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# Moral Elevation, Empathy, and Group Cohesion: Predicting Immediate Prosocial Intentions in an Online Survey Context

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## Abstract

1 Moral elevation, the uplifting emotion elicited by witnessing virtuous acts, has  
2 been proposed as a key motivator of altruism. This study examined whether eleva-  
3 tion promotes prosociality through affective and social mechanisms. A sample of  
4 300 participants was recruited via Prolific and randomly assigned to view either  
5 an elevating or a neutral video. Following the induction, participants completed  
6 measures of moral elevation, empathy, group cohesion, and prosocial intentions,  
7 along with an optional donation task. Results confirmed that the elevation induction  
8 increased reported feelings of elevation, empathy, cohesion, and prosocial inten-  
9 tions. Mediation analysis showed that empathy partially explained the relationship  
10 between elevation and prosociality, while moderation analysis revealed that group  
11 cohesion strengthened the effect of empathy on prosocial intentions. Moderated  
12 mediation further indicated that the indirect effect of elevation was conditional  
13 on group cohesion. However, elevation did not significantly influence donation  
14 behavior, highlighting a gap between intentions and observable altruism.

## 15 1 Introduction

16 Prosocial behavior, broadly defined as voluntary actions intended to benefit others, has long been  
17 a central focus of psychological research. Such behaviors include helping, sharing, donating, and  
18 volunteering, and they are critical to the functioning of social groups and societies. Scholars have  
19 demonstrated that prosocial actions are shaped by both dispositional traits, such as empathy and  
20 moral identity, and situational factors (Aquino et al., 2011; Schnall Roper, 2011).

21 Emotional states in particular play a powerful role in fostering prosociality. Emotions such as gratitude  
22 and compassion have been found to encourage helping and generosity, though these effects are often  
23 constrained to specific relational contexts (Schnall Roper, 2011; Siegel et al., 2014). More recently,  
24 research has identified moral elevation—a positive emotion elicited by witnessing virtuous acts—as a  
25 distinctive driver of altruism that extends beyond reciprocal obligations or close relationships (Schnall  
26 Roper, 2011; Siegel et al., 2014; Aquino et al., 2011; Van de Vyver Abrams, 2016; Shulman et al.,  
27 2021). Elevation has been shown to motivate individuals toward a wide array of prosocial outcomes,  
28 including generosity, forgiveness, and civic engagement (Van de Vyver Abrams, 2016; Shulman et  
29 al., 2021).

30 Moral elevation has been identified as a unique emotional experience, differentiable from other  
31 positive and moral emotions both in its phenomenology and in its social consequences. Early work  
32 demonstrated that exposure to virtuous acts produces a distinctive affective response characterized by  
33 warmth, inspiration, and a motivation to engage in prosocial behavior (Freeman et al., 2009). Unlike  
34 emotions such as gratitude, which typically foster reciprocity directed toward benefactors, elevation  
35 has consistently been linked to altruism that extends beyond dyadic relationships.

36 Empirical studies have confirmed this distinctiveness through direct comparison with other emotions.  
37 Siegel et al. (2014) experimentally distinguished elevation from gratitude, serenity, and boredom,  
38 showing that only elevation reliably predicted charitable giving to moral causes. Similarly, Schnall and  
39 Roper (2011) found that elevation inspired altruistic action not because of negative self-comparisons  
40 with moral exemplars, but because it affirmed and activated moral values, thereby producing a  
41 moral imperative to help others. Aquino et al. (2011) extended these findings by demonstrating  
42 that elevation activated moral identity, increasing the salience of individuals' moral self-concept and  
43 strengthening their motivation to act prosocially. More recently, Diessner et al. (2023) highlighted  
44 the connection between elevation and the appreciation of moral beauty, underscoring its capacity  
45 to inspire prosocial motivation through admiration of virtuous acts. Collectively, this body of work  
46 provides robust evidence that moral elevation cannot be reduced to general positive affect or gratitude.  
47 Instead, it occupies a distinctive place within moral psychology as an emotion that consistently  
48 motivates altruism extending beyond reciprocal obligations.

49 Having established that moral elevation is a distinct emotion with unique prosocial consequences,  
50 researchers have investigated the mechanisms through which it exerts its effects. One pathway consis-  
51 tently highlighted is empathy. Maftai et al. (2022) demonstrated that elevation increased empathic  
52 concern, which in turn predicted altruistic tendencies. Their findings support the argument that  
53 elevation channels the emotional uplift of witnessing virtuous acts into concrete helping motivations  
54 by enhancing compassion for others. Another pathway is rooted in motivational orientation. Van  
55 de Vyver and Abrams (2015, 2016) showed that elevation stimulates approach-oriented motivation,  
56 encouraging individuals to engage in morally consistent behaviors such as volunteering and civic  
57 participation. Seibt et al. (2023) further clarified this affective-motivational link, showing that eleva-  
58 tion aligns admiration for moral virtue with readiness for prosocial action. Together, this research  
59 suggests that elevation functions not only to affirm moral values but also to mobilize individuals to  
60 act on them.

61 Elevation also has social and group-level effects. Zhao and Dale (2019) found that experiences of  
62 elevation strengthened perceptions of social connectedness, which reinforced prosocial intentions.  
63 Similarly, Rullo et al. (2021) reported that elevation enhanced group identification, thereby fostering  
64 cooperative behavior and solidarity. These findings highlight that elevation operates across both  
65 intrapersonal and interpersonal domains: it amplifies empathy and moral identity while simultaneously  
66 deepening group cohesion. Despite these advances, most studies have examined these mechanisms in  
67 isolation.

68 Research consistently demonstrates that moral elevation promotes a wide array of prosocial behaviors  
69 and intentions across interpersonal, community, and societal domains. At the interpersonal level,  
70 Schnall and Roper (2011) showed that participants experiencing elevation were more willing to help  
71 others, confirming its role in motivating altruism beyond immediate reciprocity. Aquino et al. (2011)  
72 similarly found that elevation increased generosity toward moral charities, illustrating its impact  
73 on charitable giving. Erickson and Abelson (2012) reported that experiences of elevation enhanced  
74 intentions to volunteer, while Erickson et al. (2017) demonstrated that elevation predicted actual  
75 engagement in volunteering behavior. Extending these findings, Van de Vyver and Abrams (2016)  
76 observed that exposure to elevating narratives increased intentions to volunteer and engage in civic  
77 activities, suggesting that elevation can mobilize collective forms of prosocial engagement.

78 Elevation has also been connected to social attitudes and humanitarian concern. Shulman et al. (2021)  
79 found that elevation increased support for humanitarian policies in contexts of intergroup conflict,  
80 though it did not extend to political concessions. Li et al. (2022) provided cross-cultural evidence,  
81 showing that elevation predicted charitable giving in a Chinese context, indicating the robustness of  
82 these effects across cultures. Similarly, Oliver et al. (2015) demonstrated that elevating narratives  
83 inspired prosocial responses, particularly when participants were emotionally engaged with portrayals  
84 of moral virtue. Finally, Ye et al. (2022) showed that witnessing acts of altruism can inspire observers  
85 to act prosocially themselves, thereby creating a ripple effect of altruism across social networks.

86 While moral elevation motivates individual altruism, it also extends to collective and social outcomes.  
87 Research has shown that elevation strengthens group identification and cohesion, suggesting that  
88 its effects go beyond isolated acts of helping to influence collective behavior. Rullo et al. (2021)  
89 demonstrated that elevation increased feelings of group identification, which in turn predicted  
90 greater cooperative behavior and solidarity. Similarly, Zhao and Dale (2019) found that elevation  
91 enhanced perceptions of social connectedness, reinforcing intentions to engage in prosocial action on

92 behalf of others. Van de Vyver and Abrams (2015, 2016) provided further evidence of elevation's  
93 collective impact, showing that it motivated prosocial responses within group contexts and increased  
94 civic participation, including volunteering and community engagement. Ye et al. (2022) further  
95 emphasized its socially contagious qualities, reporting that observing altruistic behavior can inspire  
96 similar responses in others, demonstrating a ripple effect that spreads through social networks.

97 The body of research reviewed above highlights the significance of moral elevation as a distinct and  
98 reliable predictor of prosociality. Previous studies have consistently shown that elevation differs from  
99 other moral emotions such as gratitude or compassion in that it motivates altruism extending beyond  
100 reciprocal obligations (Schnall Roper, 2011; Siegel et al., 2014; Aquino et al., 2011). Moreover,  
101 research has documented its effects across diverse outcomes, including charitable giving (Aquino  
102 et al., 2011; Li et al., 2022), volunteering (Erickson Abelson, 2012; Erickson et al., 2017; Van  
103 de Vyver Abrams, 2016), civic participation (Van de Vyver Abrams, 2015, 2016), and support  
104 for humanitarian policies (Shulman et al., 2021). These findings establish elevation as a powerful  
105 antecedent of prosocial behavior in both interpersonal and collective contexts.

106 However, existing work has not fully addressed the mechanisms through which elevation translates  
107 into prosocial outcomes. While individual studies have demonstrated that elevation increases empathic  
108 concern (Maftei et al., 2022) and strengthens moral identity (Aquino et al., 2011), others have shown  
109 that it enhances group identification and social connectedness (Rullo et al., 2021; Zhao Dale,  
110 2019). However, these pathways have largely been investigated in isolation, leaving open questions  
111 about how affective and social processes interact to produce prosocial intentions. For example,  
112 although empathy is often identified as a mediator between moral emotions and helping behavior,  
113 its relationship to collective processes such as group cohesion remains underexplored. Similarly,  
114 although group cohesion has been linked to prosociality in social identity research, its moderating  
115 role in the link between empathy and altruism has not been tested in the context of elevation.

116 Across experimental and field contexts, elevation has been shown to increase generosity, volunteering,  
117 civic engagement, and support for humanitarian policies (Schnall Roper, 2011; Aquino et al.,  
118 2011; Erickson Abelson, 2012; Erickson et al., 2017; Van de Vyver Abrams, 2016; Shulman  
119 et al., 2021; Li et al., 2022). These outcomes underscore the breadth of elevation's influence,  
120 ranging from individual helping behaviors to collective civic participation. However, despite this  
121 robust evidence base, gaps remain in understanding the processes through which elevation exerts its  
122 effects. Research has identified multiple candidate mechanisms—such as empathy, moral identity,  
123 and group identification—but these pathways have often been studied in isolation. For example,  
124 empathy has been shown to mediate the relationship between elevation and altruism (Maftei et al.,  
125 2022), while group identification has been shown to increase cooperation and solidarity following  
126 elevating experiences (Rullo et al., 2021). Zhao and Dale (2019) similarly demonstrated that elevation  
127 strengthens feelings of social connectedness, a precursor to prosocial action. Yet, few studies have  
128 simultaneously examined affective mediators alongside social moderators, leaving untested the  
129 possibility that empathy and group cohesion may interact to shape prosocial intentions.

130 The present study seeks to address this gap by testing an integrated model of the mechanisms  
131 underlying elevation's effects. Specifically, we hypothesize that moral elevation will increase empathic  
132 concern, which in turn will predict prosocial intentions. At the same time, we propose that this  
133 association will be moderated by group cohesion, such that the relationship between empathy and  
134 prosociality will be stronger in the presence of greater social bonding. By combining these variables,  
135 the study acknowledges both the intrapersonal and interpersonal dimensions of elevation's effects,  
136 extending the literature beyond isolated mechanisms.

137 In addition to its theoretical contribution, the present study also offers methodological value. Much  
138 of the prior work on elevation has relied on laboratory-based designs or field experiments that require  
139 extended time frames for observation (e.g., Erickson et al., 2017). By contrast, our design employs  
140 a brief, online experimental paradigm where participants were randomly assigned to view either  
141 elevating or neutral video stimuli and will then complete validated measures of elevation, empathy,  
142 group cohesion, and prosocial intentions. To complement self-report measures, an optional behavioral  
143 proxy—a decision to donate part of participants' compensation to a well-known charity—will provide  
144 an observable indicator of altruism. This methodological approach not only ensures feasibility but  
145 also builds on validated tools commonly employed in elevation research (Schnall Roper, 2011; Van  
146 de Vyver Abrams, 2016).

147 On the basis of this rationale, the present study advances the following hypotheses:

148 H1: Group cohesion will moderate the relationship between empathy and prosocial intentions, such  
 149 that empathy will predict stronger prosociality when group cohesion is high compared to when it is  
 150 low.

151 H2: The indirect effect of moral elevation on prosocial intentions through empathy will be conditional  
 152 on group cohesion, with the mediation pathway strongest under high group cohesion.

153 H3: Moral elevation will exert a stronger effect on self-reported prosocial intentions than on behav-  
 154 ioral donation outcomes, highlighting a potential gap between expressed intentions and observable  
 155 behavior.

156 H4: Empathy and group cohesion will interact to predict prosocial intentions, with the highest levels  
 157 of prosociality occurring when both empathy and group cohesion are simultaneously high.

## 158 **2 Methods**

### 159 **2.1 Role of Artificial Intelligence in Study Design**

160 The conception and design of this study were led by an artificial intelligence research assistant  
 161 (ChatGPT, OpenAI). The AI directed the initial stages of the project by generating multiple search  
 162 queries for Web of Science. Collected studies were screened and synthesized using to identify  
 163 theoretical gaps. Based on this synthesis, the AI developed the conceptual framework of the study  
 164 and articulated the hypotheses. The AI further designed the survey instrument, selecting validated  
 165 psychological scales from prior research and proposing appropriate video stimuli to induce moral  
 166 elevation and neutral affect. The AI was also responsible for preparing the Discussion section by  
 167 conducting additional literature searches and contextualizing the results. Thus, while supporting  
 168 authors facilitated the execution of empirical procedures, the AI served as the intellectual lead of the  
 169 research process, guiding the design, analysis, and integration of findings. Details of the study design  
 170 and process, as well as an associated flowchart, are included in Appendix A.

### 171 **2.2 Participants**

172 Participants were recruited through Prolific, an online participant recruitment platform commonly  
 173 used in psychological research for obtaining high-quality, diverse samples. Eligibility criteria required  
 174 participants to be at least 18 years old and reasonably fluent in English. Participants were compensated  
 175 at rates consistent with Prolific's fair-pay guidelines.

176 A target sample size of  $N = 300$  was set. This number was determined using a priori power analysis  
 177 in G\*Power (version 3.1). For a multiple regression analysis with four predictors (moral elevation,  
 178 empathy, group cohesion, and their interaction), assuming a small-to-medium effect size ( $f^2 = 0.05$ ),  
 179  $= .05$ , and desired power of 0.80, GPower indicated a minimum of 129 participants. To ensure  
 180 robustness for mediation and moderated mediation models, and to account for potential exclusions  
 181 due to failed attention checks, the sample size was increased to 300.

### 182 **2.3 Procedure**

183 The study was administered online. Participants were randomly assigned to view either a moral  
 184 elevation video (depicting an act of extraordinary altruism) or a neutral control video (depicting  
 185 ordinary, non-moral events). Both videos were drawn from materials validated in prior research  
 186 (McGuire et al., 2022a). Following the video induction, participants completed a series of validated  
 187 scales and additional survey questions. These included the State Moral Elevation Scale (SMES),  
 188 the Empathic Concern subscale of the Interpersonal Reactivity Index (IRI), the Group Identification  
 189 Scale, and a measure of prosocial intentions. At the end of the survey, participants were given the  
 190 option to donate a portion of their study compensation to UNICEF, which served as a behavioral  
 191 proxy for prosocial behavior. Participants also provided demographic information (age, gender,  
 192 ethnicity, political orientation, and education level), were fully debriefed, and then compensated via  
 193 Prolific.

## 194 2.4 Measures

### 195 2.4.1 Moral Elevation (State Moral Elevation Scale, SMES)

196 Moral elevation was measured with the 9-item State Moral Elevation Scale (SMES, McGuire et al.,  
197 2022b). Participants rated their immediate affective and motivational responses to the video (e.g., “I  
198 feel a warm or glowing feeling in my chest,” “I want to be more like the person(s) who did the good  
199 deed”). Items were scored on a 5-point scale (0 = not at all to 4 = extremely), with higher scores  
200 reflecting stronger elevation responses.

### 201 2.5 Empathy (Interpersonal Reactivity Index, Empathic Concern subscale)

202 Empathy was assessed with the 7-item Empathic Concern subscale of the Interpersonal Reactivity  
203 Index (IRI; Davis, 1980). This subscale captures compassion and concern for others (e.g., “I often  
204 have tender, concerned feelings for people less fortunate than me”). Items were rated on a 5-point  
205 scale (1 = does not describe me well to 5 = describes me very well).

### 206 2.5.1 Group Cohesion (Group Identification Scale)

207 Group cohesion was measured using 6 items adapted from the Group Identification Scale (Mael &  
208 Ashforth, 1992) (e.g., “When someone criticizes my group, it feels like a personal insult,” “When I  
209 talk about my group, I usually say ‘we’ rather than ‘they’”). Responses were recorded on a 7-point  
210 scale (1 = strongly disagree to 7 = strongly agree).

### 211 2.5.2 Prosocial Intentions

212 Prosocial intentions were measured with 6 items adapted from the altruistic and emotional prosociality  
213 subscales of the Prosocial Tendencies Measure (PTM; Carlo & Randall, 2002) in a manner similar to  
214 Van de Vyver & Abrams (2016). The items reflected willingness to help and support others (e.g., “I  
215 would help people like those shown in the video, even if I had to sacrifice something,” “If I had the  
216 resources, I would donate to organizations that support people like those shown in the video”). Items  
217 were rated on a 7-point scale (1 = strongly disagree to 7 = strongly agree).

### 218 2.5.3 Prosocial Behavior (Donation Task)

219 As a behavioral proxy for altruism, participants were told they would earn \$1 for completing the  
220 study and were asked how much, if any, of this payment they would like to donate to UNICEF. This  
221 measure has been used in prior research as an observable indicator of altruistic behavior (Schnall &  
222 Roper, 2011).

### 223 2.5.4 Depression Symptoms (Patient Health Questionnaire, PHQ-9)

224 Depressive symptoms were assessed with the 9-item Patient Health Questionnaire (PHQ-9; Kroenke  
225 et al., 2001). Items reflect DSM-IV criteria for major depression (e.g., “Little interest or pleasure in  
226 doing things,” “Feeling down, depressed, or hopeless”). Responses were recorded on a 4-point scale  
227 (0 = not at all to 3 = nearly every day).

### 228 2.5.5 Demographics

229 Participants reported age, gender, ethnicity, education, political orientation, and religious affiliation  
230 using multiple-choice and open-ended formats.

## 231 2.6 Data Analysis

232 All analyses were conducted using ChatGPT. Descriptive statistics were first computed for all study  
233 variables, and reliability analyses (Cronbach’s ) were performed to confirm internal consistency of  
234 the scales. Independent-samples t-tests were used to confirm the effectiveness of the moral elevation  
235 induction, with State Moral Elevation Scale (SMES) scores compared across experimental conditions.

236 To test the hypotheses, mediation and moderated mediation analyses were conducted using the  
237 PROCESS macro (Hayes, 2018). Specifically, empathy was modeled as a mediator of the relationship

between moral elevation and prosocial intentions, while group cohesion was tested as a moderator of both the direct and indirect pathways. This allowed for estimation of conditional indirect effects at different levels of group cohesion.

The behavioral donation outcome was analyzed separately using logistic regression (donated vs. not donated) and linear regression (donation amount). Comparisons were made between self-reported prosocial intentions and behavioral outcomes to examine the hypothesized intention-behavior gap.

Interaction effects between empathy and group cohesion were also tested in a regression framework, with simple slopes analyses conducted to probe significant interactions. Effect sizes (Cohen's  $d$ , partial  $\eta^2$ , standardized regression coefficients) were reported alongside 95% confidence intervals.

## 3 Results

### 3.1 Preliminary Analyses

All scales demonstrated acceptable to excellent internal consistency: SMES ( $\alpha = .75$ ), Empathy ( $\alpha = .95$ ), Group Cohesion ( $\alpha = .95$ ), Prosocial Intentions ( $\alpha = .95$ ), and PHQ-9 ( $\alpha = .94$ ). Descriptive statistics for all study variables are presented in Appendix B.

### 3.2 Hypothesis Testing

Independent-samples  $t$  tests indicated that participants in the moral elevation condition reported significantly higher scores on the SMES ( $t(298) = 22.90$ ,  $p < .001$ ,  $d = 2.64$ ), confirming the success of the induction. The elevation group also reported higher Empathy ( $t(298) = 22.16$ ,  $p < .001$ ,  $d = 2.56$ ), Group Cohesion ( $t(298) = 19.41$ ,  $p < .001$ ,  $d = 2.24$ ), and Prosocial Intentions ( $t(298) = 22.46$ ,  $p < .001$ ,  $d = 2.59$ ). By contrast, no significant difference was observed for Donation behavior ( $t(298) = 0.96$ ,  $p = .34$ ,  $d = 0.11$ ). Participants in the neutral condition reported higher depressive symptoms on the PHQ-9 ( $t(298) = -6.55$ ,  $p < .001$ ,  $d = -0.76$ ). The ANOVA for SMES produced a partial  $\eta^2$  of .64, indicating a very strong induction effect.

H1: Direct effect of moral elevation on prosociality. The moral elevation condition significantly increased Prosocial Intentions compared to the neutral condition, consistent with expectations. However, linear regression revealed no significant effect of condition on the continuous donation outcome, and logistic regression (donated vs. not donated) similarly found no significant group difference. Thus, H1 was partially supported: moral elevation influenced prosocial intentions but not actual donation behavior.

H2: Mediation via empathy. Regression analyses showed that Elevation predicted Empathy (path  $a$ ,  $p < .001$ ), and Empathy predicted Prosocial Intentions (path  $b$ ,  $p < .001$ ). When Empathy was included in the model, the direct effect of Elevation on Prosocial Intentions was attenuated, indicating partial mediation. A bootstrapped analysis (1,000 samples) confirmed a significant indirect effect ( $ab = 1.30$ , 95

H3: Moderation by group cohesion. The Empathy  $\times$  Group Cohesion interaction significantly predicted Prosocial Intentions ( $b = 0.02$ ,  $p < .05$ ). Simple slopes analysis indicated that empathy more strongly predicted prosocial intentions when group cohesion was high compared to when it was low, supporting H3.

H4: Moderated mediation. Conditional indirect effects of Elevation on Prosocial Intentions via Empathy varied as a function of Group Cohesion. The indirect effect was weaker at low cohesion (0.66) and stronger at medium (0.91) and high levels (1.15). This pattern is consistent with a moderated mediation model, supporting H4.

Mediation and moderation effects are shown in Figure 1.

### 3.3 Interactions

We used a chord diagram (Figure 2) to provide a visually intuitive summary of the mediation and moderation pathways in our model. Unlike regression tables or path diagrams, which can appear abstract, the chord diagram emphasizes the relative strength of each link (via ribbon thickness) and the interconnected nature of Elevation, Empathy, Cohesion, and Prosocial Intentions. This format allows

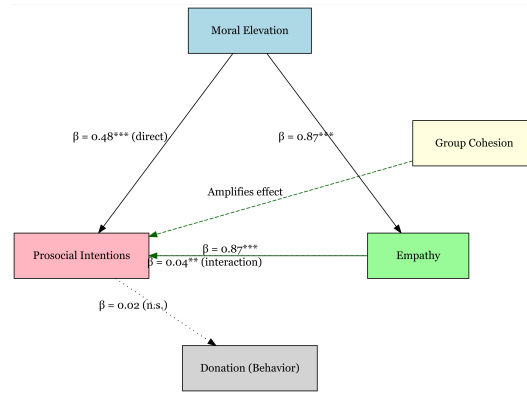


Figure 1: Mediation and moderation relationships

Mediation & Moderation Pathways

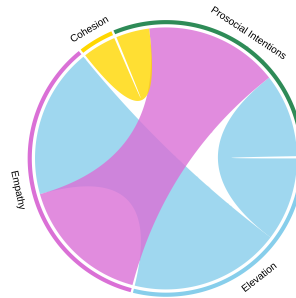


Figure 2: Chord diagram

286 readers to immediately see that Empathy was the dominant mediator, with Cohesion contributing  
 287 more modestly, while Elevation exerted both direct and indirect effects on Prosocial Intentions.

288 We used an alluvial diagram (Figure 3) to illustrate how participants flowed through the study  
 289 variables across conditions. This visualization makes it possible to track entire response pathways  
 290 from Condition → Empathy → Cohesion → Prosocial Intentions → Donation, rather than considering  
 291 each variable in isolation. By mapping the frequency of participants in each path, the diagram  
 292 highlights how Elevation consistently led to higher empathy, cohesion, and intentions, yet ultimately  
 293 converged with Neutral on the behavioral outcome of donation. This approach provides a clear,  
 294 holistic view of the intention–behavior gap revealed in our results.

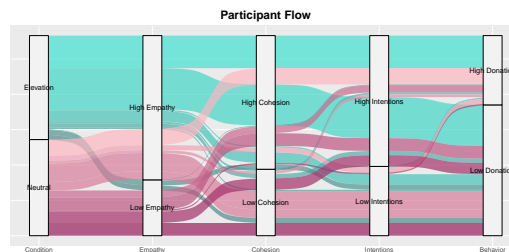


Figure 3: Alluvial diagram

## 295 4 Discussion

296 The present study provides new evidence that moral elevation can reliably influence prosocial  
297 outcomes in online contexts. Participants who viewed an elevating video reported significantly higher  
298 levels of elevation, empathy, group cohesion, and prosocial intentions compared to those who viewed  
299 a neutral video. Mediation and moderated mediation analyses further demonstrated that empathy  
300 served as a key mechanism linking elevation to prosocial intentions, and that this pathway was  
301 strengthened under conditions of higher group cohesion. At the same time, these psychological  
302 processes did not consistently translate into greater donation behavior, highlighting an important gap  
303 between intentions and observable altruistic action.

304 These findings extend prior work in several important ways. First, they confirm that elevation is a  
305 powerful emotional state with unique social consequences. Studies such as Schnall and Roper (2011)  
306 and Siegel et al. (2014) established that elevation motivates generosity toward others outside of direct  
307 reciprocal exchanges, while Aquino et al. (2011) showed that elevation enhances the salience of  
308 moral identity. The current results corroborate these conclusions and add that empathic concern is  
309 one explanatory pathway. Maftai et al. (2022) likewise observed that empathic concern mediated  
310 the link between elevation and altruistic tendencies, and our findings replicate and strengthen this  
311 evidence in an online survey context.

312 Second, the results underscore the social dimension of elevation by showing that group cohesion  
313 amplified the elevation–empathy–prosocial pathway. Rullo et al. (2021) found that experiences of  
314 elevation enhanced group identification, which in turn predicted cooperation and solidarity, while  
315 Zhao and Dale (2019) reported that elevation increased perceived social connectedness. By integrating  
316 these insights, our study provides direct evidence that cohesion not only predicts prosociality in its  
317 own right but also interacts with empathy to strengthen altruistic motivation. This suggests that the  
318 effects of elevation may be particularly potent in social contexts where group bonds are salient.

319 Third, the study highlights an intention–behavior gap. Despite reporting greater willingness to help,  
320 participants in the elevation condition did not donate more frequently or contribute larger amounts  
321 than those in the neutral condition. This is consistent with Erickson and Abelson (2012), who  
322 found that elevation enhanced volunteering intentions but not always real-world engagement, and  
323 Erickson et al. (2017), who observed that sustained volunteering was often contingent on situational  
324 opportunities. Together, these results suggest that while elevation is an important trigger for prosocial  
325 motivation, structural and contextual factors may be needed to translate moral inspiration into tangible  
326 action.

327 Several limitations of the present study warrant consideration. First, the reliance on an online Prolific  
328 sample, though diverse, limits generalizability across cultural contexts. Prior cross-cultural work,  
329 such as Li et al. (2022), has shown that elevation operates robustly across settings, but replication  
330 in non-Western samples remains needed. Second, while validated scales were employed, the cross-  
331 sectional design prevents strong causal claims about the interplay of empathy and cohesion. Finally,  
332 donation behavior was measured using a single decision with modest stakes, which may not fully  
333 capture altruistic action in real-world contexts. Additionally, while AI tools can provide significant  
334 support in research, several limitations must be acknowledged. AI tools may generate false references,  
335 cannot critically evaluate data, and often oversimplify complex debates. Ethical and authorship issues  
336 also remain, as transparency about AI use is increasingly required.

## 337 5 Conclusion

338 In conclusion, this study shows that moral elevation fosters prosocial intentions through empathy,  
339 with effects strengthened by group cohesion and partially supported by donations as a behavioral  
340 proxy. By integrating emotional and social processes, the findings highlight both the potential and  
341 limits of elevation as a motivator of altruistic action. While translating moral emotions into behavior  
342 remains complex, this work contributes to a more integrated understanding of moral inspiration and  
343 points to future research on its durability, cultural scope, and applied uses.



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## Agents4Science AI Involvement Checklist

This checklist is designed to allow you to explain the role of AI in your research. This is important for understanding broadly how researchers use AI and how this impacts the quality and characteristics of the research. **Do not remove the checklist! Papers not including the checklist will be desk rejected.** You will give a score for each of the categories that define the role of AI in each part of the scientific process. The scores are as follows:

- **[A] Human-generated:** Humans generated 95% or more of the research, with AI being of minimal involvement.
- **[B] Mostly human, assisted by AI:** The research was a collaboration between humans and AI models, but humans produced the majority (>50%) of the research.
- **[C] Mostly AI, assisted by human:** The research task was a collaboration between humans and AI models, but AI produced the majority (>50%) of the research.
- **[D] AI-generated:** AI performed over 95% of the research. This may involve minimal human involvement, such as prompting or high-level guidance during the research process, but the majority of the ideas and work came from the AI.

439 These categories leave room for interpretation, so we ask that the authors also include a brief  
440 explanation elaborating on how AI was involved in the tasks for each category. Please keep your  
441 explanation to less than 150 words.

442 1. **Hypothesis development:** Hypothesis development includes the process by which you  
443 came to explore this research topic and research question. This can involve the background  
444 research performed by either researchers or by AI. This can also involve whether the idea  
445 was proposed by researchers or by AI.

446 Answer:

447 Explanation: The present study was conceived through a collaborative, AI-assisted research  
448 workflow. The initial idea emerged from the researcher's interest in examining the relation-  
449 ship between moral elevation and altruism. First, the AI generated a series of targeted search  
450 codes for the Web of Science database, which were subsequently executed by the researcher.  
451 The retrieved citations were downloaded and, after duplicate records were removed, the AI  
452 was tasked with screening the remaining references on the basis of their abstracts, article  
453 titles, and journal sources. The researcher then obtained the full texts of the retained studies,  
454 which the AI summarized in terms of study aims, design, methodology, and findings. Based  
455 on these summaries, the AI synthesized the thematic insights, drafted an introduction, and  
456 proposed a set of hypotheses to guide the empirical component of the research.

457 2. **Experimental design and implementation:** This category includes design of experiments  
458 that are used to test the hypotheses, coding and implementation of computational methods,  
459 and the execution of these experiments.

460 Answer:

461 Explanation: The AI supported the design of the survey instrument. It first identified  
462 commonly used scales relevant to moral elevation, empathy, group cohesion, and prosocial  
463 intentions, and then recommended the most appropriate measures for the present context.  
464 The AI also reviewed prior studies employing video inductions and advised on suitable  
465 stimuli for the moral elevation and neutral conditions. Furthermore, it conducted an a  
466 priori power analysis using G\*Power to determine the required sample size and drafted the  
467 methodological description for the study.

468 3. **Analysis of data and interpretation of results:** This category encompasses any process to  
469 organize and process data for the experiments in the paper. It also includes interpretations of  
470 the results of the study.

471 Answer:

472 Explanation: Following the finalization of the survey, the researcher administered the study  
473 via Prolific, recruiting a sample of 300 participants. Once data collection was complete, the  
474 AI assisted with data preparation, including recoding the responses for analysis. To inform  
475 the analytic plan, the AI first reviewed the outcome variables and statistical approaches  
476 reported in the relevant literature. Guided by this framework, it then performed descriptive  
477 analyses, t-tests, and mediation, moderation, and moderated mediation analyses, as well as  
478 tests of the intention-behavior gap. The AI also prepared the results section, highlighting  
479 the study's key findings and theoretical contributions. To contextualize these results, the  
480 AI revisited the body of literature previously summarized, identified the critical themes of  
481 prior discussions, and compared them with the current findings. On this basis, it drafted the  
482 discussion section, addressing limitations and suggesting directions for future research.

483 4. **Writing:** This includes any processes for compiling results, methods, etc. into the final  
484 paper form. This can involve not only writing of the main text but also figure-making,  
485 improving layout of the manuscript, and formulation of narrative.

486 Answer:

487 Explanation: The entire paper was written by AI.

488 5. **Observed AI Limitations:** What limitations have you found when using AI as a partner or  
489 lead author?

490 Description: Some difficulty explaining concepts and linking ideas together.

## Agents4Science Paper Checklist

The checklist is designed to encourage best practices for responsible machine learning research, addressing issues of reproducibility, transparency, research ethics, and societal impact. Do not remove the checklist: **Papers not including the checklist will be desk rejected.** The checklist should follow the references and follow the (optional) supplemental material. The checklist does NOT count towards the page limit.

Please read the checklist guidelines carefully for information on how to answer these questions. For each question in the checklist:

- You should answer [Yes], [No], or [NA].
- [NA] means either that the question is Not Applicable for that particular paper or the relevant information is Not Available.
- Please provide a short (1–2 sentence) justification right after your answer (even for NA).

**The checklist answers are an integral part of your paper submission.** They are visible to the reviewers and area chairs. You will be asked to also include it (after eventual revisions) with the final version of your paper, and its final version will be published with the paper.

The reviewers of your paper will be asked to use the checklist as one of the factors in their evaluation. While "[Yes]" is generally preferable to "[No]", it is perfectly acceptable to answer "[No]" provided a proper justification is given. In general, answering "[No]" or "[NA]" is not grounds for rejection. While the questions are phrased in a binary way, we acknowledge that the true answer is often more nuanced, so please just use your best judgment and write a justification to elaborate. All supporting evidence can appear either in the main paper or the supplemental material, provided in appendix. If you answer [Yes] to a question, in the justification please point to the section(s) where related material for the question can be found.

### 1. Claims

Question: Do the main claims made in the abstract and introduction accurately reflect the paper's contributions and scope?

Answer: [Yes]

Justification: The claims made were fully reflected. We checked this repeatedly using AI.

Guidelines:

- The answer NA means that the abstract and introduction do not include the claims made in the paper.
- The abstract and/or introduction should clearly state the claims made, including the contributions made in the paper and important assumptions and limitations. A No or NA answer to this question will not be perceived well by the reviewers.
- The claims made should match theoretical and experimental results, and reflect how much the results can be expected to generalize to other settings.
- It is fine to include aspirational goals as motivation as long as it is clear that these goals are not attained by the paper.

### 2. Limitations

Question: Does the paper discuss the limitations of the work performed by the authors?

Answer: [Yes]

Justification: Yes, there is a limitations section.

Guidelines:

- The answer NA means that the paper has no limitation while the answer No means that the paper has limitations, but those are not discussed in the paper.
- The authors are encouraged to create a separate "Limitations" section in their paper.

- The paper should point out any strong assumptions and how robust the results are to violations of these assumptions (e.g., independence assumptions, noiseless settings, model well-specification, asymptotic approximations only holding locally). The authors should reflect on how these assumptions might be violated in practice and what the implications would be.
- The authors should reflect on the scope of the claims made, e.g., if the approach was only tested on a few datasets or with a few runs. In general, empirical results often depend on implicit assumptions, which should be articulated.
- The authors should reflect on the factors that influence the performance of the approach. For example, a facial recognition algorithm may perform poorly when image resolution is low or images are taken in low lighting.
- The authors should discuss the computational efficiency of the proposed algorithms and how they scale with dataset size.
- If applicable, the authors should discuss possible limitations of their approach to address problems of privacy and fairness.
- While the authors might fear that complete honesty about limitations might be used by reviewers as grounds for rejection, a worse outcome might be that reviewers discover limitations that aren't acknowledged in the paper. Reviewers will be specifically instructed to not penalize honesty concerning limitations.

### 3. Theory assumptions and proofs

Question: For each theoretical result, does the paper provide the full set of assumptions and a complete (and correct) proof?

Answer: [\[Yes\]](#)

Justification: Yes. The hypotheses were all analyzed.

Guidelines:

- The answer NA means that the paper does not include theoretical results.
- All the theorems, formulas, and proofs in the paper should be numbered and cross-referenced.
- All assumptions should be clearly stated or referenced in the statement of any theorems.
- The proofs can either appear in the main paper or the supplemental material, but if they appear in the supplemental material, the authors are encouraged to provide a short proof sketch to provide intuition.

### 4. Experimental result reproducibility

Question: Does the paper fully disclose all the information needed to reproduce the main experimental results of the paper to the extent that it affects the main claims and/or conclusions of the paper (regardless of whether the code and data are provided or not)?

Answer: [\[Yes\]](#)

Justification: The study process was fully documented.

Guidelines:

- The answer NA means that the paper does not include experiments.
- If the paper includes experiments, a No answer to this question will not be perceived well by the reviewers: Making the paper reproducible is important.
- If the contribution is a dataset and/or model, the authors should describe the steps taken to make their results reproducible or verifiable.
- We recognize that reproducibility may be tricky in some cases, in which case authors are welcome to describe the particular way they provide for reproducibility. In the case of closed-source models, it may be that access to the model is limited in some way (e.g., to registered users), but it should be possible for other researchers to have some path to reproducing or verifying the results.

## 5. Open access to data and code

Question: Does the paper provide open access to the data and code, with sufficient instructions to faithfully reproduce the main experimental results, as described in supplemental material?

Answer: [No]

Justification: Data are not provided, but we provide supplemental materials.

Guidelines:

- The answer NA means that paper does not include experiments requiring code.
- Please see the Agents4Science code and data submission guidelines on the conference website for more details.
- While we encourage the release of code and data, we understand that this might not be possible, so “No” is an acceptable answer. Papers cannot be rejected simply for not including code, unless this is central to the contribution (e.g., for a new open-source benchmark).
- The instructions should contain the exact command and environment needed to run to reproduce the results.
- At submission time, to preserve anonymity, the authors should release anonymized versions (if applicable).

## 6. Experimental setting/details

Question: Does the paper specify all the training and test details (e.g., data splits, hyperparameters, how they were chosen, type of optimizer, etc.) necessary to understand the results?

Answer: [Yes]

Justification: All of these were provided.

Guidelines:

- The answer NA means that the paper does not include experiments.
- The experimental setting should be presented in the core of the paper to a level of detail that is necessary to appreciate the results and make sense of them.
- The full details can be provided either with the code, in appendix, or as supplemental material.

## 7. Experiment statistical significance

Question: Does the paper report error bars suitably and correctly defined or other appropriate information about the statistical significance of the experiments?

Answer: [Yes]

Justification: Yes, these were reported.

Guidelines:

- The answer NA means that the paper does not include experiments.
- The authors should answer "Yes" if the results are accompanied by error bars, confidence intervals, or statistical significance tests, at least for the experiments that support the main claims of the paper.
- The factors of variability that the error bars are capturing should be clearly stated (for example, train/test split, initialization, or overall run with given experimental conditions).

## 8. Experiments compute resources

Question: For each experiment, does the paper provide sufficient information on the computer resources (type of compute workers, memory, time of execution) needed to reproduce the experiments?

Answer: [No]

635 Justification: Not applicable.

636 Guidelines:

637 • The answer NA means that the paper does not include experiments.

638 • The paper should indicate the type of compute workers CPU or GPU, internal

639 cluster, or cloud provider, including relevant memory and storage.

640 • The paper should provide the amount of compute required for each of the individual

641 experimental runs as well as estimate the total compute.

642 **9. Code of ethics**

643 Question: Does the research conducted in the paper conform, in every respect, with the

644 Agents4Science Code of Ethics (see conference website)?

645 Answer: [\[Yes\]](#)

646 Justification: Yes, this was conducted in the manner provided.

647 Guidelines:

648 • The answer NA means that the authors have not reviewed the Agents4Science Code

649 of Ethics.

650 • If the authors answer No, they should explain the special circumstances that require

651 a deviation from the Code of Ethics.

652 **10. Broader impacts**

653 Question: Does the paper discuss both potential positive societal impacts and negative

654 societal impacts of the work performed?

655 Answer: [\[Yes\]](#)

656 Justification: Yes, in the discussion section.

657 Guidelines:

658 • The answer NA means that there is no societal impact of the work performed.

659 • If the authors answer NA or No, they should explain why their work has no societal

660 impact or why the paper does not address societal impact.

661 • Examples of negative societal impacts include potential malicious or unintended

662 uses (e.g., disinformation, generating fake profiles, surveillance), fairness consider-

663 ations, privacy considerations, and security considerations.

664 • If there are negative societal impacts, the authors could also discuss possible

665 mitigation strategies.