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The Impact of Emotional and Rational Thinking on Two Types of Speciesism

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Abstract

Aim: In this study, we examined whether the mode of information processing and emotions influence the level of anthropocentric speciesism (the tendency to prioritize humans over other species) and pet speciesism (the tendency to prioritize companion animals over other species).

Method: Participants (N = 499), randomly assigned to one of three conditions, resolved seven moral dilemmas and assessed the moral status, likability, intelligence and capacity to feel pain, of the included species (dog, bear, fish, and rat).

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Results: Individuals guided by emotions (vs. logic) demonstrated higher levels of pet speciesism. We did not observe the reverse relationship for anthropocentric speciesism. Emotions experienced towards species were relevant only for pet speciesism under emotional thinking conditions.

Conclusion: The study only partially confirmed the results described in the literature. We suggest employing more objective manipulation methods in further research on speciesism.

Keywords: human–animal relations, speciesism, animal stereotypes, emotions

Speciesism

Attributing lesser value to the lives of certain beings and treating them worse solely because of their species membership is known as speciesism (Ryder, 1980; Singer, 2018). Caviola and Capraro (2020) argue that speciesism is not a uniform phenomenon. They distinguish between: 1) *anthropocentric speciesism* (prioritizing humans over other species) and 2) *pet speciesism* (prioritizing companion animals [e.g., dogs] over other species).

Rational and Emotional Thinking

Caviola and Capraro (2020) found that when people attempted to think rationally, the level of pet speciesism decreased, while anthropocentric speciesism increased. The opposite occurred under emotional thinking. When reasoning rationally, participants based their judgments mainly on the moral status of species; when reasoning emotionally, they relied more on likability. According to the authors, anthropocentric speciesism decreases under emotional conditions because, although humans are attributed higher moral status, animals are liked just as much as other people. Companion animals, in turn, are liked far more than other species, which explains why pet speciesism increases when emotions are prioritised (Caviola & Capraro, 2020).

The distinction between rational and emotional thinking is rooted in dual-process theories. These theories propose that moral decisions arise from the interplay of two systems: one slow, deliberate, and cognitively demanding, and the other fast, intuitive, and emotionally driven (Osman, 2004). Although these systems overlap to some extent, they often produce conflicting responses which is treated as evidence that they represent distinct modes of reasoning (Osman, 2004).

Our study focused on how these two systems influence moral decisions concerning animals. Given the prominent role emotions play in intuitive thinking, we sought to examine how the specific emotions directed toward different species shape levels of speciesism. To avoid arbitrary selection of emotions, we drew on the concept of animal stereotypes.

Animal Stereotypes

Differences in how people perceive and treat particular species are described by the Stereotype Content Model and the BIAS Map for animals (Sevillano & Fiske, 2016). The BIAS Map makes it possible to predict how a given group will be treated on the basis of the stereotype it is linked to and the emotions it evokes. The authors identified and empirically confirmed four stereotype groups.

Animals associated with the ambivalent stereotype of *prey* (subordination stereotype) are attributed high or moderate warmth but low competence. They evoke indifference and appear passive. Since many of these animals are raised for meat, people both care for them and at the same time accept and legitimize harming them. Species that fall under the ambivalent stereotype of *predators* (threatening-awe stereotype) are perceived as cold and competent. They inspire both awe and fear, which makes people inclined to protect them, but also to attack them. Animals classified under the stereotype of *pests* (contemptible stereotype) are perceived and treated in strictly negative terms. They are seen as cold and incompetent, associated with spreading disease and destroying property—therefore provoking contempt and disgust. Finally, the positive stereotype of companions (protective stereotype) includes species perceived as warm and competent, loved by humans, and sometimes even regarded as protectors. These animals enjoy a privileged status and inspire a willingness to provide both passive and active help (Sevillano & Fiske, 2016).

Speciesism and Animal Stereotypes

In the study by Caviola and Capraro (2020), participants faced moral dilemmas requiring them to choose which of two beings to help in situations of suffering or life-threatening danger, or which charity supporting those beings to donate money to. The dilemmas involved humans, dogs, pigs, elephants, and chimpanzees. Within Sevillano and Fiske's (2016) framework, these species can be classified as companions (dogs, chimpanzees, elephants) and prey (pigs). Both groups score high on warmth and evoke either positive (fondness) or neutral (indifference) emotions, and consequently sympathy. It is therefore possible that rational and emotional thinking affects levels of speciesism differently than in Caviola and Capraro's (2020) study, when dilemmas involve species that evoke a wider range of emotions. Their conclusion that "people like animals just as much as humans" (Caviola & Capraro, 2020, p. 7) may reflect the fact that only species evoking positive or neutral emotions were included in their research. Animals, however, are a highly heterogeneous group, and—as the Sevillano and Fiske (2016) model shows—different species evoke different feelings. When disfavored stereotypes are also taken into account, levels of sympathy for animals may turn out to be lower than for humans. Under emotional thinking condition, anthropocentric speciesism might therefore not only fail to decrease, but even increase when faced with species that elicit negative emotions. At the same time, emotions directed at animals should play a smaller role under rational

thinking, since in such cases participants rely mainly on moral status (Caviola & Capraro, 2020).

Moreover, Caviola and Capraro (2020) themselves noted a limitation of their study: it was unclear which emotions influenced participants' moral decisions, as all the species included in their dilemmas evoked only positive emotions. We therefore sought to address this gap. To avoid arbitrary selection of emotions, we relied on an existing, empirically supported model that includes emotions directed toward particular species: awe, fondness, contempt, and indifference (Sevillano & Fiske, 2016).

Main Study

Before conducting the main study, we ran a pilot to select four species that most strongly evoked emotions associated with different animal stereotypes in Sevillano and Fiske's (2016) model. The pilot study indicated that these were: the bear (awe; predator), the dog (fondness; companion), the rat (contempt; pest), and—contrary to the Stereotype Content Model—the fish (indifference; prey). These species were therefore included in the main study.

In the main study, participants faced a series of moral dilemmas designed to measure levels of speciesism. We also assessed the extent to which participants attributed moral status, intelligence, capacity to suffer, and likability to each species.

We formulated the following hypotheses:

H1. Levels of pet speciesism will be lower in the *rational group* than in the *emotional group*. This would replicate the findings of Caviola and Capraro (2020). We expect this pattern to occur (1.A) regardless of which emotions a given species evokes. In rational thinking condition emotions should play a smaller role, as people rely more on moral status (Caviola & Capraro, 2020). Since all animals are generally assigned relatively low moral status compared to humans (Topolski et al., 2013), this factor should not strongly differentiate perception of species. At the same time, animals evoke a wide range of emotions—from highly positive to highly negative. The species included in our dilemmas were deliberately chosen to elicit strong and contrasting emotions derived from Sevillano and Fiske's (2016) model.

H2. Levels of anthropocentric speciesism will be lower in the *emotional group* than in the *rational group*. This would align with Caviola and Capraro's (2020) findings and support their conclusion that under intuitive processing people rely primarily on sympathy and emotions, and tend to like other humans about as much as animals (considered in general). Rational processing, in contrast, is grounded in moral status, which is attributed to humans to a much greater degree than to animals (Caviola & Capraro, 2020).

H2.A. Within the *emotional group*, anthropocentric speciesism will be lower toward companions, prey, and predators, but not toward pests. Pests uniquely

represent a negative stereotype (Sevillano & Fiske, 2016), evoke strictly negative emotions, and are not liked. If moral decisions under intuitive processing are driven by emotions, participants will follow their disgust and aversion toward rats, and therefore their level of anthropocentric speciesism in this case should not decrease.

H3. Companions and predators will be attributed higher (3) intelligence, (3.A) capacity to feel pain, and (3.B) moral status than prey and pests. This is due to perceived competence, which is higher for companions and predators than for pests and prey (Sevillano & Fiske, 2016). If moral status is conferred on the basis of competence, as suggested by Caviola and Capraro (2020), then prey and pests—perceived as incompetent—should be granted less moral concern. Moreover, species in these two groups are also widely harmed by humans through farming (e.g., for meat) and pest extermination, with violence against them being socially legitimized. On these grounds, we may also expect them to be attributed lower moral status. In addition, Bratanova and colleagues (2011) found that in order to avoid the negative emotions associated with accepting the use of animals, people deny them the capacity to feel pain, thereby justifying their lower moral status and object-like treatment.

H4. Pests will be attributed lower likability than all other animals. This is the only exclusively negative stereotype, linked to emotions of contempt and disgust in Sevillano and Fiske's (2016) model. People ascribe malicious intent to pests and are ready to exterminate them, so they are most likely to be rated as low in likability.

H5. Companions will be attributed the highest levels of intelligence, capacity to feel pain, likability, and moral status. We expected this given the special role companions play in our culture and in line with the findings of Wilks et al. (2021). Companion animals are often regarded as family members and close friends, and are favored over other species, as well as being loved (Caviola & Capraro, 2020; Sevillano & Fiske, 2016).

H6. In the *rational group*, moral status will be a stronger predictor of both types of speciesism than likability. This would replicate Caviola and Capraro's (2020) results. When reasoning rationally, people tend to "set aside" emotions and focus on factual arguments, which in the context of moral decisions center primarily on moral status.

H7. In the *emotional group*, likability will be a stronger predictor of speciesism than moral status. Again, this would be consistent with Caviola and Capraro's (2020) findings. We assume that personal preferences toward species are cognitively more accessible, and—as in Caviola and Capraro's study—they will serve as the basis for moral decisions made quickly, in line with participants' first impressions.

H8. Intelligence will be the best predictor of moral status. This would replicate Wilks and colleagues' (2021) findings. We assume this may be the case

because intelligence is closely tied to perceived competence. At the same time, people view their own species as intelligent, and it is possible that when attributing intelligence to other species, they also begin to perceive them as more similar to humans. Since humans are granted higher moral status than animals, a higher perceived similarity to humans may translate into assigning other species higher moral status as well.

Main Study

Method

Participants

The main study was conducted using the Qualtrics survey platform. Participants were recruited via Polish social media groups. A total of 743 people took part, but 244 failed the manipulation check and were excluded from analyses. The final sample consisted of 499 participants: 411 women, 83 men, and 5 individuals identifying as another gender. In terms of education, 0.6% (N = 3) had primary education, 0.8% (N = 4) lower secondary, 1.6% (N = 8) vocational, 23% (N = 115) secondary, 52.1% (N = 260) higher education, and 21.8% (N = 109) were currently studying. Most respondents (97.4%, N = 486) have or previously had a companion animal. At the same time, 23.2% (N = 116) reported working with animals currently or in the past.

Measures

We used seven moral dilemmas. In each, participants were asked to distribute 100 PLN between two charities supporting a privileged and an unprivileged species. The dilemmas were as follows: 1) human vs. dog, 2) human vs. fish, 3) human vs. rat, 4) human vs. bear, 5) dog vs. rat, 6) dog vs. fish, 7) dog vs. bear. Responses were given via a slider, with the two allocated amounts always summing to 100 PLN. This tool was developed by Caviola et al. (2019), who argue it is an effective way of measuring speciesism. Although Caviola and Capraro (2020) also used other types of moral dilemmas to measure speciesism, we opted for dilemmas involving donations to charities, as this approach is more realistic. We limited ourselves to one type of dilemma to avoid lengthening the study excessively and to ensure consistent measurement of both types of speciesism across all species pairs.

Participants also evaluated animals on four single-item measures:

1. "Please rate how much you personally like the following species (1 – *strongly dislike*, 5 – *like them a lot*)."
2. "From a purely ethical perspective, please rate how morally important the life and welfare of the following species are (1 – n*ot morally important at all*, 5 – *more morally important than humans*)."

3. "How intelligent do you think the following species are? (1 – *not intelligent at all*, 5 – *more intelligent than humans*)."
4. "To what extent do you think the following species can feel pain and suffering? (1 – *not at all*, 5 – *more than humans*)."

A manipulation check was employed, consisting of a single item asking participants what guided them in the dilemmas: "emotions," "reason," or "other factors." Caviola and Capraro (2020) used the same procedure to verify manipulation effects.

Procedure

After giving informed consent, participants underwent the experimental manipulation. Those randomly assigned to the *rational group* were instructed to rely on logic and reason when making judgments. Participants in the *emotional group* were instructed to rely on their emotions and first impressions. The control group was simply informed about the number of questions. This procedure followed that of Caviola and Capraro (2020).

Next, participants faced the seven moral dilemmas. After resolving them, they rated the species in terms of intelligence, capacity to feel pain, moral status, and likability, and reported what guided their decisions (manipulation check). Finally, they completed a demographic questionnaire.

Data Analysis

We compared willingness to help particular animal species across experimental conditions using the Kruskal–Wallis test. To compare participants' evaluations of individual species, we used the Friedman test. Regression analyses were conducted to identify predictors of both types of speciesism.

Results

Many participants responded in ways inconsistent with the instructions (see Table 1). After excluding those who failed the manipulation check, the groups were markedly unequal in size, so we used nonparametric tests for most analyses.

Table 1

Responses to the Question: "What Guided Your Decisions in the Above Dilemmas?"

	Reason, logic	**Emotions, first impression**	**Other factors**
Rational group	111	86	51
Emotional group	86	136	22
Control group	106	118	28

To test the effect of the manipulation on responses to the moral dilemmas (Hypotheses 1 and 2), we calculated the overall level of both types of speciesism

by computing, for each participant, the average amount of money allocated to humans across all dilemmas measuring anthropocentric speciesism (Figure 1), and the average amount allocated to dogs across all dilemmas measuring pet speciesism (Figure 2, p. 163; Table 2). We then performed a Kruskal–Wallis test to check whether these variables differed between groups. Contrary to Hypothesis 2, there were no significant differences between groups for anthropocentric speciesism [$H(2) = 0.21$, $p = .90$, $\eta^2 < .001$]. However, we did find a difference for pet speciesism [$H(2) = 13.39$, $p = .001$, $\eta^2 = .03$]. Dunn's test with Bonferroni correction showed that participants in the *rational group* exhibited lower pet speciesism than those in the *emotional group* ($p < .001$), in line with Hypothesis 1.

Table 2

Descriptive Statistics for Responses in Moral Dilemmas (Amount of Money Allocated to the Privileged Species)

Dilemma	*M*	*SD*	Skewness	Kurtosis
Human – Dog	46.55	28.17	0.01	–0.50
Human – Bear	55.96	28.40	–0.27	–0.46
Human – Fish	70.41	28.19	–0.87	0.09
Human – Rat	71.26	31.01	–0.88	–0.29
Dog – Bear	63.38	22.12	–0.09	0.16
Dog – Fish	77.70	22.64	–0.91	0.57
Dog – Rat	78.54	23.51	–0.99	0.61
Antropocentric speciesism	61.04	24.82	–0.59	0.43
Pet speciesism	73.21	18.69	–0.67	0.81

Figure 1

Distribution of Mean Amount of Money Allocated to Animals in Dilemmas Measuring Anthropocentric Speciesism, by Information Processing Condition

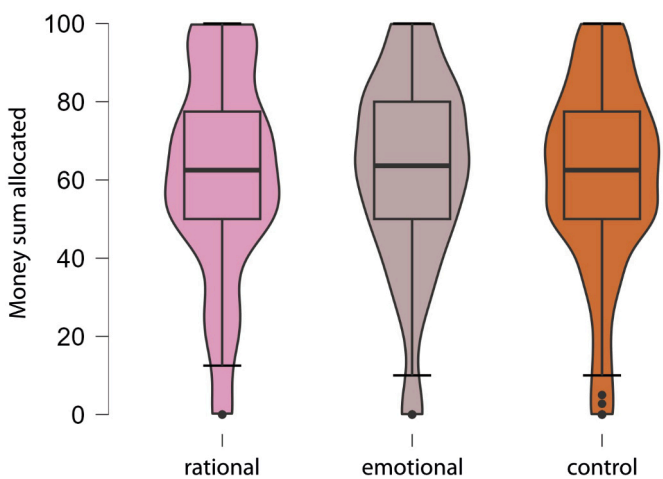
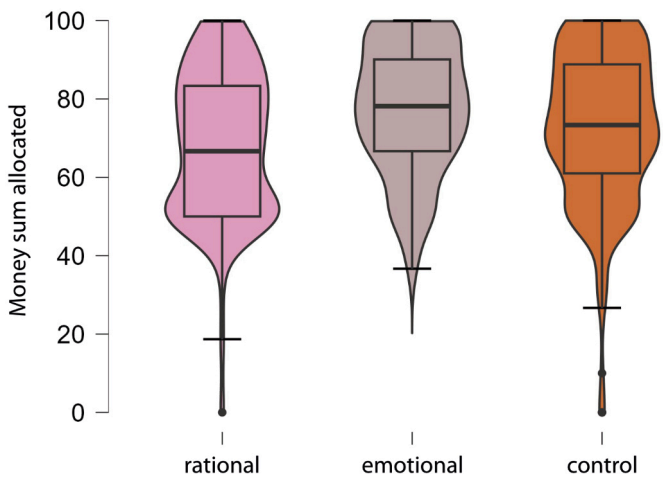


Figure 2

Distribution of Mean Amount of Money Allocated to Non-Privileged Animals in Dilemmas Measuring Pet Speciesism, by Information Processing Condition



To test whether the species of the animal mattered for the relationship between information processing style and responses to dilemmas (Hypotheses 1.A and 2.A), we conducted Kruskal–Wallis tests separately for each of the seven dilemmas. For pet speciesism, results showed differences for the dog–bear dilemma [$H(2) = 8.20$, $p = .02$, $\eta^2 = .02$] and the dog–fish dilemma [$H(2) = 18.94$, $p < .001$, $\eta^2 = .04$], but not for the dog–rat dilemma [$H(2) = 3.46$, $p = .18$, $\eta^2 = .01$]. Dunn's test with Bonferroni correction indicated that for the first two dilemmas, levels of pet speciesism were higher in the *emotional group* than in the *rational group* ($p < .001$), consistent with Hypothesis 1.A. However, Hypothesis 1.A was only partially supported, given the null result for the dog–rat dilemma.

For anthropocentric speciesism, the Kruskal–Wallis test showed a between-group difference only for the human–fish dilemma [$H(2) = 6.32$, $p = .04$, $\eta^2 = .01$]. Dunn's test indicated that the *emotional group* (vs. the *rational group*) was more inclined to support humans over fish ($p = .04$). However, the effect size was very small. We found no differences in anthropocentric speciesism for the other dilemmas: human–dog [$H(2) = 4.21$, $p = .12$, $\eta^2 = .01$], human–bear [$H(2) = 0.09$, $p = .96$, $\eta^2 = .00$], and human–rat [$H(2) = 0.24$, $p = .89$, $\eta^2 < .001$]. Thus, Hypothesis 2.A was not supported.

To examine how much intelligence, capacity to feel pain, moral status, and likability participants attributed to animals (Hypotheses 3–5), we conducted repeated-measures analyses of variance for each variable. The Kolmogorov–Smirnov test indicated that the distributions of all variables significantly departed from normality ($p < .001$ for all), and Mauchly's test showed that the assumption of sphericity was violated ($p < .001$ for all). Since the assumptions of ANOVA were not met, we used the nonparametric Friedman test.

Table 3

Evaluation of Species in Terms of Moral Status, Mental Capacities, and Likability

Species	Variable	*M*	*SD*	Skewness	Kurtosis
Dog	Intelligence	3.70	0.81	0.26	–0.78
	Capacity to suffer	4.15	0.46	–0.27	2.21
	Moral status	3.90	0.91	–0.28	0.01
	Likability	4.59	0.91	–2.86	8.12
Bear	Intelligence	3.30	0.74	0.60	0.26
	Capacity to suffer	4.00	0.49	–0.60	3.64
	Moral status	3.49	0.82	–0.64	0.78
	Likability	3.86	0.86	–0.49	0.31
Fish	Intelligence	2.42	0.91	0.55	0.42
	Capacity to suffer	3.45	0.86	–0.69	0.28
	Moral status	3.05	0.93	–0.23	–0.31
	Likability	3.46	0.91	–0.28	0.06
Rat	Intelligence	3.46	0.92	–0.20	–0.10
	Capacity to suffer	3.80	0.67	–1.37	3.32
	Moral status	2.77	1.10	–0.11	–0.94
	Likability	2.88	1.37	0.64	–1.26

The tests revealed differences across nearly all species for all characteristics (see Table 4, p. 165). Companions (dogs) were rated as more intelligent than the other animals, consistent with Hypothesis 3. Predators (bears) were judged more intelligent than prey (fish), but not more intelligent than pests (rats). Thus, Hypothesis 3 was only partially confirmed. Bears and dogs were judged more capable of experiencing pain and as having higher moral status than fish and rats, in line with Hypotheses 3.A and 3.B. Rats were the least liked species, consistent with Hypothesis 4. Dogs were the most liked species and were also perceived as the most intelligent, possessing the highest moral status, and most capable of experiencing pain (on the last variable they did not differ from bears)—all consistent with Hypothesis 5.

To test Hypotheses 6 and 7, we conducted linear regression analyses for all dilemmas in both information-processing conditions (see Table 5, p. 165).

In most dilemmas concerning anthropocentric speciesism, moral status was a stronger predictor than likability regardless of condition. The only exception was the human–rat dilemma in the *emotional group*. For pet speciesism, moral status was the stronger predictor only in the *rational group*. In the *emotional group*, likability emerged as the stronger predictor. These findings support Hypothesis 6 and provide partial support for Hypothesis 7.

To test Hypothesis 8, we again conducted regression analyses (see Table 6, p. 166). For all species except the bear, capacity to feel pain was a stronger predictor than intelligence. In all four cases, both variables turned out to be significant predictors ($p < .001$). Hypothesis 8 was therefore not supported.

Table 4

Results of Friedman Tests for Differences in Species Evaluations

Variable	$X^2(3)$	Pairwise comparisons
Likability	639.11**	Dog – Bear**
		Dog – Fish**
		Dog – Rat**
		Bear – Fish**
		Bear – Rat**
		Fish – Rat**
Intelligence	658.94**	Dog – Bear**
		Dog – Fish**
		Dog – Rat**
		Bear – Fish**
		Bear – Rat**
		Fish – Rat**
Moral status	751.35**	Dog – Bear**
		Dog – Fish**
		Dog – Rat**
		Bear – Fish**
		Bear – Rat*
		Fish – Rat**
Capacity to suffer	480.36**	Dog – Bear
		Dog – Fish**
		Dog – Rat**
		Bear – Fish**
		Bear – Rat**
		Fish – Rat**

* $p < 0.05$, ** $p < 0.001$

Table 5

Adjusted R^2 Coefficients of Regression Models for Moral Dilemmas and Beta Values for Predictors

Dilemma	Mode of information processing	R^2	Moral status	Likability	F
Human – Dog	"rational"	.30	–.64**	–.08	39.31**
	"emotional"	.30	–.56**	.03	29.41**
Human – Bear	"rational"	.35	–.60**	.00	30.99**
	"emotional"	.26	–.32**	–.30**	24.99**
Human – Fish	"rational"	.30	–.55**	–.02	24.48**
	"emotional"	.27	–.46**	–.16*	26.99**
Human – Rat	"rational"	.37	–.39**	–.30*	33.88**
	"emotional"	.41	–.31*	–.41**	47.56**
Dog – Bear	"rational"	.07	–.28*	–.06	5.16*
	"emotional"	.12	.05	–.38**	10.24**
Dog – Fish	"rational"	.23	–.36**	–.22*	17.12**
	"emotional"	.25	–.29**	–.33**	22.92**
Dog – Rat	"rational"	.47	–.50**	–.27*	50.42**
	"emotional"	.30	–.28*	–.33*	29.57**

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

Table 6

Adjusted R^2 Coefficients of Regression Models for Moral Status and Beta Values for Predictors

Species	R^2	Intelligence	Capacity to suffer	F
Dog	.24	.29**	.31**	78.92**
Bear	.14	.25**	.22**	42.10**
Fish	.22	.25**	.31**	68.15**
Rat	.20	.19**	.36**	63.73**

** $p < .001$

To examine the relationships between participants' gender and education and their levels of speciesism, we performed Kruskal–Wallis tests. We opted for nonparametric methods due to the clearly unequal number of factor levels. Gender differentiated participants in terms of anthropocentric speciesism [$H(2) = 27.24$, $p < .001$, $\eta^2 = .05$], but not pet speciesism [$H(2) = 0.92$, $p = .63$, $\eta^2 < .001$]. Dunn's test with Bonferroni correction showed that women displayed lower levels of anthropocentric speciesism than men ($p < .001$). We found no differences between women and men compared to participants identifying as another gender.

We observed no relationship between education and levels of either anthropocentric speciesism [$H(2) = 4.21$, $p = .52$, $\eta^2 = .01$] or pet speciesism [$H(2) = 4.77$, $p = .45$; $\eta^2 = .01$].

To test the impact of work experience with animals and companion animal ownership on levels of speciesism, we performed Mann–Whitney U tests. We chose a nonparametric approach because the assumption of equal group sizes was not met. Participants who had worked with animals showed lower levels of anthropocentric speciesism ($Z = 3.21$, $p = .001$), but did not differ in pet speciesism ($Z = –1.29$, $p = .20$). There were no differences between participants who had owned an animal and those who had not, either in anthropocentric speciesism ($Z = 1.48$, $p = .14$) or in pet speciesism ($Z = –0.81$, $p = .42$).

Anthropocentric speciesism correlated with pet speciesism ($r = .39$, $p < .001$).

Discussion

Our study was an attempt to extend the work of Caviola and Capraro (2020), who found that level of anthropocentric speciesism increased under rational thinking, whereas level of pet speciesism rose under emotional thinking. We examined whether introducing an additional variable—emotions toward species (awe, fondness, contempt, and indifference)—would yield more nuanced results. We also explored the criteria participants used when evaluating animals.

In the main study, participants faced four dilemmas measuring anthropocentric speciesism and three measuring pet speciesism, and we assessed their

attitudes toward the species involved. These species were selected in a pilot study on the basis of the emotions they evoked according to the concept of animal stereotypes and the BIAS Map (Sevillano & Fiske, 2016): the bear (awe; predator), the dog (fondness; companion), the rat (contempt; pest), and—contrary to the model—the fish (indifference; prey).

The procedure was preceded by an experimental manipulation intended to induce either emotional or rational thinking.

As in Caviola and Capraro's (2020) study, we observed lower pet speciesism in the *rational group* compared to the *emotional group*. Caviola and Capraro explained this by noting that while people attribute a similar moral status to different nonhuman species, the degree to which they like them varies considerably. At the same time, the *emotional group* in dilemmas measuring pet speciesism relied mainly on likability—both in their study and in ours.

In the *emotional group*, pet speciesism was higher in the dog–bear and dog–fish dilemmas, which may have been driven by the emotion of fondness toward dogs. We did not observe the same effect in the dog–rat dilemma, perhaps because pests are attributed both low moral status and low likability.

Contrary to Caviola and Capraro's (2020) findings, information processing mode in our study did not influence levels of anthropocentric speciesism. We initially suspected that this discrepancy might be explained by a lower average likability of animals (considered in general) than of humans, once species representing disfavored groups were included. However, additional analyses did not confirm this. Consistent with Caviola and Capraro's observations, our participants liked animals about as much as they liked humans. The discrepancy may therefore stem from an important limitation of our study: the non-representative sample, which contained a strong overrepresentation of women. We observed that women displayed lower levels of anthropocentric speciesism than men.

Animal species had no effect on levels of anthropocentric speciesism. The only between-group difference appeared in the human–fish dilemma, where the *emotional group* showed a higher level of bias. We see no clear explanation of this pattern. The fact that the result was borderline significant and the effect size very small suggests that it may have been a chance finding.

Participants rated rats as more intelligent than bears. This result is inconsistent with the stereotype of pests, which are considered incompetent. However, rats are indeed highly intelligent animals, and it is possible that our participants—many of whom had higher education or were students—were aware of this.

As predicted, dogs and bears were attributed the highest capacity to feel pain and the highest moral status. Companions and predators are perceived as competent, which explains why they were attributed high capacity for suffering. In our study, capacity to feel pain was also the strongest predictor of moral status—unlike in Wilks et al.'s (2021) research. The particularly strong role of suffering in determining moral status may have been due to the overrepresentation of women in our sample. Although research on gender differences in empathy has produced mixed findings, many studies suggest that women score higher in empathy (e.g., Toussaint & Webb, 2005).

The fact that rats elicited the lowest likability was consistent with our predictions, as they represent the only strictly negative stereotype.

Our hypotheses about dogs were also confirmed: they were attributed the highest moral status, greatest intelligence, and strongest capacity to feel pain. This result aligns with the assumption that they belong to the positive companion stereotype, characterized by high warmth and competence. As companion animals, in some cultures they are even treated as part of the family.

Although, as predicted, participants relied mainly on likability when reasoning emotionally and on moral status when reasoning rationally in dilemmas measuring pet speciesism, we did not observe the same pattern for anthropocentric speciesism. Regardless of processing style, participants based their anthropocentric judgments primarily on moral status. The only exception was the human–rat dilemma in the *emotional group*. It is worth noting that this constitutes yet another departure from our predictions in the case of anthropocentric speciesism, which did not occur for pet speciesism. It is possible that the method we used to measure anthropocentric speciesism was not well suited for Polish participants, or that the discrepancy again stems from the non-representative sample.

Our study also revealed that women and people with experience working with animals showed lower levels of anthropocentric speciesism compared to men and those without such experience. However, no differences emerged for pet speciesism. Likewise, companion animal ownership and education had no impact on levels of either type of speciesism.

The two forms of speciesism were correlated, consistent with Caviola and Capraro's (2020) findings. The fact that in both their study and ours the correlation was only moderate supports the view that these are distinct forms of prejudice.

To summarize, Hypotheses 1, 3.A, 3.B, 4, 5, and 6 received full empirical support in our study, while Hypotheses 1.A, 3, and 7 were partially supported. Hypotheses 2, 2.A, and 8 had to be rejected. Further research is therefore needed to test the relationships identified by Caviola and Capraro (2020). We suggest that in future studies on the influence of information processing style on speciesism, time constraints should be introduced in addition to instructions. The *emotional group* should be forced to make decisions quickly, while each dilemma in the *rational group* should be displayed for at least one minute to require deliberation. Suter and Hertwig (2011) demonstrated the effectiveness of such manipulation.

It should be noted that, in addition to the non-representative sample, our study has another limitation: the manipulation check question was not asked immediately after the manipulation, but at the end of the study. Thus, we cannot be certain it accurately reflected the effect of the manipulation. There is a risk that responses reflected individual differences between participants rather than the effectiveness of the manipulation. Moreover, we relied on nonparametric tests, which have lower statistical power than parametric tests. Additional analyses also revealed that likability and moral status were not independent in our study. For most species they correlated weakly or moderately, but for rats the correlation was strong. It is therefore difficult to disentangle the effects of these two variables on moral decisions.

Given these limitations, we approach our findings and conclusions with some caution. Further research should focus on verifying and extending the concept of animal stereotypes and should continue to explore interventions that reduce levels of speciesism, as these prejudices largely shape society's attitudes toward other species and contribute to significant suffering.

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