Kent Academic Repository
Full text document (pdf)

The Moral Divide Between High- and Low-Status Animals: The Role of Human Supremacy Beliefs

Victoria C. Krings, Kristof Dhont & Alina Salmen

Published online: 03 Jun 2021.

Submit your article to this journal ↗

Article views: 224

View related articles ↗

View Crossmark data ↗

Routledge
Taylor & Francis Group

☾ OPEN ACCESS   ⬤ Check for updates

The Moral Divide Between High- and Low-Status Animals: The Role of Human Supremacy Beliefs

Victoria C. Krings, Kristof Dhont, and Alina Salmen

School of Psychology, Keynes College, University of Kent, Canterbury, UK

ABSTRACT

People endorsing stronger beliefs in human supremacy over animals typically show less moral concern for animals. Yet, how people think about different types of animals also depends on the role of the animals in society. For instance, people are less concerned about food animals than about companion animals. It is unclear, however, how human supremacy beliefs relate to this perceived *moral divide* between different types of animals. In two surveys of British adults ($n = 196$ and $n = 256$), we tested whether human supremacy beliefs are associated with a greater perceived moral divide between high-status animals such as companion animals and low-status animals such as food animals. In both studies, participants rated the extent to which they felt obligated to show moral concern to a range of animals and completed the human supremacy beliefs scale. As expected, the results showed that participants felt more moral concern for companion animals (e.g., dogs and cats) and appealing wild animals (e.g., dolphins and chimps) than for food animals (e.g., pigs and turkeys) and unappealing wild animals (e.g., frogs and bats). Critically, confirming our hypotheses, this moral divide between high- and low-status animals was significantly larger for those holding stronger human supremacy beliefs. Furthermore, the effect of human supremacy beliefs remained after controlling for gender, age, diet, and social dominance orientation. These findings suggest that beliefs in human supremacy over animals may serve as a legitimizing strategy to preserve not only the existing human–animal hierarchy but also greater hierarchical divides between animals.

Animals come in many shapes – some are cute and fluffy, some elicit disgust, and some are considered the perfect lunch. We love our companion animals, considering them part of the family, yet eat farmed animals (Bastian & Loughnan, 2016; Joy, 2010; Loughnan et al., 2014) and recoil at the thought of wild animals linked to disease or danger (Herzog, 2010; Piazza et al., 2014). These differences between nonhuman animal categories are also reflected in the extent to which people care morally about different

CONTACT Victoria C. Krings ✉ vck6@kent.ac.uk ▣ School of Psychology, Keynes College, University of Kent, Canterbury CT2 7NP, UK

animals. People attribute different moral value to different animals based solely on their species membership, even if these animals have comparable mental and emotional capabilities (e.g., dogs and pigs). The differential treatment and moral valuation of animals have been observed across various contexts (Caviola et al., 2020; Herzog, 2010; Joy, 2010) and described as an expression of speciesism by scholars in philosophy (e.g., Horta, 2010; Singer, 1995) and psychology (e.g., Caviola et al., 2019; Caviola & Capraro, 2020; Dhont et al., 2020; Plous, 2003). We refer to this difference in attributed moral status between different animals as the moral divide. For instance, Leite et al. (2019) demonstrated that people show much less moral concern for low-status animals such as food animals (e.g., pigs) and unappealing wild animals (e.g., snakes) than for high-status animals such as companion animals (e.g., dogs) and appealing wild animals (e.g., dolphins and chimps) (see also Bratanova et al., 2011; Leach et al., 2021; Piazza, 2020). Although the tendency to value some animals over others has been intensively discussed by philosophers and animal rights advocates, the psychological factors that are potentially related to this phenomenon have received only scant research attention in the psychological literature.

Moral concern for animals is not only shaped by the animals' socially constructed classifications, but also driven by stable individual difference variables (Dhont et al., 2020; Dhont & Hodson, 2014; Loughnan et al., 2014). Specifically, the extent to which people believe that humans are inherently superior to other animals (i.e., human supremacy beliefs) is related to a greater acceptance of using animals for a wide range of practices, including industrial factory farming, breeding animals for their skin (e.g., fur coats), and the use of animals for entertainment (e.g., circus, rodeos) and cosmetic testing (Caviola et al., 2019; Dhont & Hodson, 2014). Dhont and Hodson (2014) argued that this belief in human supremacy serves as a legitimizing strategy to preserve and enhance hierarchy in human–animal relations and allows individuals to exclude all types of animals from moral circles (see also Leite et al., 2019). Indeed, if animals are considered inherently inferior to humans, then it is easier to justify the continued consumption of animal products and the use of animals for human benefits (Dhont et al., 2020; Dhont & Hodson, 2014).

It is presently unclear, however, whether human supremacy beliefs also relate to a greater perceived moral divide between different animal categories. The central hypothesis tested in the present research is that those who more strongly endorse human supremacy beliefs will make greater moral distinctions between low- and high-status animals when indicating their moral concern for animals. Indeed, although previous research shows that human supremacy beliefs longitudinally predict lower moral concern for both low- and high-status animals (Leite et al., 2019), we expected that human supremacy beliefs would be more strongly associated with moral concern for low-status animals than moral concern for high-status animals, thereby further increasing the moral divide between low- and high-status animals.

Drawing on theorizing and findings from research on human intergroup relations, it is well-established that those strongly driven by motives of power and group-based dominance (i.e., those higher on social dominance orientation, SDO) express greater prejudice toward low-status and disadvantaged human outgroups and endorse hierarchy-enhancing legitimizing myths (e.g., holding racist or sexist views) to preserve and enhance

existing social hierarchies (Hodson et al., 2010; Kteily et al., 2012; Sidanius & Pratto, 1999). Moreover, people higher on SDO not only tend to justify inequality in human intergroup relations, they are also more likely to hold speciesist attitudes (e.g., Dhont et al., 2014, 2016) and to justify or rationalize the consumption and exploitation of animals, for example, by denying the cognitive and emotional capabilities of farmed animals or focusing on the presumed normality or necessity of eating or harming animals (e.g., Hyers, 2006; Jackson & Gibbings, 2016; Piazza et al., 2015). In other words, desires for group-based dominance and inequality are implicated in people's prejudiced attitudes and behaviors both toward human and nonhuman social groups, with SDO underpinning both types of biases (Dhont et al., 2014; Dhont et al., 2016; Jackson, 2019; Salmen & Dhont, 2020).

Extending the scope of this research line, Jackson (2019) investigated the associations between SDO, speciesism, and attitudes toward a wide range of human social groups in two samples of university students. The findings showed that higher levels of speciesism are associated with more negative attitudes toward low-status and hierarchy-attenuating groups (e.g., disabled people) but not with attitudes toward high-status or hierarchy-enhancing groups (e.g., bankers). Furthermore and in line with previous research, SDO explained the relation between speciesism and negative attitudes toward low-status and hierarchy-attenuating groups, confirming its role as the common ideological root of biases in human intergroup and human–animal relations (Dhont et al., 2016).

However, whereas SDO refers to general desires for group-based dominance in human intergroup relations, we focused specifically on desires for dominance over nonhuman animals (rather than humans): human supremacy beliefs. In other words, the construct of human supremacy beliefs is theoretically parallel to SDO and both constructs are significantly, positively correlated (e.g., Dhont & Hodson, 2014), yet given the current focus on status differences between animal categories, human supremacy beliefs is arguably a more proximal variable. Indeed, if the endorsement of human supremacy beliefs functions as a strategy to maintain and enhance the status hierarchy between different groups of animals, then higher levels of human supremacy beliefs can be expected to be particularly related to lower moral concern for low-status animals, akin to how SDO is primarily related to prejudice toward human low-status groups.

Across two studies, we extended this growing body of research by investigating the associations between human supremacy beliefs and moral concern for different animal groups. Specifically, we presented participants with a list of animals belonging to low-status groups (i.e., food animals in studies 1 and 2, and also unappealing wild animals in study 2) and high-status groups (companion animals and appealing wild animals in studies 1 and 2), and asked them to rate how much moral concern they feel compelled to show each animal. In line with previous research (e.g., Leite et al., 2019), we expected that participants would show higher levels of moral concern for animals belonging to a high-status category than for animals belonging to a low-status category. Furthermore, we expected an interaction effect between animal category and human supremacy beliefs on moral concern for animals such that, although human supremacy beliefs would be associated with lower levels of moral concern for all animal categories, this effect was expected to be stronger for low-status than for high-status animal categories. As a result, a greater perceived moral divide between low- and high-status animals among those higher on human supremacy beliefs was expected.

Study 1

The aim of study 1 was to test the hypotheses in a heterogeneous sample of British adults. We focused on the moral divide between food animals, which are typically attributed a lower status, and two high-status animal categories, namely, companion animals and appealing wild animals.

Methods

Ethical approval to conduct this study was given by the research ethics committee at the authors' institution and all participants provided informed consent electronically before taking part. The sample consisted of 196 British Prolific Academic participants (M_{age} = 35.4 years, SD = 12.8; 30.1% male, 68.9% female, 1% identified as transgender/other) who completed an online survey including measures of human supremacy beliefs, moral concern for animals and demographics. Most participants self-identified as meat eaters (72.4%), 14.8% as flexitarians, 2.6% as pescatarians, 7.1% as vegetarians, 2.6% as vegans, and the remaining 0.5% identified as other. A sensitivity analysis using G*Power (Faul et al., 2009), assuming α = 0.05 and 95% power, indicated that the weakest effect size detectable with this sample size was f = 0.09 (i.e., a small effect).

Respondents completed the 6-item human supremacy beliefs scale (1, strongly disagree; 7, strongly agree; Dhont & Hodson, 2014). To measure moral concern for animals, we presented a written list of 15 animal names, all on the same page in a randomized order, including (1) companion animals: dog, cat, horse; (2) food animals: pig, cow, chicken, turkey, sheep, duck; and (3) appealing wild animals: chimp, kangaroo, dolphin, bear, lion (see also Leite et al., 2019[1]; based on Laham, 2009). Participants were asked to indicate to what extent they felt morally obligated to show concern for each animal on 7-point scales (1, Not at all; 7, Very much so). Following Leite et al. (2019), we calculated an average score of moral concern for each animal category. Correlations, means, standard deviations, and scale reliability scores are reported in Table 1. The data and materials of this study are available via the Open Science Framework: https://osf.io/7hb8z/.

Table 1. Descriptive statistics, scale reliabilities, and zero-order correlations between moral concern for different animals, human supremacy beliefs, and demographic variables in study 1.

	M	SD	α	1	2	3	4	5	6	7
1. Food animals	4.47	1.71	0.98	–	0.70**	0.64**	−0.48**	0.16*	0.09	0.34**
2. Companion animals	5.49	1.26	0.81		–	0.77**	−0.40**	0.16*	−0.01	0.23**
3. Appealing wild animals	5.38	1.35	0.94			–	−0.35**	0.14*	0.06	0.21**
4. Human supremacy beliefs	3.51	1.30	0.90				–	−0.20**	0.08	−0.34**
5. Gender	–	–						–	−0.01	0.17*
6. Age	35.40	12.83							–	0.04
7. Diet	1.52	1.02								–

Note: Gender 1 = Male, 2 = Female; Diet ranges from 1 (Meat Eater) to 5 (Vegan).
*p < 0.05.
**p < 0.001.

Results

First, we tested whether moral concern for animals significantly differed between animal categories. A repeated measures ANOVA showed significant differences between moral concern for the three animal categories ($F_{(1.69, 329.34)} = 90.39$, $p < 0.001$, $\eta_p^2 = 0.317$).[2] Participants showed greater moral concern for companion and appealing wild animals than for food animals ($F_{(1, 195)} = 135.84$, $p < 0.001$, $\eta_p^2 = 0.411$ and $F_{(1, 195)} = 91.00$, $p < 0.001$, $\eta_p^2 = 0.318$) (see Table 1 for Ms and SDs). Moral concern for appealing wild and companion animals did not significantly differ from each other ($F_{(1, 195)} = 3.17$, $p = 0.076$, $\eta_p^2 = 0.016$).

Next, we tested the hypothesis that human supremacy beliefs moderate the effect of animal category on moral concern for animals by including human supremacy beliefs as a continuous predictor of moral concern for animals in the repeated measures ANOVA. The results revealed a significant interaction between human supremacy beliefs and animal category ($F_{(1.730, 335.69)} = 11.84$, $p < 0.001$, $\eta_p^2 = 0.058$ (see note 2)), indicating that the moral divide between categories depended on human supremacy beliefs. Specifically, human supremacy beliefs moderated the moral divide between companion and food animals ($F_{(1, 194)} = 14.65$, $p < 0.001$, $\eta_p^2 = 0.070$), and between appealing wild and food animals ($F_{(1, 194)} = 15.04$, $p < 0.001$, $\eta_p^2 = 0.072$). However, human supremacy beliefs did not moderate the moral divide between the two high-status animal categories: appealing wild vs. companion animals ($F_{(1, 194)} = 0.25$, $p = 0.615$, $\eta_p^2 = 0.001$).

To further decompose and understand the significant interaction effects, we conducted a moderation analysis for within-subjects designs using the MEMORE macro for SPSS (Montoya, 2019). Specifically, extending the analytic procedures proposed by Judd et al. (2001), MEMORE allowed us to test and probe the effect of animal category (i.e., the within-subjects factor) on moral concern for animals at high (+1 SD) and low (−1 SD) levels of human supremacy beliefs (i.e., the moderator). The results of these analyses are reported in Table 2 and presented in Figure 1. Corroborating our hypothesis, both those higher and lower on human supremacy beliefs indicated to feel less moral concern for food animals than for companion animals and for appealing wild animals, yet this perceived moral divide was significantly larger for those higher on human supremacy beliefs. In other words, those with stronger beliefs in human supremacy over animals perceived larger differences between high- and low-status animal categories in terms of their moral status.

Furthermore, in line with our expectations, the results revealed that human supremacy beliefs predicted lower levels of moral concern for all animal categories, yet this effect was particularly pronounced for food animals ($b = -0.64$, $SE = 0.08$, $t_{(194)} = -7.70$, $p < 0.001$, 95% CI [−0.80, −0.47]). Human supremacy beliefs also predicted lower moral concern for companion animals ($b = -0.39$, $SE = 0.06$, $t_{(194)} = -6.02$, $p < 0.001$, 95% CI [−0.51, −0.26]) and appealing wild animals, ($b = -0.36$, $SE = 0.07$, $t_{(194)} = -5.17$, $p < 0.001$, 95% CI [−0.50, −0.22]), yet these latter associations were significantly weaker than the association between human supremacy beliefs and food animals ($b = 0.25$, SE = 0.07, $t_{(194)} = 3.83$, $p < 0.001$, 95% CI [0.12, 0.38] and $b = 0.27$, $SE = 0.07$, $t_{(194)} = 3.88$, $p < 0.001$, 95% CI [0.14, 0.41], respectively).

Table 2. Results of moderation analyses in study 1 testing the interaction between animal category × human supremacy beliefs on moral concern for animals.

	Animal category × human supremacy interaction					Low levels (−1 SD) of human supremacy beliefs					High levels (+1 SD) of human supremacy beliefs				
	b	SE	t	p	95% CI	b	SE	t	p	95% CI	b	SE	t	p	95% CI
Companion vs. food animals	0.25	0.07	3.83	< 0.001	[0.12, 0.38]	0.69	0.12	5.80	< 0.001	[0.46, 0.93]	1.34	0.12	11.22	< 0.001	[1.11, 1.58]
Appealing wild vs. food animals	0.27	0.07	3.88	< 0.001	[0.14, 0.41]	0.55	0.13	4.23	< 0.001	[0.29, 0.81]	1.26	0.13	9.72	< 0.001	[1.01, 1.52]
Companion vs. appealing wild animals	−0.02	0.05	−0.50	0.615	[−0.12, 0.07]	0.15	0.09	1.61	0.109	[−0.03, 0.32]	0.08	0.09	0.90	0.370	[−0.10, 0.26]
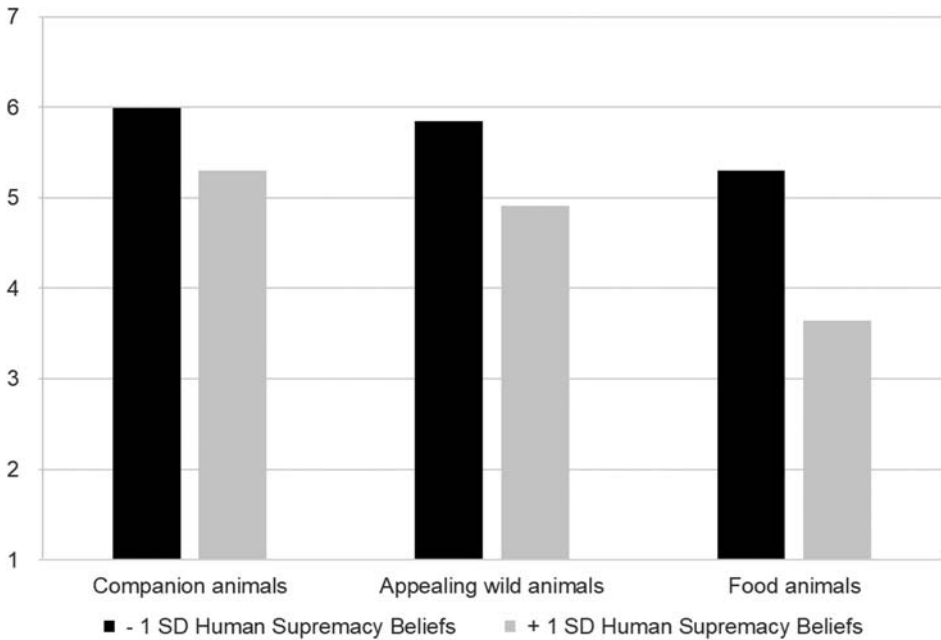
Figure 1. Moral concern ratings as a function of animal category at low (−1 *SD*) and high (+1 *SD*) levels of human supremacy beliefs (study 1).

Finally, to check the robustness of these findings, we tested the interaction effects again but additionally considered the demographic variables that were significantly correlated with any of the key variables of interest. Specifically, both gender and diet were significantly related to the moral concern variables and human supremacy beliefs, and thus we included these variables as additional predictors to adjust for their possible confounding influence. However, this did not meaningfully change the pattern of results; both human supremacy beliefs × animal category interaction effects were still significant ($b = 0.19$, $SE = 0.07$, $t_{(189)} = 2.73$, $p = 0.007$, 95% CI [0.05, 0.33] when considering companion vs. food animals, and $b = 0.22$, $SE = 0.07$, $t_{(189)} = 2.89$, $p = 0.004$, 95% CI [0.07, 0.38] when considering wild appealing vs. food animals).[3]

Study 2

The aim of study 2 was to replicate and extend the findings of study 1 by testing whether similar patterns would occur when including non-food animals holding a low status. Specifically, we additionally included unappealing wild animals such as snakes and bats as a separate low-status group (Leite et al., 2019). Furthermore, given the pronounced associations between SDO and human supremacy beliefs (e.g., Dhont & Hodson, 2014; Salmen & Dhont, 2020), we statistically controlled for SDO to demonstrate the unique role of human supremacy beliefs in predicting the moral divide between high- and low-status animal groups.

Methods

Ethical approval to conduct this study was given by the research ethics committee at the authors' institution and all participants provided informed consent electronically before taking part. Respondents were 254 British Prolific Academic participants[4] (M_{age} = 31.2, SD = 10.6; 44.1% female), who completed the relevant measures in an online survey, with 80.7% self-identified as omnivores, 11.8% as flexitarians, 1.6% as pescatarians, 3.5% as vegetarians, 1.6% as vegans, and the remaining 0.8% as other. A sensitivity analysis using G*Power (Faul et al., 2009), assuming α = 0.05 and 95% power, indicated that the weakest effect size detectable with this sample size was f = 0.09 (i.e., a small effect).

We measured human supremacy beliefs and moral concern for companion animals, food animals and appealing wild animals in a similar way as in study 1, and we added several animals belonging to the category of unappealing wild animals to the list of animals (i.e., bat, snake, snail, and frog) in the moral concern measure (see note 1). As in the first study, the list of animals was presented on one page in a randomized order. We also measured SDO with the short, 8-item measure (1, strongly disagree; 7, strongly agree) developed by Ho et al. (2015). For all correlations, means, standard deviations, and scale reliability scores, see Table 3. The data and materials of this study are available via the Open Science Framework: https://osf.io/7hb8z/.

Results

Replicating study 1, a repeated measures ANOVA confirmed that the moral concern scores varied significantly between the categories ($F_{(2.18, 553.54)}$ = 225.16, $p < 0.001$, $\eta_p^2 = 0.471$) (see note 2). Participants showed greater moral concern for companion and appealing wild animals than for food animals ($F_{(1, 253)}$ = 179.02, $p < 0.001$, $\eta_p^2 = 0.414$ and $F_{(1, 253)}$ = 63.81, $p < 0.001$, $\eta_p^2 = 0.201$). Moral concern was also higher for companion and appealing wild animals than for unappealing wild animals ($F_{(1, 253)}$ = 340.47, $p < 0.001$, $\eta_p^2 = 0.574$ and $F_{(1, 253)}$ = 341.06, $p < 0.001$, $\eta_p^2 = 0.574$). Furthermore, participants showed greater moral concern for food animals than for unappealing wild animals ($F_{(1,253)}$ = 156.26, $p < 0.001$, $\eta_p^2 = 0.382$), and greater concern for companion than for appealing wild animals ($F_{(1, 253)}$ = 50.15, $p < 0.001$, $\eta_p^2 = 0.165$).

Next, testing the moderating role of human supremacy beliefs yielded a significant interaction between human supremacy beliefs and animal category ($F_{(2.24, 564.64)}$ = 11.87, $p < 0.001$, $\eta_p^2 = 0.045$) (see note 2). Specifically, human supremacy beliefs significantly moderated the moral divide between companion and food animals and between companion and unappealing wild animals ($F_{(1, 252)}$ = 18.30, $p < 0.001$, $\eta_p^2 = 0.068$ and $F_{(1, 252)}$ = 16.28, $p < 0.001$, $\eta_p^2 = 0.061$). Furthermore, human supremacy beliefs also moderated the moral divide between appealing wild and food animals ($F_{(1, 252)}$ = 9.36, $p = 0.002$, $\eta_p^2 = 0.036$) and between appealing wild animals and unappealing wild animals ($F_{(1, 252)}$ = 15.86, $p < 0.001$, $\eta_p^2 = 0.059$). However, human supremacy beliefs did not moderate the moral divide between the two high-status animal categories: appealing wild vs. companion animals ($F_{(1, 252)}$ = 2.49, $p = 0.116$, $\eta_p^2 = 0.010$); nor between the two low-status animal categories: food animals vs. unappealing wild animals ($F_{(1, 252)}$ = 2.04, $p = 0.154$, $\eta_p^2 = 0.008$).

Table 3. Descriptive statistics, scale reliabilities, and zero-order correlations between moral concern for different animals, human supremacy beliefs, and demographic variables in study 2.

|	M	SD	α	1	2	3	4	5	6	7	8	9
1. Food animals	5.02	1.44	0.96	–	0.55**	0.63**	0.69**	–0.42**	–0.21**	0.20**	0.03	0.23**
2. Companion animals	6.06	1.06	0.84		–	0.61**	0.31**	–0.27**	–0.24**	0.15*	–0.11	0.13*
3. Appealing wild animals	5.60	1.22	0.85			–	0.64**	–0.32**	–0.29***	0.18**	0.06	0.23***
4. Unappealing wild animals	4.00	1.79	0.92				–	–0.40**	–0.29***	0.16*	0.03	0.26***
5. Human supremacy beliefs	4.09	1.34	0.86					–	0.32**	–0.28**	0.03	–0.28***
6. SDO	2.92	1.10	0.82						–	–0.22**	0.03	–0.13*
7. Gender	–	–								–	0.02	0.18**
8. Age	16.23	10.61									–	0.001
9. Diet	1.32	0.81										–

Note: Gender 1 = Male, 2 = Female; Diet ranges from 1 (Meat Eater) to 5 (Vegan).
*p < 0.05.
**p < 0.001.

To further decompose these interaction patterns, we conducted a moderation analysis for within-subjects designs (using MEMORE for SPSS; Montoya, 2019) and tested the effect of animal category on moral concern for animals at high (+1 SD) and low (−1 SD) levels of human supremacy beliefs. The results of these analyses are reported in Table 4 and presented in Figure 2. Replicating the findings of study 1, both those higher and lower on human supremacy beliefs indicated to feel less moral concern for food animals than for companion animals and for appealing wild animals, yet this perceived moral divide was significantly stronger for those higher (vs. lower) on human supremacy beliefs. Extending the findings of study 1, both those higher and lower on human supremacy beliefs felt less moral concern for unappealing wild animals than for companion animals and for appealing wild animals, yet again, this perceived moral divide was significantly stronger for those higher (vs. lower) on human supremacy beliefs. Taken together, those with stronger human supremacy beliefs perceived a larger moral divide between high- and low-status animal categories.

Furthermore, replicating the results of study 1, human supremacy beliefs showed pronounced associations with lower levels of moral concern for low-status animals (i.e., for food animals, $b = −0.45$, $SE = 0.06$, $t_{(252)} = −7.35$, $p < 0.001$, 95% CI [−0.57, −0.33]; and for unappealing wild animals, $b = −0.54$, $SE = 0.08$, $t_{(252)} = −6.99$, $p < 0.001$, 95% CI [−0.69, −0.39]). Moreover, human supremacy beliefs also predicted lower moral concern for high-status animals (i.e., for companion animals, $b = −0.21$, $SE = 0.05$, $t_{(252)} = −4.42$, $p < 0.001$, 95% CI [−0.31, −0.12]; and for appealing wild animals, $b = −0.29$, $SE = 0.05$, $t_{(252)} = −5.29$, $p < 0.001$, 95% CI [−0.39, −0.18]), yet the significant interaction terms (see Table 4)
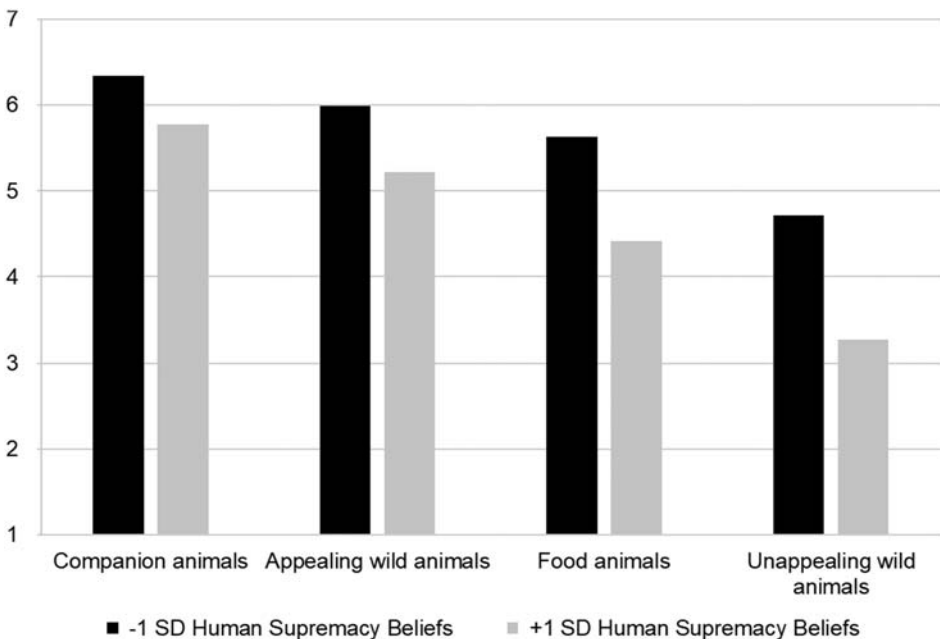
Figure 2. Moral concern ratings as a function of animal category at low (−1 SD) and high (+1 SD) levels of human supremacy beliefs (study 2).

Table 4. Results of moderation analyses in study 2 testing the interaction between animal category × human supremacy beliefs on moral concern for animals.

	Animal category × human supremacy interaction					Low levels of human supremacy beliefs					High levels of human supremacy beliefs				
	b	SE	t	p	95% CI	b	SE	t	p	95% CI	b	SE	t	p	95% CI
Companion vs. food animals	0.24	0.06	4.28	< 0.001	[0.13; 0.35]	0.72	0.11	6.74	< 0.001	[0.51; 0.93]	1.36	0.11	12.80	< 0.001	[1.15; 1.57]
Appealing wild vs. food animals	0.16	0.05	3.06	0.003	[0.06; 0.27]	0.36	0.10	3.57	< 0.001	[0.16; 0.56]	0.81	0.10	7.90	< 0.001	[0.60; 1.01]
Companion vs. unappealing wild animals	0.33	0.08	4.04	< 0.001	[0.17; 0.49]	1.62	0.15	10.57	< 0.001	[1.32; 1.93]	2.50	0.15	16.28	< 0.001	[2.20; 2.80]
Appealing vs. unappealing wild animals	0.25	0.06	3.98	< 0.001	[0.13; 0.38]	1.27	0.12	10.60	< 0.001	[1.04; 1.51]	1.95	0.12	16.24	< 0.001	[1.71; 2.18]
Food vs. unappealing wild animals	0.09	0.06	1.43	0.154	[−0.03; 0.21]	0.91	0.12	7.84	< 0.001	[0.68; 1.14]	1.14	0.12	9.86	< 0.001	[0.91; 1.37]
Companion vs. appealing wild animals	0.08	0.05	1.58	0.116	[−0.02; 0.17]	0.35	0.09	3.90	< 0.001	[0.17; 0.53]	0.55	0.09	6.13	< 0.001	[0.38; 0.73]

indicated that the associations for the low-status animal categories were significantly stronger than the associations for the high-status animal categories.

Finally, as a robustness check, we conducted the same analyses again with the additional inclusion of SDO, gender, and diet as predictors of moral concern because these variables were significantly correlated with the key variables of interest (i.e., see Table 3). Adjusting for the variance explained by SDO, gender, and diet did not meaningfully change the pattern of results. All expected interaction effects remained significant, with significant differences between the effects of human supremacy beliefs on moral concern for companion vs. food animals ($b = 0.22$, $SE = 0.06$, $t_{(240)} = 3.47$, $p < 0.001$, 95% CI [0.09, 0.34]), moral concern for companion vs. unappealing animals ($b = 0.24$, $SE = 0.09$, $t_{(240)} = 2.61$, $p = 0.010$, 95% CI [0.06, 0.42]), moral concern for appealing wild vs food animals ($b = 0.19$, $SE = 0.06$, $t_{(240)} = 3.14$, $p = 0.002$, 95% CI [0.07, 0.31]), and moral concern for appealing wild animals vs. unappealing wild animals ($b = 0.21$, $SE = 0.07$, $t_{(240)} = 2.94$, $p = 0.004$, 95% CI [0.07, 0.35]) (see note 3).

Discussion

Whether people care morally for animals varies widely between species and is directly linked to how the animals are typically treated and (de)valued in society (Dhont et al., 2020; Herzog, 2010; Joy, 2010; Leite et al., 2019; Plous, 2003). Across two heterogeneous British samples, we confirmed that most people care a great deal about the welfare and interests of companion animals and some wild animals, but significantly less about food animals and unappealing wild animals, replicating the findings of Leite et al. (2019) from the USA. Moreover, we revealed that these perceived moral divisions between high-status and low-status animal categories were greater for those holding stronger beliefs in human supremacy over animals. These findings were demonstrated after controlling for gender, diet, and SDO, highlighting the critical role of individual differences in human supremacy beliefs in relation to how people think morally about animals. More specifically, similar to how preferences for dominance and inequality in human intergroup relations is primarily related to greater negativity and lower concerns for human low-status groups, our findings showed that preferences for dominance and inequality in human–animal relations were primarily related to lower moral concern for low-status groups. Consistent with our theorizing, the present findings thus suggest that human supremacy beliefs may operate as a hierarchy-enhancing motive to preserve hierarchical distinctions between animals.

Several psychological processes may explain why those higher on human supremacy beliefs perceive a greater moral divide between high- and low-status animal categories. Indeed, past research has identified a myriad of psychological strategies that enable people to justify the lack of concern for the welfare and interests of certain animals but not others (e.g., Piazza, 2020; Rothgerber, 2020). For example, a series of studies has demonstrated that people tend to perceive food animals as lacking certain mental capacities, often denying the animals' intellectual abilities (i.e., capacity for agency/thinking) and their ability to experience or feel emotions (e.g., Bilewicz et al., 2011; Bratanova et al., 2011; Loughnan et al., 2010). In contrast to food animals, companion animals such as cats and dogs, and certain wild animals such as wolves and pandas, are perceived as

highly intelligent and sentient (e.g., Possidónio et al., 2019). These perceptions of animals' mental sophistications or the lack thereof have direct implications for people's judgement of animals' moral standing. Indeed, people rely on intelligence and sentience information to make moral judgements and attribute moral value to individuals (e.g., Bastian et al., 2012; Gray et al., 2007; Leach et al., 2021). Dementalizing food animals makes it easier not to care morally for them, which in turn helps to justify harming or eating them (e.g., Bastian et al., 2012; Hodson et al., 2014; Piazza et al., 2014). Motivated by desires to keep low-status animal groups at the bottom of the moral hierarchy, those higher on human supremacy beliefs may be more strongly motivated to engage in such justification strategies. This could in turn explain the differential ratings of moral concern between food animals and high-status animals.

Furthermore, those higher on human supremacy beliefs may be motivated to exaggerate or may be more sensitive to the undesired or negative characteristics of low-status wild animals. Specifically, companion animals and high-status wild animals are considered cuter and more similar to humans than low-status animals (e.g., snakes), whereas low-status wild animals are considered more harmful or disgusting. Previous research has shown that these dimensions of perceived harmfulness, repulsiveness, and dissimilarity to humans are all associated with lower moral standing and decreased desires to care for or protect the animals (Knight, 2008; Piazza et al., 2014; Possidónio et al., 2019). To maintain and enhance the animal hierarchy and to dominate low-status animals especially, those higher on human supremacy beliefs may be more inclined to perceive negative or undesirable features of these animals, which would explain why they show a greater moral divide between unappealing wild animals and high-status animals. Future research could examine the psychological processes underpinning the observed patterns by investigating whether those higher in human supremacy beliefs are more likely to dementalize low-status animals or show a greater attentional focus on negative characteristics of these animals.

Furthermore, due to the cross-sectional research design, our findings cannot speak to the causal directions of the relationships. Moreover, while the zero-order correlations in the study of Leite et al. (2019) showed a similar pattern of results as in the current studies (i.e., weaker associations of human supremacy beliefs with moral concern for companion animals than for food and unappealing wild animals), the longitudinal effects of human supremacy beliefs on moral inclusion of animals did not seem to substantially differ across animal categories. To further investigate this issue, future research could experimentally manipulate the perceived gap between animals and humans, for instance by describing animals as more similar to humans (e.g., Bastian et al., 2012). Closing this *human–animal divide* could not only increase moral concern toward animals, but it may also help in closing the moral divide between different animals by increasing moral concern toward low-status animals in particular.

To conclude, the present research provides further evidence for the role of human supremacy beliefs in people's moral thinking about animals and their considerations of which animals are valued or devalued. Specifically, our findings suggest that human supremacy beliefs may serve as a legitimizing motivation not only to preserve hierarchy in human–animal relations but also to maintain and enhance hierarchical and moral divides between different animal categories.

Notes

1. These animal categories are based on previous research, with factor analyses supporting these categorizations (Leite et al., 2019).
2. F-test results of the main effect of animal category are estimates adjusted for lack of sphericity using the Greenhouse-Geisser correction. Indeed, Mauchly's test for sphericity indicated that sphericity had been violated, potentially inflating the F-value if not corrected for. The Greenhouse-Geisser correction is robust to violations of sphericity and applies a correction to the degrees of freedom, leading to a valid F-ratio (e.g., Abdi, 2010).
3. Given that gender and diet were included as control variable in these analyses, only the data of those participants who indicated to belong to the gender category of men or women, and only those who did not indicate "other" as dietary category, were included in these analyses. Based on these criteria, the data of three participants were excluded from these additional analyses in study 1, and the data of nine participants were excluded from these additional analyses in study 2.
4. Two participants were excluded due to incomplete data.

Disclosure Statement

No potential conflict of interest was reported by the authors.

References

Abdi, H. (2010). The greenhouse-Geisser correction. In N. Salkind (Ed.), *Encyclopedia of research design* (pp. 544–548). Sage.

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

Bastian, B., & Loughnan, S. (2016). 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

Bilewicz, M., Imhoff, R., & Drogosz, M. (2011). The humanity of what we eat: Conceptions of human uniqueness among vegetarians and omnivores. *European Journal of Social Psychology*, *41*(2), 201–209. https://doi.org/10.1002/ejsp.766

Bratanova, B., Loughnan, S., & Bastian, B. (2011). The effect of categorization as food on the perceived moral standing of animals. *Appetite*, *57*(1), 193–196. https://doi.org/10.1016/j.appet.2011.04.020

Caviola, L., & Capraro, V. (2020). Liking but devaluing animals: Emotional and deliberative paths to speciesism. *Social Psychological and Personality Science*, *11*(8), 1080–1088. https://doi.org/10.1177/1948550619893959

Caviola, L., Everett, J. A. C., & Faber, N. (2019). 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

Caviola, L., Kahane, G., Everett, J. A., Teperman, E., Savulescu, J., & Faber, N. S. (2020). Utilitarianism for animals, Kantianism for people? Harming animals and humans for the greater good. *Journal of Experimental Psychology: General*. https://doi.org/10.1037/xge0000988

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., Costello, K., & MacInnis, C. C. (2014). Social dominance orientation connects prejudicial human–human and human–animal relations. *Personality and Individual Differences*, *61*, 105–108. https://doi.org/10.1016/j.paid.2013.12.020

Dhont, K., Hodson, G., & Leite, A. C. (2016). Common ideological roots of speciesism and generalized ethnic prejudice: The social dominance human–animal relations model (SD-HARM). *European Journal of Personality*, *30*(6), 507–522. https://doi.org/10.1002/per.2069

Dhont, K., Hodson, G., Leite, A. C., & Salmen, A. (2020). The psychology of speciesism. In K. Dhont & G. Hodson (Eds.), *Why we love and exploit animals: Bridging insights from academia and advocacy* (pp. 29–49). Routledge.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. G. (2009). Statistical power analyses using G* power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods*, *41*(4), 1149–1160. https://doi.org/10.3758/BRM.41.4.1149

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

Herzog, H. (2010). *Some we love, some we hate, some we eat: Why it's so hard to think straight about animals*. Harper.

Ho, A. K., Sidanius, J., Kteily, N., Sheehy-Skeffington, J., Pratto, F., Henkel, K. E., Foels, R., & Stewart, A. L. (2015). The nature of social dominance orientation: Theorizing and measuring preferences for intergroup inequality using the new SDO_7 scale. *Journal of Personality and Social Psychology*, *109*(6), 1003–1028. https://doi.org/10.1037/pspi0000033

Hodson, G., MacInnis, C. C., & Costello, K. (2014). (Over)valuing "humanness" as an aggravator of intergroup prejudices and discrimination. In P. G. Bain, J. Vaes, & J.-P. Leyens (Eds.), *Humanness and dehumanization* (pp. 86–110). Psychology Press.

Hodson, G., Rush, J., & MacInnis, C. C. (2010). A joke is just a joke (except when it isn't): Cavalier humor beliefs facilitate the expression of group dominance motives. *Journal of Personality and Social Psychology*, *99*(4), 660–682. https://doi.org/10.1037/a0019627

Horta, O. (2010). What is speciesism? *Journal of Agricultural and Environmental Ethics*, *23*(3), 243–266. https://doi.org/10.1007/s10806-009-9205-2

Hyers, L. (2006). Myths used to legitimize the exploitation of animals: An application of social dominance theory. *Anthrozoös*, *19*(3), 194–210. https://doi.org/10.2752/089279306785415538

Jackson, L. (2019). Speciesism predicts prejudice against low-status and hierarchy attenuating human groups. *Anthrozoös*, *32*(4), 445–458. https://doi.org/10.1080/08927936.2019.1621514

Jackson, L., & Gibbings, A. (2016). Social dominance and legitimizing myths about animal use. *Anthrozoös*, *29*(1), 151–160. https://doi.org/10.1080/08927936.2015.1082771

Joy, M. (2010). *Why we love dogs, eat pigs, and wear cows: An introduction to carnism*. Conari Press.

Judd, C. M., Kenny, D. A., & McClelland, G. H. (2001). Estimating and testing mediation and moderation in within-subject designs. *Psychological Methods*, *6*(2), 115–134. https://doi.org/10.1037/1082-989X.6.2.115

Knight, A. J. (2008). "Bats, snakes and spiders, oh my!" How aesthetic and negativistic attitudes, and other concepts predict support for species protection. *Journal of Environmental Psychology*, *28*(1), 94–103. https://doi.org/10.1016/j.jenvp.2007.10.001

Kteily, N., Ho, A., & Sidanius, J. (2012). Hierarchy in the mind: The predictive power of social dominance orientation across social contexts and domains. *Journal of Experimental Social Psychology*, *48*(2), 543–549. https://doi.org/10.1016/j.jesp.2011.11.007

Laham, S. (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

Leach, S., Sutton, R.M., Dhont, K, Douglas, K.M. (2021). When is it wrong to eat animals? The relevance of different animal traits and behaviours. *European Journal of Social Psychology*, 51(1), 113–123. https://doi.org/10.1002/ejsp.2718

Leite, A., Dhont, K., & Hodson, G. (2019). Longitudinal effects of human supremacy beliefs and vegetarianism threat on moral exclusion (vs. inclusion) of animals. *European Journal of Social Psychology*, *49*(1), 179–189. https://doi.org/10.1002/ejsp.2497

Loughnan, S., Bastian, B., & Haslam, N. (2014). The psychology of eating animals. *Current Directions in Psychological Science*, *23*(2), 104–108. https://doi.org/10.1177/0963721414525781

Loughnan, S., Haslam, N., & Bastian, B. (2010). The role of meat consumption in the denial of moral status and mind to meat animals. *Appetite*, *55*(1), 156–159. https://doi.org/10.1016/j.appet.2010.05.043

Montoya, A. K. (2019). Moderation analysis in two-instance repeated measures designs: Probing methods and multiple moderator models. *Behavior Research Methods*, *51*(1), 61–82. https://doi.org/10.3758/s13428-018-1088-6

Piazza, J. (2020). Why people love animals yet continue to eat them. In K. Dhont & G. Hodson (Eds.), *Why we love and exploit animals: Bridging insights from academia and advocacy* (pp. 229–244). Routledge.

Piazza, J., Landy, J., & Goodwin, G. (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

Piazza, J., Ruby, M. B., Loughnan, S., Luong, M., Kulik, J., Watkins, H. M., & Seigerman, M. (2015). Rationalizing meat consumption. The 4Ns. *Appetite*, *91*(1), 114–128. https://doi.org/10.1016/j.appet.2015.04.011

Plous, S. (2003). Is there such a thing as prejudice toward animals? In S. Plous (Ed.), *Understanding prejudice and discrimination* (pp. 509–528). McGraw-Hill.

Possidónio, C., Graça, J., Piazza, J., & Prada, M. (2019). Animal images database: Validation of 120 images for human–animal studies. *Animals*, *9*(8), 475. https://doi.org/10.3390/ani9080475

Rothgerber, H. (2020). How we love and hurt animals: Considering cognitive dissonance in young meat eaters. In K. Dhont & G. Hodson (Eds.), *Why we love and exploit animals: Bridging insights from academia and advocacy* (pp. 188–208). Routledge.

Salmen, A., & Dhont, K. (2020). Hostile and benevolent sexism: The differential roles of human supremacy beliefs, women's connection to nature, and the dehumanization of women. *Group Processes & Intergroup Relations*. Advance online publication. https://doi.org/10.1177/1368430220920713

Sidanius, J., & Pratto, F. (1999). *Social dominance: An intergroup theory of social hierarchy and oppression*. Cambridge University Press.

Singer, P. (1995). *Animal liberation*. Random House.