

## **The relative importance of target and judge characteristics in shaping our moral circle**

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### **Author Note**

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### **Abstract**

People's treatment of others—humans, non-human animals, and other entities—often depends on whether they think the entity is worthy of moral consideration. Recent work has begun to investigate which factors determine whether an entity is included in a person's moral circle, examining how different target characteristics (e.g., species category, perceived intelligence) or judge characteristics (e.g., empathy, political orientation) predict moral inclusion. Few studies have examined how target and judge characteristics might interact in shaping moral concern. In general, the relative importance of target and judge characteristics in predicting moral inclusion remains unclear. Here, we address this foundational question by conducting a variance component analysis of the moral circle. In two studies with participants from the Netherlands, the United States, the United Kingdom, and Australia ( $N = 836$ ), we test how much variance in judgments of moral concern is explained by target characteristics, judge characteristics, and their interaction. We consistently find that all three components explain similar amounts of variance in judgments of moral concern. Our findings provide two important insights. First, an increased focus on interactions between target and judge characteristics is needed, as these interactions explain as much variance as target and judge characteristics. Second, any theoretical account that aims to provide an accurate description of moral inclusion needs to consider target characteristics, judge characteristics, and their interaction.

*Keywords:* moral circle; moral judgment; non-human animals; multilevel modeling

**The relative importance of target and judge characteristics in shaping our moral circle**

In May 2021 the UK Government announced that animals will be formally recognized as sentient beings. This is just one example of a societal and historical trend towards moral inclusion of humans and non-humans alike, which is referred to as the expanding moral circle (Crimston et al., 2018; Singer, 1981). The moral circle captures the extent to which we consider different entities worthy of moral concern. While this concept originated in philosophy, recent years have seen a burst of psychological research attempting to chart and understand our moral circles (Crimston et al., 2016; Goodwin, 2015; Singer, 1981; Waytz et al., 2019).

A growing body of literature has examined the role of the target (i.e., the entity being judged) in shaping the moral circle. Perhaps the most comprehensive exploration was the development of the Moral Expansiveness Scale, which captures the size of people's moral circle (Crimston et al., 2016). This study finds that, typically, we ascribe most moral standing to our family and friends, followed by human in-groups and outgroups, high and low sentient animals, then plants and, finally, villains (e.g., murderers), who are granted the lowest moral standing (Crimston et al., 2016; Neldner et al., 2018). Thus, different targets are afforded different levels of moral standing and researchers have started to examine which target characteristics predict whether people include them in their moral circle, including sentience (Gray et al., 2012; Leach et al., 2021; Rottman et al., 2021), intelligence (Caviola et al., 2022; Wilks et al., 2021), species category (Caviola et al., 2019), similarity to humans (Miralles et al., 2019), beauty (Klebl et al., 2021), and moral badness (Piazza et al., 2014).

Fewer studies have focused on exploring the role of individual differences (i.e., characteristics of the judge) in shaping the moral circle. Recent studies have found that children (McGuire et al., 2022; Reinecke et al., 2021; Wilks et al., 2021), women (Caviola et al., 2019; Graça et al., 2018) and liberals (Waytz et al., 2019) appear to be more morally expansive. Crimston and colleagues (2016) found that a range of psychological factors were associated with moral expansiveness—including empathic concern, compassion, identification with all of humanity, and endorsement of certain moral foundations, and recently identified that fears of compassion predicts less moral expansiveness (Crimston et al., 2022). Finally, a large cross-cultural investigation found that, although differences in moral expansiveness across nations were small, individual differences again predicted moral expansiveness: Participants who scored

high on generalized trust and believed that the social fabric of society is strong showed increased moral concern (Kirkland et al., 2022).

Target and judge characteristics might also interact to explain judgments of moral concern. For example, some people may consistently show more moral concern for other humans but not animals. However, few studies have investigated such interactions. Henseler Kozachenko and Piazza (2021) found that older children and adults, compared to younger children, relied more on the perceived intelligence and edibility when making moral judgments. Two other studies found that human-supremacy beliefs impact moral concern granted to different categories of animal (Krings et al., 2021; Leite et al., 2019).

In sum, previous work has consistently shown that different people afford different levels of moral standing to different targets. But what explains this variation in judgments of moral concern? At a very basic level, this variation may be due to between-target differences (i.e., some targets are consistently judged as more worthy of moral concern), between-judge differences (i.e., some people consistently judge others as more worthy or moral concern), or interactions between these two factors. The majority of previous work has investigated the role of different target characteristics (e.g., perceived intelligence, sentience, or beauty), but it is not clear if target characteristics explain most variance in moral concern and should therefore be prioritized. Very few studies have examined interactions between target and judge characteristics, but it is not clear if these interactions explain so little variance in moral concern that they can be somewhat neglected. Here, we address these questions and test how important between-judge differences between-target differences, and their interactions are for understanding the moral circle.

### **Mapping the variance components of the moral circle**

When trying to predict whether a certain person will deem a certain target worthy of moral concern, how important is it to know who is making the judgment (i.e., characteristics of the judge), who is being judged (i.e., characteristics of the target), and potential interactions between the two factors? We can put this question in statistical terms: How much variance in judgments of moral concern is explained by between-judge differences, by between-target differences, and by the interaction between the two factors? In the present studies, we answer this question by estimating the variance components of the moral circle.

The inspiration for this approach is drawn from Hehman and colleagues (2017), who investigated the role of judge and target characteristics, and their interactions, in shaping first impressions. The majority of research on first impressions has focused on target-level explanations, investigating how characteristics such as facial morphology (Said et al., 2009), skin texture (Jaeger et al., 2018), and emotional expressions (Sutherland et al., 2017) influence first impressions. Yet, a variance component analysis of first impressions revealed that target characteristics only explain 15-25% of the variance in impressions and that judge characteristics and the interaction between judge and target characteristics are equally or more important for predicting impressions (Hehman et al., 2017; Xie et al., 2019). Their work revealed that the field's almost exclusive focus on understanding the role of target characteristics in impression formation is too narrow and that any account of first impressions that only focuses on target characteristics will be incomplete. These insights have already spurred research on levels of analysis that had been largely ignored thus far to gain a better understanding of the determinants of first impressions (Cook et al., 2022; Jaeger & Jones, 2022; Stoller et al., 2018). Other researchers have used the variance decomposition approach to understand the relative importance of target and judge characteristics in predicting humor appreciation (Rosenbusch et al., 2022) and attractiveness perception (Hönekopp, 2006)

Here, we take a similar approach.. Across two studies, we asked participants from four Western countries (Netherlands, Australia, United States, United Kingdom) to judge the moral standing of different entities. We estimate cross-classified multilevel regression models to calculate how much variance in judgments of moral concern is explained by between-judge differences, between-target differences, and their interaction (Hehman et al., 2017; Hönekopp, 2006; Rosenbusch et al., 2022).

Although this method does not give insights into *which* judge or target characteristics explain judgments of moral concern, the variance estimates can provide several important theoretical and practical insights. The estimates indicate how much each level of analysis (the judge, the target, and their interaction) contributes to variation in judgments of moral concern. This provides insights into (a) whether studies have previously been focusing too much on one level of analysis, and (b) which levels of analysis future studies should focus on. Previous work on the moral circle has mostly focused on either target *or* judge characteristics with most studies

focusing on the former. Few studies have modeled both types of characteristics at the same time or considered interactions between target and judge characteristics.

To illustrate the potential implications of our analyses for the field, we consider three plausible scenarios. First, our analyses might reveal that one factor explains most of the variance. For example, between-judge differences may explain much more variance in moral concern compared to between-target differences. Thus, while some target characteristics, such as similarity to humans (Miralles et al., 2019) or beauty (Klebl et al., 2021), may explain *some* variance, their overall usefulness for explaining judgments of moral concern could be very limited. In this case, more work should focus on understanding the role of judge characteristics (note that the opposite pattern might also emerge implying that future studies should primarily focus on target characteristics).

Second, our analyses might reveal that interactions between target and judge characteristics explain a considerable amount of variance. This would suggest that future studies should focus more on exploring these interactions, an approach that has not received much attention thus far.

Third, our analyses might reveal that all three levels of analysis explain non-trivial amounts of variance. This would imply that research should explore all three levels of analysis. More importantly, this would also imply that any theory that aims to accurately predict judgments of moral concern needs to consider characteristics of the target, characteristics of the judge, and their interaction. In short, charting the variance components of the moral circle will reveal which levels of analysis researchers should focus on when trying to explain judgments of moral concern.

We present the results of two studies that examine the variance structure of people's moral circle (Study 1: 255 participants providing 15,300 judgments, Study 2: 581 participants providing 62,748 judgments). Although our main goal is to estimate the variance components of the moral circle, our studies also make several other contributions to the literature. We recruit participants from four countries (the Netherlands, the United States, the United Kingdom, and Australia) who, especially in Study 2, judge the moral standing of a large set of targets (different groups of humans, non-human animals, and other entities such as plants or mountains). Thus, the current studies also provide a rich descriptive account of how people think about the moral

standing of various entities and how this varies across countries. All data and analysis scripts are available at the Open Science Framework (<https://osf.io/8cjn6/>).

### Study 1

The main goal of Study 1 ( $n = 255$  providing 15,300 judgments) was to estimate the variance structure of participants' moral circle. We recruited first-year psychology students from a Dutch university who rated the moral standing of 30 animals, and we estimated how much variance in moral concern was explained by judge characteristics, target characteristics, and their interaction. Past work has identified substantial variability in our attitudes towards different animals (Henseler Kozachenko & Piazza, 2021; Wilks et al., 2021), thus in focusing solely on animals we were able to examine this variability while limiting the numbers of judgements we asked participants to make.

### Methods

**Participants.** We recruited 258 first-year psychology students from a Dutch university who completed the study in return for partial course credit. The sample size was determined by how many participants completed the study within seven weeks. Data from three participants (1.16%) who indicated having only a poor English proficiency were excluded, leaving a final sample of 255 participants ( $M_{age} = 19.84$  years,  $SD_{age} = 2.55$ ; 84.71% female, 14.90% male, 0.39% non-binary). All participants provided informed consent prior to participation.

**Stimuli and Procedure.** We created a diverse list of 30 non-human animals that were the targets of participants' moral judgments. We sampled companion animals (e.g., dog, cat), farm animals (e.g., pigs, cows), wild animals that are common in participants' local environment (e.g., pigeons, bees), and more "exotic" wild animals (e.g., lions, orangutans). We sampled at least one mammal, bird, reptile, fish, and invertebrate and included animals that are commonly seen in a positive light (e.g., chimpanzees, elephants) or negative light (e.g., spiders, snakes; see the Supplemental Materials for a complete list of targets). Participants rated the extent to which they feel obligated to show moral concern for the welfare and interest of each animal on a scale that ranged from 1 (*absolutely no obligation*) to 9 (*very strong obligation*). Participants provided two sets of ratings. That is, after rating all 30 targets, they were asked to rate all targets again. We collated these two ratings to create an average score for each entity for each participant. Targets were displayed in a (different) random order. After completing a different study on dietary

preferences, participants completed several demographic questions, assessing their gender, age, and other characteristics.

**Analysis strategy.** When observations are nested within clusters (e.g., when a single participant provides multiple data points in a repeated-measures design), traditional linear regression models can yield biased estimates because they do not account for variation between clusters (Judd et al., 2012). Multilevel regression models account for the nested structure of the data by estimating what percentage of variance is accounted for by different clusters (Raudenbush & Bryk, 2002). While multilevel models are useful for estimating fixed effects when the data is nested, they have also been used in recent studies to estimate variance components (Hehman et al., 2017; Hönekopp, 2006; Xie et al., 2019). With a cross-classified multilevel model that includes random effects for participants, targets, and their interaction, we can calculate the intraclass correlation coefficient (ICC), which quantifies how much variance is explained by each factor (Shrout & Fleiss, 1979). In the current study, the participant-specific ICC indicates how much variance in moral judgments is explained by between-judge differences, the target-specific ICC indicates how much variance is explained by between-target differences, and the ICC for the participant-by-target interaction indicates how much variance is explained by the interaction between between-judge and between-target differences.

All analyses were conducted in R (R Core Team, 2021). To estimate the different variance components, we followed the procedure outlined by Hehman and colleagues (2017). We estimated a cross-classified intercept-only multilevel regression model using the lme4 package (Bates et al., 2015). Our analysis was based on a total of 15,300 judgments with individual judgments nested within judges (i.e., each judge rated multiple targets) and within targets (i.e., each target was rated by multiple judges). Simulations by Xie and colleagues (2019) showed that 6,000 observations were required to obtain reliable estimates of variance components. While the exact sample size requirement may vary across different studies, both of our studies were based on substantially larger samples (Study 1: 15,300 observations; Study 2: 62,748 observations), which suggests that our studies had sufficient power to yield reliable estimates. This allowed us to examine how much variance was explained by who was providing the judgment (i.e., between-judge differences) by who was being judged (i.e., between-target differences), and the interaction between judge and target characteristics.

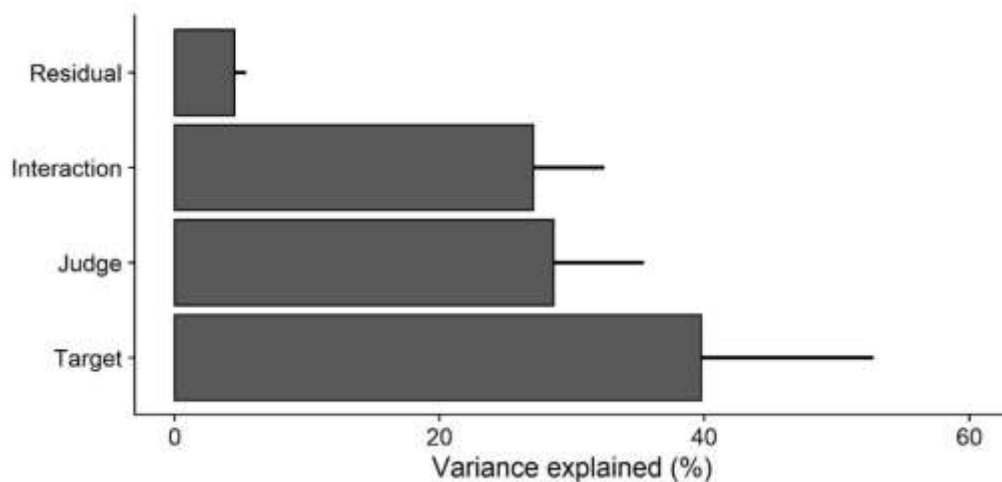


## Results

**Variance components.** To address our main question, we estimated the variance components of participants' judgments of moral concern (see Figure 1). Results showed that between-target differences explained most variance (39.77%, 95% CI [28.01%, 52.75%]), followed by between-judge differences (28.61%, 95% CI [21.42%, 35.43%]), and the judge  $\times$  target interaction (27.11%, 95% CI [21.01%, 32.47%]). The residual variance was small (4.52%, 95% CI [3.50%, 5.42%]) and the three factors combined explained more than 95% of the variance in judgments of moral concern. Each factor accounted for a considerable amount of variance, suggesting that judgments of moral concern are influenced by judge characteristics, target characteristic, and the interaction between judge and target characteristics.

**Figure 1**

*Relative contributions of target characteristics, judge characteristics, and the interaction between judge and target characteristics in explaining variation in judgments of moral concern*



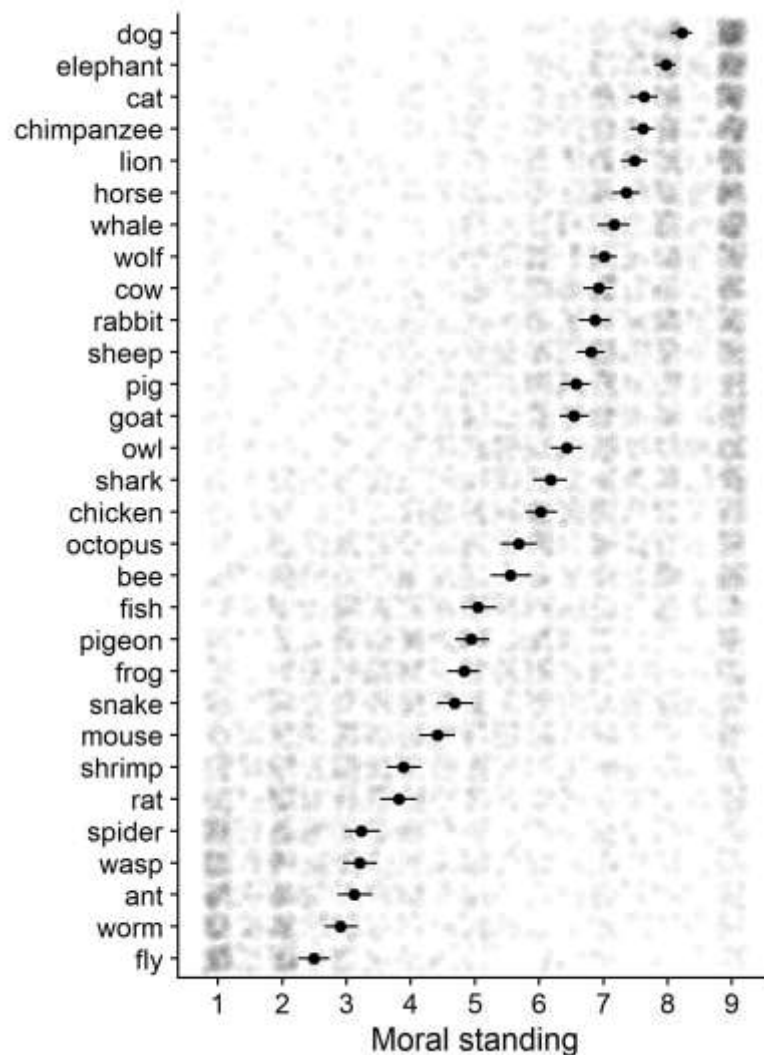
*Note.* Error bars represent bootstrapped 95% confidence intervals.

**Judge and target characteristics.** We also explored which judge and target characteristics influenced judgments of moral concern. Average ratings for all animals are displayed in Figure 2. In line with previous work (Leite et al., 2019), we found that participants showed more moral concern for companion animals (i.e., dogs, cats, rabbits, horses;  $M = 7.52$ ,  $SD = 1.77$ ) than for food animals (i.e., cows, sheep, pigs, goats, chickens;  $M = 6.58$ ,  $SD = 1.90$ ),  $t(488.7) = 6.80$ ,  $p < .001$ ,  $d = 0.59$ , 95% CI [0.48, 0.69]. Animals that are often viewed as pests (i.e., rats, spiders, ants, flies) were rated as least deserving of moral concern ( $M = 3.17$ ,  $SD =$

2.27, comparison with companion animals:  $t(254) = 85.54, p < .001, d = 2.51$ , 95% CI [2.24, 2.79], comparison with food animals:  $t(500.0) = 20.96, p < .001, d = 1.84$ , 95% CI [1.66, 2.02]). To examine the role of judge characteristics, we computed participants' average moral concern across all targets. Regressing moral concern on participants' gender and age did not reveal any significant associations.

**Figure 2**

*Average moral standing of each target*



*Note.* Error bars represent 95% confidence intervals.

## Discussion

Study 1 provided first insights into the role of judge and target characteristics in shaping the moral circle. We found that between-judge differences (40%), between-target differences (29%), and their interaction (27%) explained considerable amounts of variance in judgments of moral concern. Thus, in order to predict whether a certain person will grant moral standing to a certain target, one needs to consider not only the target being judged (which has been the focus of the majority of research in this field to date), but also the characteristics of the person making the judgement, and the interaction between the two. Put differently, an exclusive focus on target characteristics, which has been common in existing work on this topic, cannot be expected to yield precise predictions on whether a certain person will grant moral standing to a certain target.

We also offer new data to inform our understanding of how people value animals. Here, we find that pests are granted less moral status, which aligns with past research showing that disliked animals are generally granted less moral status (Piazza et al., 2014). Moreover, we replicate past work showing that companion animals are valued more than food animals.

We did not find effects of gender or age. This was somewhat surprising, as other work suggests that both of these factors impact attitudes towards animals (Caviola et al., 2019; Wilks et al., 2021). However, these findings were identified when comparing attitudes towards humans and animals. It seems, then, that other between-judge differences may have more of an impact on attitudes when comparisons are made between different animals. Thus, in Study 2, we include a broader array of targets and measure a greater number of factors about the judge.

## Study 2

In Study 2, we again estimated the variance components of participants' moral circle, but we made two important improvements to the study design. First, we recruited a larger and more diverse sample of participants ( $n = 581$  providing 62,748 judgments). We recruited participants from Australia, the United Kingdom, and the United States. This enabled us to conduct (to our knowledge) the first cross-country investigation of the moral circle. Although participants were all from countries that are considered WEIRD (Henrich et al., 2010), the lack of existing comparisons means that we have virtually no knowledge of whether the cultural similarities will be expressed in moral judgements in this context. Second, we sampled a larger and more diverse set of targets, focusing not only on animals. Following the work by Crimston and colleagues (2016), we examined moral concern for eight groups of targets, with three targets for per group:

family and friends, in-group targets (e.g., co-workers), out-group targets (e.g., foreign citizens), revered targets (e.g., charity workers), stigmatized targets (e.g., refugees), villains (e.g., murderers), plants (e.g., apple trees), and the environment (e.g., coral reefs).

## Methods

**Participants.** We recruited 598 participants from Prolific. Data from 17 participants (2.84%) who did not indicate their nationality were excluded, leaving a final sample of 581 participants ( $M_{age} = 35.63$  years,  $SD_{age} = 13.29$ ; 54.91% female, 43.03% male, 2.07% non-binary; 195 from Australia, 195 from the UK, 191 from the US). All participants provided informed consent prior to participation.

**Stimuli and Procedure.** The study design was similar to the design of Study 1, but we used an expanded set of targets. Next to the 30 non-human animals used in Study 1, we included 24 additional targets taken from the studies by Crimston and colleagues (2016). We included three targets for each of eight groups: family and friends (e.g., spouses), in-group (e.g., co-worker)s, out-group (e.g., foreign citizens), revered targets (e.g., charity workers), stigmatized targets (e.g., refugees), villains (e.g., murderers), plants (e.g., apple trees), and the environment (e.g., coral reefs; see the Supplemental Materials for a complete list of targets). Participants rated the extent to which they feel obligated to show moral concern for the welfare and interest of each target on a scale that ranged from 1 (*absolutely no obligation*) to 9 (*very strong obligation*). Participants provided two sets of ratings and all targets were displayed in a random order. After completing a different study on dietary preferences, participants completed several demographic questions that assessed their gender, age, nationality, religiousness, and political orientation.

**Analysis strategy.** We followed the same analysis strategy as in Study 1. Our main analysis, for which we estimated the variance components for the entire sample, was based on a total of 62,748 judgments.

## Results

**Variance components.** First, we examined the variance components of participants' judgments of moral concern (see Figure 3, top panel). Results showed that between-target differences explained most variance (31.95%, 95% CI [23.90%, 40.17%]), followed by between-judge differences (30.23%, 95% CI [25.99%, 34.54%]), and the judge  $\times$  target interaction (28.80%, 95% CI [25.06%, 32.37%]). The residual variance was small (9.02%, 95% CI [7.83%, 10.15%]) and the three factors combined explained more than 90% of the variance in judgments

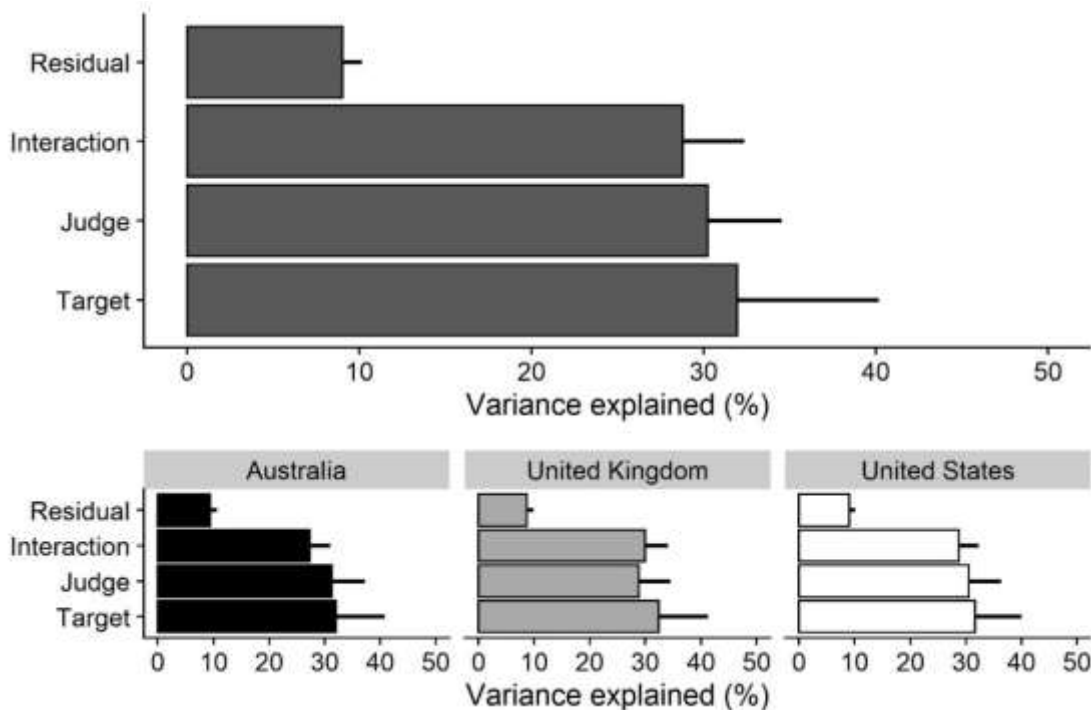
of moral concern. As in Study 1, each factor accounted for a considerable amount of variance, suggesting that judgments of moral concern are influenced by target characteristics, judge characteristic, and the interaction between target and judge characteristics.

**Cross-country differences.** Next, we examined cross-country differences. We separately estimated the variance components for participants from Australia ( $n = 195$ ), the United Kingdom ( $n = 195$ ), and the United States ( $n = 191$ ; see Figure 3, bottom panel). Judge characteristics explained 31.32% of the variance (95% CI [25.43%, 37.24%]) for Australian participants, 28.91% of the variance (95% CI [23.23%, 34.55%]) for participants from the UK, and 30.60% of the variance (95% CI [24.94%, 36.35%]) for participants from the US. Target characteristics explained 31.99% of the variance (95% CI [23.45%, 40.84%]) for Australian participants, 32.45% of the variance (95% CI [23.91%, 41.29%]) for participants from the UK, and 31.67% of the variance (95% CI [23.52%, 39.99%]) for participants from the US. The interaction between judge and target characteristics explained 27.32% of the variance (95% CI [23.40%, 31.00%]) for Australian participants, 29.93% of the variance (95% CI [25.60%, 34.05%]) for participants from the UK, and 28.72% of the variance (95% CI [24.87%, 32.35%]) for participants from the US. Thus, the variance structure of participants' moral circle was very similar across the three countries.

Average judgments of moral concern for the different targets were also remarkably similar across the three countries. Figure 4 shows the average rating for each target sorted from highest to lowest (based on the combined sample). Correlations between targets' average moral concern were almost perfect (Australia vs. UK:  $r(52) = .994$ , 95% CI [.989, .996],  $p < .001$ , Australia vs. US:  $r(52) = .991$ , 95% CI [.984, .995],  $p < .001$ , UK vs. US:  $r(52) = .988$ , 95% CI [.979, .993],  $p < .001$ ).

**Figure 3**

*Relative contributions of target characteristics, judge characteristics, and the interaction between judge and target characteristics in explaining variation in judgments of moral concern*



*Note.* Error bars represent bootstrapped 95% confidence intervals.

**Judge and target characteristics.** We also explored which judge and target characteristics influenced judgments of moral concern. Average ratings for all animals are displayed in Figure 4. In line with previous work (Leite et al., 2019) and replicating the results of Study 1, we found that participants showed greater moral concern for companion animals (i.e., dogs, cats, horses, rabbits;  $M = 6.26$ ,  $SD = 2.14$ ) than for food animals (i.e., cows, sheep, pigs, goats, chickens;  $M = 5.41$ ,  $SD = 2.20$ ),  $t(1142) = 7.33$ ,  $p < .001$ ,  $d = 0.42$ , 95% CI [0.38, 0.46]. Animals that are often viewed as pests (i.e., rats, spiders, ants, flies) were rated as least deserving of moral concern ( $M = 3.43$ ,  $SD = 2.33$ , comparison with companion animals:  $t(580) = 81.50$ ,  $p < .001$ ,  $d = 1.43$ , 95% CI [1.33, 1.54], comparison with food animals:  $t(1160) = 16.17$ ,  $p < .001$ ,  $d = 0.95$ , 95% CI [0.87, 1.02]).

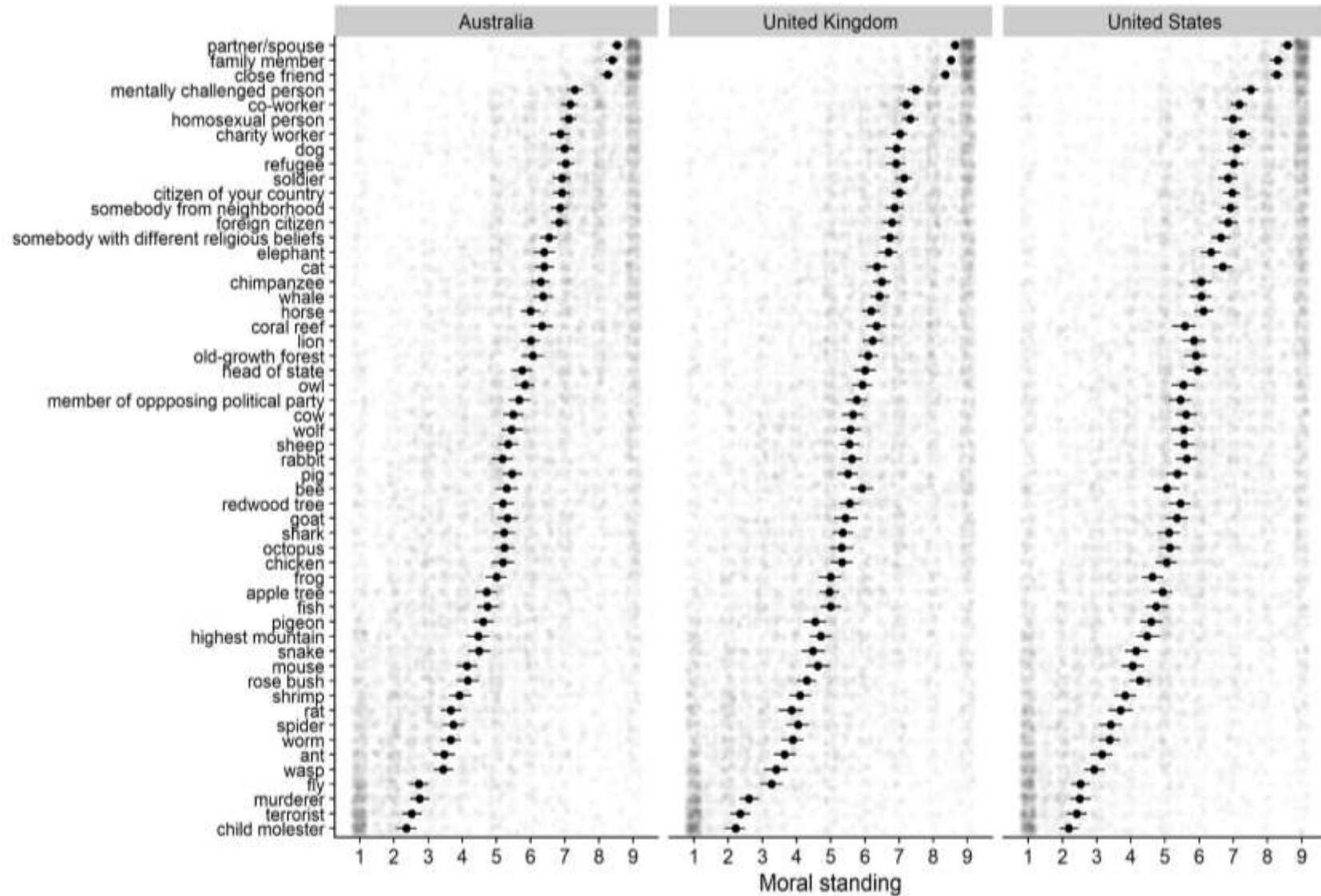
Results for the other targets showed that participants reported the greatest moral concern for family and friends (e.g., spouses;  $M = 8.43$ ,  $SD = 1.22$ ), followed by stigmatized targets (e.g., refugees;  $M = 7.18$ ,  $SD = 1.90$ ), in-group targets (e.g., co-workers;  $M = 7.01$ ,  $SD = 1.73$ ), revered targets (e.g., charity workers;  $M = 6.64$ ,  $SD = 2.07$ ), out-group (e.g., foreign citizens;  $M = 6.36$ ,

$SD = 2.11$ ), the environment (e.g., coral reefs;  $M = 5.55$ ,  $SD = 2.44$ ), plants (e.g., apple trees;  $M = 4.83$ ,  $SD = 2.28$ ), and villains (e.g., murderers;  $M = 2.44$ ,  $SD = 2.04$ ). This ranking in moral standing replicates the overall pattern found by Crimston and colleagues (2016).

To examine the role of judge characteristics, we computed participants' average moral concern across all targets and regressed this score on their gender, age, nationality, religiousness, political orientation, the extremity of their political orientation (i.e., the distance to the midpoint of the scale, which represents centrist views). Results showed that women ( $M = 5.77$ ,  $SD = 1.49$ ) showed greater moral concern than men ( $M = 5.16$ ,  $SD = 1.41$ ),  $b = -0.102$ ,  $SE = 0.046$ , 95% CI  $[-0.191, -0.012]$ ,  $t(571) = 2.23$ ,  $p = .026$ . There were also significant associations between moral concern and age,  $b = 0.013$ ,  $SE = 0.005$ , 95% CI  $[0.004, 0.022]$ ,  $t(571) = 2.85$ ,  $p = .005$ , political orientation,  $b = -0.203$ ,  $SE = 0.049$ , 95% CI  $[-0.299, -0.107]$ ,  $t(571) = 4.16$ ,  $p < .001$ , and political extremity,  $b = 0.157$ ,  $SE = 0.069$ , 95% CI  $[0.022, 0.292]$ ,  $t(571) = 2.28$ ,  $p = .023$ . Older participants, more liberal participants, and participants with more extreme political views showed greater moral concern. We did not find significant differences in moral concern between religious and non-religious participants or between participants from different countries.

**Figure 4**

*Average moral standing of each target across the three countries*



Note. Error bars represent 95% confidence intervals.



## **Discussion**

Study 2 showed that between-judge differences (32%), between-target differences (30%), and their interaction (29%) explained considerable amounts of variance in judgments of moral concern. Thus, we replicated the findings from Study 1 with larger and more diverse samples of judges and targets further highlighting the need for future research to consider both of these factors (and their interaction) when mapping people's circles of moral concern.

Importantly, we identified this pattern of results among participants from Australia, the United Kingdom, and the United States, suggesting that there are considerable cross-country similarities in which factors shape people's moral circles, at least in Western cultures. An analysis of the moral standing of all 54 targets revealed even more striking similarities across the three countries. Correlations between average ratings of moral concern were almost perfect, suggesting that, on average, the targets' relative moral standing was almost identical across the three countries.

### **General Discussion**

When do people deem others worthy of moral concern? Past work in this field has primarily focused on the role of the target in shaping these judgements (Caviola et al., 2019; Gray et al., 2012; Klebl et al., 2021; Leach et al., 2021; Miralles et al., 2019; Piazza et al., 2014; Wilks et al., 2021), while some studies have explored the role of the individual making the judgement (Crimston et al., 2016; Waytz et al., 2019). Very few studies have examined potential interactions between target and judge characteristics in shaping moral concern. We conducted a systematic exploration of how characteristics of the target, the judge, and their interaction explain variation in moral concern. Our data comprises 78,048 judgements of more than 50 different targets from 836 participants across four countries.

We consistently find that each of the three components accounts for about one third of the variance in participants' judgments of moral concern. In other words, judgments of moral concern are influenced by characteristics of the target, characteristics of the judge, and their interaction. These findings have important implications for the study of moral judgments. When trying to understand whether certain people will grant moral standing to certain entities, a sole focus on target characteristics (e.g., their perceived intelligence or beauty), which has been common in existing work, will not yield accurate predictions. Specifically, the field has been primarily focused on measuring variability in moral concern that only accounts for about one

third of the total variance, with the other two thirds largely ignored in these studies. To accurately predict moral inclusion, researchers need to consider target *and* judge characteristics, as well as their interaction. Without this, researchers might end up making broad claims about the role of certain factors (e.g., beauty) in impacting moral concern without acknowledging the limits of exactly how far these factors can shift our moral judgments.

These data have important implications for theory. Currently, most theoretical approaches to understanding moral concern center around mind perception (Gray et al., 2007; Gray et al., 2012; Leach et al., 2021). Our findings suggest that theoretical approaches may benefit from explicitly considering the role of the judge in shaping the link between mind perception and morality to offer a more comprehensive account of how we morally value others. In general, our findings show that any theoretical account that aims to provide an accurate description of moral inclusion needs to consider the role of the entity being judged, the role of the person making the judgment, and their interaction. Accounts that only focus on one level of analysis while ignoring the others cannot provide a complete and accurate account of moral inclusion.

Our findings replicated across two studies with participants from four countries. Between-judge differences played a somewhat smaller role in Study 1 compared to Study 2. One possible explanation is that the sample in Study 1 was less demographically diverse, which could have led to fewer differences in judgments of moral concern between participants. Alternatively, methodological differences could also explain the different results. Participants in Study 1 only rated animal targets, while participants in Study 2 rated both animals and humans. It may be that the absence of human targets could have led to more variability in ratings of moral worth. In line with this account, there appears to be more agreement on the moral status of humans compared to animals (see supplementary materials). This suggests that the range of targets included in the stimuli can play an important role in shaping people's moral judgements, consistent with other framing effects (Laham, 2009). We consider this another important new direction for future research.

Additional analyses revealed that the role of target and judges varied between different groups of targets (see Supplemental Materials). Specifically, target characteristics explained more variance in moral concern when judging human targets, while judge characteristics explained more variance when judging animal targets. This is again consistent with our observation that consensus is higher for human targets than for animals. However, the effect also

appears to be driven by certain human targets, where family and friends are consistently granted maximum moral concern and villains (e.g., murderers) are consistently granted very little, while judgments for other human targets (e.g., a head of state, a member of the opposing political party) were more variable across participants.

We also examined the role of specific target and judge characteristics. Across both studies, we found that companion animals were valued more than food animals, and both were valued more than pests (for similar results, see Leite et al., 2019; Piazza et al., 2014). In Study 2, we included 24 targets used in previous work on the moral circle (Crimston et al., 2016) and found an almost identical pattern of results: Participants showed the greatest moral concern for family and friends (e.g., spouses), followed by stigmatized targets (e.g., refugees), in-group targets (e.g., co-workers), revered targets (e.g., charity workers), out-group (e.g., foreign citizens), the environment (e.g., coral reefs), plants (e.g., apple trees), and villains (e.g., murderers). The only difference in the relative ranking of these groups was that stigmatized groups were afforded more moral concern than all entities except family and friends, while previous studies found that they are placed between revered and outgroup targets (Crimston et al., 2018; Crimston et al., 2016). This may reflect a social change in attitudes (Morgan et al., 2020). We also found that neither religiosity nor nationality impacted moral concern. To our knowledge, this is the first study to test either of these factors. However, we did identify a number of other judge characteristics that influenced moral concern—in line with previous work (Caviola et al., 2019; Waytz et al., 2019) older people, women, those with more extreme political views, and those on the political left tended to be more morally expansive.

### **Limitations and future directions**

Although we included participants from four different countries in our studies, it is important to note that all participants were sampled from so-called WEIRD countries, limiting the generalizability of the results (Henrich et al., 2010; Nielsen et al., 2017). Much more work is needed to explore similarities and differences in people's moral circle across a larger set of more diverse countries.

Additionally, in the current studies, we focused on the role of judge and target characteristics. Although the two factors and their interaction explained most variance in moral concern, other factors may also be important. For instance, previous studies suggest that judgments of moral concern are subject to framing effects. Laham (2009) showed that asking

people to decide which entities to exclude from the circle of moral consideration results in a wider moral circle (more entities) than asking people to decide which entities to include, presumably due to people's discomfort and casting an entity out of the moral circle. In line with this, we find some evidence that the inclusion of human targets alongside animals impacts the amount of moral concern granted. It is likely that there are other important framing effects that are yet to be identified.

Finally, results may also differ depending on the type of moral concern measured. Goodwin and Landy (2013) examined how positive and negative rights influence moral status. The authors demonstrated that we apply positive and negative rights differently to different segments of the population—for example, we grant people equal negative rights regardless of age, but grant greater positive rights to young people.

Perhaps the most ambitious and important direction for future research is to build a more comprehensive model of the factors that shape the moral circle. The present findings suggest that this requires a simultaneous consideration of target and judge characteristics (and their interactions). The ideal study would feature a large, diverse sample of participants judging a large, diverse set of targets, while many factors that are thought to influence judgments of moral concern at the target level (perceived sentience, intelligence, and beauty, species membership, similarity to humans, etc.) and the judge level (empathy, compassion, personality, speciesism, political orientation, gender, age, etc.) are assessed. While this represents an ambitious undertaking going beyond the scope of any other studies on this topic thus far, recent developments towards team science and large-scale, cross-cultural collaboration may facilitate such an endeavor (Kirkland et al., 2022; Moshontz et al., 2018).

### **Conclusion**

Across two studies with a large sample ( $N = 836$ ) and a broad set of stimuli, we examine how the characteristics of the target, characteristics of the judge, and their interaction, shape our moral circles. We find that each of these factors accounts for about one third of the variance in moral concern, suggesting that past theoretical and empirical work has focused too heavily on the role of the target. Going forward, research should more heavily weight to characteristics of the judge and judge  $\times$  target interactions. Models that aim to explain when a certain person will grant moral standing to a certain target will need to account for all three factors.

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