COLORING AND SIZE INFLUENCE PREFERENCES FOR IMAGINARY ANIMALS, AND CAN PREDICT ACTUAL DONATIONS TO SPECIES-SPECIFIC CONSERVATION CHARITIES

POLLY CURTIN | SARAH PAPWORTH

Department of Biological Sciences, Royal Holloway, University of London, Egham Hill, Egham, UK

Correspondence
Sarah Papworth, Department of Biological Sciences, Royal Holloway, University of London, Egham Hill, Egham TW20 0EX, UK.
Email: sarah.papworth@rhul.ac.uk

Funding information
National Geographic Society, Grant/Award Number: NGS-53291R-18

Abstract
As conservation has limited funds, numerous studies have identified aesthetic characteristics of successful flagship species which generate donations and conservation. However, prior information about species can also impact human preferences, and may covary with animal appearance, leading to different conclusions about which species will be most effective. To separate these two factors, we use images of imaginary animals as a novel paradigm to investigate preferences for animal appearance in conservation donors. Using discrete choice experiments, we show that potential conservation donors prefer larger imaginary animals which are multicolored and cooler toned. We found no effect of eye position or fur, which we used as a proxy for mammalian species. Furthermore, we demonstrate that these preferences can predict the number of donations received by species-specific conservation charities. These results suggest coloring, and particularly number of colors, is an overlooked aspect of animal appeal, and an important aesthetic characteristic for identifying future flagship species.

KEYWORDS
animal appearance, charity, donation, fictional animals, flagship species, human animal studies, human preferences

1 | INTRODUCTION

People seem to prefer aesthetically appealing species, and these species are also most likely to receive government and NGO conservation attention and funds (Brambilla, Gustin, & Celada, 2013; Martín-López, Montes, Ramírez, & Benayas, 2009; Metrick & Weitzman, 1996). Specifically, people prefer colorful (Barua, Gurdak, & Akhtar, 2012; Prokop & Fančovičová, 2013; Stokes, 2007), large bodied (Knegtering, Van Der Windt, & Schoot Uiterkamp, 2010; Macdonald, Burnham, Hinks, Dickman, & Malhi, 2015; Smith, Veríssimo, Isaac, & Jones, 2012) animals. These preferences have been found in various species groups species (e.g., insects, Barua et al., 2012; birds, Lišková & Frynta, 2013; mammals, Macdonald et al., 2015). Other aesthetic preferences may be specific to certain species groups, such preferences for forward facing eyes in mammals (Macdonald et al., 2015; Smith et al., 2012). Identifying preferred species has become an important research area, as organizations leverage “flagship species” to raise conservation support. Flagship species are chosen “based on its possession of one or more traits that appeal to the target audience” (Veríssimo, MacMillan, & Smith, 2011).
and are used as the focus of conservation campaigns. The differences between popular and unpopular flagship species can be substantial: at Paris Zoological Park, more popular species can raise 46 times the funds of less popular species (Colléony, Clayton, Couvet, Saint Jalme, & Prévot, 2017). Conservation science often has limited funds to prevent and reverse the biodiversity declines (Bottrill et al., 2008), thus understanding which species are best to use for raising awareness and funds is essential information of considerable practical importance.

Preference based studies have informed flagship species choices for conservation campaigns (e.g., Veríssimo et al., 2014), and investigated preferred aesthetic characteristics (e.g., Garnett, Ainsworth, & Zander, 2018; Macdonald et al., 2015). However, as these studies and others investigate preferences for real animals (see Thomas-Walters, McNulty, & Veríssimo, 2019 for a review of pro-environmental research on animal imagery), the results could be confounded by other unmeasured variables, such as prior knowledge or experience of species, rather than the variables presented in the studies (Montgomery, 2002). If aesthetics are the most important characteristic for flagship species (the “Cinderella species theory”), new flagship species should have similar aesthetic characteristics to previously successful flagship species (Smith et al., 2012). In contrast, if prior knowledge is important then flagship species must be located within existing cultural frames (known contexts in which a potential donor can view the species: the theory of flagship species action, Jepson & Barua, 2015). These two theories lead to different strategies for selecting flagship species. In the first, aesthetically pleasing but neglected “Cinderella species” can be marketed by conservation NGOs to generate new funds and awareness (Smith et al., 2012). In the theory of flagship species action (Jepson & Barua, 2015), only species which can appropriate existing positive cultural frames will be successful. Both theories suggest a subset of species can be successful as flags, but propose drawing new flagship species from different pools. Without evidence on which theory describes the decision-making processes behind choice, it is difficult to effectively use flagship species to raise awareness and funds to prevent biodiversity losses. Contextual information about species does affect participant choices, for example, donations and intention to donate have also been shown to be affected by level of existing conservation attention (Veríssimo et al., 2017) and whether a species is a pest or perceived as beneficial (Schlegel & Rüp, 2010), and the IUCN redlist status of the species (Curtin & Papworth, 2018). Even providing additional information about animal names (when compared to photos alone) has been shown to change species preferences (Carvell, Inglis, Mace, & Purvis, 1998).

Montgomery (2002) overcame the possible correlation between aesthetic characteristics and prior information in real species by presenting participants with written descriptions of hypothetical species. The study found ecological benefits were more important to participants than other species characteristics, thus appearance may be less important than other studies suggest. However, the hypothetical descriptions were open to interpretation by participants (e.g., “a species with beautiful colors and unique shape”). Here we use images of fictional animals as a novel paradigm to understand preferences for aesthetic characteristics in potential conservation donors. If prior knowledge of a species does not impact preferences, we should find the same preferences for aesthetic features of fictional animals as are found for real animals. In contrast, if preferences for aesthetic characteristics of fictional animals differ from preferences for real animals, other, unmeasured variables are influencing preferences for real species. As the animals are fictional, it is only possible to investigate stated preferences (what people say they will do) rather than revealed preferences (what they actually do). However, we compare the stated preferences for fictional animals to revealed preferences for real animals by allowing participants to donate to a choice of species conservation charities.

### TABLE 1

| Variable | Levels | Prediction |
|----------|--------|------------|
| **Eye position** | (1) Forward facing | Prefer forwards facing (Macdonald et al., 2015; Smith et al., 2012) |
| | (2) Side facing | |
| **Mammalian (furred)** | (1) Furred | Prefer mammals (Veríssimo et al., 2017)/less bald (Macdonald et al., 2015) species |
| | (2) Unfurred | |
| **Number of colors** | (1) Single color | Prefer more colors (Lišková et al., 2015) |
| | (2) Three colors | |
| **Tone** | (1) Warm toned | Prefer warm colors (Stokes, 2007), prefer bright colors—here warm or cool colors (Barua et al., 2012; Prokop & Fančovičová, 2013; Stokes, 2007) |
| | (2) Cool toned | |
| | (3) Dull toned | |
| **Body size** | (1) Small | Prefer larger body size (Knegtering et al., 2010; Macdonald et al., 2015; Smith et al., 2012)/smaller body size (Garnett et al., 2018) |
| | (2) Medium | |
| | (3) Large | |

### METHODS

#### 2.1 Imaginary animal design

Aesthetic characteristics previously associated with increased intention to conserve (Table 1) were split into the levels
Although perceived attractiveness was able to predict some of the variation in conservation preferences, the most and least attractive imaginary animals from survey 1, and most and least preferred imaginary animals to conserve in the discrete choice experiment of survey 2 were not the same. Animal types are shown underneath shown in Table 1 to create a $2 \times 2 \times 2 \times 3 \times 3$ design, with 48 unique combinations of these characteristics. Fictional animals may trigger decision heuristics based on their similarity to known species (e.g., Lišková, Landová, & Frynta, 2015). To ensure the results are generalizable to a wide range of animals, three imaginary animal body types (see Figure 1) were designed by the mural design artist Rory McCann (https://rorymccannmurals.com/). If the same preferences are seen for these three body types, then the results are more likely to be generalizable to a wider range of species. Other variables which affect preferences (such as eye size, Landová et al., 2018) were constant between the three animal types. For each body type, Rory McCann created images that varied in the first three variables in Table 1 (eye position, furring, and number of colors). The size and tone of these 24 imaginary animals were then digitally manipulated to create 216 imaginary animal alternatives. Size was manipulated in Qualtrics, Provo UT (size ratio of 2:3:4 for small, medium and large animals respectively), and the tones were digitally altered in Pixelmator Pro (version 1.4.1) to generate “cool,” “dull,” and “warm” versions of each animal (see supplementary materials).

### 2.2 Survey 1: Animal attractiveness

Overall attractiveness impacts decisions about conservation preferences (Gunnthorsdottir, 2001; Landová et al., 2018). Therefore, relative attractiveness (and believability, see supplementary materials) of the 216 imaginary animals was measured. Participants ranked 6 randomly assigned imaginary animals, with each animal seen by 6–19 participants. Participants also commented on why they chose the most and least attractive animal. This qualitative data was analyzed using Nvivo software (Bazeley & Jackson, 2013) to identify themes, and provide context for the qualitative analyses presented here (see supplementary materials).

### 2.3 Survey 2: Animal preferences using discrete choice experiments (DCE)

In an unlabeled, forced stated choice DCE with a mix and match factorial design (Rose & Bliemer, 2009), participants were presented with nine sets of choices between two of the fictional animals. Sets were generated in four blocks using the “rotation.design” function in the R package “support.CEs” (Aizaki, 2012), allowing fictional animals to be selected more than once for the design (see supplementary materials). Participants were randomly assigned to one block. For each choice pair, participants were asked “which of these animals would you rather conserve?” Participants then chose the most and least attractive imaginary animal from a random selection of 6. Finally, participants could choose to give a donation (provided by the project) of USD0.50 to one of nine species oriented registered UK conservation charities which focused on a single species group (Table S2).

### 2.4 Distribution, ethical information, and data quality

All surveys were designed and distributed using “Qualtrics” (Qualtrics, Provo, UT). Survey populations were recruited from Amazon Turk and paid $0.35, the amount recommended by Amazon Turk for the survey length. Responses were screened for data quality, and only participants which reported engaging in conservation donation behavior were included in analyses (see supplementary materials). All participants were over the age of eighteen. The study was approved by the Royal Holloway Ethical Approval Process.

### 2.5 Analysis

Analyses were conducted in R 3.1.2 (R Development Core Team, 2008). Mean attractiveness rank was calculated for each animal, then reversed so larger numbers corresponded to more attractive animals. The aesthetic characteristics in Table 1 were used as predictor variables in a multiple regression. The DCE was analyzed using mixed logit models in the R package “support.CEs” (Aizaki, 2012). Model estimates were used to calculate donation preferences for the 46 fictional animals in the DCE design. For these 46 animals, the proportion of participants in survey 2 which selected the animal as their most and least preferred animal was calculated and used as explanatory variables in a linear model with DCE model estimates as the response variable. DCE model estimates
were also used in a linear model to predict preferences for the conservation charities by predicting the probability of participants selecting an animal with same characteristics as the focal animals (Table S2).

## RESULTS

### 3.1 Survey 1: Imaginary animal attractiveness

The 334 participants (Table 2) ranked multicolored animals as more attractive than single-colored animals (Table 3). Although no effect of tone was found, color was the attribute participants used most frequently to quantitatively explain their choices for animal attractiveness (Table S4). Many of the mentions of color referred to patterning, such as preferring animals with more colors. Furred animals were ranked as more attractive than unfurred images and 22 participants stated fur contributed to their choice for the most attractive animal (Table S4). Type C animals were ranked more highly than types A and B. Although more than 10% of participants mentioned size as contributing to their decision to rank animals most or least attractive, there was no effect of size on mean attractiveness rank (Table 3). There was also no effect of eye position, although participants mentioned other facial features, such as “nose” as reasons for selecting the least attractive animal (n = 9).

### 3.2 Survey 2: DCE and revealed choices

The 407 participants (Table 2) were more likely to donate to animals that were multicolored compared to single-colored animals, and to cool toned animals compared to those with warm tones (Table 3). Participants were also more likely to donate to larger animals compared to smaller ones, with the hazard ratio for donating to a medium sized animal falling between the two. There was no evidence of an effect of dull tones, eye position, or fur. There were significant differences between the three animal types. Compared to type C, both A and B were less likely to be selected. For the 46 animals viewed by participants in the DCE, there was a –0.37 (95% CI: –0.57, –0.17) decrease in predicted probability of donating to the animals as the proportion of participants which considered the animal the least attractive increased from 0.0 to 1.0 (t = –3.74, p < .001). There was a .28 (95% CI: 0.09, 0.48) increase in predicted probability of choosing the animals as the proportion of participants which considered the animal as the most attractive increased from 0.0 to 1.0 (t = –2.94, p = .005, linear model, $F_{(2|43)} = 14.97, p < .001$, adjusted $R^2 = .38$). The most popular charity selected by participants received six times more donations than the least popular charities (jointly the Olive Ridley Turtle and FrogLife, Figure 2). Expected preferences for the nine species were positively correlated with the number of donations received (linear regression, $F_{(1|7)} = 6.54, R^2 = .41, p = .038$). Although only participants who had donated or volunteered for a conservation organization before were included, 32 participants chose not to donate, and this was the 4th most selected option.

## DISCUSSION

Perceived attractiveness is correlated with willingness to conserve imaginary animals. This finding is consistent with research on real animals by Landová et al. (2018) and Gunthorsdottir (2001), providing support for the “Cinderella species theory,” as does the positive relationship between the predicted donation preferences for the nine focal species of
Model estimates for multiple regressions of mean attractiveness and believability, where positive estimates suggest a variable increases attractiveness/believability. Variables where \( p < .05 \) are shown in bold.

| Variable                  | Survey 1: Attractiveness | Survey 2: Discrete choice experiment (DCE) |
|---------------------------|--------------------------|------------------------------------------|
|                           | Estimate ± SE            | \( F \) statistic and \( p \) value       | Hazard ratio(95% confidence interval) | Z statistic and \( p \) value |
| Intercept                 | 3.76 ± 0.13              | 1.08(1.01–1.15)                          |                            |                             |
| Size (medium)             | −0.18 ± 0.10             | \( F_{(1|206)} = 1.78 p = 0.171 \)      |                            |                             |
| Size (large)              | −0.17 ± 0.10             | 1.12(0.99–1.25)                          |                            |                             |
| Animal type (A)           | −0.28 ± 0.10             | \( F_{(2|206)} = 3.733 p = .026 \)      | 0.54(0.48–0.61)            | \( z = 10.32, p < .001 \) |
| Animal type (B)           | −0.08 ± 0.10             | 0.86(0.74–0.99)                          | \( z = 2.07, p = .039 \)  |                             |
| Eye direction (side)      | 0.01 ± 0.09              | 0.95(0.86–1.05)                          | \( z = 1.05, p = .295 \)  |                             |
| Fur (unfurred)            | −0.29 ± 0.09             | 0.92(0.84–1.01)                          | \( z = 1.68, p = .094 \)  |                             |
| Number of colours (three colors) | 0.38 ± 0.09          | \( F_{(1|206)} = 11.32 p < .001 \)    | 1.50(1.36–1.66)            | \( z = 7.89, p < .001 \)  |
| Tone (cool)               | −0.07 ± 0.10             | \( F_{(2|206)} = 1.24 p = .292 \)      | 1.12(0.99–1.26)            | \( z = 1.96, p = .050 \)  |
| Tone (dull)               | −0.16 ± 0.10             | 0.97(0.84–1.11)                          | \( z = 0.49, p = .640 \)  |                             |
| Adjusted \( R^2 \)       | .144                     |                                          |                            |                             |

Participants showed greater willingness to conserve larger imaginary animals, replicating preferences described in multiple studies on real animals (Knegtering et al., 2010; Macdonald et al., 2015; Smith et al., 2012). Surprisingly, no evidence was found for the effect of eye position, even though other studies have found these factors influence preferences for real animals (Macdonald et al., 2015; Smith et al., 2012), nor did the presence of fur affect donation preferences. However, participants did find furry animals more attractive, and referred to the animals as “furry” or “fluffy” in the qualitative analysis as a justification for preferences. Here we used fur as a proxy for mammal species, which seemed appropriate as it is a distinctive visual indicator of mammalian species, and in addition to preferring mammals (Veríssimo et al., 2017), people seem to prefer less bald species within mammals (Macdonald et al., 2015). However, mammals share other features, which are not captured by our use of fur as a proxy, thus the observed preference for mammals found in real animals may be due to

**FIGURE 2** Number of participants selecting each charity, the expected preferences for the focal animals, where expected preference for animal type C was used to predict number of donors. Estimate and 95% confidence interval from the linear regression shown.

**TABLE 3** Model estimates for multiple regressions of mean attractiveness and believability, where positive estimates suggest a variable increases attractiveness/believability. Variables where \( p < .05 \) are shown in bold.

Conservation charities and the number of participants which chose to donate to those charities.

For the imaginary animals used here, the number of colors had the greatest effect on donation preferences. Lišková et al. (2015) found participants preferred bird images with more complex patterns in both colored and grayscale images. The direction of this relationship is the same as reported here, even though we used a simple binary comparison between single color and multicolored (more patterned) animals. Increased colors also had a positive effect on attractiveness. These quantitative findings were replicated in the qualitative findings, where color was the most frequently mentioned theme. This suggests pattern complexity (here represented by the number of colors) could be an overlooked aspect of animal appeal, as it is not measured in many studies on animal attractiveness (e.g., Rádlová, Landová, & Frynta, 2018; Stokes, 2007). This finding could also explain some of the variation in color preferences found between studies. For example, Stokes (2007) found people preferred penguins with more red and yellow colors, although preferences for these colors have not been replicated in other studies (e.g., Lišková et al., 2015). However, as penguins without red or yellow coloring (e.g., Chinstrap penguins, *Pygoscelis antarctica*) tend to be monochrome black and white, Stokes (2007) finding may reflect preferences for more diverse patterning or more colors rather than warmer tones. In contrast with Stokes (2007), we found greater intention to donate to cool toned than warm toned animals, which may be analogous to preferences for blue colors in bird species (Lišková & Frynta, 2013).
some other characteristic, such as greater perceived similarity to humans (Rádlová et al., 2018). Animal type had a big effect on attractiveness and willingness to conserve, suggesting latent variables which varied between the three types and were not measured in this study could have been affecting individual choices. For example, other studies have shown inner-face features (Rádlová et al., 2018), and foreleg, head, and nose length (Landová et al., 2018) affect preferences for animal attractiveness. Long noses (such as exhibited by type B) are perceived as unattractive in real animals, such as proboscis (Nasalis larvatus) and drill (Mandrillus leucophaeus) monkeys (Rádlová et al., 2018). This facial feature may have contributed to the reduced preferences for animal type B in the DCE. Although care was taken during a pilot stage to ensure the imaginary animals did not look like specific real animals, 28 participants referred to animal type A as “bug-like” (Table S4). Animal type A was also least likely to be selected in the DCE. Insects are often perceived as less attractive than other animals, particularly those which are bug-like (Cardoso, Erwin, Borges, & New, 2011; Mesquita, Mendes Lipinski, & Sá Polidoro, 2015).

Prior research on preferences for animals has either investigated stated (e.g., Curtin & Papworth, 2018) or revealed (e.g., Colléony et al., 2017; Veríssimo et al., 2017) conservation donation preferences. In this study we investigated both stated and revealed donation preferences. In the absence of other information about novel animals, number of colors was the most significant predictor of donation behavior and stated preferences for imaginary animals explained some, but not all, of the variation in revealed preferences for the conservation of real species. The estimates from the DCE were able to predict over 40% of the variation in revealed preferences for real animals, suggesting aesthetic characteristics do impact conservation preferences. Although this finding provides some support for the Cinderella species theory, it cannot refute the theory of flagship species action. This relationship was tested with a small number of species and some species received many more or less donations than predicted. The observed strong effects of aesthetic characteristics found in real animals may still be a combination of aesthetics and unmeasured “background knowledge” which covaries with aesthetic characteristics. For example, multiple studies have found big cats receive more attention and donations than other species (Davies et al., 2018), but these species are also prominent cultural symbols (Jalais, 2008; Saunders, 1998), thus more likely to fall within the existing cultural frames of participants. This study shows aesthetic characteristics do explain variation in conservation donation behavior, but cannot establish whether these aesthetic characteristics are more important than other information individuals have about specific animals. Investigating the relative strength of aesthetic characteristics and contextual information in conservation preferences of imaginary animals would allow greater understanding of the relative importance of these factors in preferences for real animals.

ACKNOWLEDGEMENTS AND DATA

This work would not have been possible without the work of Rory McCann or the support of National Geographic (grant no: NGS-53291R-18). We are grateful to the grant reviewer for their suggestions of improvements for the overall project, and to two anonymous reviewers and the editor for the improvements suggested for this manuscript. Finally, thank you to the many people who have discussed the imaginary animal project over its development, particularly Dr. Ellen Fry. Data are available from Figshare, https://doi.org/10.17637/rh.11559396.

ORCID

Sarah Papworth https://orcid.org/0000-0002-8746-1912

REFERENCES

Aizaki, H. (2012). Basic functions for supporting an implementation of choice experiments in R. Journal of Statistical Software, 50(September), 2.

Barua, M., Gurdak, D. J., & Akhtar, R. (2012). Selecting flagships for invertebrate conservation. Biodiversity Conservation, 21, 1457–1476. Retrieved from http://doi.org/10.1007/s10531-012-0257-7

Bazeley, P., & Jackson, K. (2013). Qualitative data analysis with NVivo (2nd ed.). London: Sage Publications, Inc.

Bottrell, M. C., Joseph, L. N., Carwardine, J., Bode, M., Cook, C., Game, E. T., … Possingham, H. P. (2008). Is conservation triage just smart decision making? Trends in Ecology & Evolution, 23(12), 649–654. Retrieved from http://doi.org/10.1016/j.tree.2008.07.007

Brambilla, M., Gustin, M., & Celada, C. (2013). Species appeal predicts conservation status. Biological Conservation, 160, 209–213. Retrieved from http://doi.org/10.1016/j.biocon.2013.02.006

Cardoso, P., Erwin, T. L., Borges, P. A. V., & New, T. R. (2011). The seven impediments in invertebrate conservation and how to overcome them. Biological Conservation, 144(11), 2647–2655. Retrieved from http://doi.org/10.1016/j.biocon.2011.07.024

Carvell, C., Inglis, N. F. J., Mace, G. M., & Purvis, A. (1998). How Diana climbed the ratings at the zoo. Nature, 395, 213.

Colléony, A., Clayton, S., Couvet, D., Saint Jalme, M., & Prévot, A. C. (2017). Human preferences for species conservation: Animal charisma trumps endangered status. Biological Conservation, 206, 263–269. Retrieved from http://doi.org/10.1016/j.biocon.2016.11.035

Curtin, P., & Papworth, S. (2018). Increased information and marketing to specific individuals could shift conservation support to less popular species. Marine Policy, 88, 101–107. Retrieved from http://doi.org/10.1016/j.marpol.2017.11.006

Davies, T., Cowley, A., Bennie, J., Leyshon, C., Inger, R., Carter, H., … Gaston, K. (2018). Popular interest in vertebrates does not reflect extinction risk and is associated with bias in conservation
investment. *PLoS ONE*, 13(9), 1–13. Retrieved from http://doi.org/10.1371/journal.pone.0203694

Garnett, S. T., Ainsworth, G. B., & Zander, K. K. (2018). Are we choosing the right flags? The bird species and traits Australians find most attractive. *PLoS ONE*, 13(6), e0199253. Retrieved from http://doi.org/10.1371/journal.pone.0199253

Gunnthorsdottir, A. (2001). Physical attractiveness of an animal species as a decision factor for its preservation. *Anthrozoös*, 14(4), 204–214. Retrieved from http://doi.org/10.2752/089279301786999355

Jalais, A. (2008). Unmasking the cosmopolitan tiger. *Nature and Culture*, 3(1), 25–40.

Jepson, P., & Barua, M. (2015). A theory of flagship species action. *Conservation and Society*, 13(1), 95–104. Retrieved from http://doi.org/10.4103/0972-4923.161228

Knegtering, E., Van Der Windt, H. J., & Schoot Uiterkamp, A. J. M. (2010). Public decisions on animal species: Does body size matter? *Environmental Conservation*, 38(1), 28–36. Retrieved from http://doi.org/10.1017/S0376892910000755

Landová, E., Poláková, P., Rádlová, S., Janovcová, M., Bobek, M., & Frynta, D. (2013). Beauty ranking of mammalian species kept in the Prague Zoo: Does beauty of animals increase the respondents’ willingness to protect them? *The Science of Nature*, 105, 69.

Lišková, S., & Frynta, D. (2013). What determines bird beauty in human eyes? *Anthrozoös*, 26(1), 27–41. Retrieved from http://doi.org/10.2752/175303713X13534238631399

Lišková, S., Landová, E., & Frynta, D. (2015). Human Preferences for colorful birds: Vivid colors or pattern? *Evolutionary Psychology*, 13(2), 339–359. Retrieved from http://doi.org/10.1177/147470491501300203

Macdonald, E. A., Burnham, D., Hinks, A. E., Dickman, A. J., & Malhi, Y. (2015). Conservation inequality and the charismatic cat: *Felis sylvestris*. *Global Ecology and Conservation*, 3, 851–866. Retrieved from http://doi.org/10.1016/j.gecco.2015.04.006

Martin-Löpez, B., Montes, C., Ramírez, L., & Benayas, J. (2009). What drives policy decision-making related to species conservation? *Biological Conservation*, 142(7), 1370–1380. Retrieved from http://doi.org/10.1016/j.biocon.2009.01.030

Mesquita, P. C. M. D., Mendes Lipinski, V., & Sá Polidoro, G. L. (2015). Less charismatic animals are more likely to be “road killed”: Human attitudes towards small animals in Brazilian roads. *Biotemas*, 28(1), 85–90.

Metrick, A., & Weitzman, M. L. (1996). Patterns of behavior in endangered species preservation. *Land Economics*, 72(1), 1–16.

Montgomery, C. A. (2002). Ranking the benefits of biodiversity: An exploration of relative values. *Journal of Environmental Management*, 65(3), 313–326. Retrieved from http://doi.org/10.1006/jema.2002.0553

Prokop, P., & Fančovičová, J. (2013). Does colour matter? The influence of animal warning coloration on human emotions and willingness to protect them. *Animal Conservation*, 16, 458–466. Retrieved from http://doi.org/10.1111/avc.12014

R Development Core Team. (2008). *R: A language and environment for statistical computing*. R Foundation for Statistical Computing, Vienna, Austria.

Rádlová, E., Landová, E., & Frynta, D. (2018). Judging others by your own standards: Attractiveness of primate faces as seen by human respondents. *Frontiers in Psychology*, 9(2439), 1–16. Retrieved from http://doi.org/10.3389/fpsyg.2018.02439

Rose, J. M., & Bliemer, M. C. J. (2009). Constructing efficient stated choice experimental designs. *Transport Reviews*, 29(5), 587–617. Retrieved from http://doi.org/10.1080/01441640902827623

Saunders, N. J. (1998). *Icons of power: Feline symbolism in the Americas*. London: Routledge.

Schlegel, J., & Rupf, R. (2010). Attitudes towards potential animal flagship species in nature conservation: A survey among students of different educational institutions. *Journal for Nature Conservation*, 18(4), 278–290. Retrieved from http://doi.org/10.1016/j.jnc.2009.12.002

Smith, R. J., Verissimo, D., Isaac, N. J. B., & Jones, K. E. (2012). Identifying Cinderella species: Uncovering mammals with conservation flagship appeal. *Conservation Letters*, 5(3), 205–212. Retrieved from http://doi.org/10.1111/j.1755-263X.2012.00229.x

Stokes, D. L. (2007). Things we like: Human preferences among similar organisms and implications for conservation. *Human Ecology*, 35(3), 361–369. Retrieved from http://doi.org/10.1007/s10745-006-9056-7

Thomas-Walters, L., McNulty, C., & Verissimo, D. (2019). A scoping review into the impact of animal imagery on pro-environmental outcomes. *Ambio, Online fir*. Retrieved from http://doi.org/10.1007/s13280-019-01271-1

Verissimo, D., MacMillan, D. C., & Smith, R. J. (2011). Toward a systematic approach for identifying conservation flagships. *Conservation Letters*, 4(1), 1–8. Retrieved from http://doi.org/10.1111/j.1755-263X.2010.00151.x

Verissimo, D., Pongiluppi, T., Santos, M. C. M., Develey, P. F., Fraser, I., Smith, R. J., & Macmilan, D. C. (2014). Using a Systematic Approach to Select Flagship Species for Bird Conservation. *Conservation Biology*, 28(1), 269–277. Retrieved from http://doi.org/10.1111/cobi.12142

Verissimo, D., Vaughan, G., Ridout, M., Waterman, C., MacMillan, D., & Smith, R. J. (2017). Increased conservation marketing effort has major fundraising benefits for even the least popular species. *Biological Conservation*, 211(April), 95–101. Retrieved from http://doi.org/10.1016/j.biocon.2017.04.018

**SUPPORTING INFORMATION**

Additional supporting information may be found online in the Supporting Information section at the end of the article.

**How to cite this article:** Curtin P, Papworth S. Coloring and size influence preferences for imaginary animals, and can predict actual donations to species-specific conservation charities. *Conservation Letters*. 2020;13:e12723. https://doi.org/10.1111/conl.12723