RUNNING HEAD: Social Perception of Animals

Warmth and Competence in Animals

Verónica Sevillano

Universidad Autónoma de Madrid

Susan T. Fiske

Princeton University

[In press, Journal of Applied Social Psychology]

Abstract: 126 words
Text, references: 9628 words
Tables: 9
Figures: 2

Author Note

Verónica Sevillano, Department of Social Psychology and Methodology, Universidad Autónoma de Madrid; Susan T. Fiske, Department of Psychology and Woodrow Wilson School of Public Affairs, Princeton University.

Our thanks for support from the Fulbright Program, the Spanish Ministry of Science and Innovation, and the Russell Sage Foundation.

Correspondence concerning this article should be addressed to Verónica Sevillano, Department of Methodology and Social Psychology, Universidad Autónoma de Madrid, Madrid (Spain), 28049. E-mail address: veronica.sevillano@uam.es

Abstract

Social-perception dimensions may explain human-animal relationships because animals show intent toward humans (social perception's warmth dimension) and, consequently, their potential effect on humans is relevant (competence dimension). After reviewing current literature about perceptions of animals' ascribed intentions and abilities, three studies tested the Stereotype Content Model (Fiske, Cuddy, Glick, & Xu, 2002) and the Behaviors from Intergroup Affect and Stereotypes Map (Cuddy, Fiske, & Glick, 2007) regarding animal targets. Study 1 found a four-cluster SCM structure. Warmth and competence judgments predicted specific emotions and behavioral tendencies toward animals (Study 2). Study 3 supported associations between animals and social groups based on their respective perceived warmth and competence. Taken together, results showed the relevance of SCM dimensions for social perception of animals.

Keywords: stereotype content, animals, warmth, competence, social groups

Human beings are traditionally studied targets of social perception (Kwan & Fiske, 2008). However, recent interest in the boundaries of social cognition identifies differential attributing of mind to animals, humans, robots, and God (Gray, Gray, & Wegner, 2007), dehumanizing animalized individuals (Demoulin et al., 2004; Haslam & Loughnan, 2014), and anthropomorphizing humanized animals and gadgets (Epley, Waytz, & Cacioppo, 2007). Animals thus become relevant targets of study (Sevillano & Fiske, 2015).

People and animals as social cognitive targets might be perceived either as evoking some fundamentally similar processes, or altogether different principles might apply. This article explores the way people characterize specific animals, using as its conceptual anchor the way people describe human groups: the Stereotype Content Model (SCM; Fiske, Cuddy, Glick, & Xu, 2002) and stereotypes' emotional and behavioral implications, using the Behaviors from Intergroup Affect and Stereotypes Map (BIAS map; Cuddy, Fiske, & Glick, 2007). First, this article explores the way people characterize specific animals, based on the way people describe other humans, after reviewing previous literature that indicates the plausibility of applying the Warmth and Competence dimensions to animal targets.

Second, emotions and behaviors implied by different animal stereotypes are identified and consequently, a comprehensive map of emotional and behavioral reactions of humans to animals is presented. Third, the applicability of Warmth and Competence to animals should facilitate identifying associative relations among animals and human targets (i.e., social groups) similarly perceived in Warmth and Competence.

Testing the SCM and BIAS Map applicability for animals is important because social-perception dimensions may contribute to explaining human-animal relationships.

Stereotype Content Model for Animals?

The SCM (Fiske et al., 2002) proposes a theoretical framework integrating two basic and apparently universal dimensions of social perception, namely Warmth—perceived intent (What is the goal, good or bad, of another person/group?) and Competence—ability and general capacity (What resources, abilities, and power does a person/group have at their disposal to achieve their goal?). The joint consideration of both dimensions implies a four-quadrant space mapping the relative positions of the different social groups.

- Stereotyped groups in the high-warmth/high-competence quadrant are reference groups (in-group and allied groupse.g., the middle class).
- Stereotyped groups in the low-warmth/low-competence quadrant are groups seen as having no positive function in society (e.g., homeless people).
- Groups placed in the high-warmth/low-competence and low-warmth/high-competence quadrants receive ambivalent stereotypes revealing both positive and negative beliefs about them: groups perceived as pursuing a unthreatening goal but with no capacity to attain it in the former case (e.g., older people).
- And groups pursuing a threatening goal plus the capacity to attain it in the latter case (e.g., rich people).

This functionalistic approach may also be relevant in the context of animals (Kwan & Cuddy, 2008) to the extent that intention (warmth) and ability (competence) are also important variables for human-animal interactions (Knight, Vrij, Bard, & Brandon, 2009; Rajecki, Rasmussen, & Conner, 2007). Animals assist, explore, attack, or ignore humans. As a result, the identification of animals' intentions has implications for the way humans interact with them: To be aware of an imminent attack by an animal would imply defensive or avoidant behavior toward

it. But animals also present diverse capacities to carry out their intentions (e.g., intelligence, abilities, natural weapons).

In short, human social-perception dimensions may also explain human-animal relationships, with distinct reactions to distinct kinds of animals**:** Aggressive or friendly tendencies might reflect perceived intent (warmth); cognitive abilities (intelligence) and extraordinary sensory-physical abilities (e.g., strength, speed) might reflect perceived capacity (competence). The next section reviews current literature about perceptions of animals' ascribed intentions and abilities.

Animal Stereotypes: Intention and Competence in Animal Perception

Animals seem to suffer from inequality (Arluke & Sanders, 1996). Whereas some are accepted (e.g., dogs), others are rejected (e.g., rats). Intermediate positions include those useful as food, but uninteresting, without special sensory and physical abilities (e.g., cows); and those interesting, with extraordinary physical attributes, but fearsome (e.g., lions). Consider each in turn.

Subordination stereotype: Farm animals, rabbits, and birds. Farm animals (pigs, cows) and other animals such as rabbits or birds are perceived as lacking physical or cognitive abilities (Bastian, Loughnan, Haslam, & Radke, 2012; Eddy, Gallup, & Povinelli, 1993; Herzog & Galvin, 1992; Knight et al., 2009; Kwan & Cuddy, 2008). Caged animals are perceived as tame and passive compared to wild animals (Finlay, James, & Maple, 1988), and this view of animals may portray a disrespectful image of animals (Coe, 1985; Hutchins, Hancoks, & Crockett, 1984, cited in Finlay et al., 1988; Maple, 1983; Sommer, 1972). Caging reinforces the *per se* tame tendencies of farm animals, so they are perceived as showing inoffensive intentions toward humans. These beliefs (low intelligence, inoffensive tendencies) may conform to an ambivalent

subordination stereotype toward those animals because it mixes positive and negative beliefs. Hypothetically, these animals will be perceived as high-warmth (positive intention) and low-competence (inferior intelligence and abilities).

Threatening-awe stereotype: Wolves, lions, bears, and coyotes. Certain prototypical carnivorous animals (lions, wolves, bears) are seen as aggressive (e.g., wolves as recreational killers) and highly intelligent (Eddy et al., 1993; Kellert, 1985; Kellert, Black, Rush, & Bath, 1996; Skogen, 2001). Some characteristics of these animals are a source of awe (e.g., beauty; Kellert et al., 1996). These beliefs (intelligence and aggressive tendencies) may conform to a threatening-awe stereotype that is ambivalent. Consequently, these animals should be perceived as low-warmth/high-competence targets.

Contemptible stereotype: Invertebrates, rodents, and reptiles. Invertebrates (insects, spiders, cockroaches, crabs), mice, rats, and reptiles (lizards, snakes) are attributed low cognitive (Eddy et al., 1993; Herzog & Galvin, 1992; Knight et al., 2009) and affective capacities (Herzog & Galvin, 1992; Kellert, 1993). Some are common phobic stimuli (snakes; Ohman & Mineka, 2003) and carriers of illness (bubonic plague through rats), so these animals are perceived as a threat to humans for their harmful characteristics. These beliefs (low intelligence and harmful tendencies) may conform to a contemptible stereotype: low-warmth/low-competence.

Protective stereotype: Dogs, cats, horses, chimpanzees, and monkeys. Cultural representations of nonhuman animals in literature portray dogs and horses as especially friendly and competent (“dog is man’s best friend”; the Houyhnhnms, noble horses showing great benevolence and intelligence in the novel *Gulliver’s Travels*) and protectors of humans (Oswald, 1995). Dogs, cats, horses, and chimpanzees are perceived as similar to humans in cognitive (Eddy et al., 1993; Herzog & Galvin, 1992) and experiential capacities (e.g., fear, pain; Gray et

al., 2007; Knight et al., 2009). Some of these animals perform important work for humans (therapeutic and police use; Bachi, Terkel, & Teichman, 2012) and are considered companion animals (Belk, 1996; Franklin, 2007; Hickrod & Smith, 1982), all of which provides a positive image. These beliefs (intelligence and friendliness) may constitute a protective stereotype –high-warmth/high-competence.

Overview

The different images and beliefs regarding animals just reviewed show differential attributions of intentions and competence to animals, making it plausible to test the SCM in animals. First, animal names were obtained through several instructions, as in human SCM research, to avoid sampling bias (Pilot Study 1); frequently mentioned animals were then rated on warmth and competence dimensions and characterized through cluster analysis, in order to explore animal groupings (Study 1); with the aim of establishing the link between how people perceive animals in terms of warmth and competence and people's associated emotions and behaviors, Pilot Study 2 first collected emotions and behaviors regarding animals through open- and closed-ended questions, and then, Study 2 assessed a comprehensive list of emotional and behavioral reactions of humans to animals. Study 3 tested the associations among various animal and human social groups, based on warmth and competence.

Pilot Study 1: Selecting Relevant Animal Targets

Method

Participants. American adults (N = 178; age M = 35.9 years; 66.3% female) were recruited from mTurk and received standard compensation.

Questionnaire and procedure. Participants completed an online, open-ended questionnaire. With the aim of obtaining a nonbiased list of animals, three types of instructions

were developed, covering different classes of animals (zoo animals, animal categories, animal functions) and one instruction simply asked for a list of animals. The four instructions were: 1) *List animals' names;* 2) *List animals that have typically been in regular zoos;* 3) *List the major animal categories belonging to the animal world;* 4) *List the major categories of animals based on their function for humans.* All the instructions encouraged participants to *list animal names that come easily to mind* and emphasized that we were *not asking for any particular species, class or type of animal,* but we wanted *to know the most common ones that people think of first.* Below the instruction, the space was left blank, to avoid suggesting that we expected a particular quantity of responses. Participants were randomly assigned to one of four instructions requesting them to list animal names (see Table 1).

Results and Discussion

The mentioned numbers of distinct animal names varied across instructions: Instruction 1 = 127 names; Instruction 2 = 76 names; Instruction 3 = 64 names; and Instruction 4 = 40 names. In order to compare the instructions, we focused on the animal names mentioned by at least 15% of participants in each instruction (3-6 participants out of 19-50 per condition).

The instruction to list animals' names (Instruction 1) ultimately provided 25 animal exemplars, including animals from different environments (farm, zoo, domestic). The instruction asking to list animals in zoos (Instruction 2) limited the range of animals to exotic ones. Asking for animal categories (Instruction 3) produced biological groups in which individuals organize animals. Finally, participants asked to list animals with functions for humans (Instruction 4) produced two types of responses, exemplars of animals (cow, horse) and functions of animals in society (e.g., pets, food, transportation, labor force); see Table 1.

Taking into account these results, the following studies used the 25 animal names obtained by listing animal names as they come to mind (Instruction 1), which offered the opportunity to test the SCM with a sufficiently large number of different animal targets.

Study 1: Characterizing Animals in Warmth and Competence

Using the 25 animals of interest, a new sample rated them on SCM Warmth and Competence Scales.

Method

Participants. Americans (N = 135; age M = 36.4 years; 60% female) were recruited through mTurk for compensation. Participants working with animals either professionally or academically were excluded (N = 35). Ethnicities were: 83.8% White, 5.1% Asian, 5.1% Hispanic, 5.1% African American, and 0.7% unspecified.

Questionnaire and procedure. The questionnaire named 25 animals, which participants rated on scrambled SCM scales (Fiske et al., 2002) reflecting warmth (*warm, well-intentioned, friendly*) and competence (*competent, skillful, intelligent*), according to how the animals are *viewed by society*, using 9-point Likert scales, ranging from 1 (*not at all*) to 9 (*extremely*). To allow the possibility that *warmth* and *competence* adjectives were unsuitable to animals, a *does not apply* option appeared. Participants received written debriefing. To avoid fatigue, the sample was split, each half rating 12-13 animals. Mean completion time was 7.79 min.

Results

The Warmth and Competence Scale adjectives elicited a negligible number of *does not apply* responses (< 9%, mostly for *fish*), indicating the appropriateness of the scales. Alpha reliabilities were high for both the Warmth (α=.83) and the Competence Scales (α=.87).

Cluster analysis tested the utility of the warmth and competence dimensions to describe animals. Differences in warmth and competence ratings for each animal tested the frequency of mixed combinations.

Warmth and competence for animal stereotypes. For each animal, ratings were averaged across participants, so means provide competence and warmth scores for each animal. The 25 animals are arrayed on a two-dimensional Competence X Warmth space (Figure 1).

As in previous SCM methods (Fiske et al., 2002), two types of cluster analyses examined the structure of this two-dimensional space. Following Hair, Anderson, Tatham and Black (1995), hierarchical cluster analyses (Ward's 1963 method, minimizing within-cluster variance) determined the best-fitting number of clusters. Agglomeration statistics, using typical decision rules (see Blashfield & Aldenderfer, 1988), showed that the last large change occurred in the break between Clusters 3 and 4, so we adopted a four-cluster solution.

Next, *k*-means cluster analysis (parallel-threshold method) determined which animals fell into each cluster. Association of animals to clusters remained stable across solutions (Table 2).

- Low-warmth/high-competence "predators": tiger, bear, whale, leopard, lion
- High-warmth/high competence "companions": dog, monkey, elephant, horse, cat
- High-warmth/low-competence "prey": duck, cow, rabbit, hamster, zebra, giraffe, bird, pig
- Low-warmth/low-competence "pests": lizard, rat, chicken, snake, mouse, hippopotamus, fish

Mixed animal stereotypes. The SCM predicts many mixed stereotypes toward social groups (Fiske et al., 2002). Mixed or ambivalent stereotypes are those formed by negative and positive beliefs. If SCM describes animals, mixed stereotypes should also emerge. In order to test mixed

stereotypes: First, differential attributions of warmth and competence ratings between clusters were analyzed through ANOVAs. Mixed clusters should be higher than other clusters on one dimension but lower than other clusters on the other dimension. Secondly, within clusters, matched-pair *t*-tests compared warmth and competence ratings for each cluster. Mixed clusters should be higher on warmth than on competence or vice versa.

First, comparison of the cluster-center means (Table 3) overall confirmed SCM predictions that mixed and univalent stereotypes differed appropriately on each dimension [Warmth: $F(3, 21) = 38.787$, $p < .00001$; Competence: $F(3, 21) = 40.868$, $p < .00001$][1]. Post hoc analyses showed that the "companions" cluster, with the highest competence and warmth ratings ($M = 7.38$ and $M = 6.91$, respectively), differed significantly from the two clusters low in competence ($M = 3.84$ and 4.38, respectively, $p < .001$) and from all the other clusters in warmth ($M = 3.11$ to $M = 5.0$, $p < .001$). We predicted that the "companions" cluster would obtain the same, high degree of warmth and competence. Matched-pair *t*-tests revealed no significant differences between the scores of this cluster center in competence and warmth, $t(4) = 1.45$, $p = .222$, thus equating them as both high. Standard deviations for post hoc analyses are included in Table 3.

The "predators" cluster obtained high competence ratings ($M = 6.37$), which significantly differed from two clusters low in competence ($M = 3.84$ and 4.38, respectively, $p < .001$). We predicted that the "predator" cluster would obtain higher competence than warmth, and matched-

[1]The results may be affected by lack of familiarity or uncommonness of certain animals. Uncommon animals may be inappropriately described by warmth and competence dimensions. For this reason, the analyses were also run controlling for uncommonness of the animals. Uncommonness, as a covariate, was not significant for competence [$F(1, 19) = 1.04$), $p = 0.321$] or warmth ratings [$F(1, 19) = 3.00$, $p = 0.099$], meaning that competence and warmth ratings for clusters were not affected by uncommonness ratings. We also correlated competence and warmth ratings with uncommonness ratings. Although none of the correlations were significant, uncommonness of animals was positively correlated with competence ($r = .24$) and negatively correlated with warmth ($r = -.33$). Thus, uncommon animals were perceived as low in warmth.

pair *t*-tests confirmed that the scores of this cluster center were significantly higher in competence ($M = 6.37$) than in warmth ($M = 3.14$, $t(4) = 9.55$, $p < .001$).

The "prey" cluster showed the second highest rating on warmth ($M = 5.0$), significantly different from all other clusters ($M = 3.11$ to $M = 6.91$, $p < .001$), higher than two clusters that were low on warmth, but lower than the other cluster high on warmth (i.e., the high-high cluster). Hence, its warmth would be distinctly moderate. The score of the cluster center on competence was significantly different from all other clusters except for the lowest cluster-center score in competence, so it clearly ranks as low competence. We predicted that the "prey" cluster would obtain a higher degree of warmth than competence. Although pointing in this direction, differences between its center scores on warmth ($M = 5.0$) and competence ($M = 4.38$) were not significant, $t(7) = -1.58$, $p = .159$. On one of two statistical criteria (moderate warmth and low competence relative to other clusters), this cluster was essentially ambivalent, as predicted.

Finally, the "pests" cluster rated lowest both in competence ($M = 3.84$) and warmth ($M = 3.11$), differing significantly, as expected, from two other clusters high in competence ($M = 6.37$, 7.38, $p < .001$) and warmth ($M = 5.0$, 6.91, $p < .001$). We predicted that the "pests" cluster would obtain the same, low degree of warmth and competence. As expected, no differences were obtained between competence and warmth, $t(6) = 1.59$, $p = .163$.

Within clusters, matched-pair *t*-tests compared competence and warmth ratings for each animal. Competence and warmth ratings differed significantly for 19 of the 25 animals (Table 4). Thirteen, including all five predators, were rated as significantly more competent than warm (highest to lowest difference): *tiger, lion, leopard, bear, rat, snake, whale, monkey, elephant, hippopotamus, bird, lizard,* and *zebra*. Unexpectedly, two low-low animals, *rat* and *snake*, were rated as more competent than warm.

Six, including five of the eight prey, were rated as being significantly more warm than competent (highest to lowest difference): *hamster, rabbit, cow, chicken, duck,* and *dog* (though *dog* was similarly high in competence (M = 8.07) and warmth (M = 8.31).

Finally, competence and warmth ratings did not differ for two high-high animals (*cat, horse*) and two low-low animals (*mouse, fish*), as predicted by their cluster membership.

Discussion

Support for the applicability of SCM to animals came from perceived competence and warmth as differentiating animals in cluster analyses; four stable clusters consistently accounted for all of the animals across solutions. A "predators" cluster (*tiger, bear*) was found according to a threatening-awe stereotype: animals low in warmth and high in competence. A "companions" cluster (*dog, horse*) was observed in line with a protective stereotype: warm and competent animals. A "prey" cluster (*cow, duck*) emerged, agreeing with a subordination stereotype: warm and incompetent animals. And finally, a "pests" cluster (*lizard, rat*) was found in line with a contemptible stereotype: animals low both in warmth and competence.

As with humans, many mixed stereotypes—low competence with high warmth or vice versa—appeared in three analyses: (1) Cluster centers rated significantly higher on warmth than on competence or vice versa. (2) Half of the studied animals fell into mixed clusters if the moderate-warmth/low-competence cluster is considered as an ambivalent cluster, given the observed tendency. (3) Matched-pair *t*-tests indicated that the same animals mostly showed mixed stereotypes (9 of 13).

Differences between animals in warmth and competence were not reducible to other possible dimensions, such as animals' diet (herbivores vs. carnivores), humans' diet (edible vs. inedible animals), or size (big vs. small) because there are examples of all these categories in

every quadrant of the space. Moreover, the model applied to animal targets was *a priori* comparable to social groups. This will be explored further in Study 3.

The animal clusters roughly fit previous research: Henley (1969), using MDS, found these groups: [prey] cow, pig, rabbit, zebra, and giraffe; [pest] mouse and rat; [companion] dog, monkey, and cat; and [predator] bear, lion, tiger, and leopard. We found the same groups using SCM scales. Likewise, the results of Kwan and Cuddy (2008) are similar.

Differentiating animal competence also fits Eddy et al.'s (1993) and Knight et al.'s (2009) lists of animals ordered by cognitive abilities.

Although current analyses yielded the predicted four-cluster solution, the high-warmth/low-competence combination showed only moderate warmth, mainly due to certain animals (zebra, bird, giraffe, pig). This cluster comprised different types of animals: farm (cow, rabbit, duck) and nonfarm animals (giraffe, bird, zebra), which differed on warmth ratings. Whereas farm animals were rated significantly higher in warmth than in competence (see Table 4), nonfarm animals did not differ, leading to a lower cluster center in Warmth. Tentatively, nonfarm animals could be seen as elusive and distant (unfriendly) toward humans. Thus, this cluster may be termed moderate-warm/low-competence animals.

Turning to the rating dimensions, the Warmth and Competence dimensions may not be equally easy to ascribe to animals (a result also found with human beings, see Fiske et al., 2002). Here, compared to competence ratings, warmth ratings were generally lower. Several explanations may account for these lower ratings. Inferring intentions to animals may be more difficult than deciding about their intelligence and ability because of the differential availability of warmth and competence information (for example, through mass media, documentaries, etc.). But also, the warmth dimension may be seen as more human-specific (*friendliness,*

intentionality) than the competence dimension. Supporting this, companion animals –the closest animals to human beings— received higher ratings in warmth than other animals.

Given the plausibility of SCM applied to animals, we then addressed emotions and behavior by adapting the BIAS map to animals. The next sections introduce the BIAS Map, and Study 2 tests a BIAS map version with animals, using the lists of emotions and behaviors reported in pilot studies.

BIAS Map Adapted for Animals

Different SCM positions held by social groups imply different associated emotions (Fiske at al., 2002): admiration (for warm, competent targets), contempt (for cold, incompetent targets), pity (for warm, incompetent targets), and envy (for cold, competent targets). Jointly considering several variables, Cuddy et al. (2007) differentiated types of discriminatory behavior as a function of stereotypes and intergroup emotions. The types of discriminatory tendencies represent two degrees of intensity (active-passive) across valence (facilitative-harmful). Active and passive behavior definitions take into account the degree of effort put into the behavior itself (strong, direct or weak, indirect). Facilitative and harmful behaviors are defined according to the outcome (favorable or detrimental to the target).

The BIAS map links particular emotions and behaviors directed toward target groups: admiration elicits active and passive facilitation (help, association); contempt elicits active and passive harm (attack, neglect); pity elicits active facilitation, but passive harm (help, but also neglect); envy elicits passive facilitation, but active harm (association, but also attack).

Whereas comparison processes (Smith, 2000) and outcome attributions (Weiner, 1985) are key variables predicting the BIAS map, the intergroup relationships between animals and

humans (Plous, 2003) required adapting these processes to animals. Societal and biological factors account for the differences between the human and the animal BIAS map: (a) Humans dominate animals through control, use, and management (including eating them); and (b) social perception identifies biological interspecies differences in cognitive and emotional capacities. Hypothetically, both factors suggest certain idiosyncratic comparisons between humans and specific animals. As all animals hold a dominated societal position, lower than humans, and they appear less cognitively sophisticated (large interspecies differences), strictly speaking, humans would establish downward comparisons with all of them. This would restrict the possible emotions to only downward emotions (e.g., resentment; Smith, 2000). However, although all dominated, some animals are less unequal than others, holding superior status over other animals, due to perceived similarity to humans (pets, horse) or due to exceptional physical attributes (lion, bear). This privileged status may make such animals targets of upward-comparison emotions (e.g., admiration).

On the other hand, following attribution theory, applied to animals, implies replacing its human psychological variables of ability and effort with animals' more physical attributes and skills as perceived causes of behavior (Weiner, 1985) because the latter match the less sophisticated outcomes pursued by animals: survival.

Consequently, we expected upward and downward emotions directed toward specific animal clusters, as predicted by SCM, but the emotions elicited by allegedly inferior nonhuman beings will be more basic (positive and negative) and hostile than those ascribed to humans.

Humans' Animal Stereotypes → Human Emotions → Human Behaviors toward Animals

Low-warmth/high-competence → Awe→ Passive help, active harm. Animals belonging to the low-warmth/high-competence cluster are judged as untrustworthy and

aggressive, but skillful, and with exceptional sensory and physical capacities. These animals (e.g., lions) elicit ambivalent feelings in humans. On the one hand, fear should be the most common emotion because culture emphasizes their aggressive tendencies (Skogen, 2001). On the other hand, experiences of fascination and awe relate to such animals (Curtin, 2009). In emotion research, appraisals of threat, beauty, and exceptional abilities predict awe (Darwin, 1872/2009; Keltner & Haidt, 2003). Likewise, a sense of overcoming the limits of ordinary experience triggers awe (Van der Berg & Ter Heijne, 2005). Both nature and animals promote feelings of awe, terror, anxiety, fear, and apprehension (Koole & Van der Berg, 2005; Korpela, Hartig, Kaiser, & Furher, 2001).

Following the interpersonal social comparison theory (Smith, 2000), admiration and inspiration—upward, assimilative affects —target those who perform extraordinary actions. Low-warmth/high-competence animals' outstanding performance does not imply contrastive comparisons because their speed and strength are rarely relevant to modern humans. Perhaps impressive animals also reflect the wonder of nature that permits humans, as part of nature, to assimilate it, basking in their excellence (Curtin, 2009; Vining, 2003).

Although people (e.g., hunters, farmers) could feel envy or resentment (upward contrastive emotions) toward these animals, as for comparable social groups, animal-envy seems unlikely because social comparison processes apply to a lesser extent between humans and animals: Animals' positive outcomes rarely deprive humans. Accordingly, we hypothesized that humans will experience awe and fear toward these animals. This quadrant receives passive facilitation but active harm (Cuddy et al., 2007); that is, these animals are managed and preserved but also hunted and killed.

Low-warmth/low-competence→ Contempt→ Passive harm, active harm. Through downward, contrastive comparison, contempt marks inferior, worthless beings (Smith, 2000). Reviled animals apparently lack special abilities (low competence) but also intend to harm or exploit human beings (low warmth). Snakes and rats fit this stereotype, apparently having low cognitive capacities (Eddy et al., 1993) and being disgusting (Haidt, McCauley, & Rozin, 1993). Worthless to humans and even nonhumans, extermination is permitted. Disgust also relates to their niche (Bixler & Floyd, 1997). This quadrant receives active and passive harm (alternately killed or ignored; Cuddy et al., 2007).

High-warmth/low-competence →Indifference→ Passive harm, active help. This cluster includes farm animals and other unskilled but friendly animals. Some are part of human diets, so they are both nurtured and killed. Humans accept harm to animals through neutral language, physical remoteness, and legitimizing advertisements, which conceal suffering, prevent empathy, and promote indifference (Lerner & Kalof, 1999; Plous, 2003). Consequently, we rarely anthropomorphize them (Lerner & Kalof, 1999).

Their subordinate place suggests downward contrastive emotions, such as contempt (Smith, 2000) but, because they fulfill a function for humans, we must limit our distain to indifference. This quadrant receives active facilitation and passive harm (they are protected or ignored) (Cuddy et al., 2007).

High-warmth/high-competence→ Fondness→ Passive and active help. Due to their similarity and closeness to us, pets and animals such as, horses, and chimpanzees—warm (Oswald, 1995) and competent (Eddy et al., 1993)—elicit tender feelings. Animals belonging to this cluster also have a privileged status among humans, compared to other animals: They live with humans and are considered the closest species (Eddy et al., 1993; Plous, 2003). According

to Smith (2000), similarity and high status lead to delight (upward assimilative emotion). This quadrant receives both active and passive facilitation (helped or managed; Cuddy et al., 2007).

Pilot Study 2: Behaviors and Emotions toward Animals

Two preliminary studies developed scales for these emotions and behavioral tendencies.

Method

Participants and procedure. Two on-line preliminary studies identified specific emotions and behaviors toward animals. The first used two open-ended questions regarding each of the 25 animals identified in Pilot Study 1. American participants (N = 26; age M = 34.3, 18 females), recruited through mTurk for compensation, not professionally involved with animals[2] wrote *what they would feel when they encounter them*; and *how do American people generally behave toward them in their typical habitats, when they encounter them*. To avoid fatigue, two questionnaire versions were administrated each showing 12 and 13 animals, respectively. Participants were randomly assigned to one of the versions.

Pilot Study 2 used 25 emotions and 37 behaviors (Tables 6 and 7) collected from a wide range of sources (Cuddy et al., 2007; Finlay et al., 1988; Kellert & Berry, 1980; animal-related web pages: specific zoos, Association of Zoos and Aquaria). These emotions and behaviors matched the active and passive help-harm dimensions. American participants (N = 277; age M = 34.8, 65.1% female) not professionally involved with animals rated approximately 3-4 emotions and 4-5 behaviors for 12-13 animals (25 in total), in 16 survey versions (91-109 ratings each) using the previous instruction.

Results

[2] Participants working on farms, at zoos, or in veterinary hospitals were excluded from pilot studies (N = 7 and N = 85, respectively).

Responses to the open-ended questions and ratings about emotions and behaviors (see Table 5 and 6) were organized according to the animal clusters of Study 1, an appropriate approach because specific clusters are hypothesized to evoke specific emotions and behaviors:

- moderate-warmth/low-competence cluster (e.g., cow, duck): listed emotions included *peacefulness, happiness, boredom, indifference*; listed behaviors were *ignore* and *behave indifferently.* The highest rated associated emotion was *neutrality* (M = 6.27); all other clusters obtained lower ratings (all M*'s* < 5.29). The highest rated behavior was *eat* (M = 4.73); lower ratings were obtained in all other clusters (1.54-3.71).
- low-warmth/low-competence cluster (e.g., snake, lizard): listed emotions were *disgust, repulsion, terror, scared, annoyance, unease, boredom;* behaviors were *run away, kill, behave violently, chase, catch*. *Disgust* and *contempt* showed the highest ratings (5.19 and 3.62, respectively; on all other clusters, their ratings were lower: 1.89-2.97 for both emotions). The highest rated behaviors were *exterminate, demean, trap, persecute, reject, harm, kill, poison, attack,* and *injure* (4.30-6.59). Lower ratings were obtained in all other clusters (see Table 6).
- high-warmth/high-competence cluster (e.g., horse, dog): listed emotions were *happiness, fondness, love, calm, relaxation, be thrilled;* behaviors were *care, behave friendly*. These animals elicited the highest ratings for the emotions of *delight, attraction, pleasure,* and *tenderness* (5.98-6.78); all other clusters were lower (2.71-5.27). The highest rated behaviors were *assist, integrate, coexist, coordinate, help,* and *interact* (4.95-6.26); all other clusters were lower (see Table 6).

- low-warmth/high-competence cluster (e.g., tiger, bear): Listed emotions were *amazement, awe, wonder, worry, fear, scared, awestruck*; behaviors were *back away, poach, behave violently*. Ratings were higher for *awe, interest, amazement, fear, fascination, wonder, terror, worry,* and *threat* (7.26-7.92); all other clusters were lower (1.96-5.33). The highest rated behaviors were *avoid* and *shoot* (*M* = 7.28, 3.49); other clusters were lower (3.02-5.13 and 2.10-2.76, respectively).

Discussion

Two sets of measures (open and closed) converged. Armed with reasonable emotion and behavior items from the pilot studies, Study 2 systematically established some emotions and behavioral tendencies that define human-animal relationships. We applied three criteria to select the emotions and behaviors mainly associated with specific clusters: 1) the selected emotions (behaviors) were those that had the highest mean for one cluster in comparison to the other clusters (between clusters); 2) regarding a specific cluster, the selected emotions (behaviors) were those that had the highest mean in comparison to other emotions (behaviors), within the cluster; and 3) the selected emotions (behaviors) were those for which the difference between the highest rating in one cluster and the other three ratings was sufficiently large (between clusters). Seventeen emotions and seventeen behaviors were selected to adapt the BIAS map (Cuddy et al., 2007) to animals.

Study 2: BIAS Map for Animals

Method

Participants. Americans (N = 220; age M = 34, 66.8% females) not professionally involved with animals[3] participated on-line through mTurk for compensation. Ethnicities were: 81.8% White, 9.1% Asian, 3.2% Hispanic, 7.3% African American, and 1.4% Native American, and 0.5% other. Participants randomly received one of eight questionnaires to rate animals on elicited emotions and behaviors.

Questionnaire and procedure. Using the same 9-point scales, participants rated the same 25 animals as Study 1 on 17 emotion and 17 behavior items: *attraction, fondness, tenderness, delight, contempt, disgust, repulsion, uneasiness, threat, amazement, awe, fear, terror, neutral, boredom, comfort, indifference, sustain, support, help, behave friendly, interact, coexist, manage, monitor, conserve, kill, injure, exterminate, trap, hunt, let them die off, ignore,* and *reject*. Participants read the same instructions as in Pilot Study 2. A *does-not-apply* option appeared both for emotions and behaviors. Splitting the animal list in half to prevent fatigue yielded eight randomly assigned versions (4-5 emotions, 4-5 behaviors each).

Results

Emotions. Twenty-five factor analyses (one for each animal), using varimax rotation, were conducted on 17 emotions, yielding 5-7 factors with eigenvalues greater than 1.0. Across animals, four factors emerged consistently: fondness (*attracted, fond, tender, delight*; α = .97),

[3] Participants working on farms, at zoos or in veterinary hospitals were excluded from Study 2 (N = 72).

contempt (*contempt, disgust, repulsed, uneasy*; α = .88)[4], awe (*threatened, amazed, awe, afraid, terror*; α = .93), and indifference (*neutral, bored, comfortable, indifferent*; α = .92)[5].

Emotions within animal clusters. Contrast analyses (3:1) tested predicted emotions within clusters. Low-warmth/high-competence animals elicited more awe (M = 7.35) than other emotions (M = 3.26), $F(1, 4) = 49.50$, $p = .002$, $\eta^2_p = .85$. High-warmth/high-competence animals elicited more fondness (M = 6.31) than other emotions (M = 3.58), $F(1, 4) = 18.67$, $p = .01$, $\eta^2_p = .61$. Moderate-warmth/low-competence animals elicited more indifference (M = 5.11) than other emotions (M = 3.55), $F(1, 7) = 9.57$, $p = .02$, $\eta^2_p = .64$. Low-warmth/low-competence animals elicited more contempt (M = 5.08) than any other emotion (M = 3.55) although not significantly, $F(1, 6) = 2.07$, $p = .20$, $\eta^2_p = .19$ (Table 7).

Emotions between clusters. Contrast analyses (3:1) compared the four clusters on each emotion. Most contempt was ascribed to low-warmth/low-competence animals (M = 5.08) versus others (M = 2.75), $F(1, 21) = 12.92$, $p = .002$. Awe was higher for low-warmth/high-competence animals (M = 7.35) than for others (M = 3.54), $F(1, 21) = 26.47$, $p < .0001$. Indifference characterized moderate-warmth/low-competence animals (M = 5.11) more than others (M = 3.47), $F(1, 21) = 9.88$, $p = .005$. Fondness corresponded to high-warmth/high-competence animals (M = 6.31), versus other animals (M = 4.15), $F(1, 21) = 15.72$, $p = .001$.

[4] Although contempt is used as the label of the scale, as previous SCM research stated, disgust and contempt are the pair of emotions used for the low competence-low warmth cluster. They are empirically and conceptually related, though not identical, like envy/jealousy, pride/admiration, and pity/sympathy.

[5] Alphas computed across animals (N = 25). Across participants' responses (N between 486 and 619) alphas were: Fondness (α = .71), Contempt (α = .69), Awe (α = .86), and Indifference (α = .68).

Behaviors. Twenty-five principal component factor analyses (one for each animal), using direct oblimin rotation, were conducted on 17 behaviors, yielding 6-7 factors. Across animals, four factors emerged consistently: active facilitation (*support, help, behave friendly, interact*; α = .93), active harm (*kill, injure, exterminate, trap, reject*; α = .93), passive facilitation (*sustain, conserve*; α = .80), passive harm (*let them die off, ignore*; α = .74). Four items were dropped because they did not load consistently on any given factor (*coexist, manage, monitor, hunt*).

Active behaviors for warmth, facilitation behaviors for competence. As the warmth dimension is more important to the perception of others (see Cuddy, Fiske, & Glick, 2008), active behaviors relate to it. Correspondingly, the competence dimension relates to the less salient, more passive behaviors. Each dimension's positive pole predicts facilitative behaviors, and each dimension's negative pole predicts harmful behaviors. Animals perceived as warmer and friendlier received more active and facilitative behaviors than animals perceived as unfriendly, $t(23) = -3.99$, $p = .001$. Animals perceived as lacking warmth received more active harm than those perceived as warm, $t(14.99) = 2.99$, $p = .009$ (Table 8).

Also as predicted, competent animals received more passive facilitation than low competence animals, $t(18.10) = -4.21$, $p = .001$. Compared with high-competence animals, behaviors associated with low-competence animals were passive harm behaviors: *ignore*, $t(23) = 3.48$, $p = .002$, and *let them die off*, $t(18.17) = 4.65$, $p < .001$ (Table 8).

Emotions → Behavioral tendencies. Different emotions should predict different behavioral tendencies. We correlated emotions and behavioral tendencies at two levels. At the animal level, we averaged ratings across participants for each of the 25 animals and then calculated the emotion-behavior correlations from the animal means. At the participant level, we

calculated correlations separately for each individual participant (N = 220), converted them with Fisher's r to z-scores and averaged them, and reverted them to rs.

As expected, both active and passive facilitation were elicited by animals toward which humans feel fond (Table 9). Animals for which humans feel contempt elicited both active and passive harm (*let them die off*). *Ignore* (passive harm) was significant at the participant level, and the correlations were negative. Although unpredicted, a negative relationship might take into account that some of the highly disgusting animals (mouse, rat) represent a threat. Amazing animals elicited passive facilitation but also active harm, although only at the participant level. Finally, animals for which humans feel indifference elicited active facilitation and passive harm (*let them die off, ignore*), although *let them die off* reached significance only at the participant level (Table 9). To summarize, results supported all ten of the predicted emotion-behavior relationships at the participant level and seven out of ten at the animal level.

Discussion

Study 2 applied the BIAS map to animals. The adapted BIAS map straightforwardly accounts for human-animal relations, and the large number of salient animals supports their generalizability.

Animal warmth-competence clusters elicited specific emotions and behavioral tendencies. Moderate-warmth/low-competence animals elicited indifference, passive harm, and active help. Low-warmth/high-competence animals elicited awe, active harm, and passive help. High-warmth/high-competence animals elicited fondness and both active and passive help. Lastly, low-warmth/low-competence animals elicited contempt and both passive and active harm. These findings further support warmth/competence dimensions for animal targets, an interspecies validation of the SCM.

Differences between animal and human BIAS Maps. The main difference between social groups and animals involved high (moderate)-warmth/low-competence targets. Whereas pity and compassion related to high-warmth/low-competence human targets, they did not for comparable animals. The utilitarian relationship between animals and human beings (transport, food) limits the possible emotions toward animals. Feeling *compassion* or *pity* toward certain animals (e.g., cow, duck) may be blocked because these emotions challenge cultural customs (e.g., carnivorous diet). Indeed, pity did not differentiate between clusters (Pilot Study 2). In this regard, social distance (Plous, 2003) implies neutral feelings toward animals (Paul, 1996).

Emotions toward high-warmth/high-competence and low-warmth/high-competence animals (fondness and awe, respectively) parallel human targets (admiration and envy, respectively). Indeed, as Pilot Study 2 showed, admiration and envy fit both high-warmth/high-competence and low-warmth/high-competence animals, respectively, as the BIAS map predicts, although not uniquely. Admiration and envy are sophisticated emotions in both outcome quality (prestige, status) and dependence (one person's positive outcomes deprive another person). However, fondness and awe are more basic emotions, not driven by status concerns and not by being dependent on each other. Nevertheless, fondness preserves the positive tone of admiration (for high-warmth/high-competence targets), and awe (awe, threat) preserves the ambivalent tone and the outstanding performance implied by envy (for low-warmth/high-competence targets).

Because the SCM and BIAS Map seem to be satisfactory models of both animal and human perception, Study 3 explored associations between animal and human targets, based on Warmth and Competence dimensions. We predicted that both dimensions will be relevant to associations among animals and social groups.

Study 3: Associations among Animals and Social Groups

Method

Participants. The sample included 31 Spanish Psychology students (age *M* = 20.1 years; 77.4% female; 100% White) who voluntarily completed an online questionnaire for extra credit.

Questionnaire and procedure. The study was introduced as a videogame design study carried out by several colleges. The questionnaire named 12 animals (high-warmth/low-competence: *rabbit, cow, duck*; high-warmth/high-competence: *dog, horse, elephant*; low-warmth/high-competence: *lion, tiger, bear*; and low-warmth/low-competence: *lizard, snake, rat*) and 12 social groups (high-warmth/low-competence: *elderly, children, disabled*; high-warmth/high-competence: *Catholics, students, adults*; low-warmth/high-competence: *Chinese, businessmen, rich people*; and low-warmth/low-competence: *Moroccans, immigrants, poor people*). These animals and groups are expected to belong to the four SCM clusters, based on Studies 1 (animals) and previous research on social groups (Durante et al., 2013).

Participants had to associate animals and groups with each other. The following instructions were given:

> *Among the new videogame initiatives, there is a proposal about a social simulation game of social groups and animals**.** The videogame will have two virtual worlds: one of them will show animals, and the other will show social groups but both worlds will be comparable because of the logic in the rules of the videogame (same characters' characteristics, goals, and actions). In one of the worlds, the social world**,** the videogame will show a society in which different social groups would be composed of animals instead of people. In one of the worlds, the natural world, the videogame will show a natural world in which different animals would be represented by social groups* […] *Match each animal with a social group regarding common characteristics that you think*

they have. We are not asking for them to be matched based on physical similarity. We are asking for an animal to be selected that best represents a social group and a social group that best represents an animal.

After the task, participants received written debriefing.

Results

Animal and social groups were designated as high or low in Warmth and Competence following previous studies' findings. Contingency table analyses were run for Competence and Warmth independently. High-competence animals were associated more frequently with high-competence social groups ($\chi^2 = 7.84$, $p = .005$, $\varphi = .15$), and high-warmth animals were also associated more frequently with high-warmth social groups ($\chi^2 = 9.04$, $p = .003$, $\varphi = .16$). The same was true for low-competence and low-warmth targets (standardized residuals were equal or higher than +/-2.0 in all cells). See Figure 2.

Discussion

Presenting animals and social groups and requesting that they be associated with each other based on common characteristics showed the utility of Competence and Warmth as underlying dimensions. Animals or social group targets perceived similarly in terms of warmth and competence were more frequently matched with each other. Conversely, animals or social groups perceived differently in terms of warmth and competence were less likely to be matched with each other.

Moreover, the magnitude of the effect was similar for Warmth and Competence dimensions ($\varphi = .15$-$.16$), showing no advantage of any dimension when making the associations. Indeed, both dimensions were relevant for making the judgments.

General Discussion

The SCM states that perceived intent and capacity to carry it out guide the way individuals perceive each other. The present research showed that individuals also partly perceive animals by using such principles. Pre-existing social perception dimensions, such as the SCM dimensions, may help to organize knowledge of animals functionally, providing similarities between human and animal targets, as shown in Study 3.

Within SCM and BIAS map frameworks, warmth and competence dimensions of social perception and associated emotions and behaviors built this animal-focused research. Animals have intent towards us, resembling SCM's warmth dimension, and they have capabilities, determining how much they affect us (e.g., intelligence, size, strength), resembling SCM's competence dimension. SCM's applicability to animals (Study 1) agrees with previous research (Eddy et al., 1993; Henley, 1969; Knight et al., 2009; Kwan & Cuddy, 2008).

Emotional correlates of animal stereotypes appeared in Study 2: indifference, fondness, contempt, and awe. Finally, the predicted BIAS map behavioral correlates—along the active-passive and harmful-facilitative dimensions—were overall supported (Study 2). Moderate-warmth/low-competence prey animals elicited indifference, passive harm, and active help. Low-warmth/high-competence predator animals elicited awe, active harm, and passive help. High-warmth/high-competence pet animals elicited fondness and both active and passive help. Lastly, low-warmth/low-competence pest animals elicited contempt and both passive and active harm. The SCM and BIAS map applied to animals revealed some different specific emotions for the high-warmth/low-competence and low-warmth/high-competence clusters. Whereas stereotypically *friendly* and *incapable* humans elicit pity, comparable animals elicit a less positive emotion, indifference (at least in Study 3). Perhaps humans lack social responsibility toward high-warmth/low-competence animals–we eat some. Also, stereotypically *unfriendly* and

capable humans elicit envy, whereas comparable animals elicit a more positive emotion, awe. Humans lack outcome dependency for low-warmth/high-competence animals, so perhaps their performance does not undermine ours.

Animal targets also qualify SCM/BIAS-map behavioral tendencies. People associate with high-competence humans, whereas we conserve competent animals (both are passive facilitation); each tendency shows respect, but in different ways. However, we attack low-warmth humans, whereas we go further with animals, killing them (both are active harm); each tendency combats *enemies*. These differences in the behavioral tendencies toward animals show the differential power that animals and humans hold: Humans can cage an animal, either to watch it or decide its death.

Ultimately, the less privileged social position of animals as a collective compared to humans may explain differences in emotions and behaviors toward them. The human-animal relationship is conceptually similar to the intergroup image termed *dependent* by Alexander, Brewer, and Hermann (1999). The dependent image is generated when the in-group (humans) is stronger and has higher cultural status than the out-group (animals). This image can lead to exploitation and control over the out-group.

Unlike the SCM space for humans, the expected high-warm/low-competence animals were only moderate in warmth. A close look at warmth ratings of specific animals in this cluster reveals evident differences among them. Whereas *cow, rabbit,* and *hamster* scored 5.42-5.76, *bird, giraffe, zebra, pig,* and *duck* scored a nonoverlapping 4.57-4.83. Such animals' allegedly friendly behavior toward humans may explain the differences in warmth ratings.

Building on previous research, the number of animal targets studied was large, reinforcing the results obtained. However, it is worth noting the nature of the targets used.

Contrary to social groups, animals belong to different species. This may make it more difficult to account for all animals using the same dimensions.

Definitions of competence and warmth regarding animals were made respectively in terms of physical-intellectual capacity and friendliness tendencies. However, as warmth judgments may be triggered by physical warmth (Inagaki & Eisenberger, 2013; Williams & Bargh, 2008), certain animal characteristics may lead to inferring warmth: being furry, warm-blooded, cuddly, or human-like –an assertion to be tested in future research.

Anthropomorphism research also is informative regarding our results. Certain animals, generally those in the "companion" cluster, are easily targets of anthropomorphism (for example, pets). Pet owners may anthropomorphize their pets according to a sociability motive – need for social connections, and also to an effectance motive– the need for interacting effectively with nonhuman agents (Epley, Akalis, Waytz, & Cacioppo, 2008; Epley, Waytz, Akalis, & Cacioppo, 2008; Waytz et al., 2010). Accordingly, these animals would allegedly show high warmth and competence because they are, at least in part, anthropomorphized.

The applicability of the SCM and BIAS Map models to animals may provide insights about dehumanization processes (e.g., animalization). For example, animalization of specific social groups could be driven by the animals associated with them in terms of the common SCM cluster that they share. This animalization may have both positive (understudied) consequences – when a positive animal's characteristic is salient— and negative (frequently studied) consequences for social groups.

The stereotype framework adopted to account for perception of animals in this research is partially coherent with personality frameworks proposed for human beings and corporate brands. For example, the Big Five personality dimensions, a model developed for measuring individuals'

personality traits, can be organized into two super-factors: personal growth and socialization (Digman, 1997; see also Blackburn, Renwick, Donnelly, & Logan, 2004), coinciding with SCM's competence and warmth dimensions. In the context of brands, five brand personality dimensions have been proposed (Aaker, 1997) and among them, *sincerity* and *competence* are clearly similar to SCM's warmth and competence dimensions, which have also been applied to brands (Kervyn, Fiske, & Malone, 2012).

Our results are potentially practical. Traditionally, attitudes toward animals and environmental beliefs have explained how individuals treat animals. Attitudes toward the extinction of animal species are arguably related to social perception of animals. For example, the negative image of hyenas in the U.S. (Glickman, 1995) makes them a perfect target for aggressive human practices. Recently, the image of wolves in the U.S. has suffered the same fate (Downes, 2013). Stereotyped labels (e.g., *carnivorous*) placed upon specific animals may have dramatic consequences for these nonhuman beings lacking human privileged status, for example, ferocious lions and wolves ready to attack. The current approach points out that the perceived characteristics of warmth and competence may be relevant to explain differential behaviors aimed at animals, an affirmation that should nonetheless be tested in future research.

SCM could explain metaphorical relationships between specific animals and social groups, as uncovered in previous research. Advertising, mascots, and propaganda all ascribe specific animals to brands, products, teams, politicians, groups, and celebrities. Such practices may benefit from applying the SCM approach. Instead of focusing on the cultural meanings embodied by animals (Phillips, 1996), warmth and competence dimensions may help to evaluate the plausibility of an animal-object association in people´s mind, and also to modify the social image of an object using a specific animal.

Although our analysis is limited to warmth and competence dimensions, other characteristics such as size, not explored herein, are of unquestionable importance in the animal domain (e.g., Henley, 1969; Rips, Shoben, & Smith, 1973).

Conclusion

Despite many publications about animals and human-animal relationships, few frameworks coincide. The SCM, a framework developed for human targets, helps to account for people's perceptions of and response to animals. The rationale behind this finding is that animals are also social beings, although not human, which makes the universal dimensions of social judgment—warmth, and competence—relevant although not necessarily the only ones. Previous research has validated the SCM at the interpersonal and intergroup levels (Fiske et al., 2002; Judd, Hawkins, Yzerbyt, & Kashima, 2005; Russell & Fiske, 2008). This research shows evidence of validation at the interspecies level.

References

Aaker, J. L. (1997). Dimensions of brand personality. *Journal of Marketing Research, 34,* 347-356.

Alexander, M. G., Brewer, M. B., & Hermann, R. K. (1999). Images and affect: A functional analysis of out-group stereotypes. *Journal of Personality & Social Psychology, 77,* 78-93.

Arluke, A., & Sanders, C. R. (1996). *Regarding animals.* Philadelphia: Temple University Press.

Bachi, K., Terkel, J., & Teichman, M. (2012). Equine-facilitated psychotherapy for at-risk adolescents: The influence on self-image, self-control and trust. *Clinical Child Psychology Psychiatry, 17,* 298-312. doi:10.1177/1359104511404177.

Bastian, B., Loughnan, S., Haslam, N., & Radke, H. (2012). Don't mind meat? The denial of mind to animals used for human consumption. *Personality & Social Psychology Bulletin, 38,* 247-256.

Belk, R. W. (1996). Metaphoric relationships with animals. *Society & Animals, 4*(2), 121-145.

Bixler, R. D., & Floyd, M. F. (1997). Nature is scary, disgusting, and uncomfortable. *Environment & Behavior, 29,* 443-467.

Blackburn, R., Renwick, S. J. D., Donnelly, J. P., & Logan, C. (2004). Big Five or Big Two? Superordinate factors in the Neo Five Factor Inventory and the Antisocial Personality Questionnaire. *Personality & Individual Differences, 37,* 957-970.

Blashfield, R. K., & Aldenderfer, M. S. (1988). The methods and problems of cluster analysis. In J. R. Nesselroade & R. B. Cattell (Eds.), *Handbook of multivariate experimental psychology* (pp. 447-473). New York: Plenum Press.

Coe, J. C. (1985). Design and perception: Making the zoo experience real. *Zoo Biology, 4,* 197-208.

Cuddy, A. J. C., Fiske, S. T., & Glick, P. (2007). The BIAS map: Behaviors from intergroup affect and stereorypes. *Journal of Personality and Social Psychology, 92,* 631-648.

Cuddy, A. J. C., Fiske, S. T., & Glick, P. (2008). Warmth and competence as universal dimensions of social perception: The stereotype content model and the BIAS map. *Advances in Experimental Social Psychology, 40,* 61-137.

Curtin, S. (2009). Wildlife tourism: The intangible, psychological benefits of human–wildlife encounters. *Current Issues in Tourism, 12,* 451-474.

Darwin, Ch. (2009). *The expression of the emotions in man and animals*. London: Penguin classics. (Original work published 1872)

Demoulin, S., Leyens, J., Paladino, M. P., Rodríguez-Torres, R., Rodríguez-Pérez, A., & Dovidio, J. F. (2004). Dimensions of "uniquely" and "non-uniquely" human emotions. *Cognition and Emotion, 18,* 71-96.

Digman, J. M. (1997). Higher-order factors of the Big Five. *Journal of Personality & Social Psychology, 73,* 1246-1256.

Downes, L. (2013, December 29). *Wolf haters*. New York Times, Sunday Review, The Opinion Page.

Durante, F., Fiske, S. T., Kervyn, N., Cuddy, A. J. C., Akande, A., Adetoun, B. E., Adewuyi, M. F., Tserere, M. M., Al Ramiah, A., Mastor, K. A., Barlow, F. K., Bonn, G., Tafarodi, R. W., Bosak, J., Cairns, E., Doherty, S., Capozza, D., Chandran, A., Chryssochoou1, X., Iatridis, T., Contreras, J. M., Costa-Lopes, R., González, R., Lewis, J. I., Tushabe, G., Leyens, J-Ph., Mayorga, R., Rouhana, N. N., Smith Castro, V., Perez, R., Rodríguez-Bailón, R., Moya, M., Morales Marente, E., Palacios Gálvez, M., Sibley, C. G., Asbrock,

F., & Storari, C. C. (2013). Nations' income inequality predicts ambivalence in stereotype content: How societies mind the gap. *British Journal of Social Psychology, 52,* 726-746.

Eddy, T. J., Gallup, G. G., & Povinelli, D. J. (1993). Attribution of cognitive states to animals: Anthropomorphism in comparative perspective. *Journal of Social Issues, 49,* 87-101.

Epley, N., Akalis, S., Wayzt, A., & Cacioppo, J. T. (2008). Creating social connection through inferential reproduction: Loneliness and perceived agency in gadgets, gods, and greyhounds. *Psychological Science, 19,* 114-120.

Epley, N., Wayzt, A., Akalis, S., & Cacioppo, J. T. (2008). When we need a human: Motivational determinants of anthropomorphism. *Social Cognition, 26,* 143-155.

Epley, N., Waytz, A., & Cacioppo, J. T. (2007). On seeing human: A three-factor theory of anthropomorphism. *Psychological Review, 114,* 864-886.

Finlay, T., James, L. R., & Maple, T. L. (1988). People's perceptions of animals: The influence of zoo environments. *Environment & Behavior, 20,* 508-528.

Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A model of (often mixed) stereotype content: Competence and warmth, respectively, follow from perceived status and competition. *Journal of Personality and Social Psychology, 82,* 878-902.

Franklin, A. (2007). Human-Nonhuman animal relationships in Australia: An overview of results from the first national survey and follow-up case studies 2000-2004. *Society & Animals 15,* 7-27.

Glickman, S. E. (1995). The spotted hyena from Aristotle to the lion king: Reputation is everything. *Social Research, 62,* 501-537.

Gray, H. M., Gray, K., & Wegner, D. M. (2007). Dimensions of mind perception. *Science, 315,* 619.

Haidt, J., McCauley, C., & Rozin, P. (1993). Individual differences in sensitivity to disgust: A scale sampling seven domains of disgust elicitors. *Personality & Individual Differences, 16,* 701-713.

Hair, J. E. Jr., Anderson, R. E., Tatham, R. L., & Black, W. C. (1995). *Multivariate data analysis* (4th ed.). Upper Saddle, NJ: Prentice-Hall.

Haslam, N., & Loughnan, S. (2014). Dehumanization and infrahumanization. *Annual Review of Psychology, 65,* 399-423. doi:10.1146/annurev-psych-010213-115045

Henley, N. M. (1969). A psychological study of the semantics of animal terms. *Journal of Verbal Learning & Verbal Behavior, 8,* 176-184.

Herzog, H. A., & Galvin, S. L. (1992). Animals, archetypes, and popular culture: Tales from the tabloid press. *Anthrozoos, 5,* 77-92.

Hickrod, L. J. H., & Smith, R. L. (1982). A naturalistic study of interaction and frame: The pet as family member. *Urban Life, 11,* 55-77.

Inagaki, T. K, & Eisenberger, N. I. (2013). Shared neural mechanisms underlying social warmth and physical warmth. *Psychological Science, 24,* 2272-80. doi:10.1177/0956797613492773.

Judd, C. M., Hawkins, L. J., Yzerbyt, V., & Kashima, Y. (2005). Fundamental dimensions of social judgment: Understanding the relations between judgments of competence and warmth. *Journal of Personality and Social Psychology, 89,* 899-913.

Kellert, S. R. (1993). Values and perceptions of invertebrates. *Conservation Biology, 7,* 845-855.

Kellert, S. R. (1985). Social and perceptual factors in endangered species management. *Journal of Wildlife Management, 49,* 528-536.

Kellert, S. R., & Berry, J. K. (1980). *Phase III: Knowledge, affection and basic attitudes toward animals in American society.* United States Department of the Interior Fish and Wildlife Service.

Kellert, S. R., Black, M., Rush, C. R., & Bath, A. J. (1996). Human culture and large carnivore conservation in North America. *Conservation Biology, 10,* 997-990.

Keltner, D., & Haidt, J. (2003). Approaching awe, a moral, spiritual, and aesthetic emotion. *Cognition and Emotion, 17,* 297-34.

Kervyn, N., Fiske. S. T., & Malone, Ch. (2012). Brands as intentional agents framework: How perceived intentions and ability can map brand perception. *Journal of Consumer Psychology, 22,* 166-176.

Knight, S., Vrij, A., Bard, K., & Brandon, D. (2009). Science versus human welfare? Understanding attitudes toward animal use. *Journal of Social Issues, 65,* 463-483.

Koole, S. L., & Van der Berg, A. E. (2005). Lost in the wilderness: Terror management, action orientation, and nature evaluation. *Journal of Personality & Social Psychology, 88,* 1014-1028.

Korpela, K. M., Hartig, T., Kaiser, F. G., & Furher, U. (2001). Restorative experience and self-regulation in favorite places. *Environment & Behavior, 33,* 572-589.

Kwan, S. Y. V., & Cuddy, A. J. C. (2008, October). *(Non-Human) animal stereotypes: Reflections of anthropomorphism and cultural differences in system justification.* Paper presented at the meeting of Society of Experimental Social Psychology, Sacramento, CA.

Kwan, S. Y. V., & Fiske, S. T. (2008). Missing links in social cognition: The continuum from nonhuman agents to dehumanized humans. *Social Cognition, 26,* 125-128.

Lerner, J. E., & Kalof, L. (1999). The animal text. *Sociological Quarterly, 40,* 565-586.

Maple, T. L. (1983). Environmental psychology and great ape reproduction. *International Journal for the Study of Animal Problems, 4,* 295-299.

Ohman, A., & Mineka, S. (2003). The malicious serpent: Snakes as a prototypical stimulus for an evolved module of fear. *Current Directions in Psychological Science, 12,* 5-9. doi: 10.1111/1467-8721.01211

Oswald, L. J. (1995). Heroes and victims: The stereotyping of animal characters in children's realistic animal fiction. *Children's Literature in Education, 26,* 135-149.

Paul, E. S. (1996). The representation of animals on children's television. *Anthrozoos, 9,* 169-181.

Phillips, B. (1996). Advertising and the cultural meaning of animals. *Advances in Consumer Research, 23,* 354-360.

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

Rajecki, D. W., Rasmussen, J. L., & Conner, T. J. (2007). Punish and forgive: Causal attribution and positivity bias in response to cat and dog misbehavior. *Society and Animals, 15,* 311-328.

Rips, L. J., Shoben, E. J., & Smith, E. E. (1973). Semantic distance and the verification of semantic relations. *Journal of Verbal Learning & Verbal Behavior, 12,* 1-20.

Russell, A. M., & Fiske, S. T. (2008). It's all relative: Competition and status drive interpersonal perception. *European Journal of Social Psychology, 38,* 1193-1201.

Sevillano, V., & Fiske, S. T. (2015). Animals as social groups: Human perception of other species. *European Psychologist.* In press.

Skogen, (2001). Who's is afraid of the big, bad wolf? Young people's responses to the conflicts over large carnivores in Eastern Norway. *Rural Sociology, 6,* 203-226.

Smith, R. H. (2000). Assimilative and contrastive emotional reactions to upward and downward social comparisons. In J. Suls & L. Wheeler (Eds.), *Handbook of social comparison: Theory and research* (pp. 173-200). New York: Plenum Press.

Sommer, R. (1972). What do we learn at the zoo? *Natural History, 81*, 26-85.

Van der Berg, A. E., & Ter Heijne, M. (2005). Fear versus fascination: An exploration of emotional responses to natural threats. *Journal of Environmental Psychology, 25,* 261-272.

Vining, J. (2003). The connection to other animals and caring for nature. *Research in Human Ecology, 10,* 87-99.

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

Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review, 92,* 548-573.

Williams, L. E., & Bargh, J. A. (2008). Experiencing physical warmth influences interpersonal warmth. *Science, 322,* 606-607.

Figure 1

Four-cluster solution, Study 1

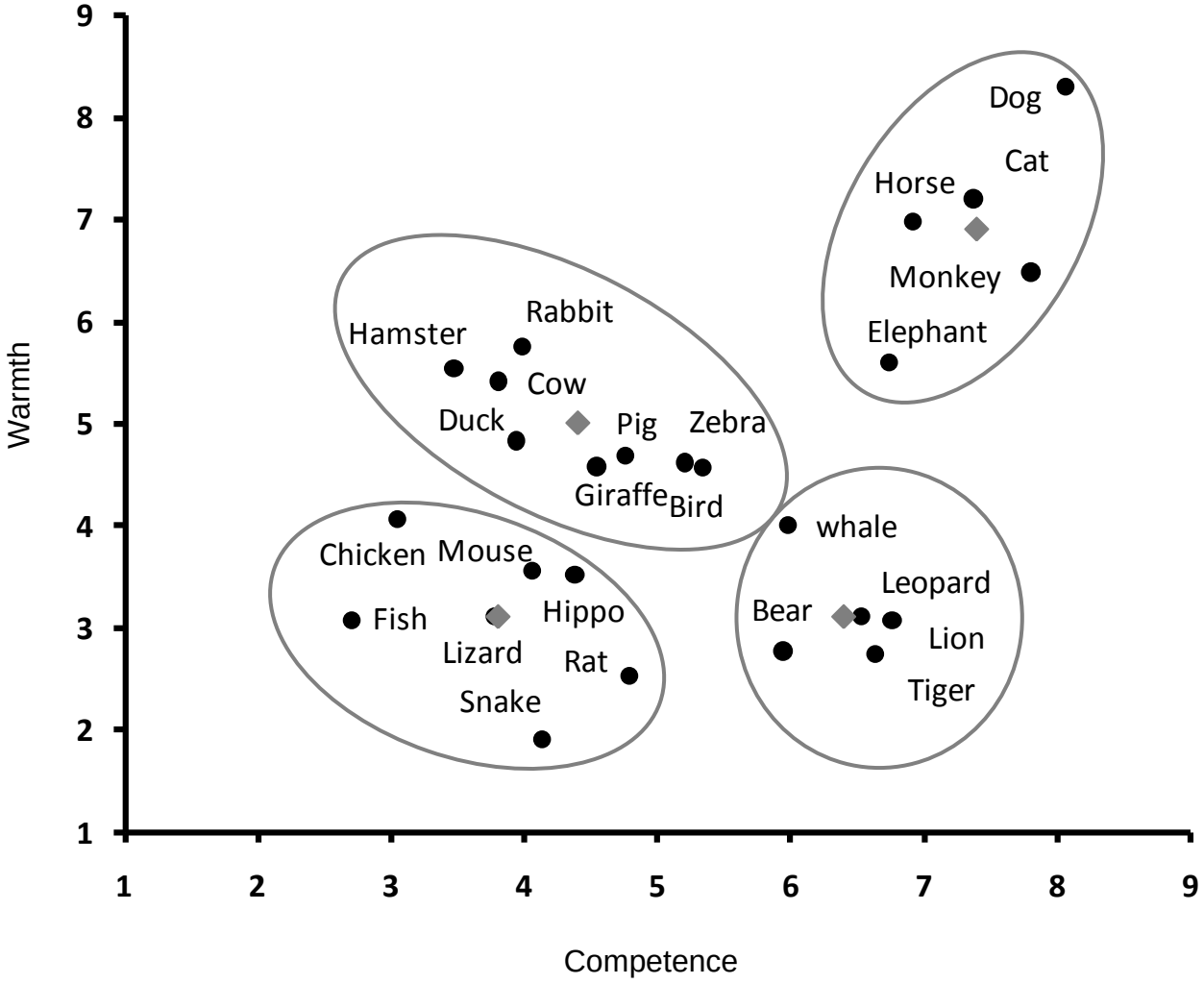
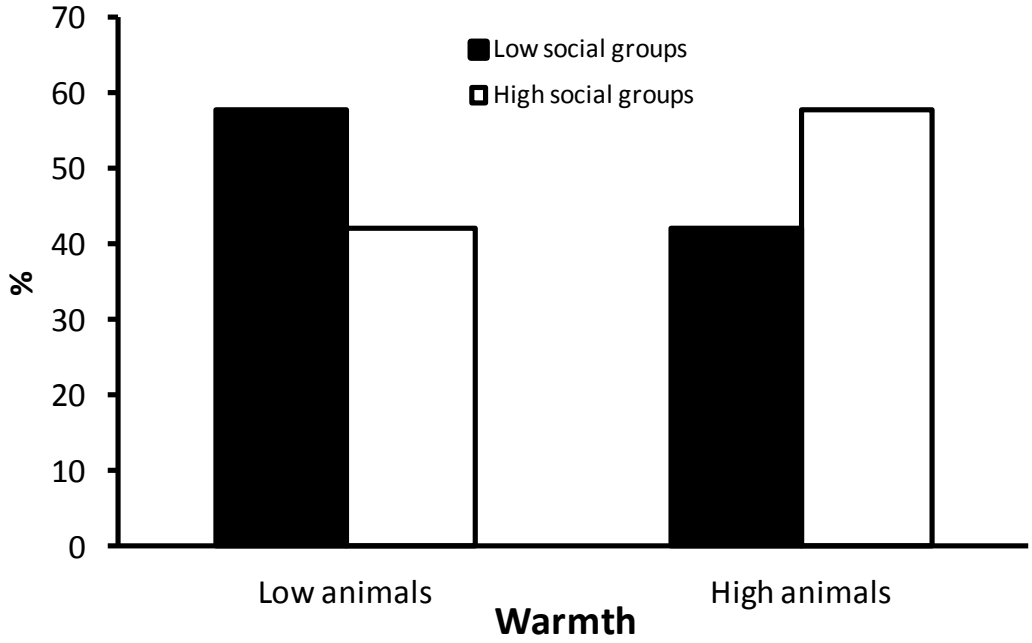


Figure 2

Associations (%) among animals and social groups based on Warmth (above) and Competence (below) Dimensions, Study 3



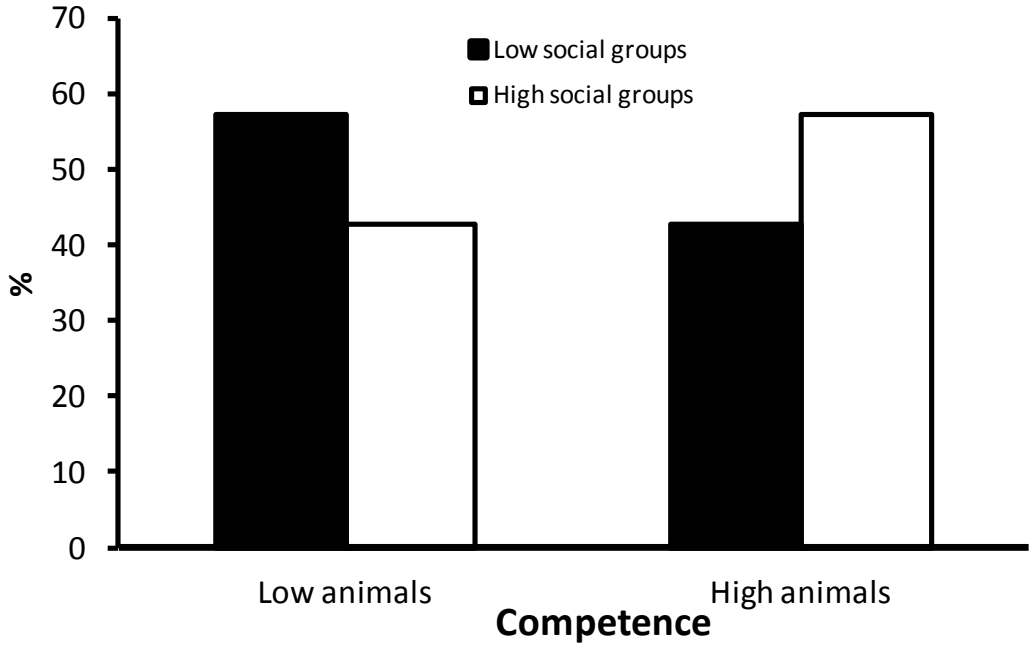


Table 1

Percentage of Mentioned Animals' Names by Instruction (Pilot Study 1, N =178)

Instruction 1: List animals' names		Instruction 2: List animals that have typically been in regular zoos		Instruction 3: List the major animal categories belonging to the animal world		Instruction 4: List the major categories of animals based on their function for humans	
Dog	92%	Lion	83%	Mammal	74%	Dog	95%
Cat	87%	Tiger	79%	Reptile	64%	Cat	84%
Lion	56%	Elephant	72%	Bird	58%	Cow	47%
Tiger	56%	Giraffe	70%	Fish	54%	Horse	37%
Elephant	51%	Bear	66%	Insect	38%	Pig	26%
Monkey	41%	Monkey	66%	Amphibian	36%	Bear	26%
Horse	41%	Gorilla	43%	Dog	20%	Deer	21%
Bear	33%	Zebra	38%	Cat	20%	Monkey	21%
Bird	33%	Snake	36%			Sheep	21%
Snake	33%	Penguin	30%			Rat	16%
Giraffe	31%	Polar Bear	23%				
Cow	28%	Seal	23%				
Zebra	28%	Hippo	21%				
Hamster	28%	Chimpanzee	15%				
Mouse	28%	Rhino	15%				
Fish	25%						
Rabbit	25%						
Pig	20%						
Rat	20%						
Hippo	18%						
Lizard	17%						
Duck	15%						
Chicken	15%						
Whale	15%						
Leopard	15%						

Note. This shows labels mentioned by at least 15% of participants. Participants mentioned on average 13.5, 9.9, 5.3, and 6.8 animal names in Instructions 1, 2, 3, and 4, respectively. Participants were randomly assigned to one of four instructions requesting them to list animal names.

Table 2

Group Clusters in Two-, Three- and Four-Cluster Solutions, Study 1

	Clusters		
Animals	2	3	4
Leopard	1	1	1
Lion	1	1	1
Tiger	1	1	1
Bear	1	1	1
Cat	2	2	2
Monkey	2	2	2
Elephant	2	2	2
Horse	2	2	2
Dog	2	2	2
Whale	1	3	3
Duck	1	3	3
Cow	1	3	3
Zebra	1	3	3
Bird	1	3	3
Pig	1	3	3
Hamster	1	3	3
Giraffe	1	3	3
Rabbit	1	3	3
Hippopotamus	1	3	4
Mouse	1	3	4
Fish	1	3	4
Lizard	1	3	4
Rat	1	3	4
Chicken	1	3	4
Snake	1	3	4

Table 3

Competence and Warmth Means for each Animal Cluster, Study 1

Animal	Cluster	Competence		Warmth
Dog, Monkey, Elephant, Horse, Cat	2	7.38 $(0.56)_b$	=	6.91 $(0.99)_b$
Tiger, Bear, Whale, Leopard, Lion	1	6.37 $(0.38)_b$	>	3.14 $(0.52)_c$
Duck, Cow, Rabbit, Hamster, Zebra, Giraffe, Bird, Pig	3	4.38 $(0.69)_a$	=	5.00 $(0.49)_a$
Hippopotamus, Lizard, Rat, Chicken, Snake, Mouse, Fish	4	3.84 $(0.73)_a$	=	3.11 $(0.71)_c$

Note. Within each row, within each Study, means differ ($p < .05$) if > is indicated. Within each column, within each study, means that do not share a subscript differ ($p < .05$). Standard deviations appear in parenthesis.

Table 4

Mean Paired Differences (Competence - Warmth) for Study 1

	Competence	Warmth	*t*
Tiger	6.64 (1.69)	2.74 (1.43)	3.900***
Lion	6.76 (1.68)	3.08 (1.50)	3.682***
Leopard	6.53 (1.62)	3.11 (1.51)	3.413***
Bear	5.94 (1.75)	2.77 (1.51)	3.172***
Rat	4.78 (2.28)	2.53 (1.52)	2.251***
Snake	4.13 (1.85)	1.91 (1.12)	2.221***
Whale	5.98 (1.71)	4.01 (1.67)	2.022***
Monkey	7.80 (1.43)	6.49 (1.44)	1.316***
Elephant	6.74 (1.56)	5.60 (1.67)	1.142***
Hippopotamus	4.38 (1.55)	3.51 (1.62)	0.861***
Bird	5.34 (1.62)	4.57 (1.54)	0.774***
Lizard	3.78 (1.89)	3.11 (1.59)	0.669***
Zebra	5.21 (1.65)	4.62 (1.72)	0.587***
Mouse	4.06 (1.66)	3.55 (1.64)	0.505
Cat	7.37 (1.06)	7.20 (1.20)	0.169
Pig	4.76 (1.81)	4.69 (1.65)	0.065
Giraffe	4.54 (1.58)	4.58 (1.62)	-0.040
Horse	6.92 (1.45)	6.99 (1.50)	-0.068
Dog	8.07 (.93)	8.31 (.91)	-0.243*
Fish	2.71 (1.31)	3.08 (1.72)	-0.346
Duck	3.94 (1.58)	4.83 (1.71)	-0.896***
Chicken	3.05 (1.63)	4.06 (1.78)	-1.017***
Cow	3.81 (1.68)	5.42 (2.03)	-1.607***
Rabbit	3.98 (1.45)	5.76 (1.61)	-1.781***
Hamster	3.47 (1.41)	5.55 (1.64)	-2.077***

Note. Standard deviations appear in parenthesis. * $p < .05$ *** $p < .001$

Table 5
Mean Ratings for Emotions Related to Clusters. Pilot Study 2

	Clusters			
	Low warmth		High Warmth	
	Low competence	High Competence	Low competence	High competence
Awe	3.35 (1.65)	**7.75 (1.54)**	3.76 (1.13)	4.39 (2.15)
Interest	3.77 (1.57)	**7.76 (1.42)**	4.21 (1.18)	5.33 (1.85)
Amazement	3.49 (1.54)	**7.27 (1.94)**	3.64 (1.34)	4.09 (1.85)
Fear	4.49 (1.28)	**7.48 (1.32)**	2.13 (1.29)	3.69 (1.56)
Fascination	3.65 (1.76)	**7.43 (1.56)**	4.42 (1.01)	5.03 (1.65)
Wonder	3.32 (1.54)	**7.26 (1.47)**	3.83 (1.05)	4.06 (2.00)
Terror	4.12 (1.28)	**7.51 (1.10)**	1.96 (0.97)	2.92 (1.10)
Worry	4.18 (1.63)	**7.51 (1.64)**	2.10 (0.90)	3.39 (1.37)
Threat	4.69 (1.65)	**7.92 (0.91)**	2.65 (1.32)	3.95 (1.16)
Delight	2.91 (1.10)	4.27 (2.22)	4.94 (1.71)	**6.05 (1.50)**
Attraction	3.26 (1.36)	5.14 (2.19)	4.52 (2.15)	**6.32 (1.86)**
Pleasure	2.98 (1.32)	4.99 (2.68)	4.62 (1.91)	**5.98 (2.23)**
Tenderness	2.71 (1.21)	4.07 (2.39)	5.27 (1.39)	**6.78 (2.00)**
Disgust	**5.19 (1.82)**	2.82 (1.88)	2.93 (1.61)	2.39 (1.37)
Contempt	**3.62 (1.84)**	2.97 (2.46)	2.25 (1.54)	1.89 (1.47)
Neutral	5.14 (1.99)	4.08 (2.78)	**6.27 (1.74)**	5.29 (2.25)
Hate	**4.89 (1.78)**	**4.39 (2.39)**	2.37 (1.32)	2.49 (1.68)
Unpleasantness	**5.35 (1.29)**	**4.94 (2.62)**	3.06 (1.84)	2.54 (1.34)
Admiration	3.12 (0.98)	**6.31 (2.23)**	4.54 (1.58)	**6.68 (1.79)**
Envy	1.85 (1.20)	**3.93 (2.44)**	2.75 (1.57)	**4.40 (2.39)**
Pity	2.50 (1.46)	2.85 (2.07)	3.59 (2.19)	3.95 (2.19)
Antipathy	4.27 (1.55)	3.95 (2.28)	3.28 (2.07)	3.21 (2.13)
Indifference	5.22 (1.85)	2.66 (1.67)	5.29 (1.28)	5.22 (1.71)
Apathy	4.55 (2.17)	4.17 (2.39)	4.42 (1.64)	4.13 (1.37)
Sorry For	2.23 (1.39)	2.97 (2.07)	2.85 (1.54)	3.18 (2.13)

Note. Emotions and behaviors selected in boldface. Standard deviations appear in parenthesis.

Table 6
Mean Ratings for Behaviors Related to Clusters. Pilot Study 2

	Clusters			
	Low warmth		High Warmth	
	Low competence	High Competence	Low Competence	High competence
Manage	3.84 (1.87)	2.73 (2.45)	**4.70 (1.73)**	**5.98 (2.40)**
Sustain	3.69 (2.10)	3.24 (2.59)	**5.15 (1.98)**	**5.94 (2.35)**
Control	3.33 (1.90)	2.53 (2.19)	**4.70 (2.04)**	**5.86 (2.61)**
Care for	3.33 (1.11)	3.04 (1.86)	**5.18 (1.72)**	**6.65 (1.84)**
Support	3.84 (1.54)	4.38 (2.76)	**6.31 (1.54)**	**6.57 (1.90)**
Tolerate	4.72 (1.33)	6.05 (2.31)	**7.36 (1.15)**	**7.54 (1.59)**
Avoid	5.13 (1.58)	**7.28 (1.73)**	3.12 (1.56)	3.02 (1.96)
Shoot	2.45 (1.52)	**3.49 (1.66)**	2.76 (1.51)	2.10 (1.04)
Assist	2.33 (1.26)	3.01 (2.02)	3.95 (2.00)	**4.95 (2.08)**
Integrate	3.47 (1.44)	1.95 (1.52)	4.01 (1.69)	**5.64 (2.17)**
Coexist	4.58 (1.48)	2.05 (1.24)	5.32 (1.54)	**6.26 (1.92)**
Coordinate	2.96 (1.48)	2.42 (1.68)	4.26 (2.00)	**5.67 (2.69)**
Help	2.75 (1.28)	4.57 (2.61)	4.37 (1.79)	**6.00 (2.26)**
Interact	3.18 (1.33)	1.76 (1.11)	3.92 (1.57)	**5.78 (1.95)**
Eat	3.71 (1.04)	1.61 (1.31)	**4.73 (1.86)**	1.54 (1.30)
Oppose	**4.55 (1.79)**	**4.09 (2.33)**	2.60 (1.69)	2.50 (1.74)
Fight	**3.57 (1.86)**	**3.55 (2.67)**	1.84 (1.18)	2.19 (1.27)
Hunt	**4.34 (1.89)**	**4.63 (2.12)**	3.43 (1.82)	2.33 (1.60)
Exclude	**4.87 (1.97)**	**5.76 (2.98)**	4.12 (1.70)	3.32 (1.87)
Exterminate	**5.03 (1.73)**	3.25 (2.02)	2.81 (1.72)	2.45 (1.38)
Demean	**4.30 (2.04)**	2.21 (1.80)	3.46 (1.95)	3.07 (1.60)
Trap	**5.18 (1.90)**	3.22 (1.78)	3.23 (1.75)	3.18 (1.88)
Persecute	**5.39 (1.62)**	3.73 (2.21)	3.73 (1.73)	3.09 (1.68)
Reject	**5.29 (1.25)**	4.23 (2.55)	2.70 (1.15)	2.65 (1.86)
Harm	**5.99 (1.36)**	3.93 (2.18)	3.79 (1.80)	2.78 (1.64)
Kill	**6.59 (1.54)**	4.30 (2.25)	4.51 (1.69)	2.49 (1.50)
Poison	**4.88 (2.60)**	2.59 (2.47)	2.77 (2.45)	2.53 (2.38)
Attack	**5.25 (1.80)**	3.91 (2.43)	3.42 (1.91)	2.18 (1.42)
Injure	**5.66 (1.76)**	3.61 (2.37)	3.49 (2.21)	2.61 (1.56)
Conserve	3.14 (1.53)	**5.56 (2.59)**	4.55 (2.00)	**5.72 (2.35)**
Monitor	3.89 (1.77)	**5.36 (2.43)**	4.55 (1.89)	**5.38 (2.29)**
Take for granted	5.72 (1.92)	5.53 (2.62)	6.42 (1.78)	6.27 (2.18)
Undermine	5.11 (2.02)	4.72 (2.64)	4.65 (2.13)	4.12 (2.37)
Protect	2.65 (1.25)	5.71 (2.32)	4.06 (1.95)	5.38 (2.43)
Neglect	4.50 (2.15)	4.13 (2.32)	3.84 (1.87)	3.73 (1.44)
Ignore	4.29 (1.58)	2.55 (2.03)	5.01 (1.87)	4.37 (1.87)

Note. Standard deviations appear in parenthesis.

Table 7

Emotions Elicited by Animal Clusters, Study 2

	Fondness	Awe	Indifference	Contempt
High-Warmth/High-Competence	**6.31 (1.19)**	4.02 (1.61)	4.30 (1.37)	2.41 (0.50)
Low-Warmth/High-Competence	3.94 (1.26)	**7.35 (0.95)**	2.29 (0.59)	3.56 (0.70)
High-Warmth/Low-Competence	5.40 (1.05)	2.79 (1.19)	**5.11 (1.09)**	2.45 (0.94)
Low-Warmth/Low Competence	2.88 (1.17)	4.05 (1.82)	3.72 (1.58)	**5.08[a] (2.33)**

Note. Numbers in boldface indicate emotions predicted to be high for particular clusters. For awe, tenderness, comfortable, indifferent, and neutral emotions, the *does not apply* option was chosen by 1 or 2 participants (3-7%). Delight, disgust, bored, terror, contempt, uneasy, and fond were not applied to animals by 1 to 4 participants (3-14%). For the rest of emotions, this response option was chosen by 1 or none (< 3%). Standard deviations appear in parenthesis.

[a]Within-clusters analysis did not show significant differences between contempt and the average of the other three emotions (p = .200) whereas between-cluster analysis did show significant differences between contempt ascribed to the low-warmth/low-competence cluster and all the others (p = .002).

Table 8

Behavioral Tendencies by Warmth and Competence Stereotypes, Study 2

	Warmth						Competence					
	High		Low					High		Low		
	M	*SD*	*M*	*SD*	*p*			*M*	*SD*	*M*	*SD*	*p*
Active facilitation α = 0.93[a]	5.29	1.62	3.19	0.88	***		Passive facilitation α =.80	5.93	0.44	4.33	1.36	***
Active harm α =.93	2.69	0.84	4.46	1.88	**		Passive harm α = .74					
							Ignore	3.05	1.00	4.77	1.33	**
							Passive harm: let them die off	3.36	0.57	5.61	1.74	***

Note. Regarding behaviors, the *does not apply* option was chosen by 1 to 3 participants (3-11%) for conserve, sustain, exterminate, hunt, monitor, trap, befriend, support, interact, kill, and coexist; by 4 participants (14%) for help and ignore; by 1 to 6 participants (3-22%) for injure, reject, and manage. No specific animal was systematically ascribed with the *does not apply* option on emotions or behaviors.

[a]Alphas computed across animals (N = 25). Across participant's responses (N between 459 and 642) alphas were: active facilitation (α = .69), active harm (α = .66), passive facilitation (α = .69), and passive harm (α = .17). As the passive harm dimension showed an extremely low alpha when computed across participants' responses, analyses regarding this dimension were conducted separately for the *let them die off* and *ignore* behaviors.

** $p < .01$. *** $p < .001$.

Table 9

Correlations of Behavioral Tendencies with Emotions, Study 2

	Behavioral Tendency				
				Passive Harm	
Predictor	Active Facilitation	Active Harm	Passive Facilitation	let them die off	Ignore
			Animal level		
Emotions					
Fond	**.83*** **	-.73***	**.51** **	-.56**	.09
Contempt	-.63***	**.80*** **	-.66***	**.57** **	-.05
Awe	-.66***	-.05	**.43***	-.38+	-.77***
Indifference	**.78*** **	-.19	-.17	.19	**.74*** **
			Participant level		
Emotions					
Fond	**.59*** **	-.55***	**.26*** **	-.31***	.03
Contempt	-.50***	**.61*** **	-.23***	**.29*** **	-.09*
Awe	-.47***	**.07***	**.26*** **	-.20***	-.43***
Indifference	**.52*** **	-.13***	-.08*	**.11*** **	**.31*** **

Note. Boldface correlations were predicted to be significant (17 of 20). Active Facilitation: *help, support, behave friendly, interact*; Active Harm: *kill, trap, injure, exterminate, reject*; Passive Facilitation: *Conserve, sustain.*

+ $p < .06$. * $p < .05$. *** $p < .001$.