Check for updates

Received: 11 September 2025 | Accepted: 10 March 2026

DOI: 10.1111/bjso.70073

the british psychological society
promoting excellence in psychology

ARTICLE

Deconstructing the moral circle: Obligations as the driver of moral expansion

Charlie R. Crimston[1] | **Joshua Rottman**[2] | **Karri Neldner**[3] | **Matti Wilks**[4] | **Tarli Young**[5]

[1]School of Medicine & Psychology, Australian National University, Canberra, Australia

[2]Department of Psychology, Franklin & Marshall College, Lancaster, USA

[3]School of Psychological Science, University of Western Australia, Perth, Australia

[4]Department of Psychology, University of Edinburgh, Edinburgh, UK

[5]School of Psychology, University of Queensland, Brisbane, Australia

Correspondence
Charlie R. Crimston, School of Medicine & Psychology, Australian National University, Canberra, Australia.
Email: charlie.crimston@anu.edu.au

Abstract

Who do we believe deserves rights, and when do we feel personally obligated to protect them? Expanding the moral circle has been seen as a hallmark of moral progress, yet existing research has rarely examined how different kinds of moral judgements, recognizing rights versus endorsing obligations, shape this process. The present research disentangles these judgements across human and non-human entities to better understand how they predict prosocial decision-making. Across three studies (N=1256), we consistently found that people were more willing to grant moral rights than to endorse moral obligations, particularly for human targets. Yet only obligations emerged as a reliable predictor of prosocial intentions across both high- and low-cost behaviours. Study 3 extended these findings by distinguishing between positive and negative forms of moral judgement, showing that while negative rights and obligations were attributed more broadly, positive obligations most strongly motivated helping, especially towards non-human entities. Together, these findings demonstrate that rights may expand the moral circle symbolically, but obligations, particularly positive obligations, supply the motivational force that is most closely tied to prosociality. This distinction offers new theoretical insight into moral cognition and highlights practical avenues for fostering prosocial engagement in a time of expanding but often inconsistent moral concern.

KEYWORDS

moral circle, moral concern, moral decision-making, moral expansiveness, prosociality

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.
© 2026 The Author(s). *British Journal of Social Psychology* published by John Wiley & Sons Ltd on behalf of British Psychological Society.

BACKGROUND

What belongs within our moral circle? Of course, there is no objective answer to who or what deserves moral treatment (Goodwin, 2015). Moreover, in daily life, we are often inconsistent. We may acknowledge the moral rights of starving children overseas or profess a love for animals, suggesting an expansive moral concern. Yet we might decline to donate to charities that feed starving children or frequently consume meat, suggesting a narrower concern. These inconsistencies likely reflect varied motivations, constraints or cognitive dissonance. However, one underexplored explanation is the ambiguity in the notion of moral worth.

Specifically, thinking about the moral rights other entities deserve may differ from thinking about the moral obligations moral agents owe to them. Put differently, there may be a difference between acknowledging that another entity deserves moral standing and concluding that I am responsible for ensuring that happens.

In everyday decision-making, to what extent do perceptions of rights and obligations represent distinct moral criteria? And if distinct, how might they differentially connect to prosocial behaviour? In the current research, we examine this distinction and advance understanding of the psychology of the moral circle by (a) conceptually and empirically disentangling judgements of rights versus one's own obligation to defend those rights, (b) testing how these judgements predict prosociality and (c) exploring whether they differ across human and non-human recipients.

The moral circle

The moral circle distinguishes between those deemed worthy and unworthy of moral consideration (Singer, 1981). Although originally philosophical in origin, it has become an increasingly prominent topic within social psychology (Caviola et al., 2018; Crimston et al., 2016, 2018b; Dhont et al., 2019; Graham et al., 2017; Jaeger & Wilks, 2023; Kirkland et al., 2023; Laham, 2009; Opotow, 1993; Waytz et al., 2019). This growing body of work has identified antecedents of moral inclusion (e.g. anthropomorphism, compassion and trust), demonstrated systematic prioritization of humans over non-humans (though see Rottman et al., 2021) and shown that moral inclusion varies across individuals, contexts and development.

Collectively, this research has clarified who we include in our moral circle and under what conditions. However, critics of the traditional binary framework argue that treating moral inclusion as all-or-nothing oversimplifies the structure of moral concern (Crimston et al., 2016; Goodwin, 2015). Humanity's inconsistent application of rights and obligations illustrates this problem: moral inclusion is rarely all-or-nothing but instead reflects multiple forms and degrees of concern that warrant further differentiation.

Varying moral commitments

Not all moral commitments are equal. For example, the collection of entities we feel obligated not to harm is often broader than those towards whom we feel a binding duty to protect or provide (Goodwin & Landy, 2014; Olson et al., 2011; Opotow, 1994; Pizarro et al., 2006). This distinction echoes frameworks that differentiate negative and positive moral claims. Negative rights are 'rights against' interference (e.g. the right not to be harmed), whereas positive rights are 'rights to' provision or support (e.g. the right to be aided; Goodwin, 2015). Similarly, Janoff-Bulman et al. (2009) distinguish between proscriptive morality (avoiding harm) and prescriptive morality (actively doing good). Their work suggests that proscriptive norms are more widely endorsed and seen as mandatory (akin to negative moral rights), while prescriptive norms are applied more selectively (akin to positive moral rights), particularly when fulfilling them entails personal cost.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

These theoretical distinctions reflect everyday moral reasoning. For instance, people may agree it is wrong to harm a stranger but feel no obligation to help them. Recognizing moral standing (e.g. an entity deserving protection) may not necessarily create a sense of obligation to act. This asymmetry in extending moral concern has implications for how we conceptualize and measure moral inclusion.

Deconstructing the moral circle

To address limitations of traditional moral inclusion models, the construct of moral expansiveness (and the associated moral expansiveness scale; MES) was developed as a more nuanced account of moral inclusion (Crimston et al., 2016). Moral expansiveness captures the breadth of entities—human, animal and environmental—judged worthy of moral concern, while also assessing the depth of that concern: the extent to which individuals feel personally responsible for ensuring moral treatment. In this way, moral expansiveness incorporates both perceived moral status and personal obligation, offering a graded, multidimensional view of the moral circle (Figure 1).

Empirical work has demonstrated the reliability of the MES in predicting prosocial intentions and behaviour in adults and children (Crimston et al., 2016, 2018b; Neldner et al., 2018). Research has also explored the developmental trajectory of moral concern (Marshall et al., 2025; Neldner et al., 2018, 2023), antecedents of moral expansiveness (Crimston et al., 2018a, 2022) and the non-linear nature of concern across human and non-human targets (Rottman et al., 2021).

However, the MES in its current form simultaneously assesses perceptions of rights and obligations, raising the possibility that these dimensions are conflated. This may obscure meaningful differences in how people morally evaluate others. To advance the theoretical and empirical utility of the framework, it is important to examine these dimensions independently.

Specifically, disentangling rights from obligations can help answer key questions:

- Do people differentiate between rights and obligations when evaluating human and non-human or proximal versus distant targets?

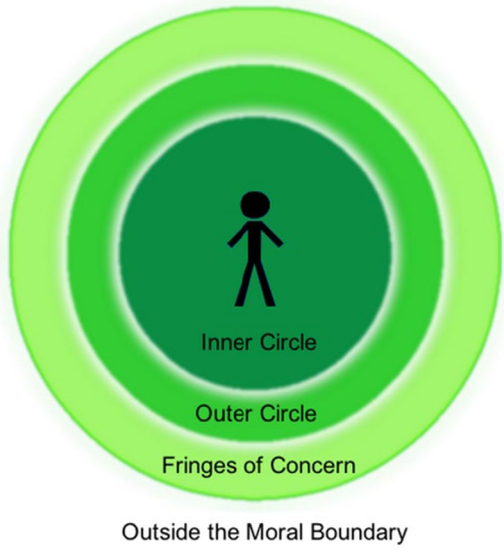

FIGURE 1 The multidimensional approach of the MES (Crimston et al., 2016).

- Are obligations, which often involve greater personal cost (Crimston et al., 2016; Opotow, 1993), more predictive of prosocial action than the ascription of rights?
- How do these dimensions relate to alternative moral frameworks, such as positive versus negative rights?

Holyoak and Powell's (2016) framework of deontological coherence is useful here. Their work suggests that people aim to resolve competing concerns through coherence-seeking across rights and duties. However, coherence does not imply symmetry; rights and obligations may be treated differently depending on context, personal cost or social distance. For example, individuals may affirm that animals have a right to be free from harm, yet feel no personal obligation to donate to animal welfare charities.

Building on this, prior research offers testable predictions. Goodwin and Landy (2014) find that negative rights are generally seen as more fundamental, broadly applicable and easier to extend. Positive rights, by contrast, require greater resource commitments and are less universally applied. In line with this, Gilead et al. (2017) found that violations of positive rights were judged more permissible for socially distant others, whereas negative rights were applied more consistently. Together, these insights underscore the need to empirically separate perceived moral status from felt obligation. Doing so will clarify the psychological asymmetries that shape moral judgement and help explain when and for whom moral concern translates into meaningful action.

The current research

Across three studies, we examined ascriptions of moral rights and obligations, and subsequent prosocial decision-making, towards human and non-human entities. Given the greater cost and commitment of extending obligations, we predicted that people would report more expansive circles of rights than obligations (H1), and that obligations, relative to rights, would be the stronger predictor of prosocial decision-making (H2). Finally, we tested these predictions separately across human and non-human entities, though no specific species-based predictions were made.

STUDY 1

Participants

Two hundred US participants (52.5% identified male, 47.0% female, 0.5% non-binary/other; M_{age} = 35.30, SD = 10.75) were sourced through Amazon's Mechanical Turk. An a priori power analysis was conducted in G*Power to determine the sample size required to detect the predicted main effect of framing (rights vs. obligations). Assuming a small-to-medium effect size of Cohen's f = .15, α = .05, desired power of .95, the analysis indicated that a minimum sample of N = 180 participants was required. Eleven participants (5.50%) were removed from analyses after failing the attention checks, leaving a final sample of 189 for analysis.

Measures and procedure

Using a within-subjects design, participants completed two versions of the MES—the moral rights version and moral obligations version—in random order. Following the completion of these scales, participants completed measures of prosocial decision-making, attention checks and demographics.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Moral expansiveness scale (adapted)

The original MES instructions (Crimston et al., 2016) were amended for each condition to highlight either ascending levels of moral rights or ascending levels of moral obligations (see Table S1). In each version of the MES, participants were tasked with assigning a set of entities into one of four moral boundaries that represent varying degrees of moral worth (inner circle, outer circle, fringes of concern and outside the moral boundary). Definitions for these boundaries were altered across the two versions of the MES to reflect perceived levels of moral rights and moral obligations. For example, the inner circle of moral rights was defined as suitable for entities that '… hold indisputably high levels of moral rights', whereas the inner circle of moral obligations represented those entities for which 'you have an unwavering moral obligation to ensure their protection'.

A list of 20 entities (e.g. family member, refugee, chimpanzee and old growth forest) evenly divided into 10 categories was presented in random order to participants in both conditions (see Table S2 in the Supporting Information for a complete list of entities). Following the procedure of Crimston et al. (2016), overall mean scores were then calculated based on the placement of the 20 entities within the four graded boundaries (inner circle = 3, outer circle = 2, fringes = 1, outside = 0), with higher scores indicating greater moral expansiveness. As with the original MES, both versions of the scale held high internal consistency: moral rights ($\alpha = .91$) and moral obligation ($\alpha = .92$).

Prosociality

Two measures captured intentions to act prosocially towards human and non-human entities. Participants were asked to imagine a scenario in which they had already decided to donate a kidney and were able to choose who the recipient of that kidney would be. Specifically, they were asked to indicate how willing they would be for that kidney to go to a member of six marginalized group identities (e.g. undocumented immigrant and transgender individual; 1 = *extremely unlikely* to 7 = *extremely likely*; $\alpha = .89$). The second measure asked participants to imagine that they had recently inherited a large sum of money and to indicate their willingness to donate to a set of six non-human charities (e.g. save chimpanzee habitats and protect remaining rainforests; 1 = *extremely unlikely* to 7 = *extremely likely*; $\alpha = .96$).

Data analysis

To test differences between moral rights and moral obligations (H1), we conducted within-subject ANCOVAs with MES framing (Rights vs. Obligations) and Target (Human vs. Non-Human) as within-subject factors. Order of completion was included as a covariate due to a detected order effect. To examine associations with prosocial intentions (H2), we computed zero-order Pearson correlations and conducted separate linear regression models predicting human- and non-human-directed prosocial intentions from moral rights and moral obligations scores, entered simultaneously.

Results

We begin by reporting descriptive statistics and testing for potential order effects. We then examine differences between moral rights and moral obligations judgements (H1), including interactions with species. Finally, we test whether moral rights and moral obligations differentially predict human and non-human prosocial intentions (H2).

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 1 Descriptive statistics and correlations from key variables, Study 1.

Variable	Mean (*SD*)	Min–max	1.	2.	3.	4.	5.	6.	7.	8.
1. MES Rights: Overall	1.77 (.55)	0.00–2.95	–	–	–	–	–	–	–	–
2. MES Rights: Humans	2.09 (.57)	0.00–3.00	.82***	–	–	–	–	–	–	–
3. MES Right: Non-humans	1.29 (.83)	0.00–3.00	.81***	.34***	–	–	–	–	–	–
4. MES Obligation: Overall	1.57 (.53)	0.00–3.00	.69***	.50***	.63***	–	–	–	–	–
5. MES Obligation: Humans	1.77 (.51)	0.00–3.00	.60***	.66***	.32***	.82***	–	–	–	–
6. MES Obligation: Non-humans	1.27 (.83)	0.00–3.00	.55***	.20**	.71***	.85***	.40***	–	–	–
7. Prosociality: Humans	3.17 (1.61)	1.00–7.00	.21**	.16*	.18*	.27***	.22**	.23**	–	–
8. Prosociality: Non-humans	4.64 (1.82)	1.00–7.00	.37***	.19**	.42***	.41***	.25**	.42***	.44***	–

Note: *p<.10, **p<.01, ***p<.001.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Preliminary analyses

Descriptive statistics and correlations between key variables are presented in Table 1. An order effect emerged in Study 1, whereby participants who completed the *rights* version of the MES before the *obligations* version reported significantly higher moral obligation scores ($M=1.67$, $SD=0.53$) than participants who completed the *obligation* version first ($M=1.48$, $SD=0.52$), $F(1, 187)=6.45$, $p=.012$, $\eta_p^2=.03$. No order effect emerged on the moral rights measure (*rights* first: $M=1.75$, $SD=0.54$; *obligations* first: $M=1.79$, $SD=0.57$), $F(1, 187)=0.22$, $p=.638$, $\eta_p^2=.001$. As such, the order in which participants completed the MES tasks was controlled for in all analyses.

Differences between moral rights and moral obligations

In line with H1, a within-subjects ANCOVA revealed a main effect of MES framing whereby participants produced higher MES scores when judging the perceived moral rights of other entities ($M=1.69$, $SE=.04$), compared to their moral obligations to protect those entities ($M=1.52$, $SE=.04$), $F(1, 187)=37.18$, $p<.001$, $\eta_p^2=.17$. We found a main effect of species whereby humans ($M=1.93$, $SE=.04$) were deemed more morally worthy overall than non-humans ($M=1.28$, $SE=.06$), $F(1, 188)=71.08$, $p<.001$, $\eta_p^2=.28$. In addition, a significant interaction between these factors also emerged, $F(1, 187)=29.66$, $p<.001$, $\eta_p^2=.14$. Pairwise comparisons indicated that the difference in perceptions of rights versus obligation was only significant for human targets ($M=0.32$, $SE=.03$; $p<.001$), and not for non-human targets ($M=0.02$, $SE=.05$; $p=.731$; Figure 2), whereas the species difference was significant across both moral rights ($M=0.80$, $SE=.06$; $p<.001$) and moral obligation judgements ($M=0.50$, $SE=.06$; $p<.001$). Mean MES scores across the 10 entity categories are also presented in Figure 3 and Table S3.

Predictive power of moral rights versus moral obligations

Beginning with zero-order correlations, perceptions of human moral rights ($r=.16$, $p=.028$) and obligations to human targets ($r=.22$, $p=.003$) were both significantly associated with kidney donation intentions. Similarly, perceptions of non-human moral rights ($r=.42$, $p<.001$) and obligations to non-human targets ($r=.42$, $p<.001$) were both associated with financial donation intentions to environmental

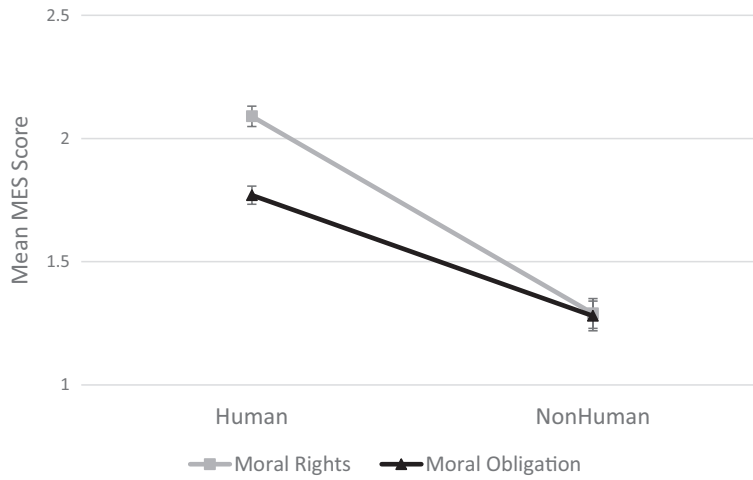

FIGURE 2 Interaction between perceived moral rights versus moral obligation in human and non-human targets, Study 1.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

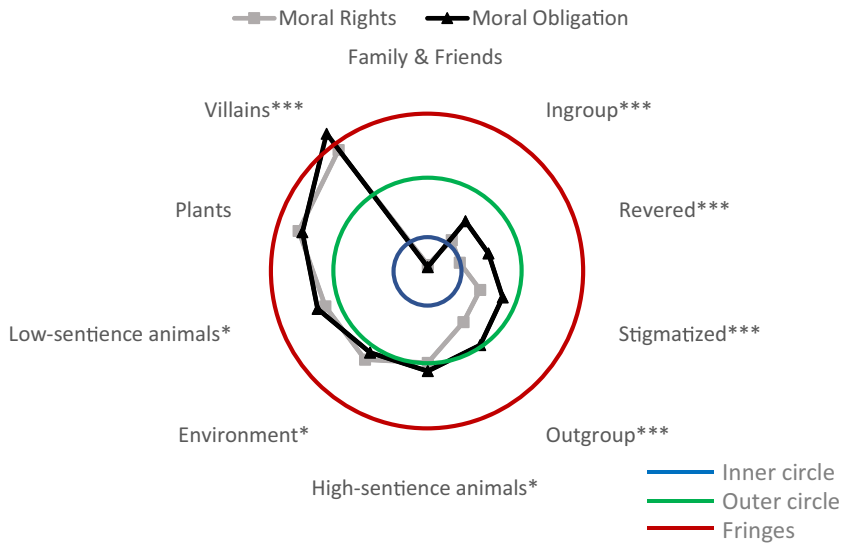

FIGURE 3 Normative pattern of entities on the Moral Expansiveness Scale for judgements of moral rights and moral obligation, Study 1. More central positions indicating greater moral value. *p<.05, ***p<.001.

organizations. When analysing the predictive power of moral rights and moral obligation judgements via linear regression, the model for human prosociality was significant, $F(3, 185)=3.10$, $p=.028$, $R^2=.048$. In line with H2, increased acknowledgement of moral obligations towards humans emerged as a significant and unique statistical predictor of reported willingness to donate a kidney to others, $b=0.20$, $SE=.10$, $p=.041$, 95% CI [0.01, 0.40], however, perceptions of moral rights were no longer significant, $b=0.03$, $SE=.10$, $p=.760$, 95% CI [−0.16, 0.22]. The model for non-human prosociality was also significant, $F(3, 185)=16.13$, $p<.001$, $R^2=.21$. Both perceived moral rights, $b=0.25$, $SE=.09$, $p=.007$, 95% CI [0.07, 0.44], and moral obligations, $b=0.24$, $SE=.09$, $p=.011$, 95% CI [0.06, 0.42] accounted for unique variance in non-human prosocial intentions. Collinearity diagnostics revealed multicollinearity did not reach problematic levels in the human (VIF<1.88) or non-human regressions (VIF<2.03).

Discussion

The results of Study 1 provided strong support for our hypotheses. In line with H1, people were more willing to extend moral rights to other entities than they were to acknowledge a moral obligation to protect these entities. However, this distinction between judgements of moral rights versus obligations emerged only for human targets, with no significant difference observed for non-human entities (when examined as overall categories). Further, in support of H2, moral obligations accounted for unique variance in prosociality towards humans over and above perceptions of moral rights, whereas both rights and obligations independently accounted for unique variance in prosociality towards non-human entities.

STUDY 2

Although Study 1 provided strong support for our predictions, several limitations were identified. In Study 1, the prosocial intention measures differed across human and non-human targets (i.e. kidney donation vs. financial donation), which may account for the differential effects of rights and obligations

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

across species (especially the unique role of obligations for humans). However, it is possible that obligations are more relevant when the prosocial act requires greater commitment (e.g. donating a kidney), and that this may have driven the observed effects. To address these issues, Study 2 included prosocial decision-making measures matched across humans and non-humans, involving either a high time commitment (volunteering) or a lower time commitment (donation). We also refined our MES definitions to more clearly differentiate rights from obligations. All hypotheses and methods for Study 2 were pre-registered (https://aspredicted.org/gwst-8mmc.pdf). We predicted that moral obligations would be more restrictive than moral rights (H1), but that this effect would be moderated by species, emerging only for human targets (H2). We further expected that moral obligations (vs. moral rights) would be the stronger predictor of prosocial intentions (H3).

Participants

Four-hundred and thirty-two US participants (48.60% female, 48.40% male, 3% non-binary/other; M_{age}=29.86, SD=12.72) were sourced through Prolific. To take part, participants had to be residing in the United States, be 18+ years of age and have at least a 95% approval rating on Prolific. Replicating the within-subjects design of Study 1, participants were presented with an introduction to the concept of moral circles before they were asked to complete both versions of the MES in random order. Following the MES tasks, participants completed our updated prosociality measures and attention checks. Twenty-nine participants (6.71%) were removed for either failing one or both attention checks (n=8) or because they experienced technical difficulties when completing the MES measures (n=21), leaving a final sample of 403 for analyses. Study 2 was designed to replicate and extend Study 1 with a larger sample. Based on the effect sizes observed in Study 1 (η_p^2=.17 for the main effect of framing; unstandardized b=0.20–0.25 for regression effects), a post hoc analysis indicated that our sample of N=403 provided adequate power (>95%) to detect effects of similar magnitude.

Measures

Moral rights versus moral obligation

In Study 2, the MES definitions were fine-tuned to more clearly differentiate between perceived moral rights and moral obligations (see Table S4 in the Supporting Information for full definitions). Specifically, moral rights were framed primarily as the deservingness of protection from harm: 'Entities with moral rights are worthy of being granted certain protections (i.e., the protection from harm). Their well-being matters and it would be wrong to harm them'. Moral obligations were framed as representing a personal responsibility to protect other entities, with explicit mention of personal costs: 'Having moral obligations towards other entities means you should protect these entities. Their well-being matters and you have a personal responsibility to defend it'. This decision was made so that each construct would more closely align with existing distinctions of moral worth in the literature, such as the difference between positive and negative rights (see Goodwin, 2015).

Both versions of the MES retained their high internal consistency; moral rights (α=.91), moral obligation (α=.91). In addition, changes were made to the MES entity list for Study 2 to achieve an equal representation of humans (12 targets) and non-human entities (12 targets). The novel non-human categories included 'farmed animals' (cow and pig) and 'pets' (dog, cat; see Table S5 in the Supporting Information for the full entity list). These new lists retained high internal consistency across both the rights (human α=.89; non-human α=.93) and obligations (human α=.87; non-human α=.93) versions of the MES.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 2 Descriptive statistics and correlations from key variables, Study 2.

Variable	Mean (*SD*)	Min–max	1.	2.	3.	4.	5.	6.	7.	8.
1. MES Rights: Humans	2.16 (.46)	0.33–3.00	–	–	–	–	–	–	–	–
2. MES Obligation: Humans	1.74 (.47)	0.33–3.00	.52***	–	–	–	–	–	–	–
3. MES Right: Non-humans	1.73 (.64)	0.00–3.00	.24***	.11*	–	–	–	–	–	–
4. MES Obligation: Non-humans	1.36 (.64)	0.00–3.00	.11*	.35***	.66***	–	–	–	–	–
5. Donation: Humans	2.86 (1.06)	1.00–5.00	.12*	.29***	.12*	.16**	–	–	–	–
6. Volunteering: Humans	2.85 (1.06)	1.00–5.00	.11*	.31***	.10	.17**	.75***	–	–	–
7. Donation: Non-humans	2.69 (1.03)	1.00–5.00	−.01	.13*	.26***	.33***	.64***	.45***	–	–
8. Volunteering: Non-humans	2.81 (1.08)	1.00–5.00	.00	.16**	.27***	.39***	.45***	.65***	.70***	–

Note: *p<.05, **p<.01, ***p<.001.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Prosociality

Four measures captured intentions to act prosocially across a set of eight charitable causes, four of which were human-centred ('feed the homeless', 'legal assistance for minority groups', 'overseas disaster relief', 'medical aid to war-torn countries') and four of which were non-human-centred ('restore local animal shelters', 'protect engendered species', 'protect the world's remaining rainforests' and 'save threatened coral reefs'). Measures were split into intentions to make a financial donation to the causes (lower commitment), split by human ($\alpha = .89$) and non-human entities ($\alpha = .89$), and intentions to volunteer time in order to aid these causes (higher commitment), again split by human ($\alpha = .90$) and non-human entities ($\alpha = .87$; 1 = *none at all* to 5 = *a great deal*).

Data analysis

To examine differences between moral rights and moral obligations (H1–H2), we conducted 2 × 2 within-subject ANCOVAs with MES framing (Rights vs. Obligations) and Target (Human vs. Non-Human) as within-subject factors. Order of completion was again included as a covariate due to the observed order effect. Significant interactions were followed by pairwise comparisons. To examine associations with prosocial intentions (H3), we first computed zero-order Pearson correlations. We then conducted separate linear regression models predicting donation and volunteering intentions (split by human and non-human targets) from moral rights and moral obligations scores, entered simultaneously. Order was controlled for in all models, and collinearity diagnostics were inspected to ensure acceptable variance inflation levels.

Results

We begin by reporting descriptive statistics and testing for order effects, consistent with Study 1. We then examine differences between moral rights and moral obligations judgements across species (H1–H2). Finally, we test whether moral rights and moral obligations differentially predict prosocial intentions (donations and volunteering) towards human and non-human targets (H3).

Preliminary analyses

Descriptive statistics and correlations between all key variables are presented in Table 2. Mean MES scores across the 12 entity categories are presented in Table S6. In line with Study 1, we again saw a significant association between the perceived moral rights and moral obligations towards other entities ($r = .56$, $p < .001$). An MES order effect again emerged as in Study 1. Participants who completed the *rights* version of the MES first reported significantly higher moral obligation scores ($M = 1.61$, $SD = 0.46$) than participants who completed the *obligation* version first ($M = 1.48$, $SD = 0.45$), $F(1, 401) = 8.29$, $p = .004$, $\eta_p^2 = .02$. Once again, no order effect emerged on the moral rights measure (*rights* first: $M = 1.95$, $SD = 0.42$; *obligations* first: $M = 1.94$, $SD = 0.46$), $F(1, 401) = 0.08$, $p = .776$, $\eta_p^2 = .000$. As such, the order in which participants completed the MES tasks was again controlled for in all analyses.

Differences between moral rights and moral obligations

A 2 × 2 within-subjects ANCOVA was conducted. In line with H1, a significant main effect of framing emerged whereby perceived moral rights ($M = 1.95$, $SE = 0.02$) were significantly higher than perceived

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

moral obligations (M=1.55, SE=0.02), F(1, 401)=232.88, p<.001, η_p^2=.37. Predictably, we again saw a main effect of species whereby humans (M=1.95, SE=.02) were deemed more morally worthy overall than non-humans (M=1.55, SE=.03), F(1, 401)=59.70, p<.001, η_p^2=.13. Partially in line with H2, a significant framing × species interaction also emerged, F(1, 402)=5.34, p=.021, η_p^2=.01. However, pairwise comparisons indicated that the mean difference in rights versus obligation judgements was significant for both human (M=0.43, SE=.02; p<.001) and non-human targets (M=0.37, SE=.03, p<.001; Figure 4).

Predictive power of moral rights versus moral obligations

Zero-order correlations again revealed that perceiving greater moral rights was linked to significantly higher donation (human targets: r=.12, p=.014; non-human targets: r=.26, p<.001) and volunteering intentions (human targets: r=.11, p=.028; r=.27, p<.001). Similarly, perceiving greater moral obligations was linked to significantly higher donation (human targets: r=.29, p<.001; non-human targets: r=.33, p<.001) and volunteering intentions (human targets: r=.31, p<.001; non-human targets: r=.39, p<.001).

Consistent with H3, when entered into a regression model, perceived moral obligations towards humans emerged as a significant independent predictor of reported willingness to donate, b=0.31, SE=.06, p<.001, 95% CI [0.20, 0.42], and intentions to volunteer, b=0.35, SE=.06, p<.001, 95% CI [0.24, 0.46] across a range of human charities. In contrast, perceived moral rights were not a significant predictor of donation, b=−0.04, SE=.06, p=.534, 95% CI [−0.15, 0.08] or volunteering intentions in the model, b=−0.07, SE=.06, p=.239, 95% CI [−0.18, 0.04]. Also, in line with H3, the same pattern emerged for non-human targets. Perceived moral obligations towards non-humans were significantly associated with reported willingness to donate, b=0.28, SE=.06, p<.001, 95% CI [0.16, 0.40], and intentions to volunteer, b=0.38, SE=.06, p<.001, 95% CI [0.26, 0.50] across a range of non-human charities. In contrast, perceived moral rights were not significantly tied to intentions to donate, b=0.07, SE=.06, p=.241, 95% CI [−0.05, 0.20] or to volunteer, b=0.02, SE=.06, p=.725, 95% CI [−0.10, 0.14]. As in previous studies, collinearity diagnostics revealed that multicollinearity did not reach problematic levels across the four regression models tested (VIF<1.78).

FIGURE 4 Interaction between perceived moral rights versus moral obligation in human and non-human targets, Study 2.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Discussion

The results of Study 2 provided further robust support for our hypotheses. Perceptions of moral obligations were not as expansive as perceptions of basic moral rights, a difference which was slightly more pronounced for human targets than in was for non-human targets. Moreover, when both constructs were included simultaneously, only perceived moral obligations (not moral rights) was significantly associated with prosocial intentions. This was true of prosocial intentions that required a higher (i.e. volunteering) and lower (i.e. donating money) degree of involvement, across both human and non-human targets.

STUDY 3

Although Study 2 addressed key limitations of Study 1 by matching prosocial behaviours across human and non-human entities and clarifying the distinction between moral rights and obligations, two issues remained untested. First, the operationalization of moral obligations in previous studies included an emphasis on personal responsibility. This raises the question of whether the observed effects were driven by the *obligation* itself or the *personal* nature of responsibility. Second, while our research distinguished between moral rights and obligations, it has not yet examined how these judgements align with broader philosophical distinctions, specifically *positive* (duties to act) and *negative* (duties to refrain) moral claims.

Study 3 was designed to address these points. We removed references to personal responsibility in the moral obligation definition and introduced a new framing manipulation, distinguishing between *positive* and *negative* forms of both moral rights and obligations. This allowed us to examine not only whether people extend rights more broadly than obligations, but also whether they more readily endorse *negative* (e.g. the right not to be harmed) over *positive* (e.g. the right to be helped) moral claims, and whether these effects vary across human and non-human targets. As in Study 2, we also assessed whether these distinctions predict intentions to act prosocially. All hypotheses and methods were pre-registered in accordance with open science practices (https://aspredicted.org/4K8_NL1). We predicted that:

1. people would extend moral rights more broadly than moral obligations;
2. negative rights and obligations would be extended more broadly than positive rights and obligations;
3. there would be a three-way interaction between rights/obligations, positive/negative framing and target type, such that *positive obligations* would show the smallest human–non-human discrepancy, whereas *negative rights* would show the largest;
4. moral obligations would be stronger predictors of prosocial decision-making than moral rights;
5. positive rights and obligations would be stronger predictors of prosocial decision-making than their negative counterparts.

Study 3 also departed from the within-subjects design of Studies 1 and 2 by employing a between-subjects design. This methodological shift was motivated by the consistent order effects observed in both earlier studies: participants who completed the moral rights version of the MES first subsequently reported significantly higher moral obligation scores than those who completed the obligations version first. While we statistically controlled for order in Studies 1–2, the between-subjects design eliminates this confound entirely and provides a more conservative test of our hypotheses. Additionally, replicating our key findings across both within-subjects and between-subjects designs strengthens confidence in their robustness.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Participants

Six-hundred and twenty-four US participants (48.60% female, 49.470% male, 1.6% non-binary/other; M_{age} = 41.99, SD = 14.51) were sourced through Prolific. To take part, participants had to be residing in the United States, be 18+ years of age and have at least a 95% approval rating on Prolific. Participants were randomly assigned to complete one of four versions of the MES (positive moral rights, negative moral rights, positive moral obligations, negative moral obligations). Following the MES task, participants completed the same prosociality measures and attention checks used in Study 2. The sample size for Study 3 was determined a priori via power analysis using GLIMMPSE 3.1.0 for a general linear mixed model. The analysis was conducted to detect the predicted interaction effects among Framing (Rights vs. Obligations), Type (Positive vs. Negative) and Target (Human vs. Non-Human) at $\alpha = .05$. The power analysis indicated that a minimum sample of $N = 588$ participants was required to achieve approximately 80% power ($1 - \beta = .802$). To account for anticipated exclusions (approximately 5%), we aimed to recruit at least 620 participants. Five participants (0.80%) were removed for failing an attention check, leaving a final sample of 619 for analyses.

Measures

Moral rights versus moral obligation

Participants were randomly assigned to complete one of four possible versions of the MES (see Table S7 for the full definitions). Two versions of the Moral Rights MES were created, one that emphasized positive rights (… their moral treatment is vital, and in all cases, it would be wrong for them to be denied their rights) and the other negative rights (… their moral treatment is vital, and in all cases, it would be wrong for them to be harmed). Similarly, two versions of the Moral Obligations MES were drafted, one emphasizing positive obligation (… their moral treatment is vital, and in all cases, there is a commitment to actively protect their well-being) and the other negative obligation (… their moral treatment is vital, and in all cases, there is a commitment to avoid harming them). In Study 3, we retained the 12 human and 12 non-human entity categories used in Study 2 (Table S5). All four versions of the MES produced their high internal consistency: positive moral rights ($\alpha = .92$), negative moral rights ($\alpha = .90$), positive moral obligation ($\alpha = .91$), and negative moral obligation ($\alpha = .92$).

Prosociality

We retained the same prosociality measures from Study 2. We calculated four mean prosociality scores for each participant: two scores for the average prosociality for human ($\alpha = .90$) and non-human ($\alpha = .91$) donation intentions and two for human ($\alpha = .91$) and non-human ($\alpha = .91$) volunteering intentions.

Data analysis

In Study 3, we conducted generalized linear mixed models (GLMMs) to examine the effect of Framing (Rights vs. Obligations), Type (Positive vs. Negative) and Target (Human vs. Non-Human) on participants' moral expansiveness scores. We entered these as fixed effects, along with all interactions. We pre-registered that we would include Participant and Item as random intercepts (available at: https://aspredicted.org/4K8_NL1). However, following the recommendation to keep models maximal (Barr et al., 2013), we also included random slopes of Target on Participant, allowing each participant to have a different slope for Human and non-Human entities and a random slope for the effect of Type

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

and Framing on each Entity, allowing condition differences to vary by entity type. For full details, see Supporting Information.

For the prosociality measures, we conducted Pearson correlations between variables and linear regression models to examine the predictive effect of mean moral expansiveness, Framing and Type on prosociality scores (split into human and non-human models). However, unlike previous studies, we included a three-way interaction between moral concern, Framing and Type, as the effect of Framing and Type was expected to be stronger for individuals with high levels of concern than for those with low levels.

Results

We first report descriptive statistics. We then test our pre-registered predictions regarding differences in moral expansiveness as a function of Framing (Rights vs. Obligations), Type (Positive vs. Negative) and Target (Human vs. Non-Human) using GLMMs (H1–H3). Finally, we examine whether MES scores differentially predict prosocial intentions as a function of Framing and Type (H4–H5).

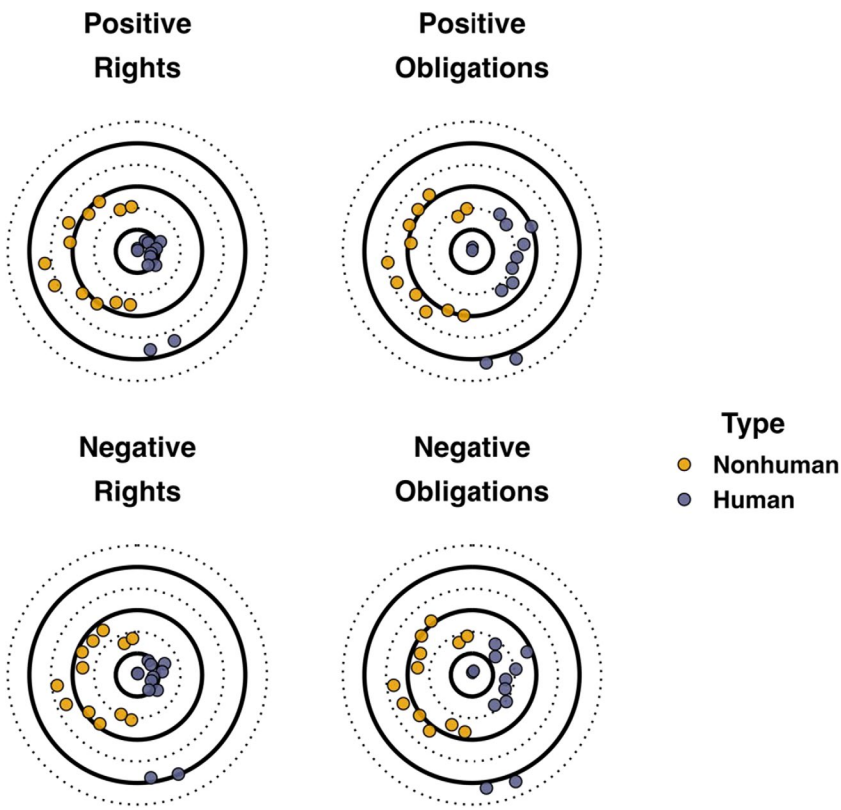

FIGURE 5 Mean moral scores for each Human and Non-human entity, Study 3. Values closest to the centre represent the highest levels of concern. Bold circles indicate the boundaries dividing each level of concern. Bold central circle: Entities inside this circle were in the *inner circle* of concern (score = 3), bold middle circle: Entities inside this circle were in the *outer circle* of concern (score = 2), bold outer circle: Entities inside this circle were in the *fringes* of concern (score = 1), and entities outside this circle were *outside* the circle of concern (score = 0).

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

TABLE 3 Descriptive statistics and correlations from key variables, Study 3, separated by framing conditions (rights vs. obligations).

Variable	Mean (*SD*)	Min–max	Within-group correlations			
			1.	2.	3.	4.
1. MES Rights: Humans	2.31 (1.03)	0.00–3.00	–	–	–	–
2. MES Obligations: Humans	1.85 (1.08)	0.00–3.00	–	–	–	–
3. MES Rights: Non-humans	1.60 (.94)	0.00–3.00	.22***	–	–	–
4. MES Obligation: Non-humans	1.54 (.92)	0.00–3.00	–	.32***	–	–
5. Donation: Humans	2.60[a] (1.10)	1.00–5.00	.08	.24***	.04	.04
6. Volunteering: Humans	2.57[a] (1.15)	1.00–5.00	.07	.27***	.11	.12*
7. Donation: Non-humans	2.59[a] (1.09)	1.00–5.00	−.08	.04	.14*	.27***
8. Volunteering: Non-humans	2.64[a] (1.15)	1.00–5.00	−.05	.05	.22***	.34***

Note: *$p<.05$, ***$p<.001$.

[a]These are overall sample mean and *SD* scores, collapsed across both Rights and Obligations conditions.

Mean MES scores across the 12 entity categories are presented in Table S8 and Figure 5. Descriptive statistics and correlations between key variables are presented in Table 3. An expanded set of correlations between MES versions and donation outcome measures is presented in Table S9.

Differences between moral rights and moral obligations

In line with H1, our GLMM found a significant effect of Framing, with participants in the moral rights conditions ($M=1.96$, $SD=1.05$) having more expansive circles than participants in the moral obligation conditions ($M=1.69$, $SD=1.01$; $\beta=-.02$, $SE=.10$, $F(1, 64.11)=22.05$, $p<.001$; 95% CIs [−0.21, 0.17]). In line with H2, we found that participants making judgements about negative rights/obligations ($M=1.88$, $SD=1.03$) had more expansive moral circles than participants making judgements about positive rights/obligations ($M=1.77$, $SD=1.04$; $\beta=.21$, $SE=.08$; $F(1, 454.71)=7.21$, $p=.008$; 95% CIs [0.07, 0.37]).

These effects were qualified by a series of interactions, which showed partial support for H3. While participants reported higher expansiveness for human targets in the rights conditions ($M=2.31$, $SD=1.03$) than in the obligation conditions ($M=1.85$, $SD=1.08$), no significance difference emerged for non-human targets between the rights ($M=1.60$, $SE=.94$) and obligations conditions ($M=1.54$, $SD=0.92$; Figure 6) In addition, there were significant interaction effects between Framing and Target ($\beta=-.54$, $SE=.11$; $F(1, 42.84)=16.19$, $p<.001$; 95% CIs [−0.77, −0.32]) and Type and Target, ($\beta=-.29$, $SE=.08$; $F(1, 293.35)=6.35$, $p=.012$; 95% CIs [−0.45, −0.13]).

The 3-way interaction between Framing, Type and Target qualified these effects, with participants in the positive rights condition showing the strongest difference in moral expansiveness towards human ($M=2.34$, $SD=1.03$) and non-human targets ($M=1.49$, $SD=0.96$; $\beta=.28$, $SE=.11$; $F(1, 611.22)=6.17$, $p=.013$; 95% CIs [0.06, 0.50]), followed by negative rights (humans: $M=2.27$, $SD=1.03$; non-humans: $M=1.71$, $SD=0.91$), which was in contrast to our predictions that negative rights would show the greatest contrast. As predicted, positive obligations was the most similar between types of entities (humans: $M=1.78$, $SD=1.05$; non-humans: $M=1.47$, $SD=0.89$). Our conditional r squared revealed that while our fixed effects explained 9% of the variation in our data, the total model explained 71% variance, revealing that much of the variation derives from variation in individuals' judgements across the various entities (captured in our random effects) (Figure 7).

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

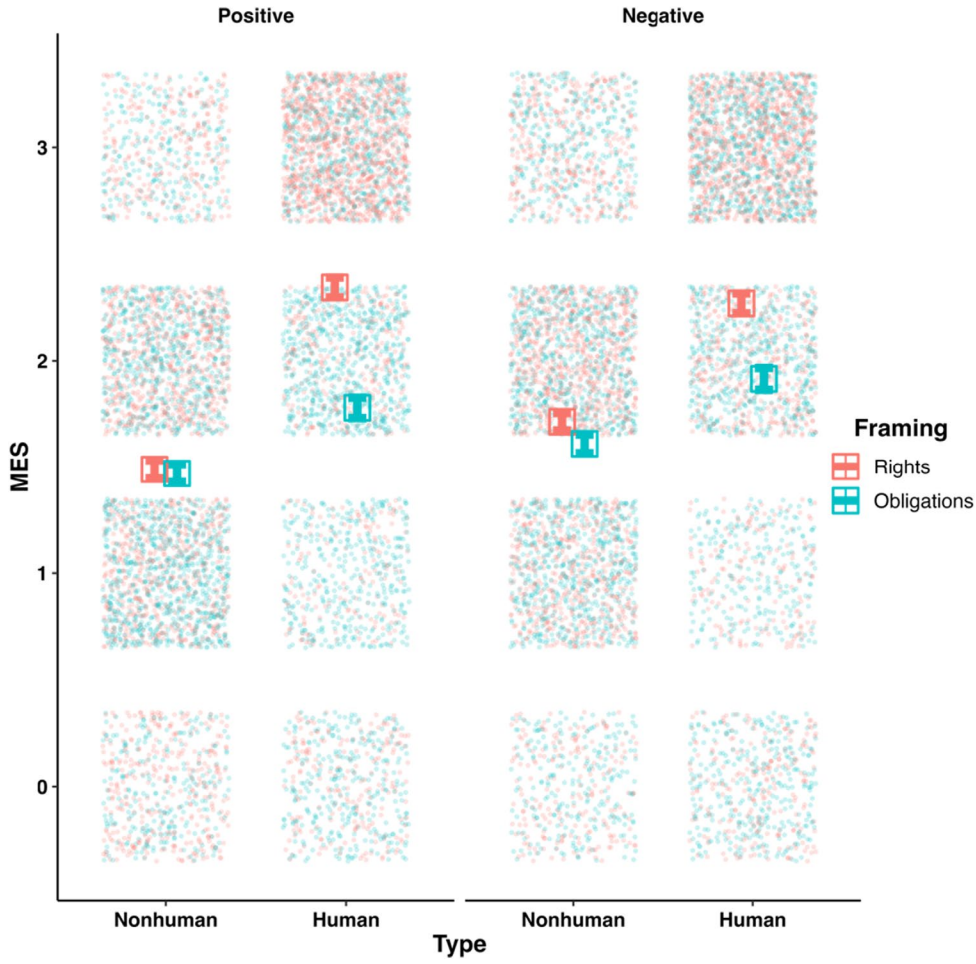

FIGURE 6 Perceived moral rights were extended more broadly than perceived moral obligations for human targets only (Study 3). The scattered dots depict raw participant concern scores for each human and non-human entity, jittered for better visualization. The mean moral expansiveness scores in each condition are shown with square blocks, with standard deviation bars included. Here we can see that the plotted mean MES were higher for rights than obligations when evaluating human targets (across both positive and negative framing), whereas this difference was not observed for non-human targets.

Predictive power of moral rights versus moral obligations

For participants in the moral rights condition, while MES scores for humans were not significantly associated with donation or volunteering intentions for human targets (Table 3), scores for non-humans were positively associated with donation and volunteering intentions for non-human targets. For participants in the moral obligations condition, higher obligation scores were significantly associated with higher donations and volunteering intentions for both human and non-human targets (Figure 8).

Both regression models for human targets revealed a significant 2-way interaction between MES scores for humans and Framing, suggesting that at high levels of reported concern, participants in the Obligations condition reported a willingness to donate more money (Figure 7), and volunteer more time (Figure 9), to human charities than participants in the Rights condition (Donations: $b = 0.41$, $SE = .27$, $p = .048$, 95% CIs [−0.12, 0.95]; Volunteering: $b = 0.58$, $SE = .28$, $p = .017$, 95% CIs [0.02, 1.14]). However, at low levels of reported concern, no significant differences were found. The type of framing (positive or negative) was not significantly associated with donation or volunteering intentions towards human charities.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

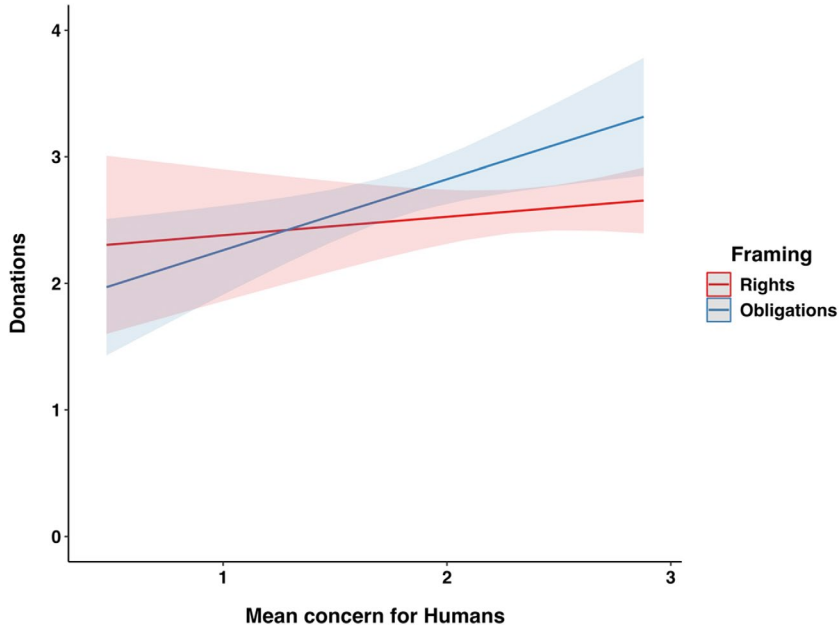

FIGURE 7 At higher levels of MES scores for human targets, moral obligation framing was more strongly associated with donation intentions than moral rights framing. With lower MES scores, no difference between framings emerged.

Both regression models for non-human targets revealed a significant 3-way interaction between MES scores for humans, Framing and Type, suggesting that at high levels of reported concern, and when discussing positive rights/obligations, participants in the Obligations condition reported higher donation (Figure 8), and volunteering intentions (Figure 10) to non-human charities, (Donations: $b = -0.69$., $SE = .26$, $p = .008$, 95% CI [−1.19, −0.18]; Volunteering: $b = -0.67$, $SE = .27$, $p = .013$, 95% CI [−1.19, −0.14]). However, at low levels of reported concern, and when discussing negative rights/obligations, there was no difference between Rights and Obligations conditions. As in previous studies, no models showed problematic values for multicollinearity (VIF = 1 for all variables when using an adjusted Generalized Variance Inflation Factor (GVIF) to account for interaction terms in the regression e; Fox & Monette, 1992).

Discussion

The results of Study 3 provided partial support for our hypotheses. Consistent with H1, participants extended moral rights more expansively than obligations, a difference especially pronounced for humans compared to non-humans. In line with H2, negative rights and obligations were extended more broadly than positive ones. The three-way interaction (H3) offered partial support: as predicted, positive obligations were judged most similarly across humans and non-humans, but contrary to expectations, positive rights showed the largest human–non-human differentiation. With respect to prosocial behaviour, results supported H4: moral obligations showed stronger and more consistent associations with donation and volunteering intentions than moral rights. Finally, findings for H5 offered partial support: type (positive vs. negative) did not matter for human-directed behaviour, but for non-human targets, positive obligations were associated with greater intentions to donate and volunteer at high levels of moral concern.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

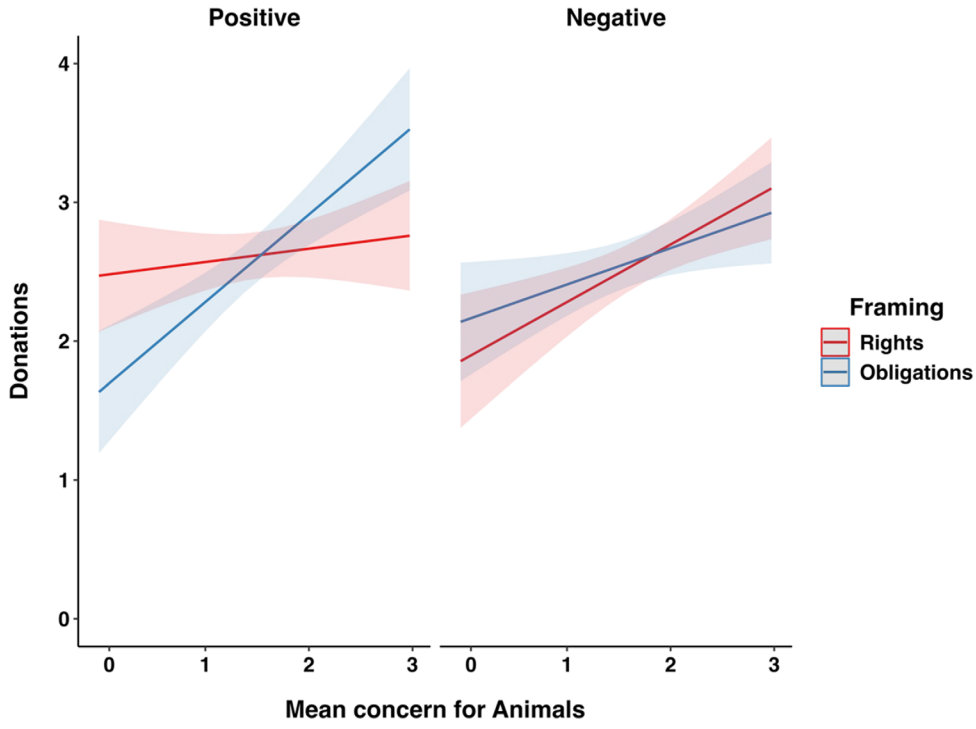

FIGURE 8 Among participants with high MES scores for animals, positive obligation framing was associated with higher donation intentions than positive rights framing. No differences between framings emerged under negative conditions.

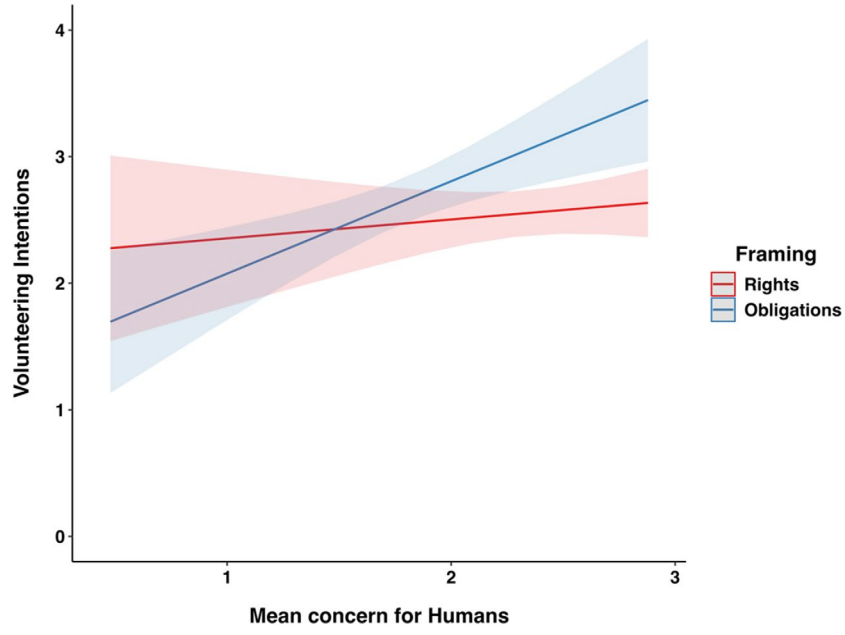

FIGURE 9 At higher levels of MES scores for human targets, obligation framing was more strongly associated with volunteering intentions than rights framing. No framing differences were observed at lower MES levels.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

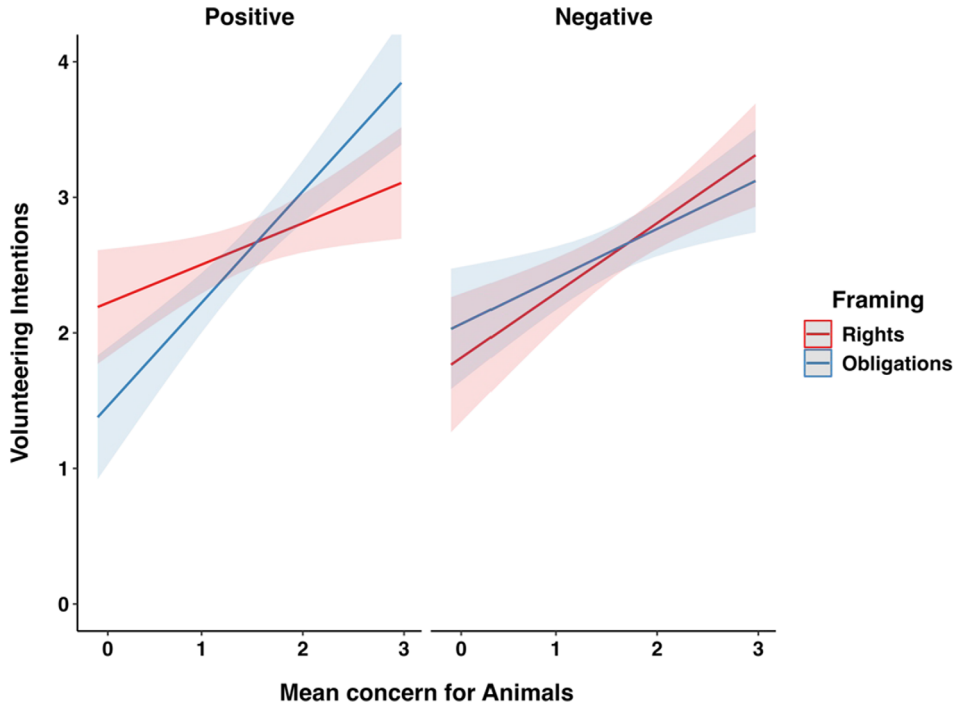

FIGURE 10 Among participants with high MES scores for animals, positive obligation framing was associated with higher volunteering intentions than positive rights framing. No differences between framings emerged under negative conditions or at low MES levels.

GENERAL DISCUSSION

The current research revealed important differences in how people ascribe moral rights versus obligations to other entities, especially in how these judgements connect to prosocial decision-making. Across three studies, we found that people are more willing to say a wide range of humans and non-humans deserve basic rights than to say they personally have an obligation to protect those same entities.

In Study 1, this distinction emerged only for human targets, with no significant differences for non-humans considered as a broad category. In addition, for humans, only obligations were uniquely associated with prosociality towards humans, whereas for non-humans, both rights and obligations were independently tied to prosocial behaviour intentions. In Study 2, the rights–obligations distinction was again more pronounced for humans. Importantly, obligations were the sole unique statistical predictor of prosocial intentions across both high-involvement behaviours (volunteering) and lower-involvement behaviours (donating money), for humans and non-humans.

Study 3 reinforced these patterns while extending them in important ways. As in the earlier studies, rights were extended more broadly than obligations, particularly for humans, and obligations showed stronger associations with prosocial behaviour intentions. At the same time, Study 3 revealed that the type of moral judgement mattered: negative rights and obligations were granted more widely than positive ones, and positive obligations stood out as being uniquely tied to helping, especially towards non-humans.

Variations in moral commitments

Together, these studies show that people are generally more willing to grant rights than to assume obligations, especially for humans. Yet it is obligations, particularly positive obligations, that were more

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

consistently associated with prosocial intentions. These findings suggest that obligations may play a distinctive role in moral circle expansion.

These conclusions align with prior claims that our circles of basic commitments not to harm are distinct from our circles of binding commitments to protect and provide (Goodwin, 2015; Goodwin & Landy, 2014; Pizarro et al., 2006). Similarly, the current findings resonate with omission bias (Baron & Hershey, 1988; Baron & Ritov, 2004; Kordes-de Vaal, 1996). Specifically, rights extending more broadly than obligations correspond with findings that people consider it more wrong to actively harm an entity than to fail to help it.

These findings advance understanding of the moral circle and connect to accounts of moral circle expansion (Crimston et al., 2016; Singer, 1981). While rights may broaden the circle symbolically, they often lack the action potential to translate concern into behaviour. Obligations, by contrast, appear to function as the bridge between recognizing rights and acting on them. Conceptually, we propose that acknowledging rights represents a lower level of moral commitment than accepting an obligation. In this sense, obligations appear reminiscent of deeply held moral convictions (Skitka, 2010). As moral convictions produce high action potential and a refusal to compromise (Skitka, 2010), we would expect greater reluctance to violate obligations relative to rights. Moreover, given the enhanced commitment of obligations, acknowledgements of obligations likely rely on acknowledgements of rights, while rights can exist without obligations. However, additional data are needed to investigate these possibilities (see discussion below on longitudinal analyses).

We also found evidence of species-level differences, most notably that the rights–obligations gap was larger for humans than non-humans. Though both rights and obligations were elevated for humans, the gap may reflect the expectation that humans reliably possess the agency to flourish independently. By contrast, because non-humans are perceived to lack traits of responsibility and self-determination, we may more readily judge them as warranting protective obligations. Study 3 adds nuance here: although non-humans were attributed fewer rights overall, when people did endorse positive obligations towards them, these obligations strongly predicted helping. At the same time, and contrary to expectations, positive rights showed the greatest human–non-human differentiation (with humans awarded these rights more readily than non-humans), suggesting that people may draw sharper boundaries around who is granted proactive entitlements compared to who is owed protection.

This asymmetry resonates with a broader literature showing that moral commitments towards non-humans are comparatively fragile. Non-humans are often valued instrumentally or seen as exploitable when their needs conflict with human goals (Dhont & Hodson, 2014, 2019). Research on human–animal relations highlights this inconsistency: people connect strongly with some animals (e.g. pets) but readily withdraw concern when moral costs arise (e.g. farmed animals; Amiot & Bastian, 2015; Bastian & Crimston, 2016; Bastian, Costello, et al., 2012; Caviola et al., 2018). Social psychological theory points to dissonance reduction, habits and social norms as mechanisms that help people resolve these tensions (Bastian & Loughnan, 2017). Our findings extend this work by showing that although non-humans may be granted fewer rights, endorsement of positive obligations can nonetheless motivate meaningful prosocial behaviour.

The current findings also inform the measurement of moral expansiveness. While both perceived rights and obligations were initially built into the MES to be inclusive of all relevant considerations regarding moral valuation, it is clear from our data that moral obligations are doing most of the heavy lifting when it comes to predicting subsequent prosociality. Moreover, Study 3 shows that the type of moral judgement matters: negative rights and obligations were attributed more broadly, but positive obligations were uniquely predictive of prosocial behaviour. This suggests that obligation-based measures may need to distinguish between avoidance ('do no harm') and proactive ('help and protect') commitments. In addition, the current findings highlight that the MES could be adapted to study various forms of moral worth depending on the research questions being explored (e.g. wanting to capture the breadth of strong vs. weaker moral commitments). In light of the current findings, an avenue for future research might be to determine whether an obligation-based framing of the MES empirically invokes the same stubbornness and call to action as stringent moral convictions.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Implications for MES research and intervention

The present findings clarify the distinct roles of moral standing and personal commitment within moral expansiveness. The scale was developed to capture both the breadth of moral inclusion and the depth of commitment to ensure moral treatment (Crimston et al., 2016), and as such, reflects an integrated form of moral valuation in which moral standing and felt responsibility are intertwined. Our results suggest, however, that these components can show distinct empirical patterns.

Across studies, rights were extended more broadly than obligations, whereas obligations were more consistently associated with prosocial intentions. This distinction helps specify which aspect of moral expansiveness may be most closely tied to subsequent moral and prosocial action. One interpretation is that rights may represent a lower-threshold form of moral recognition, whereas obligations reflect a higher-commitment stance that carries greater action potential. In this sense, rights may be necessary for moral inclusion, but obligations may be more of a trigger for motivating costly engagement.

This distinction may help contextualize prior MES findings. For example, earlier work linking moral expansiveness to prosocial behaviour (Crimston et al., 2016) may primarily reflect variation in obligation-based concern embedded within the scale, as perceived obligations appear more closely tied to behavioural intentions than recognition of rights alone. Similarly, research documenting variation in the structure of moral expansiveness, such as individuals who prioritize concern for nature over humans (Rottman et al., 2021), may reflect differences in the commitments people feel towards different entities, including stronger stewardship-based obligations towards the natural world. Distinguishing rights from obligations therefore provides a clearer lens for interpreting when moral inclusion reflects behavioural commitment versus broader moral recognition.

These findings also provide guidance for future research. When the focus is on symbolic inclusion—who is seen as meriting moral consideration—rights-based framings may be appropriate. When the goal is to understand when moral concern translates into costly helping, obligation-based framings may be more diagnostic. Study 3 further suggests that distinguishing between negative commitments (avoiding harm) and positive commitments (actively helping and protecting) may be especially important, as positive obligations were most consistently associated with prosocial intentions.

More broadly, this distinction may help explain why moral circle expansion often appears broad in principle, yet inconsistent in practice (Bastian, Loughnan, et al., 2012). For example, people may acknowledge the moral rights of starving children overseas or profess a love for animals, yet decline to donate to relevant charities or continue to consume meat. In such cases, rights may be extended widely, while obligations are reserved more selectively, creating a gap between expressed moral inclusion and enacted moral responsibility.

Finally, the rights–obligations distinction has implications for experimental work seeking to shift moral expansiveness. Prior research shows that moral expansiveness can be experimentally increased (Kirby et al., 2024; Song et al., 2023). The present framework suggests that such interventions may differentially affect rights-based recognition and obligation-based commitment. It is possible that some manipulations broaden perceived rights without increasing felt obligation, whereas others may strengthen obligation-based commitments, particularly positive obligations, which appear most closely tied to prosocial behaviour. Future work could examine whether shifts in moral expansiveness are concentrated in one component and whether this explains variation in behavioural outcomes.

Limitations and future directions

Moving forward, there are a number of additional considerations for future research. In the current research, we did not directly test the causal links between moral rights and obligations. However, an order effect observed in Studies 1 and 2 suggested that participants who completed the moral rights version of the MES before the obligations version subsequently reported higher obligation scores compared to those who completed obligations first. This pattern may simply reflect a general

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

preference for consistency (Guadagno & Cialdini, 2010). Alternatively, it may hint that recognizing rights can sometimes scaffold stronger obligations: once we acknowledge another entity as having moral standing, we become more willing to accept a personal responsibility to defend that status. Future research using longitudinal and experimental designs will be needed to clarify whether rights reliably precede and influence obligations, or whether this order effect reflects a short-term consistency bias.

In addition, the current studies only investigated links to prosociality in the form of intentions, not actual behaviours. Though past work has established links between MES decision-making and prosocial behaviours (Crimston et al., 2016), future research should examine whether the predictive distinction between moral rights and obligations holds when tested against actual behaviour (FeldmanHall et al., 2012). This could include donation tasks, volunteering opportunities, or costly helping scenarios, allowing stronger conclusions about the behavioural force of obligations.

The current data also cannot speak to why differences emerged between perceived rights and obligations across species. One avenue would be to identify and unpack the dimensions that qualify targets for rights and obligations. For instance, given that mind perception plays a crucial role in determining moral status (Gray et al., 2012; Rottman et al., 2021; Waytz et al., 2010), future research could examine the relationships between dimensions of mind perception (e.g. agency and patiency; Gray et al., 2007) and various forms of moral worth (Piazza et al., 2014). Relatedly, examining finer distinctions between MES targets may provide further insights into MES decision-making (e.g. ingroup vs. outgroup, sentient animals vs environmental objects). Study 3 also highlighted that positive rights, unexpectedly, showed the largest human–non-human differentiation. Replicating and unpacking this effect will be crucial, as it may reveal boundary conditions on how entitlements are granted across species.

Finally, future research might provide further insight into the mechanisms that transform moral rights into obligations. Specifically, it will be important to identify the factors that lead to commitments resistant to motivational whims and that reduce moral disengagement in pursuit of self-interest (Bandura, 1999; Bandura et al., 1996). This may include studying interventions that amplify positive obligations, exploring cross-cultural differences in the salience of rights versus obligations, and testing whether obligation-based framings invoke the same stubbornness and action potential as moral convictions (Skitka, 2010), potentially leading to the creation of moral obligation norms.

CONCLUSIONS

Who deserves our moral concern, and when do we feel responsible for protecting them? The current research shows these are not the same question. Across three studies, we found a clear distinction between recognizing that others deserve basic rights and accepting a personal obligation to act on their behalf. Entities are more likely to be treated morally not just when their well-being is acknowledged as relevant, but when people feel personally responsible for defending it. This gap between rights and obligations has important consequences: rights may broaden our moral circle symbolically, but obligations may drive us to follow through with prosocial action. As standards of moral consideration continue to expand (Pinker, 2011), it will be increasingly important to understand not only who we believe deserves rights but also who moves us to step into the role of moral guardian.

AUTHOR CONTRIBUTIONS

Charlie R. Crimston: Conceptualization; methodology; investigation; funding acquisition; writing – original draft; writing – review and editing; data curation; formal analysis. **Joshua Rottman:** Conceptualization; methodology; writing – original draft; writing – review and editing; formal analysis; investigation. **Karri Neldner:** Writing – review and editing; formal analysis; writing – original draft; investigation. **Matti Wilks:** Writing – review and editing; writing – original draft; investigation. **Tarli Young:** Writing – review and editing; writing – original draft.

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

ACKNOWLEDGEMENTS

Open access publishing facilitated by Australian National University, as part of the Wiley - Australian National University agreement via the Council of Australasian University Librarians.

CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interests.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study will be made openly available on the Open Science Framework upon publication of this manuscript.

ORCID

Charlie R. Crimston https://orcid.org/0000-0002-4529-786X

REFERENCES

Amiot, C. E., & Bastian, B. (2015). Toward a psychology of human-animal relations. *Psychological Bulletin*, *141*(1), 6–47. https://doi.org/10.1037/a0038147

Bandura, A. (1999). Moral disengagement in the perpetration of inhumanities. *Personality and Social Psychology Review*, *3*(3), 193–209. https://doi.org/10.1207/s15327957pspr0303_3

Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1996). Mechanisms of moral disengagement in the exercise of moral agency. *Journal of Personality and Social Psychology*, *71*(2), 364–374. https://doi.org/10.1037/0022-3514.71.2.364

Baron, J., & Hershey, J. C. (1988). Outcome bias in decision evaluation. *Journal of Personality and Social Psychology*, *54*(4), 569–579. https://doi.org/10.1037/0022-3514.54.4.569

Baron, J., & Ritov, I. (2004). Omission bias, individual differences, and normality. *Organizational Behavior and Human Decision Processes*, *94*(2), 74–85. https://doi.org/10.1016/j.obhdp.2004.03.003

Barr, D. J., Levy, R., Scheepers, C., & Tily, H. J. (2013). Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of Memory and Language*, *68*(3), 255–278. https://doi.org/10.1016/j.jml.2012.11.001

Bastian, B., Costello, K., Loughnan, S., & Hodson, G. (2012). When closing the human-animal divide expands moral concern: The importance of framing. *Social Psychological and Personality Science*, *3*(4), 421–429. https://doi.org/10.1177/1948550611425106

Bastian, B., & Crimston, D. (2016). The moral psychology of resource use. In *The social psychology of morality* (pp. 274–288). Routledge. https://doi.org/10.4324/9781315644189

Bastian, B., & Loughnan, S. (2017). Resolving the meat-paradox: A motivational account of morally troublesome behavior and its maintenance. *Personality and Social Psychology Review*, *21*(3), 278–299. https://doi.org/10.1177/1088868316647562

Bastian, B., Loughnan, S., Haslam, N., & Radke, H. R. (2012). Don't mind meat? The denial of mind to animals used for human consumption. *Personality and Social Psychology Bulletin*, *38*(2), 247–256. https://doi.org/10.1177/0146167211424291

Caviola, L., Everett, J. A. C., & Faber, N. S. (2018). The moral standing of animals: Towards a psychology of speciesism. *Journal of Personality and Social Psychology*, *116*(6), 1011–1029. https://doi.org/10.1037/pspp0000182

Crimston, C. R., Bain, P. G., Hornsey, M. J., & Bastian, B. (2016). Moral expansiveness: Examining variability in the extension of the moral world. *Journal of Personality and Social Psychology*, *111*(4), 636–653. https://doi.org/10.1037/pspp0000086

Crimston, C. R., Blessing, S., Gilbert, P., & Kirby, J. N. (2022). Fear leads to suffering: Fears of compassion predict restriction of the moral boundary. *British Journal of Social Psychology*, *61*(1), 345–365. https://doi.org/10.1111/bjso.12483

Crimston, C. R., Hornsey, M. J., Bain, P. G., & Bastian, B. (2018a). Moral expansiveness short form: Validity and reliability of the MESx. *PLoS One*, *13*, e0205373. https://doi.org/10.1371/journal.pone.0205373

Crimston, C. R., Hornsey, M. J., Bain, P. G., & Bastian, B. (2018b). Toward a psychology of moral expansiveness. *Current Directions in Psychological Science*, *27*(1), 14–19. https://doi.org/10.1177/0963721417730888

Dhont, K., & Hodson, G. (2014). Why do right-wing adherents engage in more animal exploitation and meat consumption? *Personality and Individual Differences*, *64*, 12–17. https://doi.org/10.1016/j.paid.2014.02.002

Dhont, K., & Hodson, G. (2019). *Why we love and exploit animals: Bridging insights from academia and advocacy*. Routledge.

Dhont, K., Hodson, G., Loughnan, S., & Amiot, C. E. (2019). Rethinking human-animal relations: The critical role of social psychology. *Group Processes & Intergroup Relations*, *22*(6), 769–784. https://doi.org/10.1177/1368430219864455

FeldmanHall, O., Mobbs, D., Evans, D., Hiscox, L., Navrady, L., & Dalgleish, T. (2012). What we say and what we do: The relationship between real and hypothetical moral choices. *Cognition*, *123*(3), 434–441. https://doi.org/10.1016/j.cognition.2012.02.001

Fox, J., & Monette, G. (1992). Generalized collinearity diagnostics. *Journal of the American Statistical Association*, *87*(417), 178–183.

Gilead, M., David, Y. B., & Ecker, Y. (2017). Not our fault: Judgments of apathy versus harm toward socially proximal versus distant others. *Social Psychological and Personality Science*, *9*(5), 568–575. https://doi.org/10.1177/1948550617714583 (Original work published 2018).

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

Goodwin, G. P. (2015). Experimental approaches to moral standing. *Philosophy Compass*, *10*(12), 914–926. https://doi.org/10.1111/phc3.12266

Goodwin, G. P., & Landy, J. F. (2014). Valuing different human lives. *Journal of Experimental Psychology. General*, *143*, 778–803. https://doi.org/10.1037/a0032796

Graham, J., Waytz, A., Meindl, P., Iyer, R., & Young, L. (2017). Centripetal and centrifugal forces in the moral circle: Competing constraints on moral learning. *Cognition*, *167*, 58–65. https://doi.org/10.1016/j.cognition.2016.12.001

Gray, H. M., Gray, K., & Wegner, D. M. (2007). Dimensions of mind perception. *Science*, *315*(5812), 619. https://doi.org/10.1126/science.1134475

Gray, K., Young, L., & Waytz, A. (2012). Mind perception is the essence of morality. *Psychological Inquiry*, *23*(2), 101–124. https://doi.org/10.1080/1047840X.2012.651387

Guadagno, R. E., & Cialdini, R. B. (2010). Preference for consistency and social influence: A review of current research findings. *Social Influence*, *5*(3), 152–163. https://doi.org/10.1080/15534510903332378

Holyoak, K. J., & Powell, D. (2016). Deontological coherence: A framework for commonsense moral reasoning. *Psychological Bulletin*, *142*(11), 1179–1203. https://doi.org/10.1037/bul0000075

Jaeger, B., & Wilks, M. (2023). The relative importance of target and judge characteristics in shaping the moral circle. *Cognitive Science*, *47*(10), e13362. https://doi.org/10.1111/cogs.13362

Janoff-Bulman, R., Sheikh, S., & Hepp, S. (2009). Proscriptive versus prescriptive morality: Two faces of moral regulation. *Journal of Personality and Social Psychology*, *96*(3), 521–537. https://doi.org/10.1037/a0013779

Kirby, J. N., Hoang, A., & Crimston, C. R. (2024). A brief compassion focused therapy intervention can increase moral expansiveness: A randomized controlled trial. *Mindfulness*, *15*(2), 282–294. https://doi.org/10.1007/s12671-023-02300-7

Kirkland, K., Crimston, C. R., Jetten, J., Rudnev, M., Acevedo-Triana, C., Amiot, C. E., Ausmees, L., Baguma, P., Barry, O., Becker, M., Bilewicz, M., Boonyasiriwat, W., Castelain, T., Costantini, G., Dimdins, G., Espinosa, A., Finchilescu, G., Fischer, R., Friese, M., … Bastian, B. (2023). Moral expansiveness around the world: The role of societal factors across 36 countries. *Social Psychological and Personality Science*, *14*(3), 305–318. https://doi.org/10.1177/19485506221101767

Kordes-de Vaal, J. H. (1996). Intention and the omission bias: Omissions perceived as nondecisions. *Acta Psychologica*, *93*(1–3), 161–172. https://doi.org/10.1016/0001-6918(96)00027-3

Laham, S. M. (2009). Expanding the moral circle: Inclusion and exclusion mindsets and the circle of moral regard. *Journal of Experimental Social Psychology*, *45*(1), 250–253. https://doi.org/10.1016/j.jesp.2008.08.012

Marshall, J., Wilks, M., Caviola, L., & Neldner, K. (2025). When development constricts our moral circle nature human behaviour. *Human Behavior*, *9*, 1537–1545. https://doi.org/10.1038/s41562-025-02212-7

Neldner, K., Crimston, C. R., Wilks, M., Redshaw, J., & Nielsen, M. (2018). The developmental origins of moral concern: An examination of moral boundary decision making throughout childhood. *PLoS One*, *13*(5), e0197819. https://doi.org/10.1371/journal.pone.0197819

Neldner, K., Wilks, M., Crimston, C. R., Jaymes, R. W. M., & Nielsen, M. (2023). I may not like you, but I still care: Children differentiate moral concern from other constructs. *Developmental Psychology*, *59*(3), 549–566. https://doi.org/10.1037/dev0001485

Olson, J. M., Cheung, I., Conway, P., Hutchison, J., & Hafer, C. L. (2011). Distinguishing two meanings of moral exclusion: Exclusion from moral principles or principled harm-doing? *Social Justice Research*, *24*(4), 365–390. https://doi.org/10.1007/s11211-011-0141-8

Opotow, S. (1993). Animals and the scope of justice. *Journal of Social Issues*, *49*(1), 71–85. https://doi.org/10.1111/j.1540-4560.1993.tb00909.x

Opotow, S. (1994). Predicting protection: Scope of justice and the natural world. *Journal of Social Issues*, *50*(3), 49–63. https://doi.org/10.1111/j.1540-4560.1994.tb02419.x

Piazza, J., Landy, J. F., & Goodwin, G. P. (2014). Cruel nature: Harmfulness as an important, overlooked dimension in judgments of moral standing. *Cognition*, *131*(1), 108–124. https://doi.org/10.1016/j.cognition.2013.12.013

Pinker, S. (2011). *The better angels of our nature: Why violence has declined*. Allen Lane.

Pizarro, D. A., Detweiler-Bedell, B., & Bloom, P. (2006). The creativity of everyday moral reasoning: Empathy, disgust, and moral persuasion. In *Creativity and reason in cognitive development* (pp. 81–98). Cambridge University Press. https://doi.org/10.1017/CBO9780511606915.006

Rottman, J., Crimston, C. R., & Syropoulos, S. (2021). Tree-huggers versus human-lovers: Anthropomorphism and dehumanization predict valuing nature over outgroups. *Cognitive Science*, *45*(4), e12967. https://doi.org/10.1111/cogs.12967

Singer, P. (1981). *The expanding circle: Ethics and sociobiology*. Farrar, Straus & Giroux.

Skitka, L. J. (2010). The psychology of moral conviction. *Social and Personality Psychology Compass*, *4*(4), 267–281. https://doi.org/10.1111/j.1751-9004.2010.00254.x

Song, J. Y., Klebl, C., & Bastian, B. (2023). Awe promotes moral expansiveness via the small-self. *Frontiers in Psychology*, *14*, 1097627. https://doi.org/10.3389/fpsyg.2023.1097627

Waytz, A., Iyer, R., Young, L., Haidt, J., & Graham, J. (2019). Ideological differences in the expanse of the moral circle. *Nature Communications*, *10*(1), 4389. https://doi.org/10.1038/s41467-019-12227-0

Waytz, A., Morewedge, C. K., Epley, N., Monteleone, G., Gao, J.-H., & Cacioppo, J. T. (2010). Making sense by making sentient: Effectance motivation increases anthropomorphism. *Journal of Personality and Social Psychology*, *99*(3), 410–435. https://doi.org/10.1037/a0020240

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License

SUPPORTING INFORMATION

Additional supporting information can be found online in the Supporting Information section at the end of this article.

How to cite this article: Crimston, C. R., Rottman, J., Neldner, K., Wilks, M., & Young, T. (2026). Deconstructing the moral circle: Obligations as the driver of moral expansion. *British Journal of Social Psychology*, *65*, e70073. https://doi.org/10.1111/bjso.70073

20448309, 2026, 2, Downloaded from https://bpspsychub.onlinelibrary.wiley.com/doi/10.1111/bjso.70073 by Franklin & Marshall College, Wiley Online Library on [17/09/2026]. See the Terms and Conditions (https://onlinelibrary.wiley.com/terms-and-conditions) on Wiley Online Library for rules of use; OA articles are governed by the applicable Creative Commons License