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The Social Stereotypes of Wolves and Brown Bears

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RUNNING HEAD: Social stereotypes of wolves and brown bears

Abstract

Large carnivores are challenging to conserve because people are ambivalent. This research analyzed the social perception of wolves and brown bears from a novel psychological approach rarely used within conservation: animal species stereotypes (category-based generalizations). Spanish college students ascribed 17 characteristics to wolves (Study 1, $N = 144$ participants) and 18 to brown bears (Study 2, $N = 199$). Four domains—*Physical* (e.g., beautiful), *Species-related* (carnivorous), *Cognitive* (cunning), and *Social* (dangerous)—captured the stereotype content of both species, with the *Social (Physical)* domain being more relevant for wolves (bears). Results indicated that people a) identified stereotypes for large carnivores, as they do for people; and b) held ambivalent stereotypes (including positive and negative characteristics). Findings extend the stereotype content model and can inform the conservation of large carnivores in the 21st century.

Keywords: social stereotype, large carnivores, wolf, brown bear, social psychology, intergroup relations, conservation biology

Introduction

The relevance of integrating psychological frameworks into conservation biology has been highlighted for more than a decade (Bruskotter & Wilson, 2014; Saunders et al., 2006). Specifically, expectancy-value and risk-perception models have mainly guided research on the psychological aspects of species conservation (e.g., Bruskotter & Wilson, 2014; Manfredi, 2008). Key constructs of these models typically include value orientations, norms, hazards, and attitudes regarding animal species (Manfredi, 2008). Other relevant constructs in social psychology, such as *social stereotypes* (hereafter, “stereotypes”), however, have been neglected within the discipline. Animal stereotypes can be useful because they predict conservation support (Sevillano & Fiske, 2019a).

The analysis of stereotypes belongs to the study of intergroup relations. Traditionally, the individual’s reactions to a group (e.g., “immigrants”) or its members (e.g., an immigrant person) have been conceptualized in cognitive (i.e., stereotypes), affective (i.e., prejudices), and behavioral components (i.e., discriminatory behaviors) (Fiske, 1998). The stereotypes are the set of shared beliefs about the traits and attributes that people perceive as characteristic of social groups. Stereotypes are functional for people, simplifying their perception of others. Others are seen as having the same characteristics of the stereotyped group they belong to. For example, “immigrants” are viewed as unintelligent and untrustworthy (Fiske et al., 2002). These stereotypes (cognitions) may generate *prejudices*: evaluations or attitudes toward a group or its members. In intergroup relations, prejudices are equivalent to attitudes when referring to general evaluations or emotional reactions toward groups (Dovidio & Gaertner, 2010). Distinct prejudices, in turn, predict discrimination, which is “an inappropriate treatment of individuals because of their group membership” (Dovidio & Gaertner, 2010, p. 1085).

Someone perceiving immigrants as unintelligent and untrustworthy may feel contempt and avoid them (Cuddy et al., 2007).

We propose that people hold stereotypes about animal species (see also Jürgens & Hackett, 2017, 2021; and Skogen, 2001). For large carnivores, the characteristics associated with certain species (i.e., stereotypes) may contribute to negative attitudes (i.e., prejudices), increasing social tensions around the best way to conserve and coexist with these species (i.e., discrimination). For example, Sevillano and Fiske (2016) found that stereotypically unfriendly animals (large carnivores, rats) make people feel threatened and disgusted (prejudice); practices such as intense persecution or hunting (behaviors) seem understandable. Conservation biology frequently deals with societal beliefs about animal species. Acknowledging such a chain of beliefs (stereotypes)-negative attitudes (prejudices)-negative behaviors (discrimination) may help to improve the design of conservation actions and communication campaigns (see a similar approach within construal level theory taken by Slagle et al., 2019).

Conservation literature uses other constructs similar or related to stereotypes. For example, social representations, or symbolic meanings (e.g., López-Bao et al., 2017; Skogen et al., 2008) broadly refer to beliefs about animal species. However, those beliefs concern diverse aspects of the animal, while stereotypes entail a specific type of beliefs: the animal “way of being”, its traits, or attributes. In the same vein, when attitude research tackles the attributes associated with animal species, the object of study is the same as in stereotype research. Attitudes also include the affective and behavioral component, while stereotypes limit to beliefs towards a target (cognitions).

This research addressed the limited attention paid to stereotypes associated with animal species. We focused on the analysis of the stereotypes of two large carnivores

commonly involved in conservation conflicts in Europe: wolves (*Canis lupus*) and brown bears (*Ursus arctos*), each with a distinct image.

Stereotype Content of Wolves and Brown Bears

Conservation literature, although not specifically targeting stereotypes, has identified traits, and attributes associated to wolves and brown bears. The social image linked to wolves is predominantly negative (Dressel et al., 2015; Jürgens & Hackett, 2021; Skogen et al., 2017). The characterization of wolves depicts them as cruel, recreational killers, intelligent, aggressive, evil, and bold (e.g., Johansson et al., 2012; Skogen, 2001; Skogen et al., 2008). However, positive characteristics, such as powerful, strong, noble, or beautiful are also observed (Anthony & Tarr, 2019; Jürgens & Hackett, 2017). Brown bears are seen as territorial, valuable species for watching, cute, cuddly, and dangerous (Balčiauskas & Kazlauskas, 2012; Blekesaune & Rønningen, 2010).

The differences in the images (i.e., stereotype content) of the two animal species may help explain the differences in attitudes toward them, particularly, regarding feelings of fear. For example, a belief in the more malevolent nature of wolves than of bears toward humans may explain the more negative attitudes toward wolves. In contrast, attitudes toward bears are usually more positive compared to those toward wolves in Europe. Moreover, attitudes toward bears are more positive over time, compared to wolves; for the latter, attitudes seemed to become less favorable the longer people coexist with them (Dressel et al., 2015). Fear of wolves may reflect stereotypes about them or instead people's mistrust of the managing authorities as ineffective in mitigating the human-wolf conflict (Johansson et al., 2012; Lescureux & Linnell, 2010). However, in the case of brown bears, fear is governed directly by the appraisal of the species as dangerous and unpredictable (Johansson et al., 2012). These examples illustrate both similarities in some

factors driving negative interactions with humans in both species, but also differences which emerge in some key constructs usually used (i.e., attitudes).

The Stereotype Content Model of Human Social Groups and Animal Species

Research on stereotype content was guided in early studies by lists of attributes ascribed to social groups (Katz & Braly, 1933). More recently, the Stereotype Content Model (SCM) (Fiske et al., 2002) identified the main dimensions of stereotype content: Warmth and Competence. Warmth entails perceived intent, positive (i.e., friendly, trustworthy), or not, whereas Competence refers to perceived ability to enact those intents, that is, high ability (i.e., intelligent, confident), or not. When people think about social groups, they focus on how friendly or unfriendly their intentions are (i.e., Warmth) and how capable or incapable they are to achieve their goals (i.e., Competence). For example, in Western societies, Chinese or businesspeople are often perceived as unfriendly (not warm) but competent (Aragónés et al., 2015; Fiske et al., 2002). The two dimensions appear in related models of social perception, suggesting their generality (Abele et al., 2021).

Paralleling perception of human groups, animal species vary in stereotypic warmth (degree of positive intent) and competence (degree of skill or intelligence), resulting in distinct clusters of species being viewed as similar in those dimensions (Sevillano & Fiske, 2016). Animal species' ratings on warmth and competence scales show that large carnivores—tigers, bears, leopards, lions, and whales—are all perceived as highly intelligent, but also as ill-intentioned animals. In other words, high in competence but low in warmth. All these species fit the generic label as “predators”. Animals such as dogs, monkeys, elephants, horses, and cats are perceived as highly intelligent but also as well-intentioned. Correspondingly, these species fit the generic labels as “companions” or “protected targets”. A large group of medium to large non-carnivore species composed of

ducks, cows, rabbits, hamsters, zebras, giraffes, birds, and pigs obtained moderate ratings in warmth but low scores in competence and were generically labeled as “prey”. Finally, animals such as lizards, rats, chickens, snakes, mice, hippopotamuses, and fish were seen as low in warmth and competence and were generically labeled as “pests”.

Beyond warmth and competence, other dimensions for understanding human responses to animals have been suggested (Kellert, 1985; Serpell, 2004). For example, Serpell (2004) proposed a model of attitudes based on affect (affective responses toward animals), and utility (instrumental value of animals). There is some overlap between the SCM and Serpell’s model. The SCM indeed includes the affective responses to animals, but those are jointly based on warmth and competence. Furthermore, utility is limited to animals’ competence for human benefit whereas SCM’s competence alludes to a general capacity of the animal.

Aim

The beliefs associated to wolves and brown bears in conservation research make up the stereotype of predators resulting from the animal SCM (Sevillano & Fiske, 2019b): unfriendly (dangerous) but intelligent animals (cunning). However, systematic characterizations are still lacking. Research on conservation biology focuses on certain characteristics (e.g., fear, danger, esthetic value) using apparently *a priori* selected attributes or attributes from depth-interviews (Skogen et al., 2008); whereas psychological research uses *a priori* scales of stereotype content (e.g., friendliness, intelligence; Sevillano & Fiske, 2016). Consequently, the range of characteristics and their associated weight for defining the wolves’ and brown bears’ stereotypes remain unknown. This research systematically examined the social stereotype of wolves and brown bears using the

traditional methodology in research on stereotypes of groups of people. The specific hypotheses derived from studies are as follows:

- Hypothesis 1 (H1): The specific stereotype content of wolves will relate to the attributes of beauty, intelligence, powerful, fearsome, and dangerous. We expect a very similar stereotype content for brown bears, although somewhat more positive.

- Hypothesis 2 (H2): The stereotypes of wolves and brown bears identifying the specific positive and negative characteristics will be ambivalent (i.e., neither positive nor negative valence). A high perceived consensus is also expected, indicating the normative nature of the stereotypes.

- Hypothesis 3 (H3): Studies research using a priori selected characteristics found that large carnivores are seen as unfriendly (warmth) and intelligent animals (competence). Accordingly, we expect that warmth and competence-related attributes regarding both species will be observed.

Methods

The stereotype content of wolves and brown bears were described through the characteristics associated to these species, the *estimated consensus* (the percentage of people in Spanish society holding each characteristic), and *valence* (the degree of positivity or negativity they considered each characteristic has) in two studies. To identify the stereotypes, we used a *free listing* of characteristics technique. When people are asked to list animal's characteristics, they can base their responses on their personal beliefs about the species or on the beliefs held by society, i.e., social stereotypes (Devine & Elliot, 1995). As this research deals with social stereotypes, we stressed the society's view in the instructions used: "List the characteristics that most of the Spanish population associate to wolves [brown bears]." This instruction reduces the ambiguity of the task and makes it clear that

we were asking about beliefs held by Spanish society, independently of the people's personal agreement with them. This methodological approach is traditional in research on social stereotypes (Cuddy et al., 2009; Devine & Elliot, 1995; Fiske et al., 2002).

We conducted a content analysis of the participants' responses. From two pilot studies (for wolves and brown bears), we developed the two coding schemes that were used later to categorize the responses listed by participants in the main studies. The coding process entailed the labelling and categorization of responses. Researchers read the participants' responses in pilot study, adding codes at the side, and arranging them into categories. Following, three researchers coded participants' responses to main studies using the coding schemes. Next, some codes were merged into categories and others remained separate. For describing the stereotype content, we followed two criteria typically applied in the literature (Bergsieker et al., 2012; Bonam et al., 2016; Karlins et al., 1969). We selected those categories mentioned at least by 10% participants – the working categories, and among them, the ones that accounted for 50% of all responses (i.e., uniformity index) (Katz & Braly, 1933). The first criteria allowed us to obtain a more comprehensive stereotype content by including enough characteristics. The second criteria generated a uniformity index of the stereotype based on the characteristics with higher agreement. Following qualitative research procedures (Strauss & Corbin, 1998), the working categories were organized into more abstract explanatory domains, thereby generating a content scheme for both species. The data that support the findings of the studies are openly available in <https://doi.org/10.21950/EJNBKQ>.

Study 1: The Stereotype of Wolves

Pilot Study

A sample of 30 Spanish Psychology ($M_{\text{age}} = 19.2$; $SD = 1.35$; 97% women) students generated characteristics that most Spaniards would associate with wolves. The total number of generated characteristics across all participants was 189, with each participant providing an average of 6.07 ($SD = 1.87$). The characteristics were then examined via content analysis. First, the characteristics were grouped following grammatical and semantic criteria. Singular and plural (e.g., agresivo, agresivos [in English, aggressive (singular), aggressive (plural)]), root and derived terms (e.g., aggressive, aggressiveness), and synonyms were included in the same category (e.g., intelligent and cunning). Second, distinct responses related to the species' habitat (e.g., mountain, forest) were merged because the frequency for the single responses was low and there were no important differences in valence and consensus. This was also observed for cultural topics (e.g., werewolf, moon) and physical characteristics (e.g., grey, blue eyes). However, the categorization was conservative, maintaining some characteristics separated due to the high frequency of mention (e.g., dangerous, aggressive)¹. The 22 most prevalent categories (mentioned at least by 10% participants) were: aggressive, dangerous, beautiful, packing animals, wild, physical characteristics, cunning, predator, strong, cultural-symbolic topics, carnivorous, nocturnal animal, habitat-related issues, resemblance to dogs, solitary, hierarchical, in danger of extinction, protector, rapid, harming, fearsome, and howls. This pilot study produced over 41 categories for the coding scheme to be used in the main study.

Main Study 1

¹Notice that dangerous and aggressive may also indicate subtle differences in the perception of animals' behaviors. Whereas dangerous seems to imply humans to some extent (dangerous for humans), aggressive seems to describe animal's behavior independently of humans. Here, although in separate categories in the content system due to high frequency, they were treated as analogous, indicating negative social animal behavior tendencies (see Table 3) because the possible differences are so far speculative.

Method

Participants, procedure, and measures. A total of 144 Spanish Psychology college students participated in the study in exchange for credits ($M_{\text{age}} = 19.0$; $SD = 1.63$; 92% women). Participants completed a paper-and-pencil questionnaire in the lab. Following Bonam et al. (2016)'s procedure, participants were asked to list the characteristics that most Spaniards would associate with wolves on ten numbered cards. Then, they indicated the valence for each characteristic on a semantic differential scale ranging from -3 (*very negative*) to +3 (*very positive*). Next, participants estimated consensus among Spaniards about the characteristic, that is, the percentage of Spaniards who associate it with wolves. Each characteristic was rated on an 11-point scale ranging from 0% to 100% (at 10% intervals).

Coding and inter-rater reliability. Responses were categorized using the coding scheme developed in the pilot study. Three judges, including one of them blind to the hypotheses, independently categorized the participants' responses. Judges assigned each response to only one category. The remaining responses that did not fit any category were included in the *miscellaneous* category. The inter-rater agreement was high, with Cohen's kappas ranging from .89 to .90, with all $p < .001$.

Results

Participant-generated Characteristics

Participants mentioned a total of 881 characteristics for wolves (*Mean number for participant* = 6.01, $SD = 2.06$, range: 1–10), indicating that people can spontaneously identify stereotypic characteristics of wolves.

Content

The coding scheme allowed easily classifying 792 responses (90%) into 35 categories, leaving the remaining 10% unclassified (miscellaneous). The wolf stereotype is made up of 17 categories (mentioned by at least for 10% of participants), which were the working categories in subsequent analyses (see Table 1). The three most frequent categories were mentioned by approximately 50% of participants. Using the uniformity index (Bergsieker et al., 2012; Bonam et al., 2016; Katz & Braly, 1933), that is, the number of characteristics that account for 50% of the sample's responses, we found that seven categories concentrated 50% of all generated responses: dangerous, beautiful, wild, aggressive, packing animal, cunning, and carnivorous². This finding supports the existence of a uniform view of wolves that the participants believe the Spanish population to have.

Valence

First, we calculated the average of characteristics' valence for each participant (i.e., mean valence). At the individual level, the mean valence was negative for 67 participants (47%), neutral for 13 participants (9%), and positive for 64 (44%)³. Specifically, half of the sample (54%) gave a similar number of positive and negative characteristics (i.e., equal number of characteristics or one characteristic of difference), indicating ambivalent stereotypes of wolves among participants. The most negative characteristics were aggressive, dangerous, scary, and harmful (valence range: -2.33 – -1.75). The most positive ones were beautiful, cunning, elegant, rapid, packing animals, and strong (range: +1.31 – +2.52). The mean valence for all categories across participants was close to the neutral point ($M = -0.07$, $SD = 1.01$, $t(143) = 0.78$, $p = .438$, $d = 0.07$). Limited to the working categories (16 categories because danger of extinction is not really a negative or positive

² Predator and danger of extinction were mentioned with the same frequency as carnivorous.

³ Any negative number was considered as a negative valence and vice versa.

characteristic of wolves), the mean valence showed a negative tendency ($M = -0.17$, $SD = 1.12$, $t(143) = 1.86$, $p = .065$, $d = 0.15$). The correlation between the 17 categories' valence and percentage of mention was nonsignificant, $r(15) = -.15$, $p = .56$. This indicates that participants did not mention positive categories more frequently than negative ones, or vice versa⁴.

Consensus and Valence-consensus Association

The mean consensus for the 17 characteristics was high, between 90% for carnivorous and 52% for elegant ($M = 78.25$, $SD = 9.96$). That is, participants believed that most Spaniards would agree with these characteristics describing wolves, thereby showing their normative nature. We analyzed whether negative characteristics were perceived as more socially consensual than positive ones. Participants did not estimate a higher agreement for negative than for positive characteristics, and vice versa⁵: $r(15) = -.34$, $p = .19$.

Content Scheme of Wolves' Stereotypes

As is usual in qualitative research (Strauss & Corbin, 1998), we organized the categories in more abstract explanatory domains, resulting in four domains: species-related, social, physical, and cognitive (see Table 3). The domain of species-related characteristics included taxonomic-related characteristics (e.g., carnivorous), habitat-type characteristics (e.g., wild), and the species' conservation status (e.g., danger of extinction). The domain of social characteristics was made up of inter- and intraspecific behavioral tendencies (e.g., aggressive). The domain of physical characteristics included physical appearance (e.g.,

⁴ Considering all 35 categories, the correlation was still nonsignificant, $r(33) = -.24$, $p = .16$.

⁵ Considering all 35 categories, a tendency was observed: more negative characteristics associated with wolves were judged to have higher levels of consensus than positive ones, $r(33) = -.29$, $p = .09$.

beauty) and abilities (e.g., strong, rapid). Lastly, the domain of cognitive characteristics only contained the species' intelligence (e.g., cunning). For the wolf stereotype, the species-related and the social domains were more salient for participants, with the social domain being clearly negative.

Discussion

People perceive wolves as dangerous, beautiful, wild, aggressive, packing, cunning, and carnivorous animals. All characteristics anticipated by hypothesis H1 were observed, except for powerful. Three other attributes appeared: wild, packing, and carnivorous. Half of the sample gave a similar number of positive and negative attributes. This finding supported hypothesis H2 and is coherent with studies that show large carnivores are perceived ambivalently (Jürgens & Hackett, 2021; Kellert, 1985; Sevillano & Fiske, 2016). Accordingly, negative (positive) characteristics were not more frequently mentioned, nor did they obtain higher consensus than positive (negative) ones. Negative characteristics of wolves may be more salient than positive ones in conflictive contexts with the species, similar to human social groups.

Participants spontaneously mentioned wolves' intentions toward humans (e.g., dangerous, harmful), all of them ill-intentioned, as well as physical and cognitive abilities (e.g., rapid, cunning). The dangerous and harmful bad intentions of wolves imply that they are perceived as low in warmth. The physical and cognitive abilities of wolves imply that they are perceived as high in competence. Therefore, results across participants are consistent with the relevance attributed to warmth and competence by the animal SCM, as stated in hypothesis H3.

Study 2: The Stereotype of Brown Bears

Pilot Study

We followed the same procedure as in the wolves' pilot study. Participants (30 Spanish Social Sciences college students; $M_{\text{age}} = 20.6$; $SD = 1.69$; 77% women) mentioned 229 characteristics of brown bears ($M = 7.63$; $SD = 2.14$) resulting in a total of 38 categories. Different from Study 1, distinct responses related to physical characteristics (e.g., furry, brown) were not merged because of their high observed frequency. The 22 most prevalent characteristics (mentioned at least by 10% participants) were as follows: big, aggressive, furry, wild, brown, dangerous, strong, habitat-related issues, mammal, in danger of extinction, beautiful, carnivorous, animal, sleepy, cunning, fearsome, protector, captive, big eater, scary, free, and territorial.

Main Study 2

Methods

Participants, procedure, and measures. A total of 199 Spanish Social Sciences college students ($M_{\text{age}} = 21.9$; $SD = 3.3$; 83% women) participated in the study. Procedure and measures were the same than Study 1.

Coding and inter-rater reliability. Responses were categorized using the coding scheme developed in the brown bears' pilot study. Three judges, with one blind to the research (different from the blind judge of the wolves' study), independently categorized the participants' responses. As additional criteria, when the frequency was higher than four responses and there was no previously defined category in the coding scheme, a new category was created. The remaining responses were included in the miscellaneous category. Inter-rater agreement ranged from .81 to .88, with all $p < .001$.

Results

Participant-generated Characteristics

Participants mentioned 1,375 total characteristics (*Mean number for participant* = 6.91, *SD* = 2.25, range: 1–10), showing that people spontaneously identified stereotypic characteristics of brown bears.

Content

The *a priori* criteria allowed classifying 1255 responses (91%) into 55 categories, leaving the remaining 9% unclassified (miscellaneous). The brown bear stereotype is made up of 18 categories (mentioned by at least for 10% of participants; see Table 2). The three most frequent characteristics were mentioned by approximately 50% participants, and the nine categories which comprised approximately 50% responses were: big, furry, brown, aggressive, dangerous, wild, habitat-related issues, in danger of extinction, and beautiful. As in the case of wolves, there is a homogeneous view of brown bears.

Valence

At the participant level, the mean valence was negative for 83 participants (42%), neutral for 13 participants (77%), and positive for 103 (52%). Importantly, half of the sample (50%) gave a similar number of positive and negative characteristics, indicating an ambivalent stereotype of brown bears across participants. The most negative categories were in danger of extinction, dangerous, and aggressive (range: -2.34 – -1.47). The difference between the negativity associated with in danger of extinction for the species and that associated with dangerous, a negative species characteristic for human beings. The most positive categories were protector, beautiful, cunning, and omnivorous (range: +1.20 – +2.55). The mean valence for all categories across participants was slightly positive ($M = 0.26$, $SD = 1.07$, $t(198) = 3.42$, $p = .001$, $d = 0.24$). Limited to the working categories (17 categories because of exclusion of danger of extinction), the mean valence was significantly positive although very weak ($M = 0.34$, $SD = 1.10$, $t(198) = 4.37$, $p < .001$, $d =$

0.31). The correlation between the categories' valence and percentage of mention was nonsignificant, $r(16) = -.23, p = .35^6$.

Consensus and Valence-consensus Association

The mean estimation of consensus for the 18 categories was high, between 90% for strong and 57% for in danger of extinction ($M = 80.14, SD = 12.47$). The correlation between the characteristics' valence and the estimated consensus was nonsignificant, $r(16) = -.23, p = .35^7$.

Content Scheme of Brown Bear's Stereotypes

We successfully applied the content scheme generated for wolves to the eighteen working categories of brown bears (see Table 3). For the brown bear stereotype, the species-related and the physical domains were more salient for participants, with none being clearly negative. To compare the images of wolves and brown bears, we tested and found the differential salience of domains by the species ($\chi^2 = 102.86, p = .001$, Cramér's $V = .25, p < .001$). The social, cognitive, and, to a lesser extent, species-related domains were more frequently mentioned for wolves than the physical domain (with adjusted residuals higher than $\pm 1.96^8$), with the social domain being clearly negative. The brown bear stereotype was centered on the physical domain, non-specifically negative. In line with this, brown bears ($M_{valence} = 0.34, SD = 1.10$) were more positively perceived than wolves ($M_{valence} = -0.17, SD = 1.12, t(341) = 4.24, p < .001$).

Discussion

⁶ Considering all 55 categories, the correlation was still nonsignificant, $r(53) = -.11, p = .43$.

⁷ Considering all 55 categories, the correlation was still nonsignificant, $r(53) = -.05, p = .69$.

⁸ Adjusted residuals higher than ± 1.96 indicates that the number of cases in that cell is significantly larger or smaller than would be expected if the null hypothesis were true, $\alpha = .05$.

People perceive brown bears as big, furry, brown, aggressive, dangerous, wild, related to a specific habitat, in danger of extinction, and beautiful animals. Several of these characteristics were anticipated by hypothesis H1, except for powerful. Six other attributes related to physical appearance, wilderness, habitat, and danger of extinction also appeared. As predicted, brown bears' characteristics were slightly more positive than wolves. As in the case of wolves, half of the participants gave a similar number of positive and negative characteristics. Brown bears' stereotype comprised a mixture of valence attributes, thereby supporting hypothesis H2. The spontaneous mention of warmth and competence attributes also emerged, in accordance with hypothesis H3. Similar to wolves' stereotype, participants mentioned brown bears' (bad) intentions toward humans (e.g., aggressive, dangerous), which are related to low warmth, as well as physical and cognitive abilities (e.g., strong, cunning), which are related to high competence.

General Discussion

The extant psychological frameworks in conservation science have neglected the stereotype construct within the discipline so far (but see Jürgens & Hackett, 2017). This research showed that people identify stereotypes of wolves and brown bears, similar to as they do for social groups. These stereotypes are highly uniform, ambivalent, and consensual. The high uniformity is supported by the low number of characteristics needed to describe them: seven for wolves and nine for bears. The fewer characteristics, the more uniform the stereotype is considered to be. This is remarkable since the number of characteristics describing national stereotypes are higher than those reported here. For example, 11 characteristics for the stereotype of Jews, 13 for Germans, 14 for African Americans, and 26 for Turks (Bergsieker et al., 2012).

The stereotypes of wolves and brown bears is comprised of a mix of positive and negative characteristics, showing that large carnivores are perceived ambivalently. The ambivalence toward these large carnivore species allows us to understand their capacity to elicit strong opposite reactions in society— polarizing the views about the best way to conserve and coexist with these species (Jürgens & Hackett, 2021).

The characteristics reported in the studies were considered broadly shared by Spanish society, obtaining consensus ratings over 50%. Nonetheless, some characteristics showed a high consensus rating but a low frequency of mention, indicating certain discrepancy. We argue that those characteristics with a highest discrepancy may be less relevant for the social stereotype of the species (e.g., strong, big).

The Dimensions of the Stereotype Content Model

Following the animal SCM, the warmth and competence dimensions—intent and capability, respectively—are of relevance in the case of large carnivores. Using a different methodology from previous research (i.e., rating scales), but traditional in research on stereotypes of groups of people (i.e., listing characteristics), we found that competence (cunning, strong) and warmth (aggressive and dangerous) were spontaneously mentioned for large carnivores, consistent with previous research (Sevillano & Fiske, 2016).

Stereotype Content of Large Carnivores and Conservation Biology

We found highly similar stereotypes for wolves and brown bears in terms of characteristics and associated valence. Both animal species shared 10 out of 17 characteristics (59%; e.g., cunning, big, beautiful, dangerous, wild). Among the unshared characteristics, wolves appear more threatening (scary) than brown bears (protector). Accordingly, brown bears' stereotype was slightly positive, which is consistent with the more positive perception of brown bears found in attitudinal research (Dressel et al., 2015).

The stereotype of aggressive and dangerous animals would feed the perception of large carnivores as a significant threat, especially for wolves, even though they may cause less damage to property (e.g., Swenson & Andrén, 2005) and attack fewer people than bears (Penteriani et al., 2016).

The content scheme organized in four domains summarizes these differences, showing that the wolf stereotype (vs. brown bear) is defined by species-related (wild, packing), social (dangerous, harming humans), and cognitive domains (cunning). Meanwhile, the physical domain is more relevant for brown bears stereotype (big). We argue that the differential mention of physical and social domains for the two species may partially explain this positive perception of brown bears (see also the mass media effect in the negative perception of wolves; e.g., Houston et al., 2010). The physical domain was not clearly negative, while the social domain was clearly negative. The relevance of the social domain for the stereotype content of the wolf is coherent with research showing that the cost of coexisting with wolves are higher compared to bears (Bautista et al., 2019), and perhaps, a higher political use of wolves compared to bears (Chapron & López-Bao, 2020).

Although attitudes toward wolves are more negative, people report less fear toward this species (Johansson et al., 2012). According to its stereotype content, the brown bear is personally threatening in physical terms (big, strong), which may explain the more intense fear of it. Actually, the number of attacks on people reported in recent decades is higher for brown bears than for wolves (Bombieri et al., 2019; Penteriani et al., 2016). However, the wolf is a cunning enemy, harming humans symbolically and economically through “suspicious” management practices of authorities (Johansson et al., 2012; Jürgens & Hackett, 2021). The “fear” is directed toward the authorities (i.e., lacking social trust) (Johansson et al., 2017). Stereotype content helps to reconcile these findings.

The associated characteristic of wild is in line with the traditional association of large carnivore species with wilderness (Jürgens & Hackett, 2021; Kellert, 1985; López-Bao et al., 2017). This association impedes our collective ability to envision conservation alternatives for these predators that do not include wilderness, with consequences for the recovery of these species (López-Bao et al., 2017).

Limitations and Future Research

As is usual in research on the stereotype content model, we asked participants to list characteristics that society holds about large carnivores. We did not ask about personal beliefs regarding those species. For this reason, the responses generated are fairly consistent with previous applied research on conservation biology. The study participants were college students and mainly female. This highly specific sample may have influenced findings portraying a stereotype that diverges to some extent from the stereotype held by society (e.g., by mentioning more positive characteristics). Future studies should include different types of samples to confirm or limit these findings. Since this is the first time, to the best of our knowledge, that animal stereotypes are being studied through this approach, we consider the findings not entirely conclusive but an important piece of evidence.

Complementary research in conflictive areas may explore the social stereotype in the affected population to explain the different positions held by the rural-urban population, for example. Indeed, stereotype content may be more salient depending on people's values and beliefs and predict the restriction of the distribution of wolves and bears in the wild (Becker et al., 2019).

Conclusions

This article identified the content of the stereotype of wolves and brown bears. To the best of our knowledge, this is the first time that the social stereotype methodology has

been used with animal species. Our research opens the door to study intergroup phenomena regarding animal targets: stereotype, prejudice, and discrimination. For example, some behavioral tendencies of humans toward animal species may be seen as discriminatory practices (e.g., limited territory available, animal extinction) (Chapron & López-Bao, 2020) guided by prejudiced feelings and stereotypes. Undoubtedly, the term discrimination should be used with caution. For example, in Norway, the wolf population goal is for 4 to 6 wolf litters to be born each year within the designated management area for breeding wolves that covers approximately 5% of the country. This collides with recent theories of property rights of animals to habitat (Hadley, 2015).

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Table 1

*Categories of Responses for the Stereotype of Wolves: Frequency, Valence and Consensus**(N = 144)*

Categories	Response examples	% participants ^a	<i>f</i> ^b	Valence	Consensus
				<i>M (SD)</i>	<i>M (95% CI)</i>
1. Dangerous*	dangerous, danger, fierce	90%	129	-2.24 (0.8)	83% (81-85)
2. Beautiful*	beautiful, nice	57%	82	2.52 (0.6)	70% (65-74)
3. Wild*	wild, wild animal, indomitable	51%	73	-0.36 (1.3)	89% (87-92)
4. Aggressive*	aggressive, violent	36%	52	-2.33 (0.9)	75% (71-80)
5. Packing animal*	Pack, work/live in packs, sociable	35%	50	1.42 (1.3)	74% (69-80)
6. Cunning*	cunning, intelligent, clever	26%	38	2.24 (1.0)	77% (71-83)
7. Carnivorous*	carnivore, eats meat	19%	27	-0.33 (1.0)	90% (85-96)
8. Predator	predator, hunter	19%	27	-0.81 (1.2)	87% (82-93)
9. Danger of extinction	danger of extinction, scarce	19%	27	-0.81 (2.3)	70% (63-78)
10. Habitat-related issues	forest, mountain, nature	16%	23	0.82 (1.1)	83% (76-91)
11. Rapid	fast, rapid	16%	23	1.61 (1.3)	78% (71-86)
12. Elegant	elegant, noble	15%	21	2.24 (1.1)	52% (44-60)
13. Scary	fear, scary	14%	20	-2.15 (0.7)	76% (70-82)
14. Nocturnal	nocturnal, night, come out at night	13%	19	-0.16 (0.4)	74% (65-83)
15. Harming	damage to livestock, attacking cattle	11%	16	-1.75 (1.2)	75% (67-84)
16. Strong	strong, strength	10%	14	1.31 (1.5)	83% (74-92)
17. Big	big, large	10%	14	-0.07 (0.9)	73% (65-81)

^a Percentage of participants that have mentioned each category; ^b Frequency of mention of each category ($N_{Total} = 881$);

* Characteristics that account for 50% of the total responses

Table 2

Categories of Responses for the Stereotype of Brown Bear: Frequency, Valence, and Consensus (N = 199)

Categories	Response examples	% Participants ^a	<i>f</i> ^b	Valence	Consensus
				<i>M (SD)</i>	<i>M (95% CI)</i>
1. Big*	big, big size, heavy, fat	84%	167	0.54 (1.29)	87% (85-89)
2. Furry*	hairy, lot of hair, fur, soft	46%	91	1.04 (1.32)	85% (81-89)
3. Brown*	brown, brown, dark	45%	90	0.44 (0.96)	81% (77-86)
4. Aggressive*	aggressive, fierce	43%	86	-1.47 (1.64)	74% (70-79)
5. Dangerous*	dangerous, can attack humans	37%	73	-1.92 (1.44)	81% (78-85)
6. Wild*	wild, not domestic	32%	64	-0.09 (1.79)	80% (76-85)
7. Habitat-related issues*	forest, mountain, nature, cave	31%	61	1.15 (1.31)	73% (68-79)
8. Danger of extinction*	in danger of extinction, scarce	21%	41	-2.34 (1.80)	57% (49-64)
9. Beautiful*	pretty, attractive, beautiful	20%	39	2.13 (1.01)	71% (64-77)
10. Mammal	mammal, viviparous	19%	38	0.71 (1.25)	86% (79-93)
11. Carnivorous	carnivore, eats meat	19%	38	-0.16 (1.18)	81% (74-88)
12. Strong	strong, strength, robust	19%	37	1.03 (1.87)	90% (87-94)
13. Predator	hunter, predator, fisherman	17%	34	0.52 (2.03)	80% (71-88)
14. Claws	claws, claws, sharp claws	16%	32	0.34 (1.88)	81% (74-88)
15. Protector	protector, protect their young	15%	29	2.55 (0.74)	64% (55-74)
16. Omnivore	omnivore, eats everything	13%	25	1.20 (1.56)	67% (56-78)
17. Cunning	cunning, intelligent, calculating	11%	22	1.73 (1.35)	61% (51-72)
18. Hibernator	hibernate, hibernating in winter	10%	20	0.60 (1.35)	70% (57-83)

^a Percentage of participants which mentioned each category; ^b Frequency of mention of each category ($N_{Total} = 1375$);

* Characteristics that account for 50% of the total responses

Table 3

Content Scheme for the Stereotype of Wolves and Brown Bears: Domains and Characteristics

Domains	Characteristics	
	Wolves (n = 17)	Brown bears (n = 18)
1. Species-related	38% (2.1)	33% (-2.1)
Taxon	packing animal, carnivorous, predator, nocturnal	carnivorous, predator, mammal, omnivorous, hibernator
Habitat-type	habitat-related issues, wild	habitat-related issues, wild
Conservation Status	danger of extinction	danger of extinction
2. Social	33% (6.5)	19% (-6.5)
	dangerous, aggressive, scary, harming humans	dangerous, aggressive, protector
3. Physical	24% (-9.3)	46% (9.3)
Appearance	beautiful, big, elegant	beautiful, big, furry, brown, claws,
Ability	strong, rapid	Strong
4. Cognitive	6% (3.8)	2% (-3.8)
	cunning	Cunning

Note. Mentions for wolves ($N_{\text{total}} = 655$) and brown bears ($N_{\text{total}} = 987$). Adjusted residuals in parenthesis. Residuals higher than ± 1.96 are significant.