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CONTRIBUTED PAPER

Emotional and attitudinal responses to social media depictions of human–wildlife interactions at wildlife tourist attractions

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Abstract

Wildlife tourist attractions (WTAs) can permit interactions between humans and wildlife that are detrimental to the animals' welfare and species conservation. Social media portraying human–wildlife interactions could affect people's perceptions of their acceptability and desirability or stimulate demand for detrimental practices. To date, there is no evidence that viewing human–wildlife interactions on social media is linked to emotional responses or a desire to actually engage in such activities in real life. We created an experimental, international, online survey to assess how responses to social media representations of WTAs correlate with the desire to attend them. We presented respondents from 6 countries with 6 types of WTA under 4 experimental treatments. The treatments comprised different formats describing the WTA: plain text, plain text + photograph, short video clip, and long video clip. For each combination of WTA and treatment, we asked how likely respondents would be to visit the WTA and assessed their emotional response to the animals featured. Among our 2427 respondents, social media format did not consistently influence respondents' desire to attend a venue or their emotional responses. Positive emotional responses and desire to attend a given WTA, however, were strongly correlated, and both varied with respondents' countries. Respondents from the United States were most likely to attend, followed by Australia, the United Kingdom, Sweden, Denmark, and the Netherlands. Positive emotional responses of respondents from each country mirrored this order. Younger respondents and those who used a greater number of social media platforms were more likely to attend each WTA than older respondents with less engagement with social media. Responses to our survey differed by respondents' country, and high social media usage, especially among younger users, may normalize the types of human–wildlife interactions being viewed and prevent those users from engaging critically with social media content.

KEYWORDS

animal welfare, emotional response, human–wildlife interaction, social media, wildlife tourism attraction

INTRODUCTION

Wildlife tourism is very diverse and broadly comprises wildlife watching (viewing or otherwise interacting with free-ranging animals) and captive wildlife tourism (viewing animals in human-made confinement—principally zoos, wildlife parks, animal sanctuaries, and aquaria, but also circuses and shows by mobile wildlife exhibitors), hunting tourism, and fishing tourism (Moorhouse et al., 2015). These activities can give rise

to an array of different impacts. Wildlife tourism can provide income and social benefits for human populations (Charles & Hamid, 2022; Karanth et al., 2012), which in turn can secure habitats and advance animal welfare and conservation objectives (Ballantyne et al., 2011; Higginbottom, 2004; Macdonald & Wester, 2021). Conversely, some wildlife tourism can negatively affect the conservation and welfare status of subject taxa and individuals, whether in the wild or captivity (Ballantyne et al., 2009; Higginbottom, 2004). Negative effects include removal

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of individuals from wild populations, injury, disease, and death (Green & Higginbottom, 2001; Higginbottom, 2004), short- and long-term animal behavioral changes (Constantine, 2001; Constantine & Beider, 2008; Lundquist et al., 2013; Zhou et al., 2013), stress and aberrant physiological responses (Bejder et al., 1999; Fernandez et al., 2009; Knight & Cole, 1995; Reynolds & Braithwaite, 2001), altered feeding and reproductive behavior (Constantine & Beider, 2008; Peters et al., 2013; Reynolds & Braithwaite, 2001), and habitat alteration and loss (Green & Higginbottom, 2001; Reynolds & Braithwaite, 2001).

We defined *wildlife tourist attractions* (WTAs) as nonzoo, non-hunting attractions that offer opportunities for tourists to interact with specific taxa of nondomestic animals, either in captive or wild settings, many of which claim benefits for wildlife that they do not deliver (Fennell et al., 2024; Moorhouse et al., 2017). Research by Moorhouse et al. (2015) showed that 24 types of WTA collectively negatively affect the animal welfare status of 230,000–550,000 individual animals and that 120,000–340,000 animals in these WTAs had been sourced in ways likely to negatively affect their species' conservation status. These WTAs hosted an estimated 3.6–6 million tourists per annum, of which ~60% are estimated to have supported attractions with negative impacts (Moorhouse et al., 2015). No global body regulates WTAs, so in many countries their standards are determined primarily by what tourists find acceptable (Fennell et al., 2024). Therefore, WTAs offering attractive interactions remain profitable so long as visitors do not object to the animals' conditions and leave reputationally damaging feedback (e.g., Fennell et al., 2024; Moorhouse et al., 2017; Seele & Gatti, 2017).

Use of social media influences users' behavior, attitudes, and choices across multiple sectors, from political persuasion (Diehl et al., 2016) to consumer habits (Goh et al., 2013). Many authors have highlighted the role of social media in promoting the desire for interactions with wildlife and wild animals as pets (e.g., Bergman et al., 2022; Kredens & Vogt, 2023; Lenzi et al., 2020; Quarles et al., 2023). With respect to wildlife, conservation, and animal welfare, social media could popularize a number of detrimental activities across a number of settings. Social media posts can encourage people to travel to specific locations and, once there, behave in specific ways (Gretzel, 2019; Llodra-Riera et al., 2015), which may degrade local environments if those places lack necessary infrastructure to cope with tourist influxes (de l'Église, 2019). Similarly, online behaviors, such as posting wildlife selfies that involve interactions with wild animals, can unintentionally promote species exploitation (Bergman et al., 2022), and displaying wild animal pets in the media could foster positive perceptions of their exploitation and increase demand for them, potentially fueling the wildlife trade (Moloney et al., 2021; Sollund, 2011). Representations of human–wildlife interactions in videos and imagery, and the resultant public response, may influence public perceptions, societal behavior, and social norms regarding appropriate treatment of wild animals (e.g., Harrington et al., 2023; Riddle & MacKay, 2020; Thomas-Walters et al., 2020). In the context of WTAs, social media risks promoting the misconception that it is unconditionally acceptable, humane, or safe (for animals or humans) to touch and hold wild animals in tourism settings (e.g., Carder et al., 2018; Osterberg & Nekaris, 2015; Van Hamme et al., 2021).

Despite the above, few studies have demonstrated links among social media content, its popularity, and real-world negative impacts on wildlife. Quarles et al. (2023) demonstrated that users of YouTube, TikTok, and Giphy preferred videos of slow lorises (*Nycticebus* spp.) situated in anthropogenic contexts. Moreover, videos in which lorises displayed signs of stress or ill health had more views than videos portraying healthy lorises in natural conditions, a finding in line with previous work showing that YouTube videos portraying lorises in ill health and unnatural conditions had higher numbers of views and likes (Nekaris et al., 2015). Kredens and Vogt (2023) demonstrated that the content of social media photographs on Instagram varied with the ethical standards at WTAs. Tourists visiting sanctuary venues, which had clearer conservation outputs and higher animal welfare standards, posted photographs that were more wildlife centered, with captions indicating understanding of the animal's context. By comparison, photographs posted by tourists from venues with lower conservation and welfare standards contained more close-proximity selfies, as well as anthropocentric and low-involvement captions (Kredens & Vogt, 2023).

Results of the above studies suggest a relationship among the conservation and welfare standards experienced by wildlife in captive environments, the format and content of social media depicting those animals and the human–wildlife interactions involved, and the degree to which the social media are viewed and liked by the public. It is possible that social media representations of interactions at WTAs could encourage viewers to seek out and visit those WTAs in real life, thereby perpetuating through attendance activities that are likely to be damaging for species conservation and individual animals' welfare. As examples, both YouTube and TikTok host videos of orangutan boxing taking place at a WTA in Thailand, an interaction long understood to have severe negative animal welfare impacts (e.g., Agoramoorthy & Hsu, 2005) and that has been openly criticized in the British press (e.g., Ardehali, 2017). At the time of writing, 2 such boxing videos had been viewed a combined total of 21.8 million times. Such videos also have considerable potential to generate income for those posting them and the social media platforms on which they are posted (Carvalho et al., 2023). Engagement with social media in this context could therefore promote and fund, through increased attendance, harmful practices and financially reward those performing the promotion.

It is unknown to what extent different formats of social media involving wildlife tourism interactions may promote real-world consumption. It is also unknown to what extent emotional responses to social media portrayals of human–wildlife interactions may translate into real-world actions. Our study addresses calls for research into the representation of wild animals across social media platforms and the ways in which these may influence demand for wildlife (e.g., Lenzi et al., 2020). Specifically, we sought to ascertain the degree to which social media depicting interactions at WTAs might promote the desire in viewers to attend the venues hosting those interactions.

We conducted an experimental, international survey with the primary objective of assessing the extent to which different social media representations of activities at WTAs correlate with

the desire to attend those WTAs in real life. Secondly, we aimed to assess respondents' emotional responses to the types of media presented to ascertain the extent to which these emotions may correlate with expressed desire to consume these experiences in the real world.

METHODS

Study design and overview

We created an experimental survey to determine the extent to which different formats of media (plain text, text + photograph, short video, long video) describing the same interaction at a WTA would affect respondents' desires to visit the WTA and the extent to which the media formats promoted different emotional responses to the subject animals in the WTAs.

Our objective was to obtain 400 full responses from respondents in each of 6 countries: Australia, Denmark, the Netherlands, Sweden, the United Kingdom, and the United States. These countries were chosen to provide a range of culturally Western consumer countries with relatively affluent populations that are likely to travel (domestically and abroad) to participate in WTA experiences. We additionally selected these countries to provide samples across countries in which animal welfare standards, and associated legislation, differ. Legislative protections for animals in the United States and Australia, for example, are weaker overall than those in Denmark, the Netherlands, Sweden, and the United Kingdom (e.g., in not explicitly recognizing animal sentience in law [<https://api.worldanimalprotection.org/indicators>]), which may affect the attitudes of the local populace.

We tested 4 experimental treatments for examples of each of 6 types of WTA. First, we tested plain text (62–67 words) that provided a factual account of the activities at each WTA. The length of the text was a compromise between easy readability and providing sufficient detail (e.g., Moorhouse et al., 2017) (text in Table 1). Second, the plain text was accompanied by a still photograph of the WTA (Figure 1). Third, we tested a short video in portrait format as found on sites, for example, TikTok and YouTube Shorts. Videos were selected on the basis of popularity, such that each had at least 100,000 views on its host platform (views ranged from 106,000 to 38.8 million) and had lengths of 10–30 s (mean length 24 s). Fourth, we tested a long video in landscape format, as typically hosted on YouTube. Long videos were selected on the basis of having at least 100,000 views (views ranged from 131,000 to 26 million in the samples used) and lasting 30–101 s (mean length 79 s). For a given WTA type, the short and long video treatments were drawn from footage captured at 2 different venues, and the photograph treatment was created by combining representative stills taken from the 2 videos (Figure 1).

The 6 types of WTA described in the above treatments were tiger interactions, sloth interactions, elephant painting, elephant rides, orangutan interactions, and orangutan boxing (see full descriptions in Table 1). These WTA interactions were cho-

sen to represent a broad range of activities, all of which have negative animal welfare implications (Agoramoorthy & Hsu, 2005; Moorhouse et al., 2015). Moreover, we expected a priori that these negative impacts would vary with respect to how easily discernible they are to viewers of the videos (e.g., viewers could be expected to perceive welfare issues surrounding 2 orangutans boxing one another, but may not so readily perceive harm resulting from humans holding a sloth). All these activities can currently be undertaken by tourists visiting WTAs in several countries.

Each respondent was shown 4 of the 6 WTA types, selected randomly and presented sequentially. Each WTA type was allocated to one of the 4 experimental treatments and non-repetitively sampled such that all 4 treatments were seen by each respondent. The order in which treatments were presented was randomized. Therefore, any given WTA type and any given treatment were seen only once by any one respondent. The selection of WTA types and treatments was managed such that the distribution of each was kept constant among nationalities and across the sample as a whole. Each combination of treatment and WTA was assessed by approximately 400 respondents, representing approximately 66 from each different country.

Affective responses to each WTA and treatment combination were assessed using a method adapted from Luebke et al. (2016) and Myers et al. (2004). Respondents were asked to rate the intensity of various feelings they experienced while observing or reading the media presented. The 12 emotional terms were *curiosity*, *fear*, *respect* or *admiration*, *boredom*, *concern*, *wonder* or *awe*, *amusement*, *sense of connection*, *love*, *attraction*, *sympathy*, and *contempt*. These terms encompassed the range of positive and negative emotions likely to be experienced by attendees viewing animal attractions and were assessed on a Likert-type scale sensu Luebke et al. (2016) (details below).

The survey was designed in collaboration with, and conducted by, market research professionals (Touchstone Partners Limited, <http://www.touchstonepartners.co.uk>) who coordinated respondent recruitment through proprietary market research panels. Respondents had signed up to receive surveys from the panels and were approached via email with a brief synopsis. Participation was voluntary. The panels initially selected respondents to ensure a demographically representative distribution of ages and sexes across each country and to provide the requested number of replicates of each experimental treatment, after removing those that took less than one third of the median response time (a market research industry standard action to exclude disengaged respondents). Panelists were familiar with surveys but not contacted so frequently as to have become unrepresentative of the wider population. Participant recruitment and consent and initial data processing were conducted by Touchstone Partners in adherence with the Market Research Society code of conduct (<https://www.mrs.org.uk/pdf/MRS-Code-of-Conduct-2019.pdf>). Subsequent data analysis standards were overseen by World Animal Protection in full accordance with the British Sociological Association Statement of Ethical Practice (BSA 2017). Ethical review was obtained from Manchester Metropolitan University (project 64464).

TABLE 1 The name of each wildlife tourist attraction (WTA) type as presented to respondents in a survey on the effect of social media format on emotional response to and desire to attend such WTAs and the description of the activities.

Attraction name	Description of activities
Orangutan World	At this attraction, you can watch 2 orangutans—in boxing shorts and gloves—pretend to box each other in a small ring. Between rounds, another orangutan, wearing a bikini, holds up a card showing the round number. One orangutan will try to kiss her. Eventually one of the orangutans pretends to be knocked out. If you want, you can record the experience on your phone.
Orangutan Safari	At this attraction, you can sit on a bench or a swing next to an orangutan. The orangutan will put its arm around you, hold your hand, kiss you on the cheek, pull faces, balance with a leg raised in the air, and, at the end, will give you a hug. If you want, you can record the experience on your phone.
Tiger Territory	At this attraction, you can get into an enclosure with a tiger. You will be able to stroke, rub, and cuddle the tiger and hold its tail. You can also tease the tiger into jumping for a lure that you hold on a pole. You can also see and hold baby tigers. If you want, you can record the experience on your phone.
Elephant Valley Park	At this attraction, you can put on your swimming costume and get into a river with an elephant while it is bathing. You will be able to climb onto the elephant's back, and it will carry you and might squirt you with water. Family or friends will be able to join in too. If you want, you can record the experience on your phone.
Elephant Village	At this attraction, you can watch elephants as they paint pictures. With their handlers standing by, the elephants will approach an easel, pick up a paintbrush, dip it in the paint, and draw a picture. Sometimes an elephant might draw an image of an elephant, or of flowers, or write a name. If you want, you can record the experience on your phone.
Sloth Hangout	At this attraction, you can cuddle a sloth. The handlers will take you into the sloth's enclosure and then will then pick up the sloth and give it to you to hold. The sloth will place its claws over your shoulders, and you will be able to carry it and cuddle it. If you want, you can record the experience on your phone.

Survey questions

Respondents were asked 6 initial questions: age, gender, level of education, and which broad categories of occupations they worked in (Appendix S1). Respondents who worked in tourism and leisure or in journalism and media were excluded from further participation because they were likely to be more informed about issues surrounding WTAs than those typically seeking and being influenced by social media depicting WTA interactions. The fifth question was “When abroad on holiday, which of these types of attractions would you never visit?” Response choices to this question were zoo or wildlife attraction, theme parks, water parks, museums, aquariums or oceanariums, theatre or concerts, music event or festival, sporting event, gardens or parks, and historic sites and landmarks. Respondents who said they would never visit a zoo or wildlife attraction were also excluded. Finally, respondents were asked “Have you ever visited a wildlife attraction or zoo where you were allowed to touch the animals?” (response choices were yes or no).

Next, respondents were shown text that read, “We’re now going to show you some descriptions, images and videos relating to wildlife attractions that you might see online” and shown sequentially 4 combinations of WTA type and treatment. For each combination they were asked, “Assuming you were in the country and staying nearby, how likely would you be to visit the attraction described here?” Response options were *Very likely*, *Quite likely*, *Neither likely nor unlikely*, *Quite unlikely*, and *Very unlikely*. They were then shown text that read, “Thinking about the [description/video] you have just seen, we’d like you to imagine you are visiting this attraction. Please indicate your agreement with each of these statements.” The statements are listed in Table 2, and responses were on a Likert scale (*Agree strongly*, *Agree slightly*, *Neither agree nor disagree*, *Disagree slightly*, and *Disagree strongly*).

TABLE 2 Statements used to assess respondents’ affective responses to each wildlife tourist attraction (WTA) type and treatment combination in a survey on the effect of social media format on emotional response to and desire to attend such WTAs.

Statement number	Statement
1	I feel afraid of this animal.
2	I feel bored by this animal.
3	I feel contempt toward this animal.
4	I feel concerned for this animal.
5	I feel sympathy for this animal.
6	I feel a sense of respect or admiration for this animal.
7	I feel a sense of connection to this animal.
8	I feel amused by this animal.
9	I feel love for this animal.
10	I feel an attraction to this animal.
11	I feel a sense of wonder or awe about this animal.
12	I feel curious about this animal.

Respondents were next asked “Which of these social media / messaging platforms do you use?” Respondents were asked to select all applicable platforms from the following list: Discord, discussion or community forums, Facebook, Facebook Messenger, Instagram, LinkedIn, Nextdoor, Pinterest, Quora, Reddit, Skype, Snapchat, Threads, TikTok, X (formerly Twitter), Vimeo, WhatsApp, YouTube, Other (please specify), or “I don’t use any of these.”

They were then asked a series of questions concerning household composition, the broad employment area of the principal earner, and income bracket in local currency.

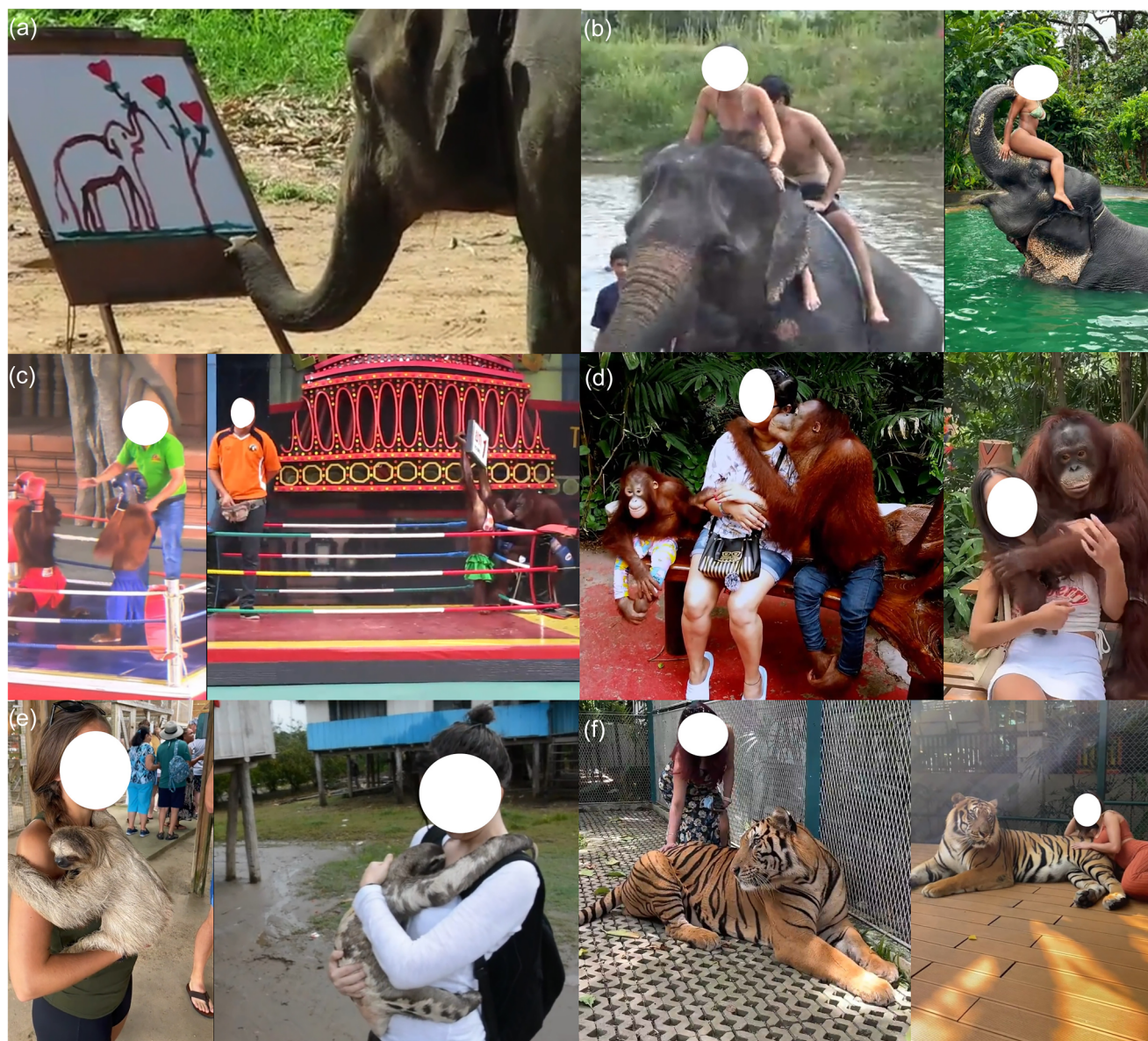


FIGURE 1 Six images of wildlife tourist attraction (WTA) types shown to respondents from Australia, Denmark, the Netherlands, Sweden, the United Kingdom, and the United States in a survey on the effect of social media format on emotional response to and desire to attend such WTAs: (a) elephant painting, (b) elephant riding, (c) orangutan boxing, (d) orangutan interactions, (e) sloth interactions, and (f) tiger interactions.

Statistical analyses

We used repeated measures ordinal logistic regressions implemented in Program R (R Core Team, 2024) with the ordinal package (Christensen, 2015, 2022) to analyze respondents' level of desire to attend each WTA type and treatment combinations. Respondents' stated likelihood of attending the WTA was the response variable. Available explanatory variables were respondents' age; sex; country of residence; treatment; treatment order (i.e., was the WTA and treatment the first, second, third, or fourth combination assessed by the respondent); whether or not the respondents had previously visited attractions where they were permitted to touch animals; whether or not the respondent had children; number of social media platforms they used (entered as a covariate); respondents' positive affect

score for each WTA (covariate); and their emotional response to the WTA and treatment (see below for the derivation of this variable) (Appendix S1). Where appropriate, odds ratios were calculated from the regression coefficients for each variable factor of interest as $\exp(\text{coefficient})$ (Christensen, 2015, 2022).

To examine the pattern of responses to the 12 emotional terms for each WTA, we used exploratory factor analysis, a statistical method that condenses suites of correlated variables into a smaller number of constructed variables (e.g., Bandalos, 2017; GeeksforGeeks 2024). The analysis was conducted using the Factanal package in Program R, with a varimax rotation. Each WTA type was analyzed separately because of the a priori likelihood that different WTA types could stimulate different affective responses and because the results of pilot analyses indicated that responses to different WTAs would be different. For

each WTA type, we then constructed a single variable from the derived factor loadings. These variables were then combined into a single data set used as the response variable in a repeated measures linear model, with explanatory variables of respondents' age, sex, country of residence, treatment, treatment order, whether or not the respondents had previously visited attractions where they were permitted to touch animals, and whether or not the respondent had children and the number of social media platforms they used (entered as a covariate) (Appendix S1). The response variable did not depart from the underlying assumptions of the statistical test.

RESULTS

Overview

We received full responses from 2427 people, with 401–406 responding from each of the 6 countries. Of our sample, 1196 identified as male, 1223 identified as female, and 16 identified as having a different gender or did not wish to say. The mean age of respondents was 48 (SD 17.5) (range 18–92). Any given WTA type was viewed by 402–406 respondents. Each experimental treatment was viewed by 605–608 respondents. The mean number of respondents viewing a given combination of WTA type and treatment was 405 (range 368–438 across all 24 combinations). The total number of invitations issued was not tracked; therefore, response rates could not be calculated.

Exploratory factor analyses

For each WTA type, factor analysis identified 3 underlying factors. For all WTA types, the first factor comprised 6 items from the original list of 12 emotions (Statement 6–12) (Table 2), with the exception of tiger interactions, which comprised these 6 plus Statement 5 (Table 2). These 6 items all reflected positive affects.

For all WTAs, the second factor comprised the same 2 items, Statements 4 and 5 (Table 2). For 3 WTAs, these 2 items were accompanied by Statement 8, but as a negative loading (i.e., the value of the second factor was larger for respondents who stated they were less amused by a given animal), and for one WTA, they were accompanied by Statement 6 (Table 2). This second factor therefore typically contained emotions reflecting negative affects, particularly concern, sympathy, and seriousness.

For all WTAs, the third factor comprised the same 3 items (Statements 1–3), with the exception of tiger interactions, which comprised only Statements 2, 3, and 6, the latter of which was present as a negative loading (Table 2). This third factor therefore contained emotions reflecting negative affects of fear, boredom, and contempt or disrespect.

For the first factor, comprising the 6 positive affect terms, the value of Cronbach's alpha ranged from 0.83 to 0.88; thus, there was a high degree of internal consistency, and the items measured a single construct. For the second factor, the value of Cronbach's alpha ranged from 0.56 to 0.72; thus, there was

TABLE 3 Repeated measures linear models of factors affecting respondents' positive affect score after viewing each wildlife tourist attraction (WTA) type.

Source	df	F	p
Age	1	5.03	0.0251
Sex	1	5.97	0.0146
Order of treatments	1	2.74	0.979
Treatment	3	3.49	0.0149
WTA type	5	64.75	<0.001
Whether respondent had had previous close interaction with wildlife at WTA venues	1	40.77	<0.001
Country	5	9.00	<0.001
Whether the respondent had children	1	2.02	0.156
Number of platforms used	1	92.31	<0.001
Educational level	1	1.22	0.269

a low degree of internal consistency. Cronbach's alpha for the third factor ranged from 0.55 to 0.63; again, there was a low degree of internal consistency. Further analyses were limited to only the first factor. The factor loadings were used to construct a single variable that measured positive affect score for each combination of WTA type and treatment for each respondent.

Factors correlating with positive emotional responses to videos

Mean positive affect scores varied markedly among WTA types. Orangutan boxing had the lowest mean scores (16.91 [SD 4.43]), and tiger interactions had the highest (18.35 [3.92]) (Table 3; Figure 2). Respondents' positive affect scores were, however, influenced by an interaction between WTA type and the experimental treatment in a separate model in which this term was included (effect of WTA $\times$ treatment likelihood ratio test [LRT] = 2.17, df = 15, p = 0.006) (Figure 2).

Post hoc tests showed that this interaction term derived from short videos having a smaller than expected effect on respondents shown elephant riding (coefficient -0.641 [SE 0.275]), orangutan boxing (coefficient -0.928 [0.276]), and orangutan cuddling (coefficient -0.738 [0.272]). Long videos had a smaller than expected effect on orangutan boxing (-0.737 [0.277]), orangutan cuddling (-0.952 [0.275]), and tiger interactions (-0.546 [0.276]).

Overall, there was no evidence that the effect of treatment on positive affect score was consistent among WTA types (Figure 2a). As examples, marginal mean effects of treatment on respondents shown orangutan boxing were such that mean positive affect scores for photograph, short video, and long video were -0.428 (95% confidence interval [CI] -0.014 to -6.12), -0.457 (95% CI -0.012 to -0.969), and -0.0708 (95% CI -0.003 to -0.998), respectively, lower than the text reference. For tiger interactions, positive affect scores were, respectively,

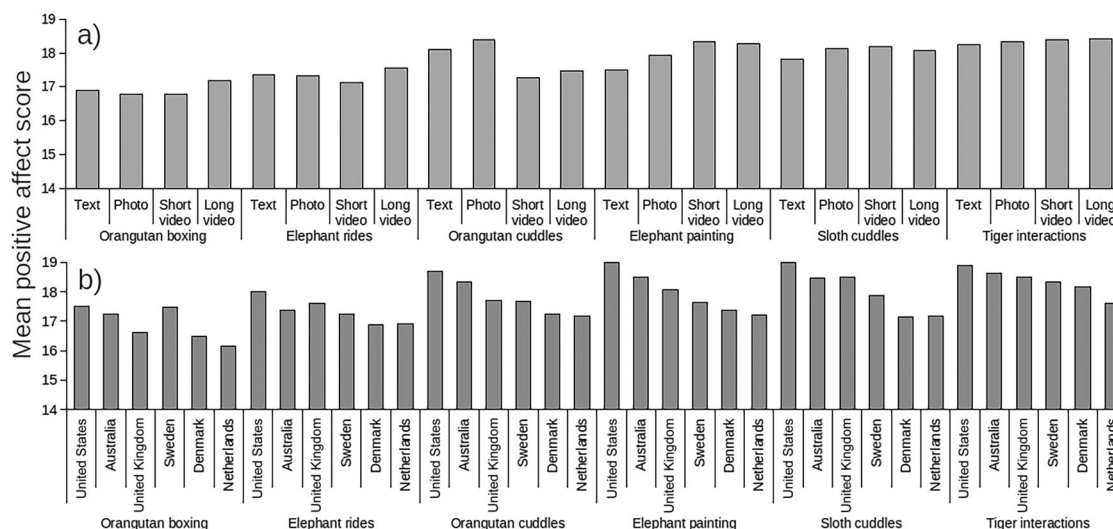


FIGURE 2 The effect of (a) the wildlife tourist attraction (WTA) type and treatment and (b) respondents' country of residence and WTA type on respondents' mean positive affect scores.

0.245 (95% CI 0.042 to 0.660), 0.204 (95% CI 0.029 to 0.782), and 0.120 (95% CI 0.034 to 0.747) higher than the text reference for these treatments (Figure 2a).

There was a substantial effect of respondents' country of residence on mean positive affect score (Table 3; Figure 2b). Respondents from the United States provided the highest overall positive affect scores (mean = 18.6 [4.4] across all WTA types), followed by respondents from Australia (18.1 [3.8]), the United Kingdom (17.8 [3.7]), Sweden (17.7 [4.1]), Denmark (17.2 [3.9]), and the Netherlands (17.0 [4.2]) (Figure 2). The order of these mean scores mirrors the order of the likelihood of attending each WTA (Figure 2). Positive affect scores also significantly positively correlated with the number of social media platforms used by respondents (Table 3; Figure 3). Overall, respondents who used 12 or more social media platforms gave scores that were a mean of 1.2 times higher (mean scores of 20.4 [3.8]) than those who used 0–2 platforms (mean scores of 17.0 [4.1]) (Figure 3).

Positive affect scores were higher for respondents who had previously visited attractions in which they were permitted to interact with wild animals (Table 3), a mean of 18.1 (SD 4.2), compared with 17.1 (4.0) for those who had not previously interacted. Positive affect scores were also higher for older respondents, such that age contributed a maximum of an additional 1.01 to positive affect score. Female respondents provided marginally higher mean positive affect scores than male respondents (17.9 [4.0] and 17.6 [4.1], respectively). There was no evidence that positive affect scores varied with the order in which treatments were shown, whether respondents had children, or their educational level (Table 3).

Factors affecting likelihood of attending WTAs

There was no evidence of a main effect of treatment affecting selected likelihood of attending a given WTA type (Table 4;

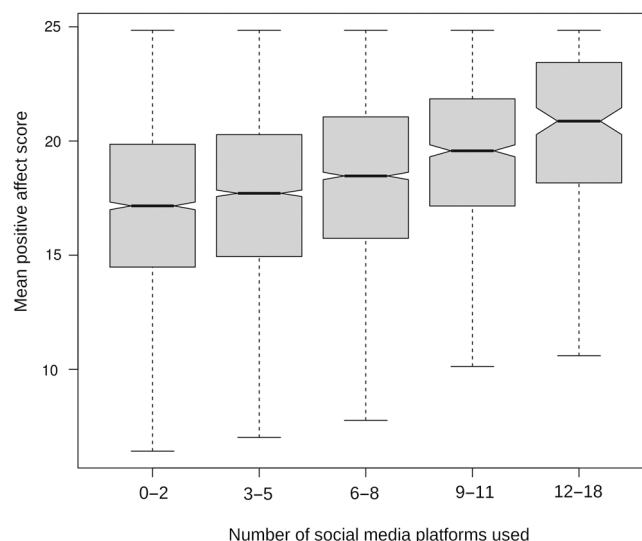


FIGURE 3 Relationship between mean positive affect score relative to respondents' emotional response to each combination of wildlife tourist attraction (WTA) type and experimental treatment, and the number of social media platforms used by respondents (horizontal line, median; box ends, 25th and 75th percentiles; whiskers, minimum and maximum data values). For clarity, responses are pooled across WTA types.

Appendix S2). The proportion of all respondents stating they would be very likely or quite likely to attend ranged from 38.3% to 40.3%, across the 4 treatment groups, and the proportion stating they would be quite unlikely or very unlikely ranged from 44.4% to 46.7% (Appendix S2). The effect of the experimental treatment did vary among different types of WTA in a separate model that included this interaction term (effect of WTA $\times$ treatment LRT = 56.51, df = 15, $p < 0.001$), but post hoc tests showed that this result derived from only 3 combinations of WTA and treatment, and the nature and direction of the effect were not consistent. For elephant rides and orangutan

TABLE 4 Likelihood ratio tests (LRTs) of factors affecting respondents' stated likelihood of visiting any given wildlife tourist attraction (WTA) type, derived from repeated measures ordinal logistic regression, in a survey on the effect of social media format on emotional response to and desire to attend such WTAs.

Source	df	LRT	<i>p</i>
Positive affect score	1	1567.6	<0.001
Age	1	113.49	<0.001
Sex	1	1609.6	<0.001
Order of treatments	1	217.0	<0.001
Treatment	3	6.31	0.097
Whether respondent had had previous close interaction with wildlife at WTA venues	1	16.7	<0.001
Country	5	22.0	<0.001
Whether the respondent had children	1	20.80	<0.001
Number of platforms used	1	9.67	0.0019
WTA type	5	829.18	<0.001
Educational level	1	1.47	0.225

boxing, respondents selected lower attendance likelihoods when shown short videos, compared with the plain-text reference (Wald test, $\chi^2 = 2.228$, $p = 0.0259$ and $\chi^2 = 3.846$, $p < 0.001$, respectively) (Appendix S2). For sloth interactions, respondents selected higher attendance likelihoods when shown the long video (Wald test, $\chi^2 = -2.645$, $p = 0.008$) (Appendix S2). In summary, there was no evidence of an overall effect of the format of the information (text, text + photograph, short video, long video) or any consistent effect among the different WTA types (Appendix S2).

Self-reported desire to attend a given WTA type correlated strongly with a respondent's positive affect score for that WTA type (Table 4). Mean positive affect score for respondents who selected the highest desire to attend given WTA was 21.0 (3.0), whereas for respondents selecting the lowest desire, this was 16.18 (SD 4.6).

There was a substantial effect of respondents' country of residence on self-reported desire to attend each WTA type (Table 4; Appendix S2). Respondents from the United States and Australia selected the highest attendance likelihoods, with 61.3% and 49.1%, respectively, stating that they were very likely or quite likely (hereafter high likelihoods) to attend (average across all WTA types), and 24.5% and 34.4%, respectively, selecting low likelihoods (selected quite unlikely or very unlikely) (Appendix S2). More respondents from the United Kingdom selected low attendance likelihoods than high attendance likelihoods (41.1% and 46.5%, respectively) (Appendix S2). Respondents from Denmark and Sweden were substantially more likely to select lower than higher likelihoods; 30.3% and 33.2% selected high likelihoods and 55.1% and 47.1% selecting low likelihoods, respectively. The lowest likelihoods occurred among respondents from the Netherlands; only 21.9% selected high likelihoods and 65.2% selected low likelihoods (Appendix

S2). There was evidence of an interaction between country of residence and WTA type from a separate model that included this interaction term (effect of country $\times$ WTA LRT = 45.41, $df = 25$, $p = 0.008$), but post hoc tests showed this comprised only respondents from the United Kingdom selecting higher likelihoods of attending sloth interactions (Wald test, $\chi^2 = -2.22$, $p = 0.0264$) (Appendix S2) and respondents from the United States selecting lower than expected likelihoods of attending tiger interactions (Wald test, $\chi^2 = 2.443$, $p = 0.0146$) (Appendix S2).

Selected attendance likelihood varied strongly with WTA type (Table 4; Appendix S2). Post hoc tests showed no significant difference between elephant painting (the reference, for which 50.4% of respondents selected a high attendance likelihood) and sloth cuddling (48.1% high attendance) (Wald test, $\chi^2 = 1.458$, $p = 0.14485$) but substantial differences from the reference for each of elephant rides (40.4% high attendance), orangutan cuddles (38.2%), tiger interactions (34.0%), and orangutan boxing (25.9%) (Wald test for each $\chi^2 > 9.467$, $p < 0.001$) (Appendix S2). Selected likelihood of attending each WTA was strongly correlated with the number of social media platforms used by respondents (Table 4; Appendix S3). Odds ratios for the effect of social media platforms demonstrated that individuals who used 18 platforms were 12.8 (95% CI 6.5–28.9) times more likely to select higher likelihoods than those who did not use any, depending on the WTA in question (Appendix S3). The proportion of respondents using high numbers of platforms, however, was relatively small. The majority of respondents (62.5%) used fewer than 6 platforms, with 33.4% selecting high attendance likelihoods. A further 27.4% of respondents used 6–8 platforms, with 46.7% selecting high attendance likelihoods. Only 10.1% of respondents used 9 or more platforms. Of respondents using 9–11 platforms (8.0% of the total), 53.1% selected high attendance likelihoods. Of those using 12 or more platforms (2.1% of the total), 76.0% selected high attendance likelihoods (Appendix S3).

Older respondents were less likely to select high attendance likelihoods than were younger respondents (Table 4). Odds ratios for the effect of age indicated that the youngest respondents (18 years old) were 9.7 times (95% CI 5.7–16.5) more likely to select higher attendance likelihoods than were the oldest (92 years old). Across all WTA types and treatments, 56.1% of all respondents aged 18–25 selected high attendance likelihoods, compared with 25.0% of those aged 65 and over. Age and use of social media were highly correlated (Wilcoxon signed ranks test, correlating age and number of platforms used, $W = 5895153$, $p < 0.001$), such that the mean number of platforms used halved between the youngest age category (18–24, a mean of 6.2 platforms) and the oldest (over 65, a mean of 3.1 platforms).

Likelihood of attending these WTAs varied with respondents' sex (Table 4), with odds ratios indicating that female respondents were 2.1 times (95% CI 1.7–2.6) less likely to select higher attendance likelihoods. Whether respondents had children affected their stated likelihood of attending each type of WTA (Table 4). Odds ratios indicated that respondents with children were 1.8 times (95% CI 1.4–2.3) more likely to

select higher attendance likelihoods than respondents without children.

Likelihood of selecting high attendance likelihoods varied with whether respondents had previously visited venues permitting interactions with wild animals (Table 4). Odds ratios for the effect of this indicated that respondents who had previously visited such attractions were 2.1 times (95% CI 1.6–2.7) more likely to select high attendance likelihoods. In each country, the majority of respondents had previously visited attractions where they were permitted to interact with wild animals (77.8% of respondents in Denmark, 74.6% in Australia, 73.1% in Sweden, 70.2% in the United States, 66.4% in the United Kingdom), with the exception of the Netherlands (49.6%).

DISCUSSION

Social media posts can influence attitudes and create social norms (Spartz et al., 2017; Wang et al., 2021), and social media that portrays human–wildlife interactions could affect the public's perceptions of the acceptability and desirability of these interactions (Freund et al., 2021; Moloney et al., 2021; Nekaris et al., 2013; Quarles et al., 2023; Spee et al., 2019). Results of several studies analyzing social media videos in which humans handle wildlife species showed that comments left by viewers indicate a positive public perception of the implied exploitation of the species involved and concluded that the videos risked the normalization of threatened wild animals as pets and the legitimization of the wild animal pet trade (e.g., Moloney et al., 2021; Nekaris et al., 2013; Quarles et al., 2023; Spee et al., 2021). Such concerns assume that changes in public sentiment are likely to translate into attitudes and actions in real-world scenarios, but no studies have yet supplied evidence for such a link.

We found a strong correlation between positive affect scores in response to our WTA types and the desire to attend those venues. This relationship was reflected at the level of respondents' countries. Percentages of respondents selecting high attendance likelihoods varied from 61.3% to 21.9% across different countries (United States > Australia > United Kingdom > Sweden > Denmark > Netherlands) (Appendix S2). The order of high attendance likelihood by country was mirrored in the mean positive affect scores provided by respondents (Figure 2). Similarly, desire to attend WTAs increased with the number of social media platforms used by respondents, such that those using the highest number were approximately 13 times more likely to select high likelihoods of attendance than those using none (Appendix S3). Positive affect scores also positively correlated with the number of social media platforms used (Appendix S3). Finally, respondents who had previously attended venues where they were permitted to touch wild animals selected higher likelihoods of attending each WTA and yielded higher positive affect scores for these WTAs. Our results therefore suggest that positive emotional responses to social media portrayals of human–wildlife interactions are likely to translate into real-world desire to participate in those interactions.

Experimental treatments (text + photographs, short videos, or long videos) had no consistent effect on positive affect scores or desire to attend WTAs in comparison with the reference treatment, which was a plain-text description of the available interactions (Table 1). We speculate that the observed treatment effects primarily derived from the content of the media, and the type of animal and interaction, rather than the format. Our data therefore did not support the contention that different types of depictions of wildlife interactions are more likely than others to stimulate desire to participate in those interactions.

The propensity of respondents to respond with positive emotions to portrayals of human–wildlife interactions and to state that they wished to participate in those interactions appears to be embedded in respondents' social norms and cultures, as evidenced by the strong, consistent effect of respondents' country of residence on emotional response (positive affect score) and desire to attend each WTA. Attitudes toward animals vary among countries. A study of 2174 respondents showed that respondents' orientations with respect to the value of wildlife (assessed on scales representing “dominion” and “mutualism” beliefs, where the former prioritizes human well-being and the latter represents striving for egalitarian relationships with wildlife) varies significantly across 7 countries (Jacobs et al., 2022). Such attitudes may be affected by a number of factors, including, potentially, the legislative context in a country and the impact of awareness-raising campaigns. As an example of the latter, Sinclair et al. (2022) found that agreement with the proposition that chickens need room to explore and exercise is largest in countries where extensive “cage-free” campaigns had occurred. As an example of the former, World Animal Protection's Animal Protection Index provides an overall letter-band grade for 50 countries, based on 10 indicators related to the status of national and international legal protections afforded to animals in those countries. The United States and Australia were awarded an overall D, whereas Denmark, the Netherlands, Sweden, and the United Kingdom were awarded an overall B (<https://api.worldanimalprotection.org/>), indicating an overall higher level of animal protection. This is a relatively coarse measure that does not account for our observed differences between, for example, the United Kingdom and the Netherlands. However, the finding suggests a relationship between individuals' attitudes and the wider norms relating to standards of animal treatment, and further research may be warranted to establish a relationship among, for example, countries' animal protection legislation, their populations' perceptions of how well their society treats animals, and statistics on the frequency of occurrence of animal welfare abuses in those countries.

Jacobs et al. (2022) found that women were typically more oriented toward mutualism and less toward dominion than men. This accords with our own finding that women were significantly less likely to select high likelihoods of attending WTAs than were men. The exception to this was the sloth attraction, for which both sexes were equally likely. We speculate that the nature of that attraction, in which a sloth is held by a single human, makes the negative impacts more difficult to discern. However, such gender-related results could equally be explained if women were more fearful of some wildlife than were men.

This has been demonstrated for 2 large carnivores (wolves [*Canis lupus*] and bears [*Ursus arctos*] [Johansson & Karlsson, 2011]), but evidence across the species in our study is lacking. We raise this possibility only to demonstrate the potential for alternative interpretations of our finding.

Greater use of social media platforms by our respondents correlated with higher positive affect scores and increased stated likelihoods of attendance of each of our WTAs. This relationship could indicate a role of social media exposure in influencing respondents' ability to critically appraise the impacts of WTAs in our study. Social media users have been characterized as imagining themselves to be in front of a large audience (Bottaro & Faraci, 2022) and preferentially posting about their great positive moments but not their negative moments, emotions, and experiences (Bottaro & Faraci, 2022; Schreurs et al., 2023; Vermeulen et al., 2018) (although certain platforms may encourage more negative comments [Vermeulen et al., 2018]). Many social media users are therefore consistently exposed to a positivity bias in terms of the nature of the posts they view, and younger users may be particularly susceptible to such biases (Bottaro & Faraci, 2022; Schreurs et al., 2023; Vermeulen et al., 2018). In our study, respondents in the youngest age category (18- to 24-year-olds) used approximately twice as many platforms on average as the oldest (over 65), such that the effects of age and social media usage are partially confounded.

Younger respondents selected higher likelihoods of attending any given WTA than did older respondents. Work in the United States (Manfred, 2008) and the Netherlands (Vaske et al., 2011) shows that younger people tend to support mutualistic rather than domination-based attitudes toward wildlife, findings that appear to counter those of our study. We speculate, however, that young respondents were less able to discern problematic elements in the human–wildlife interactions portrayed and therefore responded with heightened desire to attend these WTAs. Younger respondents' underlying attitudes concerning the use of wildlife may have been promutualistic, but these respondents may have had a diminished ability to recognize interactions that contravene welfare standards compared with older respondents. We also speculate that the higher prevalence of high social media usage among younger respondents may have inclined them toward more positive emotions concerning the interactions portrayed and to be less critical of the content of the media presented. If true, this finding suggests that by hosting portrayals of human–wildlife interactions, social media may be perpetuating and normalizing these interactions, particularly among younger users.

Our experimental survey was conducted via an online platform. Although our respondents were asked to indicate their likely behavior if in the country of a given WTA and staying nearby, it remains uncertain whether they would actually attend the WTA in reality: they would have had little real expectation of visiting a WTA in the near future. Behavior can be viewed as being generated by individual's capability, opportunity, and motivation (Michie et al., 2011). Many of our respondents were motivated to participate and, if provided with opportunity and capability, may well enact that behavior. Conversely, it remains uncertain how respondents who selected low attendance likeli-

hoods might act in reality when on holiday and provided with an opportunity to visit a WTA, especially because capability and opportunity to enact a behavior can both influence motivation to do so (Michie et al., 2011). Tourists may operate in a different moral space than in their daily lives (Thomas, 2005) and may not see holidays as a context in which they should be responsible for ethical decisions (Barr et al., 2010; Becken, 2007). This may increase the attractiveness of WTAs to in-country tourists and decrease the likelihood of their engaging with the ethical consequences of their choice (see Moorhouse et al. [2017] for further discussion).

Our data did not support the hypothesis that photographs and videos are more likely to stimulate demand for WTAs than plain text, but we could not determine whether, in the absence of any mention of WTAs on social media platforms, demand for these interactions would be lower. All of the treatment levels in our study, including the text-only reference level, could potentially be viewed as promoting WTAs, insofar as respondents may not previously have been aware of the existence of the WTAs. We were unable to test the hypothesis that any mention of WTA activities in any form on social media stimulates demand, due to the impossibility of creating a control in which WTAs were not described. We explicitly tested only the extent to which the format of the media was responsible for stimulating demand—in answer to which we found little consistent evidence.

Policy implications

When viewing portrayals of human–wildlife interactions of types known to be detrimental to the wildlife, different demographic groups responded with different levels of positive emotions, with more positive emotions correlating with higher levels of desire to participate in those interactions. This finding suggests that the propensity to uncritically assess the desirability of human–wildlife interactions shown on social media is to some extent socially embedded, such that we found clear distinctions among respondents from different countries. We also found that high social media usage among our respondents correlated with increased likelihood of positive emotional responses to the interactions portrayed and increased desire to engage in those interactions in real life. High social media usage also inversely correlated with respondents' ages, as did desire to engage in these interactions. We therefore caution that high social media usage, especially among younger users, may normalize the types of human–wildlife interactions being viewed and prevent those users from critically engaging with the content, potentially thereby driving custom to WTAs likely to be harmful to species conservation and animals' welfare. Many countries are currently revising or drafting new legislation governing online behavior and the limits of domestic sale and advertisement of overseas activities that may harm wildlife (examples from in the United Kingdom include the Online Safety Act and the Animals [Low-Welfare Activities Abroad] Act). Our findings add support to concerns that online depictions of human–animal interactions in particular, and excessive

consumption of social media in general, especially by younger people, could have real-world implications for wildlife protection standards globally. Finally, beyond legislation, our findings suggest that social media companies should take action to limit the online normalization of human–animal interactions by identifying and removing problematic content and by conducting awareness campaigns, which have previously highlighted other topics (e.g., <https://www.tiktok.com/discover/autism-awareness-week?lang=en>) and could be similarly employed to educate users on the detrimental impacts of human–wildlife interactions.

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SUPPORTING INFORMATION

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

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