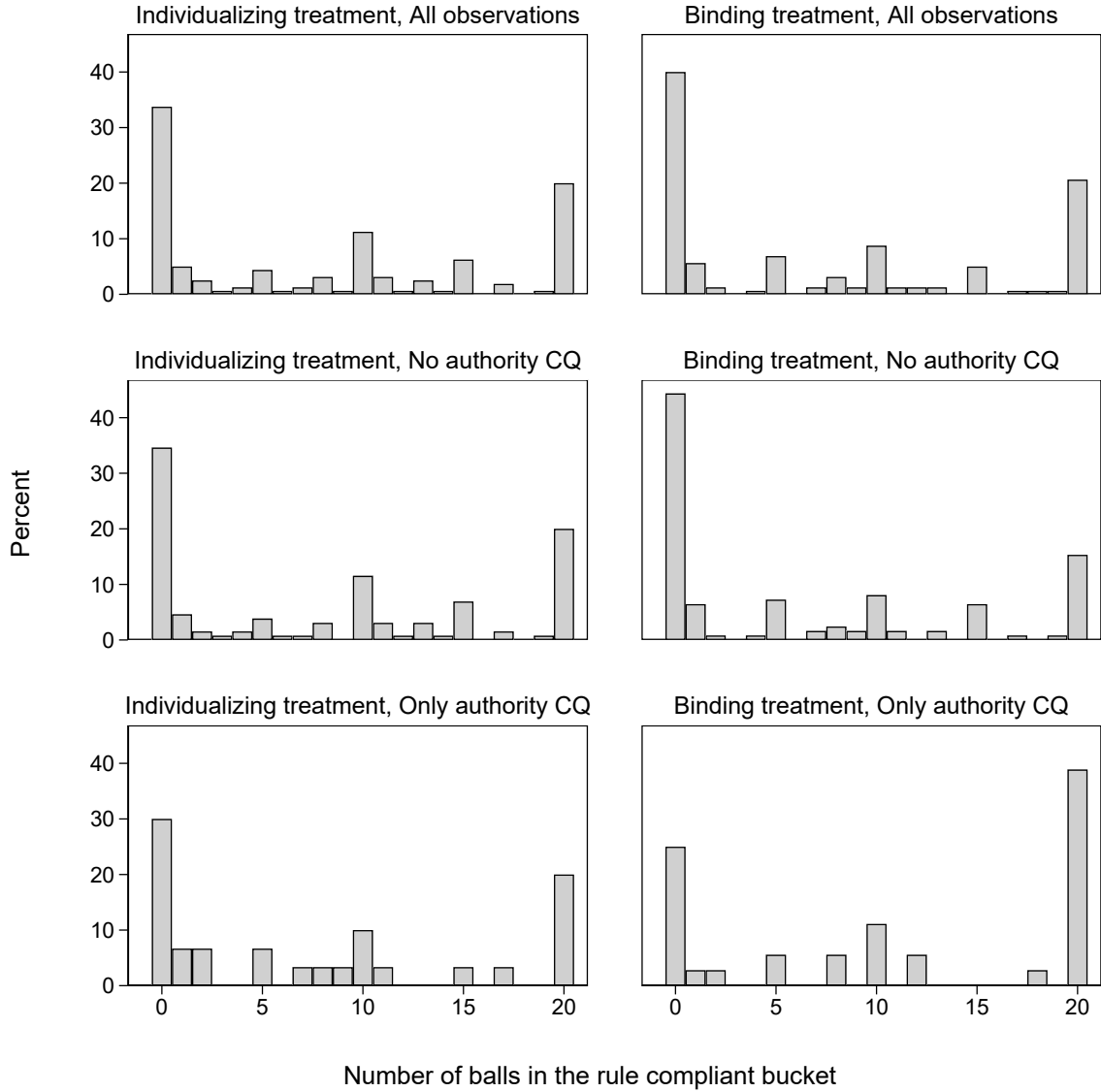
In Hypothesis 4, we predicted that the number of balls in the rule-compliant bucket of the group rule-following task would be higher in the individualizing than the binding treatment. However, our statistical analysis only supported this hypothesis if we excluded observations randomly assigned the authority control question (66 out of 320 observations). This subsection examines how randomly assigning a participant the authority control question<sup>46</sup> influenced the behavior in the group rule-following task. The authority control question asked the participants to state how the social group answered the following question: “When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking - Whether or not someone showed a lack of respect for authority?”. In the individualizing treatment, the correct answer was “Slightly relevant,” and in the binding treatment, “Somewhat relevant.” We found that this variation had a heterogeneous effect on our treatments. While assigning the authority control question did not influence the number of balls in the rule-compliant bucket in the individualizing treatment, it significantly increased the number of balls in the rule-compliant bucket of the binding treatment. This made it less likely to observe the treatment effect described in Hypothesis 4.

To examine how the authority control question influenced behavior in the group rule-following task, we plotted six histograms that show the number of balls in the rule-compliant bucket separated by treatment and by whether the participant was randomly assigned any control question, the authority control question, or any control question other than the authority control question (see Figure 3). In the individualizing treatment, assigning the authority control question had little effect on the behavior in the group rule-following task. However, in the binding treatment, assigning the authority control question reduced the number of participants that placed 0 balls in the rule-compliant bucket and increased the number of participants that placed 20 balls in the rule-compliant bucket.

To test this impression formally: Participants assigned to the individualizing treatment and any question other than the authority control question placed on average 8.24 balls in the rule-compliant bucket. Those individuals assigned to the individualizing treatment and the authority control question placed on average 7.77 balls in the rule-compliant bucket. According to a Wilcoxon-Mann-Whitney test, this difference of  $-0.47$  balls in the rule-compliant bucket was not statistically significant ( $p = 0.90$ ). On the other hand, participants assigned to the binding treatment and any question other than the authority control question placed on average 6.44 balls in the rule-compliant bucket. Those individuals assigned to the binding treatment and the authority control question placed on average 10.86 balls in the rule-compliant bucket. According to a Wilcoxon-Mann-Whitney test, this difference of 4.42 balls in the rule-compliant bucket was statistically significant ( $p = 0.004$ ). It appears that the authority control question increased the number of balls in the rule-compliant bucket in the binding treatment but not in the individualizing treatment. One reason

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<sup>46</sup>The authority control question is the only question directly related to the group rule-following task (see Table 1).



**Figure 3:** Number of Balls in the Rule-Compliant Bucket by Treatment and Control Question

Notes. For reference, 130 out of 160 observations in the individualizing treatment and 124 out of 160 observations in the binding treatment were not assigned the authority control question. CQ, Control Question.

for this might be that individuals were primed towards either weak or strong respect towards authority.<sup>47</sup> Consequently, individuals in the group rule-following task might have had a stronger desire to comply with arbitrary rules from an authority (Group A) in the binding treatment than the individualizing treatment.<sup>48</sup> We should note that the priming effect ran counter to the group identification effect we expect to see between treatments (see Hypothesis 4).

### B.3 Decomposition of the Effect of Moral Similarity on Group Identification

**Table 10:** Decomposition of the Effect of Moral Similarity on Group Identification (Individualizing and Binding Indices)

	<i>Identification (distance)</i>			
	(1)		(2)	
	Coef.	Std. err.	Coef.	Std. err.
<i>Individualizing index</i>	0.098**	(0.030)	0.076*	(0.030)
<i>Binding index</i>	0.028	(0.017)	0.034*	(0.017)
<i>Distance individualizing index</i>	-0.185***	(0.032)	-0.112**	(0.038)
<i>Distance binding index</i>	-0.098***	(0.025)	-0.084***	(0.024)
<i>Binding treatment</i>			-0.191**	(0.066)
Constant	0.486***	(0.119)	0.578***	(0.125)
Controls		No		Yes
Log-likelihood		-33		-19
BIC		100		136
Number of cases		320		320

Notes. We used Tobit regressions with robust standard errors. The controls include the following variables: One dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one and two. We report standard errors in the parentheses. Coef., Coefficient; Std. err., Standard error.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

This subsection examines the effect of distance in progressivism on group identification in more detail. In section 6.4, we report that a decrease in the absolute difference in progressivism between an individual and

<sup>47</sup>A review of priming in economics can be found in Cohn and Maréchal (2016)

<sup>48</sup>This finding contrasts the results of Kimbrough and Vostroknutov (2016), who did not observe any effect of the five moral foundations of moral foundations theory on rule-following in the traffic-light rule-following task (see Appendix E.1 of their study).

**Table 11:** Decomposition of the Effect of Moral Similarity on Group Identification  
(Harm, Fairness, Ingroup, Authority, and Purity)

	<i>Identification (distance)</i>			
	(1)		(2)	
	Coef.	Std. err.	Coef.	Std. err.
<i>Harm</i>	0.061*	(0.029)	0.051	(0.028)
<i>Fairness</i>	0.046	(0.029)	0.029	(0.026)
<i>Ingroup</i>	0.003	(0.025)	-0.004	(0.025)
<i>Authority</i>	0.024	(0.027)	0.035	(0.026)
<i>Purity</i>	-0.011	(0.020)	-0.000	(0.018)
<i>Distance harm</i>	-0.023	(0.036)	-0.005	(0.036)
<i>Distance fairness</i>	-0.165***	(0.035)	-0.108**	(0.036)
<i>Distance ingroup</i>	-0.028	(0.023)	-0.036	(0.023)
<i>Distance authority</i>	-0.034	(0.032)	-0.039	(0.032)
<i>Distance purity</i>	-0.040	(0.026)	-0.014	(0.024)
<i>Binding treatment</i>			-0.196**	(0.063)
Constant	0.496***	(0.119)	0.589***	(0.123)
Controls		No		Yes
Log-likelihood		-32		-17
BIC		133		166
Number of cases		320		320

Notes. We used Tobit regressions with robust standard errors. The controls include the following variables: One dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one and two. Coef., Coefficient; Std. err., Standard error.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

the social group increased identification with this social group. However, progressivism in itself is a composite index. It describes the degree to which individuals endorse individualizing foundations (harm and fairness) over binding foundations (ingroup, authority, and purity). In this subsection, we replicate our analysis from the main section with the components contained in the progressivism index. We found that the distance in the individualizing and the binding index both influenced group identification. Furthermore, this effect was mainly driven by the distance in the fairness foundation.

We first examined how distance in the individualizing and the binding index influenced group identification. To do so, we estimated two Tobit regression models with robust standard errors. In all models, we used the distance group identification measure of the “Inclusion of Ingroup in the Self Scale” as our dependent variable. In the first model, we regressed the dependent variable against the subject’s individualizing index, the subject’s binding index, the absolute difference between the individual’s individualizing index and the social group’s implied individualizing index, and the absolute difference between the individual’s binding index and the social group’s implied binding index. In the second model, we added a binding treatment dummy. We also included a set of control variables, which we labeled “Control Variables 1.” The set included: One dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one and two. We report the results in Table 10. As can be seen, the coefficients for the distance in the individualizing and the binding index were negative and significant in both models ( $p < 0.01$ ). This result suggests that both the similarity in the individualizing and the binding moral values affect group identification.

To examine how the distance in the individual moral foundations influenced group identification, we estimated two additional Tobit regression models with robust standard errors. In all models, we used the distance group identification measure of the “Inclusion of Ingroup in the Self Scale” as our dependent variable. In the first model, we regressed the dependent variable against the subject’s scores in each of the five moral foundations (harm, fairness, authority, ingroup, and purity) and the absolute difference between the individual’s score and the implied social group’s score in each of the five moral foundations. In the second model, we added a binding treatment dummy and the control variables in the set “Control Variables 1.” We report the results in Table 11. As can be seen, only the distance in fairness was negative and significant ( $p < 0.01$ ).<sup>49</sup>

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<sup>49</sup>Dehghani et al. (2016) used the moral foundations dictionary to measure the moral foundations of Twitter users as implied by their Tweets. They found that the distance in the purity, but not in any other moral foundation, predicted the distance between two people in the social network. Using lab studies, they showed that the distance in purity between two subjects predicted the preferred self-reported social and physical distance. Contrary to these results, we did not observe any effect of the distance in purity on group identification.



## B.4 Effect of Treatment on Alternative Group Identification Measures

This subsection examines the robustness of the effect of treatment on group identification. In Hypothesis 3, we conceptualized group identification with the distance measure of the “Inclusion of Ingroup in the Self Scale.” However, we also could have used other identification measures. For example, we could have used the overlap measure of the “Inclusion of Ingroup in the Self Scale.” This measure measures group identification as the percentage of overlap between the “You” and the “Group A” circle. The overlap identification measure can take on values ranging from 0 (weak identification / the circles do not overlap) to 1 (strong identification / The “You” circle is contained in the “Group A” circle).<sup>50</sup> We could have also used the identification question from the behavioral questionnaire (see Appendix C.9). In it, we asked participants to rate how closely attached they felt to Group A. The normalized question identification measure could take on values ranging from 0 (“Not at all attached” ) to 1 (“very strongly attached”).<sup>51</sup> We did not find any noticeable difference due to changes in the conceptualization of group identification.

To examine how group identification’s conceptualization influenced our results, we replicate our analysis from Hypothesis 3 with the measures mentioned above. According to the overlap identification measure, the average group identification was 0.28 in the individualizing and 0.07 in the binding treatment. The 0.21 point difference was significant using a one-sided t-test ( $p < 0.001$ ). According to the question identification measure, the average group identification was 0.54 in the individualizing and 0.34 in the binding treatment. The 0.20 point difference was significant using a one-sided t-test ( $p < 0.001$ ).

## B.5 Effect of Alternative Group Identification Measures on Rule Compliance

This subsection examines the robustness of the effect of group identification on rule compliance. In Hypothesis 5, we conceptualized group identification with the distance measure of the “Inclusion of Ingroup in the Self Scale.” However, we could have also used the overlap measure from the same scale or the identification question from the behavioral questionnaire (for more information, see Appendix B.4). We did not find any noticeable difference due to changes in the conceptualization of group identification.

To examine how group identification’s conceptualization influenced our results, we replicate our analysis from Hypothesis 5 with the measures mentioned above. We estimated four Tobit regression models: In all models, we used the number of balls in the rule-compliant bucket of the group rule-following task as our dependent variable. In the first model, we regressed the dependent variable against the overlap identification

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<sup>50</sup>The literature of identity fusion (Jiménez et al., 2016; Swann, Gómez, Seyle, Morales, & Huici, 2009) assumes that an overlap between the circles symbolizes that personal and social-image are aligned about the group attitude. Since participants in our experiments were introduced to an unknown group, this appeared to be unlikely. However, this measure presumably captures an extreme form of group identification.

<sup>51</sup>The question was unincentivized and took place after the experiment. Consequently, while answering, participants might have desired to appear consistent with their behavior in the group rule-following task.

**Table 12:** The Effect of Alternative Group Identification Measures on Rule Compliance

	<i>Balls in the blue bucket</i>			
	(1)	(2)	(3)	(4)
<i>Identification (overlap)</i>	6.428*	7.161*		
	(2.954)	(3.139)		
<i>Identification (question)</i>			27.506***	30.995***
			(3.475)	(3.771)
<i>Binding treatment</i>		-6.153		-1.425
		(4.750)		(4.143)
Constant	4.258***	7.005	-6.648***	-9.625*
	(1.169)	(4.718)	(1.876)	(4.679)
Controls	No	Yes	No	Yes
Log-likelihood	-742	-729	-710	-694
BIC	1,500	1,556	1,436	1,486
Number of cases	320	320	320	320

Notes. We used Tobit regressions. The standard errors are displayed in parentheses. The controls include the following variables: The subject's progressivism, the distance in progressivism, one dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one, two and three.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

measure. In the second model, we added a binding treatment dummy. We also included a set of control variables, which we labeled “Control Variables 2.” The set included: The subject’s progressivism, the distance in progressivism, one dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one, two, and three. In the third model, we regressed the dependent variable against the question identification measure. In the fourth model, we again added a binding treatment dummy and the control variables in the set “Control Variables 2.” We report the results in Table 12. As can be seen, the identification measures were positive and significant in all four specifications ( $p < 0.05$ ). However, changing the conceptualization of group identification changed the size of the estimated coefficient. If group identification increased by 1, the number of balls in the rule-compliant bucket, *ceteris paribus*, increased by approximately 7 (overlap measure), 14 (distance measure / see Table 6), or 29 (question measure). The model fit according to the Log-Likelihood, and the Bayesian Information Criterion increased in the same order. The reasons for this finding might have been that the overlap measure only captured an extreme form of group identification and that the question measure also captured the desire to appear consistent with previous choices in the group rule-following task. However, in general, it seems that our findings were robust to changes in the conceptualization of group identification.

## B.6 Effect of Alternative Moral Similarity Measures on Group Identification

This subsection examines the robustness of the effect of moral similarity on group identification. In the study’s main section, we conceptualized morality with the five foundations from moral foundations theory (harm, fairness, ingroup, authority, and purity). Hereby, we focused on the progressivism index that aggregates all five foundations into one index by subtracting the individualizing foundations (harm and fairness) from the binding foundations (ingroup, authority, and purity). To create one index of (inverse) moral similarity, we calculated the absolute difference between the individual’s progressivism and the social group’s implied progressivism. However, we could have also calculated different moral similarity indices based on moral foundations theory. For example, we could have calculated the Euclidean<sup>52</sup> and Chebyshev<sup>53</sup> distance between the individual’s moral position and the social group’s moral position. We found that the effect of moral similarity on group identification was robust to changes in the conceptualization of moral similarity.

To examine how using these distance measures would have influenced our results, we estimated four Tobit regression models with robust standard errors. In all models, we used the distance group identification measure of the “Inclusion of Ingroup in the Self Scale” as our dependent variable. In the first model, we

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<sup>52</sup>Euclidean distance puts equal weight on the distance of all five moral foundations. Unlike progressivism, Euclidean distance does not impose a distinction between individualizing and binding moral values.

<sup>53</sup>Chebyshev distance only considers the moral foundation that differs the most between the individual and the social group. Therefore it only takes into account the most salient difference between the individual and the social group.

**Table 13:** The Effect of Alternative Moral Similarity Metrics on Group Identification

	<i>Identification (distance)</i>			
	(1)	(2)	(3)	(4)
<i>Progressivism</i>	0.006 (0.016)	-0.003 (0.016)	-0.004 (0.016)	-0.011 (0.016)
<i>Euclidean distance</i>	-0.091*** (0.019)	-0.069*** (0.018)		
<i>Chebyshev distance</i>			-0.094*** (0.028)	-0.088*** (0.025)
<i>Binding treatment</i>		-0.234*** (0.066)		-0.258*** (0.064)
Constant	0.913*** (0.047)	0.974*** (0.066)	0.874*** (0.051)	0.978*** (0.070)
Controls	No	Yes	No	Yes
Log-likelihood	-49	-26	-56	-28
BIC	121	139	134	142
Number of cases	320	320	320	320

Notes. We used Tobit regressions with robust standard errors. The standard errors are displayed in parentheses. The controls include the following variables: One dummy for each control question (except for the harm control question), interactions between the control question dummies and the binding treatment dummy, and the time spent on stages one and two.

\* $p < 0.05$ ; \*\* $p < 0.01$ ; \*\*\* $p < 0.001$ .

regressed the dependent variable against the subject’s progressivism and the Euclidean distance between the individual’s moral position and the social group’s moral position. In the second model, we added a binding treatment dummy and the control variables in the set “Control Variables 1.” In the third model, we regressed the dependent variable against the subject’s progressivism and the Chebyshev distance between the individual’s moral position and the social group’s moral position. In the fourth model, we again added a binding treatment dummy and the control variables in the set “Control Variables 1.” We report the results in Table 13. As can be seen, both the Euclidean distance and the Chebyshev distance were negative and highly significant in all models ( $p < 0.001$ ). Furthermore, if one compares the log-likelihood and BIC of those models with the models reported in Table 6, one can see that the progressivism index had the highest goodness-of-fit out of all three measures.

## Appendix C Experimental Materials

In the following subsections, we report the instructions of our online experiments. With this, it should be noted that: 1.) Everything below a screen tag (e.g., “**Screen 1:**”) was displayed on the same screen. 2.) Everything below a horizontal separation line was displayed in one text box. If the separation line includes centered text, the text was used as a text box title. 3.) Input items are always described by stating the used questions (“Q”) and all possible answers among which the participants could choose (“A”). 4.) In some cases we include comments (e.g., “[*Example comment*]”) that were not included in the online experiments. 5.) We do not include small details (e.g., buttons and their labels).

### C.1 Moral Foundations Questionnaire

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**Screen 1:**

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**Information:**

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In Part 1, we want you to answer a questionnaire. Please read the questions carefully and answer truthfully.

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**When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking?** Please rate each statement using this scale:

[5] = Extremely relevant (This is one of the most important factors when I judge right and wrong)

[4] = Very relevant

[3] = Somewhat relevant

[2] = Slightly relevant

[1] = Not very relevant

[0] = Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)

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Q1: “Whether or not someone suffered emotionally”

Q2: “Whether or not someone’s action showed love for his or her country”

Q3: “Whether or not someone showed a lack of respect for authority ”

Q4: “Whether or not someone violated standards of purity and decency”

Q5: “Whether or not someone was good at math”

Q6: “Whether or not some people were treated differently than others”

Q7: “Whether or not someone cared for someone weak or vulnerable”

Q8: “Whether or not someone acted unfairly”

Q9: “Whether or not someone did something to betray his or her group”

Q10: “Whether or not someone conformed to the traditions of society”

Q11: “Whether or not someone did something disgusting”

Q12: “Whether or not someone was cruel”

Q13: “Whether or not someone was denied his or her rights”

Q14: “Whether or not someone showed a lack of loyalty”

Q15: “Whether or not an action caused chaos or disorder”

Q16: “Whether or not someone acted in a way that God would approve of”

A: “Extremely relevant”, “Very relevant”, “Somewhat relevant”, “Slightly relevant”, “Not very relevant”  
or “Not at all relevant”

<b>Screen 2:</b>
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**Information:**

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In Part 1, we want you to answer a questionnaire. Please read the questions carefully and answer truthfully.

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Please read the following sentences and indicate your agreement or disagreement:

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Q17: “Compassion for those who are suffering is the most crucial virtue”

Q18: “When the government makes laws, the number one principle should be ensuring that everyone is treated fairly”

Q19: “I am proud of my country’s history”

Q20: “Respect for authority is something all children need to learn”

Q21: “People should not do things that are disgusting, even if no one is harmed”

Q22: “It is better to do good than to do bad”

Q23: “One of the worst things a person could do is hurt a defenseless animal”

Q24: “Justice is the most important requirement for a society”

Q25: “People should be loyal to their family members, even when they have done something wrong”

Q26: “Men and women each have different roles to play in society”

Q27: “I would call some acts wrong on the grounds that they are unnatural”

Q28: “It can never be right to kill a human being”

Q29: “I think it’s morally wrong that rich children inherit a lot of money while poor children inherit nothing”

Q30: “It is more important to be a team player than to express oneself”

Q31: “If I were a soldier and disagreed with my commanding officer’s orders, I would obey anyway because that is my duty”

Q32: “Chastity is an important and valuable virtue”

A: “Strongly agree”, “Moderately agree”, “Slightly agree”, “Slightly disagree”, “Moderately disagree” or “Strongly disagree”

[We adopted the moral foundations questionnaire from Graham et al. (2011). The questionnaire consisted of two parts: The moral relevance section and the moral judgment section. We converted the categorical ratings of both sections into integers from 0 (“Not at all relevant” / “Strongly disagree”) to 5 (“Extremely relevant” / “Strongly agree”). The questions were either included to measure the harm foundation (Q1, Q7, Q12, Q17, Q23, Q28), the fairness foundation (Q2, Q8, Q13, Q18, Q24, Q29), the ingroup foundation (Q3, Q9, Q14, Q19, Q25, Q30), the authority foundation (Q4, Q10, Q15, Q20, Q26, Q31), the purity foundation (Q5, Q11, Q16, Q21, Q27, Q32) or as attention checks (Q6, Q22). The foundations were calculated by taking the mean of all contained items. In addition, we calculated the individualizing index by averaging the score of the harm and fairness foundations and the binding index by averaging the scores of the ingroup, authority and purity foundations. Lastly, we calculated the progressivism index by subtracting the individualizing index from the binding index (Clark et al., 2017). This index could take on values ranging from  $-5$  (not at all individualizing & extremely binding) to  $+5$  (extremely individualizing & not at all binding).]

## C.2 Rule Elicitation Task

<b>Screen 1:</b>
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**Information:**

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In Part 1, we want you to read about a situation that other people will be facing in the future. While you yourself will **not** be in this situation, we want you to read about it, and then we will ask you a question. At the following stage, you will be able to reopen the text describing the situation.

**Please take a moment to read about this situation:**

In today’s study, you will decide how to allocate 20 balls between two buckets. Your task is to put each of the balls, one-by-one, into one of the two buckets: the blue bucket or the yellow bucket. The balls will appear in the center of your screen, and you can allocate each ball by clicking and dragging it to the bucket of your choice. For each ball you put in the blue bucket, you will receive £0.05, and for each ball you put in the yellow bucket, you will receive £0.10.



### The rule is to put the balls in the blue bucket

Your payment will be based on your decisions: it is the sum of payments from the blue and yellow buckets.

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<b>Screen 2:</b>
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**Information:**

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In Part 1, we want you to answer a question. Please read the question carefully and answer truthfully.

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Q: “If you had to describe the rule to other study participants, how would you describe it?”

A: “The rule is to put the balls in the blue bucket” or “The rule is to put the balls in the yellow bucket”

### C.3 Introduction to Group A

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<b>Screen 1:</b>
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**Information:**

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In Part 1, we want to introduce you to another group of participants. During the rest of this study, we will call this group “**Group A**”. Some time ago, Group A took part in another study. Among other things, this study included a questionnaire. Below you can see the answers of Group A to a small selection of five questions. In each case, the answer is the rating that is closest to the average rating that we received from all members of Group A. We want you to carefully read and memorize the answers provided by members of Group A. On the next page, we will show you one question, and we will ask you to select the same response as members of Group A. If you choose the correct answer, you will receive a bonus of £0.50! We will tell you whether you were right at the end of the study.

---

**When deciding whether something is right or wrong, to what extent are the following considerations relevant to the thinking of Group A?** They rated each statement with the following scale:

[5] = Extremely relevant (This is one of the most important factors when I judge right and wrong)

[4] = Very relevant

[3] = Somewhat relevant

[2] = Slightly relevant

[1] = Not very relevant

[0] = Not at all relevant (This consideration has nothing to do with my judgments of right and wrong)

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1. Whether or not someone cared for someone weak or vulnerable: [*In the individualizing treatment: Very Relevant / in the binding treatment: Somewhat Relevant*]
2. Whether or not some people were treated differently from others: [*In the individualizing treatment: Very Relevant / in the binding treatment: Somewhat Relevant*]
3. Whether or not someone's action showed love for his or her country: [*In the individualizing treatment: Not very relevant / in the binding treatment: Somewhat Relevant*]
4. Whether or not someone showed a lack of respect for authority: [*In the individualizing treatment: Slightly relevant / in the binding treatment: Somewhat Relevant*]
5. Whether or not someone violated standards of purity and decency: [*In the individualizing treatment: Slightly relevant / in the binding treatment: Somewhat Relevant*]

<b>Screen 2:</b>
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**Information:**

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In the box below, you can see one of the five questions presented on the last page. Please, select the rating that is closest to the average rating that we received from all members of Group A. If you choose the correct answer, you will receive a bonus of £0.50! We will tell you whether you were right at the end of the study.

---

**When deciding whether something is right or wrong, to what extent is the following consideration relevant to the thinking of Group A?** Please rate the statement in the same way as members of Group A did by using this scale:

[5] = Extremely relevant (This is one of the most important factors when they judge right and wrong)

[4] = Very relevant

[3] = Somewhat relevant

[2] = Slightly relevant

[1] = Not very relevant

[0] = Not at all relevant (This consideration has nothing to do with their judgments of right and wrong)

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Q: “Whether or not someone cared for someone weak or vulnerable:”, “Whether or not some people were treated differently from others:”, “Whether or not someone’s action showed love for his or her country:”, “Whether or not someone showed a lack of respect for authority:” or “Whether or not someone violated standards of purity and decency:”

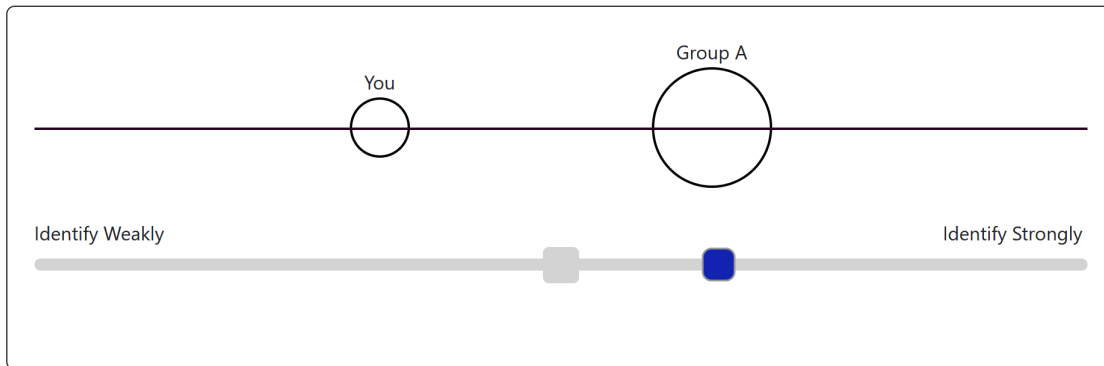
A: “Extremely relevant”, “Very relevant”, “Somewhat relevant”, “Slightly relevant”, “Not very relevant” or “Not at all relevant.”

### C.4 Group Identification Task

**Screen 1:**

**Information:**

In Part 2, we want to know your identification with Group A. On the scale below you can see two circles: One representing you and one representing Group A. You can change the distance between the two circles by moving the blue slider on the scale. Moving the slider to the left moves the circles further apart and signals that you identify very little with Group A. Moving the slider to the right moves the circles closer to each other and signals that you identify very much with Group A. Please move the slider to a position in which the distance between the two circles most accurately describes your identification with Group A. Please zoom out if the scale is only displayed partially.



### C.5 Rule Following Task

**Screen 1:**

**Information:**

In Part 3, you are going to play a game. You will receive the instructions for this game on the next page. Some parts of these instructions have been select by members of Group A. In addition to answering the questions that were presented to you in Part 1, the members of Group A also were asked to select a description for the game you are about to play. The description that was chosen by the majority was included in the instruction

you are about to receive.

**Screen 2:**

**Information:**

In Part 3 of this study, you will decide how to allocate 20 balls between two buckets. Your task is to put each of the balls, one-by-one, into one of the two buckets: the blue bucket or the yellow bucket. The balls will appear in the center of your screen, and you can allocate each ball by clicking and dragging it to the bucket of your choice. For each ball you put in the blue bucket, you will receive £0.05, and for each ball you put in the yellow bucket, you will receive £0.10.

**According to the members of Group A, the rule is to put the balls into the blue bucket**

Your payment from Part 3 will be based on your decisions: it is the sum of payments from the blue and yellow buckets. After you have completed the task, a “Continue” button will be displayed at the bottom of the page.



## C.6 Norm Elicitation

**Screen 1:**

**Information:**

In Part 2, we ask you to evaluate certain behaviors that may have occurred in another study. Up until this point, the participants of the other study had a very similar experience to you: Before participating

in the study, they answered the same questionnaire that you answered (more on this later), and they were introduced to the same Group A that you were introduced to in Part 1. We want you to read the instructions for one of their subsequent tasks. While you yourself will not play this game, you should read the instructions carefully. After you have read those instructions, you will receive further instructions that will detail your own task.

**You will be able to reopen these instructions when you make your final decisions!**

————— **Please take a moment to read about the task that you have to evaluate:** —————

**Page 1:**

In this part, you are going to play a game. You will receive the instructions for this game on the next page. Some parts of these instructions have been select by members of Group A. In addition to answering the questions that were presented to you in Part 1, the members of Group A also were asked to select a description for the game you are about to play. The description that was chosen by the majority was included in the instruction you are about to receive.

**Page 2:**

In today’s study, you will decide how to allocate 20 balls between two buckets. Your task is to put each of the balls, one-by-one, into one of the two buckets: the blue bucket or the yellow bucket. The balls will appear in the center of your screen, and you can allocate each ball by clicking and dragging it to the bucket of your choice. For each ball you put in the blue bucket, you will receive £0.05, and for each ball you put in the yellow bucket, you will receive £0.10.

**According to the members of Group A, the rule is to put the balls into the blue bucket**

Your payment will be based on your decisions: it is the sum of payments from the blue and yellow buckets.

<b>Screen 2:</b>
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————— **Information:** —————

Your task in Part 2 is to evaluate how socially appropriate it is to put 0, 5, 10, 15, or 20 balls into the blue bucket while placing the remaining balls into the yellow bucket. In your judgment, you can rate any behavior on a scale that ranges from “Very socially inappropriate” to “Very socially appropriate”. Hereby, “Very socially inappropriate” indicates that the behavior is inconsistent with what most people expect an Individual ought to do, whereas “Very socially appropriate” indicates that the behavior was consistent with what most people expect an Individual ought to do. To further support you in your decision: A behavior might be considered as socially appropriate if most people agree that it is the “proper” thing to do, whereas a behavior might be considered as socially inappropriate if people might get angry if they observe a person doing it. You can find screenshots of your task and of your possible answers in the box below.

You will be able to reopen these instructions when you make your final decisions!

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Screenshots of your upcoming task:

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The image contains two screenshots of a survey interface. Both screenshots are titled "How socially appropriate is it ...".

The top screenshot shows five rows of questions, each followed by a dropdown menu:

- ... to put 0 balls into the blue bucket and 20 balls into the yellow bucket:
- ... to put 5 balls into the blue bucket and 15 balls into the yellow bucket:
- ... to put 10 balls into the blue bucket and 10 balls into the yellow bucket:
- ... to put 15 balls into the blue bucket and 5 balls into the yellow bucket:
- ... to put 20 balls into the blue bucket and 0 balls into the yellow bucket:

The bottom screenshot shows the same five rows of questions. The first dropdown menu is open, displaying a list of seven options:

- Very socially appropriate
- Socially appropriate
- Somewhat socially appropriate
- Somewhat socially inappropriate
- Socially inappropriate
- Very socially inappropriate

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**Screen 3:**

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**Information:**

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But wait, there's more! We don't want you to tell us whether you personally believe that the behavior is socially appropriate or inappropriate. Instead, we want you to guess how most other's from a specific group of people would rate the behavior. In the following, we will call this specific group of people, the "**Matching Group**". You should note that the Matching Group and Group A consist of different people. We will tell you more about the Matching Group on the next page.

Learning about your Matching Group is important because your earnings will depend on it. At the end of the study, we will randomly select one of the five situations (put 0, 5, 10, 15, or 20 balls into the blue bucket) for all participants. Then we will compare your evaluation in this situation with the most frequent evaluation that we received from all members of your Matching Group (this includes you). If you selected the same appropriateness rating as was most frequent in your Matching Group, you will receive a bonus of £2.00. If

you selected a different rating, you will earn no bonus.

**You will be able to reopen these instructions when you make your final decisions!**

<b>Screen 4:</b>
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**Information:**

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Now we will explain to you who the members of your Matching Group are. Before participating in this study, each participant answered the same questionnaire. This questionnaire contained two types of questions (**category 1** and **category 2**). The questions included in the two categories differ in that they are concerned with different aspects of morality. For some people, the considerations expressed in category 1 are more important than those expressed in category 2, whereas for other people, the opposite is true. Lastly, some people might value both categories equally. Your answers indicate that:

**For you, the considerations of category 1 are more important to those of category 2!**

We call the group of participants, for whom the statements from category 1 were more relevant and agreeable than those of category 2, your **Matching Group**. Please read the questions contained in each category carefully and try to understand what both categories express. It might help you to imagine what kind of person would prefer either category. It is crucial that you understand who is in your Matching Group since it will help you to give us the same response as to what most people from your Matching Group believe constitutes socially appropriate or socially inappropriate behavior. Consequently, it will make it more likely for you to receive the additional £2.00.

**You will be able to reopen these instructions when you make your final decisions!**

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**Category 1:**

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**To what extent are the following considerations relevant to your thinking about right and wrong:**

- Whether or not someone suffered emotionally
- Whether or not some people were treated differently than others
- Whether or not someone cared for someone weak or vulnerable
- Whether or not someone acted unfairly
- Whether or not someone was cruel
- Whether or not someone was denied his or her rights

**Indicate your agreement or disagreement:**

- Compassion for those who are suffering is the most crucial virtue.

- When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
- One of the worst things a person could do is hurt a defenseless animal.
- Justice is the most important requirement for a society.
- It can never be right to kill a human being.
- I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.

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**Category 2:**

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**To what extent are the following considerations relevant to your thinking about right and wrong:**

- Whether or not someone's action showed love for his or her country
- Whether or not someone showed a lack of respect for authority
- Whether or not someone violated standards of purity and decency
- Whether or not someone did something to betray his or her group
- Whether or not someone conformed to the traditions of society
- Whether or not someone did something disgusting
- Whether or not someone showed a lack of loyalty
- Whether or not an action caused chaos or disorder
- Whether or not someone acted in a way that God would approve of

**Indicate your agreement or disagreement:**

- I am proud of my country's history.
- Respect for authority is something all children need to learn.
- People should not do things that are disgusting, even if no one is harmed.
- People should be loyal to their family members, even when they have done something wrong.
- Men and women each have different roles to play in society.
- I would call some acts wrong on the grounds that they are unnatural.
- It is more important to be a team player than to express oneself.
- If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.



- Chastity is an important and valuable virtue.

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<b>Screen 5:</b>
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**Information:**

Please, rate now how socially appropriate it is to put 0, 5, 10, 15, or 20 balls into the blue bucket while placing the remaining balls into the yellow bucket. Should you have any questions remaining, you can reopen any of the previous instructions by clicking on the buttons below.

---

**How socially appropriate is it ...**

Q1: "... to put 0 balls into the blue bucket and 20 balls into the yellow bucket:"

Q2: "... to put 5 balls into the blue bucket and 15 balls into the yellow bucket:"

Q3: "... to put 10 balls into the blue bucket and 10 balls into the yellow bucket:"

Q4: "... to put 15 balls into the blue bucket and 5 balls into the yellow bucket:"

Q5: "... to put 20 balls into the blue bucket and 0 balls into the yellow bucket:"

A: "Very socially appropriate", "Socially appropriate", "Somewhat socially appropriate", "Somewhat socially inappropriate", "Socially inappropriate" or "Very socially inappropriate"

## C.7 Socio-Demographic Questionnaire

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<b>Screen 1:</b>
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**Information:**

Before we inform you about your earnings and transfer you back to Prolific, we would like to ask you some optional questions. In doing so, please consider that all your data is collected anonymously and will not affect your payment!

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1. [*Age*]

Q: "What is your age?"

A: Any integer number

2. [*Gender*]

Q: "What is your gender?"

A: "Male", "Female" or "Other"

3. [*Ethnicity*]

Q: "Which of the following best describes your ethnicity?"

A: “White”, “Black”, “Hispanic”, “Asian” or “Other”

4. [*Degree*]

Q: “What is your highest obtained degree?”

A: “None”, “High school diploma”, “Bachelor’s degree”, “Master’s degree” or “Doctorate degree”

5. [*Employment Status*]

Q: “What is your current employment status?”

A: “Full time employed”, “Part time employed”, “Unemployed”, “Self-employed”, “Student”, “Housewife / husband” or “Retired”

6. [*Income*]

Q: “Approximately, how high is your yearly income in US Dollar (after taxes)?”

A: “\$0 - \$10,000”, “\$10,000 - \$25,000”, “\$25,000 - \$50,000”, “\$50,000 - \$75,000”, “\$75,000 - \$100,000”, “\$100,000 - \$150,000” or “More than \$150,000”

7. [*Community*]

Q: “Which type of community do you live in?”

A: “Urban”, “Suburban” or “Rural”

8. [*Religion*]

Q: “How would you describe your religious views?”

A: “Christian”, “Jew”, “Buddhist”, “Muslim”, “Hindu”, “Atheist” or “Other”

9. [*Politics*]

Q: “How would you describe your political affiliation?”

A: “Very liberal”, “Liberal”, “Moderate”, “Conservative” or “Very conservative”

## C.8 User Experience Questionnaire

<b>Screen 1:</b>
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**Information:**

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Before we inform you about your earnings and transfer you back to Prolific, we would like to ask you some additional questions. In doing so, please consider that all your data is collected anonymously and will not affect your payment!

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1. [*Device*]

Q: “What device did you use during this study?”

A: “Desktop PC”, “Notebook”, “Tablet”, “Cellphone” or “Other”

2. [*Browser*]

Q: “What browser did you use during this study?”

A: “Chrome”, “Safari”, “Firefox”, “Other” or “Unknown”

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**The following questions are optional and can be left blank:**

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3. [*Understanding Problems*]

Q: “If you had any problems of understanding during the experiment, please let us know in this field:”

A: Open form text input

4. [*Technical Problems*]

Q: “If you had any technical problems during the experiment, please let us know in this field:”

A: Open form text input

5. [*Comments*]

Q: “Do you have any further comments?”

A: Open form text input

## C.9 Behavioral Questionnaire

<b>Screen 1:</b>
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**Information:**

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Before we inform you about your earnings and transfer you back to Prolific, we would like to ask you some additional questions. In doing so, please consider that all your data is collected anonymously and will not affect your payment!

1. [*Alternative Group Identification Measure*]

Q: “On a scale from 1 to 10, please rate how closely attached you felt to Group A throughout the experiment (1: Not at all / 10: Very strongly)”

A: Any integer number between 1 and 10 (including 1 and 10)

2. [*Reason for Rule Following*]

Q: “In Part 3, why did or didn’t you follow the rule to put all the balls into the blue bucket?”

A: Open form text input

## References

- Clark, C. B., Swails, J. A., Pontinen, H. M., Bowerman, S. E., Kriz, K. A., & Hendricks, P. S. (2017). A behavioral economic assessment of individualizing versus binding moral foundations. *Personality and Individual Differences, 112*, 49–54. doi:[10/gfxk2c](https://doi.org/10/gfxk2c)
- Cohn, A., & Maréchal, M. A. (2016). Priming in economics. *Current Opinion in Psychology, 12*, 17–21. doi:[10/gjtp9g](https://doi.org/10/gjtp9g)
- Dehghani, M., Johnson, K., Hoover, J., Sagi, E., Garten, J., Parmar, N. J., . . . Graham, J. (2016). Purity homophily in social networks. *Journal of Experimental Psychology: General, 145*(3), 366–375. doi:[10/f8bqq8](https://doi.org/10/f8bqq8)
- Graham, J., Nosek, B. A., Haidt, J., Iyer, R., Koleva, S., & Ditto, P. H. (2011). Mapping the moral domain. *Journal of Personality and Social Psychology, 101*(2), 366–385. doi:[10/cq64hc](https://doi.org/10/cq64hc)
- Jiménez, J., Gómez, Á., Buhrmester, M. D., Vázquez, A., Whitehouse, H., & Swann, W. B. (2016). The dynamic identity fusion index: A new continuous measure of identity fusion for web-based questionnaires. *Social Science Computer Review, 34*(2), 215–228. doi:[10/f8cwpX](https://doi.org/10/f8cwpX)
- Kimbrough, E. O., & Vostroknutov, A. (2016). Norms make preferences social. *Journal of the European Economic Association, 14*(3), 608–638. doi:[10/f8wj56](https://doi.org/10/f8wj56)
- McFadden, D. (1974). Conditional logit analysis of qualitative choice behavior. In P. Zarembka (Ed.), *Frontiers in econometrics* (pp. 105–142). New York: Academic Press.
- Swann, W. B., Gómez, Á., Seyle, D. C., Morales, J. F., & Huici, C. (2009). Identity fusion: The interplay of personal and social identities in extreme group behavior. *Journal of Personality and Social Psychology, 96*(5), 995–1011. doi:[10/dx5mf2](https://doi.org/10/dx5mf2)