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## **Social Media Contexts Moderate Perceptions of Animals**

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### **Abstract**

The rapid rise of social media in the past decade represents a new space where animals are represented in human society, and this may influence human perceptions. In this study, 211 participants (49% female) between the ages of 18 to 44 were recruited to an online survey where they viewed mock-up pages from a social media site. All participants saw the same image of an animal, but were randomly assigned to a positive or negative narrative condition. When participants were presented with the critical narrative they perceived the animal to be more stressed ( $\chi^2=13.99, p<0.001$ ). Participants expressed reservations in face of a narrative they disagreed with in free text comments. Overall, this study found evidence to suggest that people moderate their discussions on human-animal interactions based on the social network they are in, but these relationships are complex and require further research.

### **Keywords**

Digital Cultures, captive primates, exotic pets, digital human-animal interactions

## Introduction

Social media sites (SMS) are a rapidly expanding form of human communication. They can be defined as “virtual places that cater to a specific population in which people of similar interest gather to communicate, share, and discuss ideas” (Raacke & Bonds-Raacke, 2008, p 169). Popular sites, especially among teenagers, are Facebook, Twitter, Instagram, YouTube, and Tumblr (Lenhart, Purcell, Smith, & Zickuhr, 2010). In the US, Facebook is the most visited SMS (Greenwood, Perrin, & Duggan, 2016), and claimed a global reach of 2 billion users in 2017 (Ingram, 2017). In 2012 over half of adults under 54, and 86% of adults aged 18-29 used SMS, compared to less than 10% of the population in 2005 (Zickuhr & Madden, 2012). Gere (2008) proposed that this shift in human communication created a digital culture, a unique method of sharing social norms and curating behaviours. A modern, cohesive definition of culture from a sociology point of view is difficult to find (Smith, 2016), however Smith proposed that studies of culture need to recognise both the unique space in which the culture exists in and the performative aspect of culture, its ability to be shared. Ruths & Pfeffer (2014) suggest that researchers ought to explore differences between psychosocial effects and platform-driven behavior, as platforms bring their own ecosystems and cultures to the data collected. For example, Malik, Dhir, & Nieminen (2016) found that ‘social gratification’, the number of ‘likes’, ‘comments’ and ‘shares’ a post received, are a positive driver of sharing activity on Facebook. This is unsurprising, given human behavior is strongly mediated by social reputation (Izuma, 2012), and SMS interactions provide a mechanism for people to judge their community contributions.

As humans use online spaces to record their relationships with other humans, they also use them to describe and contextualize their relationships with non-human animals (hereafter ‘animals’). Human-animal interactions (HAI) covers the gamut of experiences humans have had with animals in all forms of cultures and societies, from animal worship, animal use and animal companionship

(Knight & Herzog, 2009). Traditional media shapes, and is shaped by, HAI. In experimental settings, participants who view television advertisements featuring non-human primates (hereafter 'primates') in entertainment contexts, for example, seeing a chimpanzee interact with an object like a human would, increased the participants' likelihood of agreeing that chimpanzees should be owned as pets (Schroepfer, Rosati, Chartrand, & Hare, 2011). Similarly, when participants in a survey viewed images of chimpanzees in proximity to humans (Ross, Vreeman, & Lonsdorf, 2011), and anthropomorphic still images of chimpanzees (Leighty et al., 2015), they perceive chimpanzees to be more suitable pets. Many of the relationships observed between traditional media and HAI can also be observed in digital culture. Animals are often considered 'totemic', representing some aspect of a person or society that can be used as shorthand for communication (Passariello, 1999), such as the animal 'meme' (Dynel, 2016). In one case, an image of a Malayan sun bear progressed from a classic 'meme' example of absurdist humour, to an outlet for confessing socially taboo topics (Vickery, 2014). This style of HAI is entirely one-sided, with humans appropriating animals, and possibly sublimating animal needs in favour of their own. For example, the popularity of a video of a slow loris being 'tickled' was associated with a number of users expressing a desire to interact with the animals as pets (Nekaris, Campbell, Coggins, Rode, & Nijman, 2013), despite their at-risk conservation status.

In this study, we sought to explore how the context of a particular SMS may affect the users attitudes towards exotic pets. The primary hypothesis was that users exposed to pro-exotic pet content would be more accepting of exotic pets than those exposed to anti-exotic pet content. The secondary hypothesis was that these attitudes would be more strongly expressed when the content had a high 'social loading', e.g. had received many 'likes'.

## **Materials and Methods**

### ***Ethical Review***

This study was reviewed and approved by Human Ethical Review Committee within the Royal (Dick) School of Veterinary Studies (HERC\_20\_16).

### ***Choice of Social Media Site***

An 'access control scheme' site was considered most appropriate as these are commonly used by people 'researching' purchasing decisions (Hughes, Rowe, Batey, & Lee, 2012; Morris, Teevan, & Panovich, 2010). 'Access control scheme' sites, such as Facebook, allows users to select who to share content with and work primarily through their network (friends, family, 'liked' pages or groups, Neier & Zayer, 2015; Pang & Zhang, 2015), but do allow for unknown users to interact with one another.

Facebook allows for the creation of 'groups' which are 'followed' by individual users. In order to produce a mock-up Facebook group which would be Pro or Anti exotic pet keeping, a variety of terms relating to exotic pet ownership were used with Facebook's inbuilt search function. These terms were: "funny animals", "exotic pets", "monkey", "monkid", "monkey pet", and "monkey baby". Popular results consisted of pro and anti exotic-pet pages and groups, personal posts about exotic pets, and short videos of exotic animals. Given the focus of the search terms, it is unsurprising that most animals featured were primates, however large cat species such as tigers, cheetahs and servals were also observed. It should be noted however that we were not interested in species identification, but rather the general topics of the posts and comments in order to recreate believable pages. Pages were rarely species-specific, and outside of easily recognisable animals such as tigers, posts rarely identified the specific species. Most primates were referred to as 'monkeys'. Given that users have not consented for this data to be used in research, this study opted instead to create a survey with a mock Facebook page in order to explore users' self-reports of behaviour, in line with the Association for Internet Researcher's ethical guidance (Markham & Buchanan, 2012). In order to produce fake pages, we categorised the informational elements of a typical Facebook group

post as follows: 'Content' was the media or text being shared, 'commentary' was the original poster's editorialising of that content. 'Social loading' was the quantity of interactions, e.g. 'likes' and 'shares' that the content received. Finally the 'social network response' was the user's discussion of the content (see study design below).

### ***Participants***

Participants were recruited to the study via the commercial online survey platform SurveyMonkey's ([www.surveymonkey.com](http://www.surveymonkey.com)) volunteer respondent cohort. This cohort provides demographic data to the platform and can be targeted for wide scale recruitment. The volunteers are incentivized to complete surveys by a small (approx. \$1) donation to one of the affiliated charities. Using a purchased survey cohort to collect responses allowed us to recruit from the general public and avoid recruiting people via university channels, as followers of animal-related organisations on SMS would have done so because they are presumably interested in animal welfare. The selected demographic contained adults aged 18-44 that resided in the United States. Participants who matched the criteria were emailed the link by the commercial platform automatically until the minimum purchase threshold of 200 respondents was reached, meaning participants received no information about the survey in their initial email. In total, we received 238 returned surveys. Responses were discarded where the main questions of the survey were incomplete and so there were 211 useable responses. The age category was retained as in the platform's demographic data and was not asked for in the survey specifically, due to concerns from the ethics panel regarding collecting unnecessary identifying data. There were no significant differences in gender, age or educational status across the four conditions (Table 1).

### ***Study Design***

Survey participants were shown a mock-up image of a Facebook group page (condition). There were four conditions: Pro-exotic pet keeping with high social loading (Pro-High), Pro-exotic pet keeping with low social loading (Pro-Low), Anti-exotic pet keeping with high social loading (Anti-High), and Anti-exotic pet keeping with low social loading (Anti-Low). For all four conditions, the content was the same animated image of a Cotton-top tamarin (*Saguinus oedipus*). This image and individual was used for convenience and because the authors' owned the rights to the video. The colour image depicts the tamarin standing on an artificial branch, looking at the surroundings. The background is the enclosure wall, painted different shades of green. A rope and artificial branch are the only exhibit furnishings in frame.

**Table 1:** Respondent demographics across condition, N=211

<b>Condition</b>	<b>Anti Primate Keeping High Social Loading</b>	<b>Anti Primate Keeping Low Social Loading</b>	<b>Pro Primate Keeping High Social Loading</b>	<b>Pro Primate Keeping Low Social Loading</b>
<b>Gender</b>				
<b>Male</b>	11.4% (N=24)	14.3% (N=30)	13.8% (N=31)	8.1% (N=17)
<b>Female</b>	11.4% (N=24)	9.5% (N=20)	13.8% (N=29)	14.8% (N=31)
<b>In another way*</b>	0.5% (N=1)	1.0% (N=2)	0	0.5% (N=1)
<b>Age</b>				
<b>18-29</b>	12.9% (N=26)	15.4% (N=31)	15.4% (N=31)	12.9% (N=26)
<b>30-44</b>	10.9% (N=22)	8.9% (N=18)	12.9% (N=26)	10.9% (N=22)
<b>Education Status</b>				
<b>Some college or less</b>	10.9% (N=23)	10.9% (N=23)	13.3% (N=28)	10.4% (N=15)
<b>Bachelor Degree</b>	8.5% (N=18)	7.1% (N=15)	10.9% (N=23)	10.4% (N=22)
<b>Masters or higher</b>	3.8% (N=8)	6.6% (N=14)	4.3% (N=9)	6.2% (N=13)

\* In gender breakdowns 'in another way' was not included

We observed groups most commonly shared and discussed video content. We opted for a moving image due to the technological industry's comment on SMS as places that encourage video media consumption (Greenberg, 2016). Therefore, we decided we wanted to produce a moving or

animated image. Due to technological limitations at the time, we were unable to embed a video into the survey, and so a GIF (Graphics Interchange Format) was created from the video to create a looped animation which would play like a video, and be robust across different devices that may access the survey.

Both Pro and Anti narratives featured the same Pro or Anti content respectively. The themes expressed in the social network responses were similar in content but different in valence between Pro and Anti narratives. Both High conditions stated the page had received 44K+ 'likes', while both Low conditions featured 4 'likes' (Figure 1). A few months prior to data collection, Facebook had introduced 'reactions' as well as 'likes' (Stinson, 2016). We decided to include 'like' and 'love' as the reactions as we judged a post using only 'likes' would appear immediately dated, but there was no distinction between how many people 'liked' versus 'loved' each post, similar to Facebook's presentation at the time. The comments were rewritten from real comments observed on SMS, in order to express similar themes with different emotional valence in each narrative. For example, the comment about the primate being 'like a dog' was paraphrased from recurring observations online (Table 2). Each participant only saw one condition, which they were assigned via their provided birth month to ensure approximate equal numbers across conditions as there was no facility for randomising condition entry in the platform available.

**Figure 1:** *Comparison of two fictional Facebook groups, the 'Anti-Low' condition and the 'Pro-High' condition. Note that the 'Anti-High' condition is identical to 'Anti-Low', aside from the number of*



reactions, and vice versa for 'Pro-Low' and 'Pro-High'

### Condition: Anti-Low

**AF Animal Freedom**  
May 13 at 6:45pm · 🌐

These breeders should be ashamed. Monkeys belong in the wild and not in homes as pets!

Like · Comment · Share

4

1 share

Write a comment...

- Stop treating them like babies...  
Like · Reply · May 13 at 6:59pm
- Exotic animals aren't like dogs. They don't make good pets. Zoos can't properly take care of them, how could a private owner?  
Like · Reply · May 13 at 6:54pm
- Wild animals will never be domesticated and are rarely tame. Keeping them at home will be damaging. To them and the owner.  
Like · Reply · May 13 at 7:09pm

### Condition: Pro-High

**Monkey Babies**  
May 13 at 6:45pm · 🌐

Cute! My baby is ready to come home from the breeder!! Now that all of my kids are gone, I am so lucky to welcome my new MONKID to the family.

Like · Comment · Share

44K

16,962 shares

Write a comment...

- Aw! Just like a baby!  
Like · Reply · May 13 at 6:59pm
- Ugh! I want one!! I already have a dog...how hard could it be? They aren't that different  
Like · Reply · May 13 at 6:54pm
- I bet this guy makes a perfect pet. So many snuggles! Plus exotics bond to their owners & enjoy living w them!!  
Like · Reply · May 13 at 7:09pm

Page Name

Commentary

Content

Social Loading

Social network response

**Table 2:** *Pro and Anti Narrative Commentary and Social Network Response comparison.*

<b>Theme</b>	<b>Text</b>
<b>Pro Exotic Pet Keeping</b>	
<b>Original Poster's Commentary</b>	Cute! My baby is ready to come home from the breeder!! Now that all of my kids are gone, I am so lucky to welcome my new MONKID to the family.
<b>Response Comment Theme: Human Comparison</b>	Aw! Just like a baby!
<b>Response Comment Theme: Comparison with Domestic Animal</b>	Ugh! I want one!! I already have a dog ... how hard could it be? They aren't that different
<b>Response Comment: Theme: Suitability of Pet</b>	I bet this guy makes a perfect pet. So many snuggles! Plus exotics bond to their owners & enjoy living w them!!
<b>Anti Exotic Pet Keeping</b>	
<b>Original Poster's Commentary</b>	These breeders should be ashamed. Monkeys belong in the wild and not in homes as pets!
<b>Response Comment Theme: Human Comparison</b>	Stop treating them like babies...
<b>Response Comment Theme: Comparison with Domestic Animal</b>	Exotic animals aren't like dogs. They don't make good pets. Zoos can't properly take care of them, how could a private owner?
<b>Response Comment: Theme: Suitability of Pet</b>	Wild animals will never be domesticated and are rarely tame. Keeping them at home will be damaging. To them and the owner.

After being shown the image of the Facebook group, participants answered a series of questions regarding their attitudes towards the animal and the commenters in the image (Table 3). Even Likert scales were used to obtain a forced decision on whether the environment was appropriate for the primate and whether the primate would make a suitable pet. Mid-points on odd Likert-like scale can be undesirable where there is concern that respondents may conceal answers they perceive to be socially unacceptable (Garland, 1991).

**Table 3:** Survey questions used for all treatments and their response types. \*Name would be “Animal Freedom” for negative posts, “Monkey Babies” for positive posts

Number	Question	Response Type
1	If you were to respond to this discussion, write your response below.	Open Response
2	The environment you saw in the picture was appropriate for that animal.	4-Point Likert Scale*
3	This animal will make a suitable pet.	4-Point Likert Scale*
4A	Would you like this animal as a pet?	Yes / No
4B	Other comments?	Open Response
5	How do you think this animal feels? Choices (nonexclusive) <ul style="list-style-type: none"> <li>• Happy</li> <li>• Sad</li> <li>• Excited</li> <li>• Stressed</li> <li>• Don't Know</li> </ul>	Multiple Response
6	The page *[name] is knowledgeable about animals.	4-Point Likert Scale*

\* Levels: Strongly Disagree, Disagree, Agree, Strongly Agree

### ***De-Brief***

To avoid participants leaving with an altered view of this subject, a de-brief was given at the end of the survey. The final page showed a ‘negative-high’ image, ‘positive-low’ image, and the video which the GIF was created from. It also stated that the purpose of the research was to study the relationship between SMS use and human perceptions of non-human animal welfare. It was additionally requested that participants did not share any information about the survey on SMS or any other media platform, although this was not followed up by the researchers.

## ***Analysis***

The three Likert scale questions, the suitability of the primate as a pet, the suitability of the environment, and the knowledge of the original poster, were compared across SMS context, age, gender, and education via Kruskal-Wallis tests using R Version 3.6.0 ("Planting of a Tree", R Core Team, 2019) and the 'likert' package (Bryer & Speerschneider, 2016). Kruskal-Wallis tests were interpreted through one and two-tailed multiple comparison tests to establish which groups showed significant differences with the use of the `pgirmess` package (Giraudoux, 2018).

After seeing the page and ensuing discussion, participants were asked what they would write if they were to respond to the discussion. Both authors contributed to a thematic analysis identifying the broad themes present in the comments and then Author 2 coded the themes via qualitative data management software (N Vivo 11, QSR International). During coding, Author 2 was blind to the condition the participant was in and used a constructive grounded theory method (Charmaz, 2006) with the fundamental question being 'how do participants resolve the animal welfare issues presented in the narrative in their own comments'. To explore differences between demographics and treatments, a series of  $\chi^2$  analyses were run .

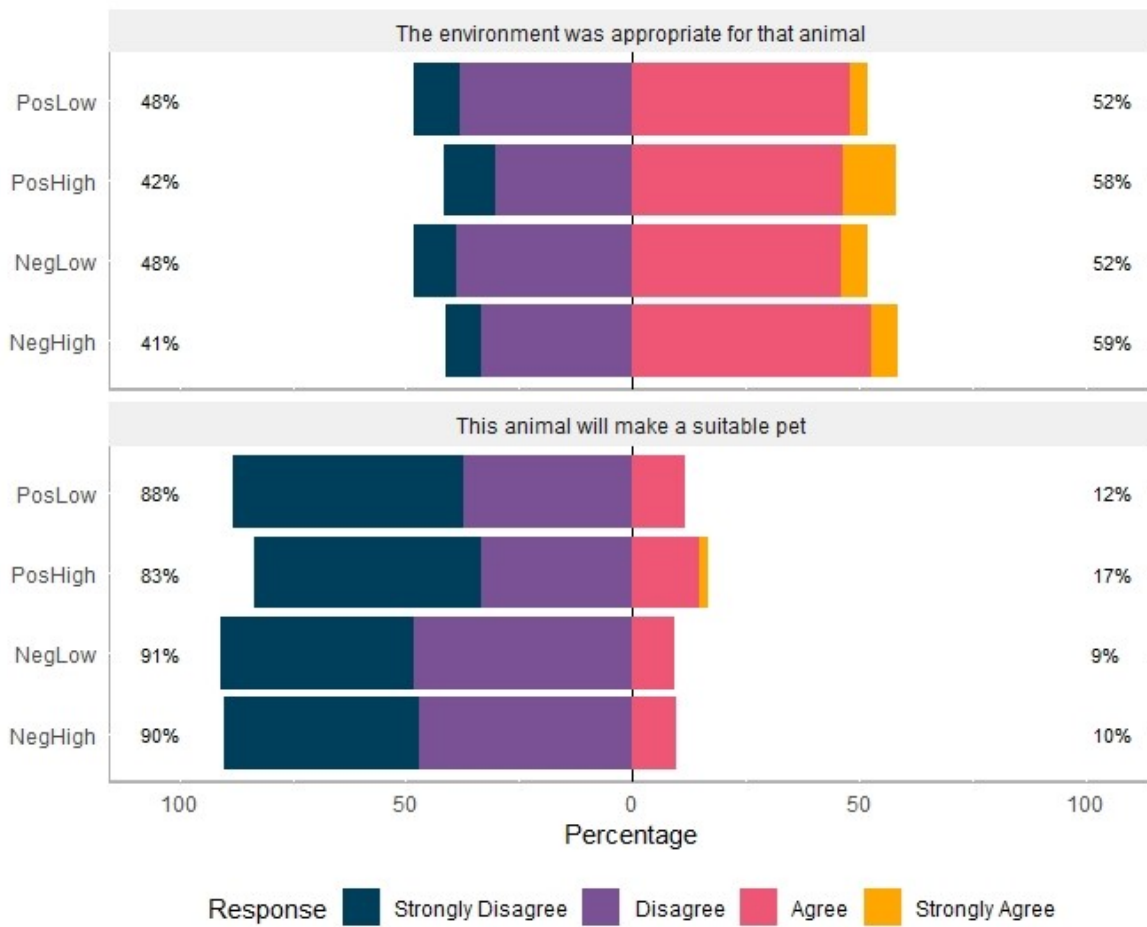
1 **Results**

2 ***Participant Attitudes to Captive Primates***

3 SMS context had no effect on whether participants thought the environment was appropriate for  
4 the animal ( $H= 1.1549$ ,  $df = 3$ ,  $p = 0.7638$ ) or whether the animal would make a suitable pet ( $h =$   
5  $04435$ ,  $df = 3$ ,  $p = 0.9311$ , Figure 2). Age, gender and education had no effect on these scores in  
6 multiple comparison tests. A little over half of all participants (55.2%) felt that the environment the  
7 primate was pictured in was suitable. Across all conditions, only 11.4% of participants felt the animal  
8 would make a suitable pet and the majority (74.9%) stated that they personally would not like the  
9 primate as a pet. Participants were asked about the animal's mood, and despite being presented  
10 with the same image, participants' responses differed across experimental condition. Participants  
11 who were shown the Pro narrative were more likely to agree that the primate was stressed ( $\chi^2(1, N$   
12  $= 211)=13.99$ ,  $p<0.001$ ,  $OR = 2.9$ ), whereas those who were shown the Anti narrative were more  
13 likely to respond 'don't know' ( $\chi^2(1, N = 211)=10.21$ ,  $p =0.001$ ,  $OR = 2.8$ ).

14

15 **Figure 2:** Participants agreement rating regarding environment and pet suitability of primate across  
 16 SMS condition (n = 211)



17

18

19 **Participant Attitudes to Original Poster of Content**

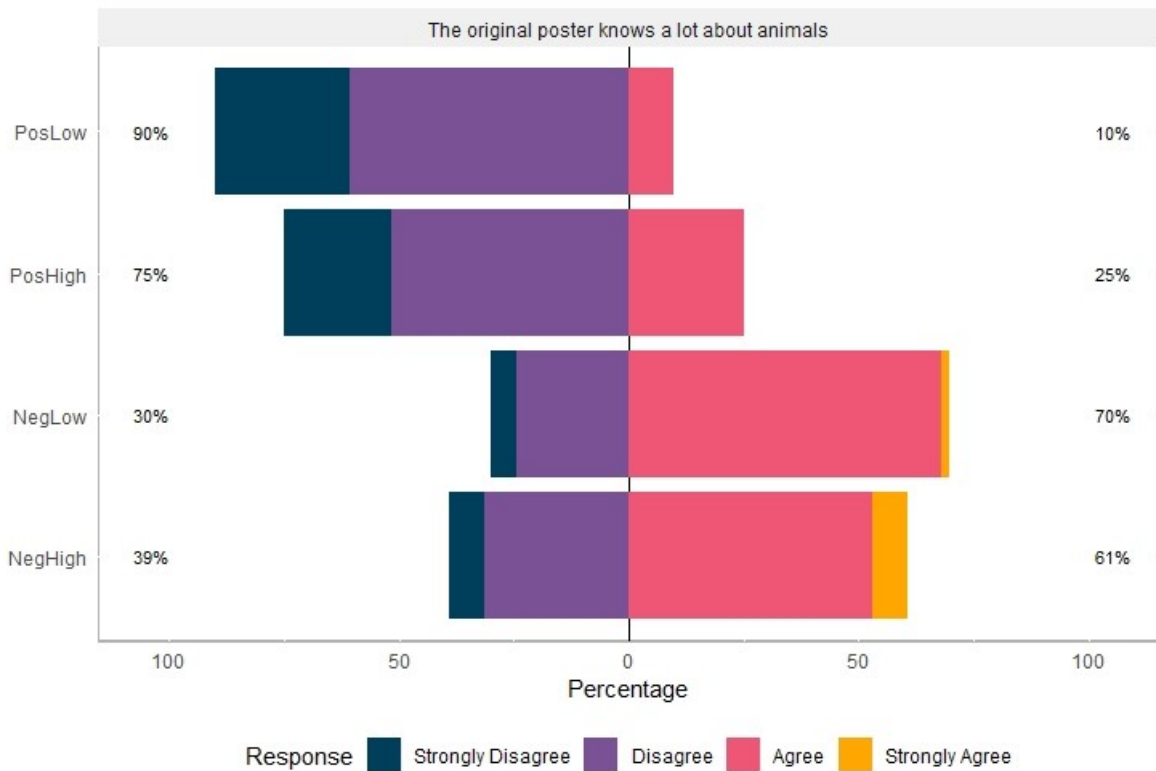
20 There was no effect of gender, education or age on participants' rating of poster's knowledge.

21 However, the positive SMS context was rated as more knowledgeable about animals ( $H = 52.584$ ,  $df$

22  $= 3$ ,  $p < 0.001$ , Figure 3).

23

24 **Figure 3: Participants' (n = 211) agreement with the statement "The original poster knows a lot**  
 25 **about animals"**



26

27

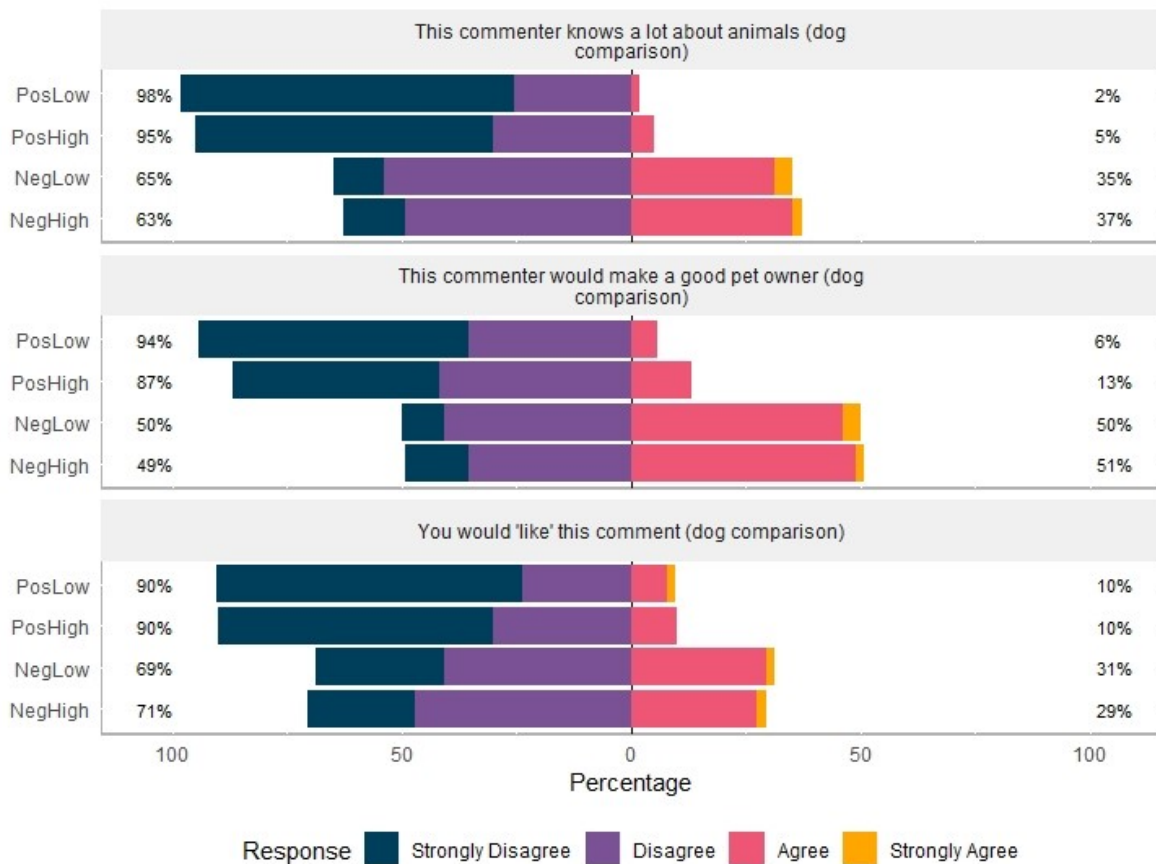
28 **Participants' Attitudes to Commenters**

29 *Comments Comparing Primates to Domesticated Dogs*

30 Participants viewed a statement comparing primates to domesticated dogs and were asked if they  
 31 agreed with three statements: "this person knows a lot about animals", "This person would make a  
 32 good pet owner" and "you would 'like' this comment". There was no effect of age, gender or  
 33 education on participant responses. The Anti commenters were more often considered more  
 34 knowledgeable ( $H = 78.119$ ,  $df = 3$ ,  $p < 0.001$ ) than the Pro commenters. The Anti comment was more  
 35 often considered a good pet owner ( $H = 58.943$ ,  $df = 3$ ,  $p < 0.001$ ) and participants showed a higher  
 36 tendency to hypothetically like the Anti comment ( $H = 32.049$ ,  $df = 3$ ,  $p < 0.001$ , Figure 4)

37

38 **Figure 4: Participants' (n = 211) agreement with commenter statements comparing primates to**  
 39 **domesticated dogs**



40

41

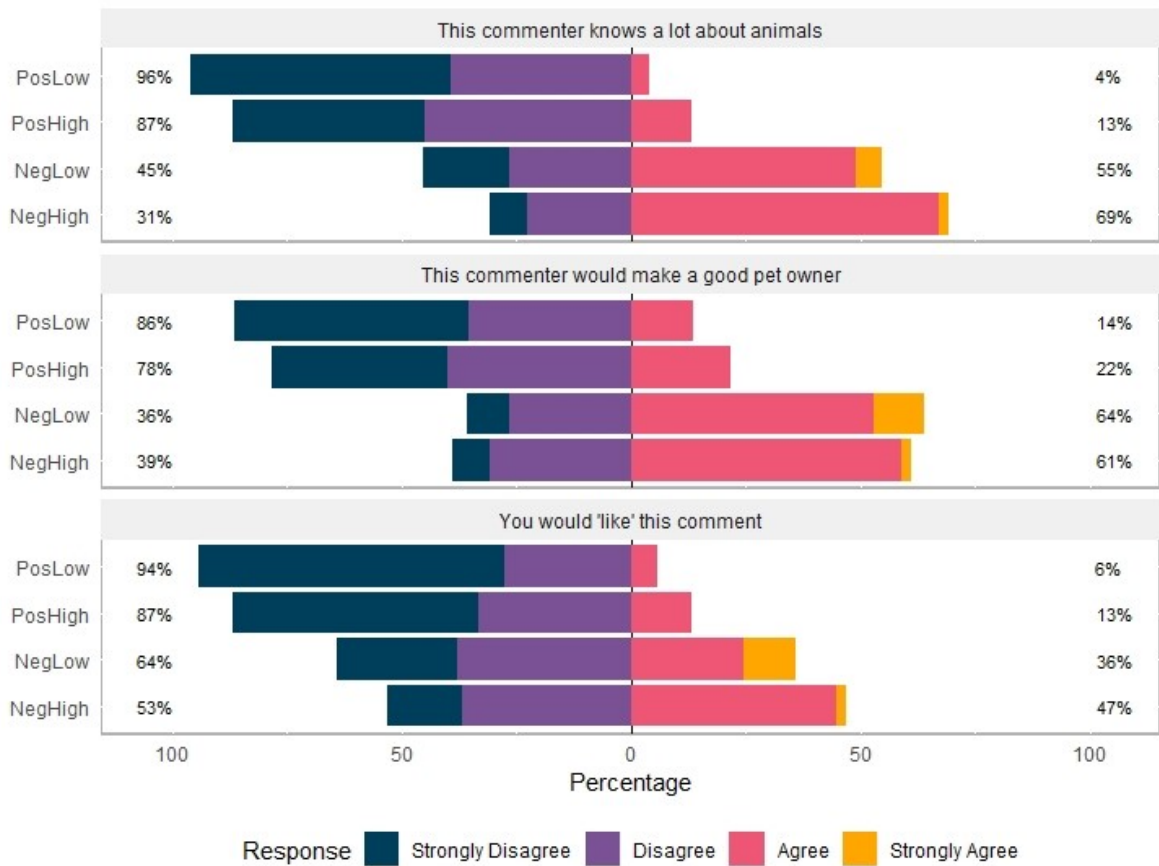
42 *Comments Considering Domesticated Primates*

43 When shown the discussion of whether primates constitute a domesticated species, the Anti  
 44 comment was more often considered knowledgeable (H = 66.668, df = 3, p <0.001) than the Pro  
 45 comment. The Anti comment was more often considered a good pet owner (H = 55.76, df = 3,  
 46 p <0.001) than the Pro comment. And finally, participants were more likely to say they would 'like'  
 47 the Anti comment than the Pro comment (H = 43.638, df = 3, p <0.001, Figure 5).

48



49 **Figure 5: Participants' (n = 211) agreement with commenter statements discussing primates as pets**



50

51

52

53 **Free-Text Responses**

54 The themes identified in the free text responses are characterised in Table 4.

55 **Table 4** Themes identified from participant's responses to the Facebook discussion and differences between Pro and Anti Primate Pet Keeping Conditions

Theme	% of Comments in Negative Context (N)	% of Comments in Positive Context (N)	$\chi^2$ (Fisher's Exact Test True Odds Ratio $\neq$ 0 $p$ ; 95% CI)	Example Comment
<b>Active Opt Out</b>	5.9% (N=6)	3.6% (N=4)	0.62 ( $p=0.52$ ; 0.12, 2.61)	I would totally _never_ respond to this discussion.
<b>Aggression to Poster</b>	4.0% (N=4)	4.6% (N=5)	0.44 ( $p=1$ ; 0.24, 5.99)	This is disgusting! Wild animals are NOT pets. They belong in the wild!
<b>Monkey is Cute</b>	3.0% (N=3)	17.3%(N=19)	11.54 ( $p<0.001$ ; 1.90, 36.89)	Monkeys are the cutest!
<b>Monkey is Dangerous</b>	7.9% (N=8)	2.7% (N=3)	1.92 ( $p=0.123$ ; 0.05,1.42)	Too many accidents can happen when keeping wild animals in your home.
<b>Legal Doubts</b>	1.0%(N=1)	3.6% (N=4)	1.59 ( $p=0.371$ ; 0.36, 187.49)	Adorable! Are monkeys allowed as pets in the US?
<b>Monkeys Can Be Pets</b>	9.9% (N=10)	0	9.35 ( $p<0.001$ ; 0, 0.38)	If properly cared for, monkeys can make great pets!
<b>Reservations</b>	2.0% (N=2)	19.1% (N=21)	15.87 ( $p<0.001$ ; 2.70, 104.68)	Is the home really a better place for monkeys than the wild?
<b>Wild Animals Should Be Free</b>	28.7% (N=29)	15.5% (N=17)	5.43 ( $p=0.03$ ; 0.22,0.93)	This is a wild animal and should not be contained in a cage. It has special needs and requirements that a normal person can not give it.
<b>Wild Animals Require A Lot of Care</b>	14.9% (N=15)	9.1% (N=10)	1.67 ( $p=0.209$ ; 0.22, 1.45)	Owning a monkey seems like a huge responsibility.
<b>I Would Like a Monkey</b>	1.0% (N=1)	6.4% (N=7)	4.17 ( $p=0.067$ ; 0.84, 308.85)	I would like one but i have 3 dogs allready hands full

57 Some participants said they would not participate in the discussion, but others admitted they may  
58 respond in a certain way while privately holding other opinions.

59 *I wrote a nice message on the facebook page, but I really think it would be silly to get a*  
60 *monkey. They are not domesticated animals!*

61 *-Pro Narrative*

62

63 *Normally, I wouldn't post any comment on the page but since the survey required me to, I*  
64 *was being optimistic for both the owner and the monkey wishing them good fortune because*  
65 *from the comments I saw, I would have felt bad posting the only negative comment.*

66 *-Pro Narrative*

67

68 We termed a common theme 'reservations'. These comments often asked the original commenter a  
69 question which was designed to encourage critical thought about having a monkey as a pet, while  
70 not attacking the original commenter directly. They used language to soften their comment, often  
71 starting with a positive statement and then asking questions to encourage the poster to think  
72 critically, or expressing reserved doubts about the practice.

73 *Good luck taking care of it. From what I've heard they're more difficult to take care of than a*  
74 *human baby.*

75 *- Pro Narrative*

76

77 *So cute! Are you sure that it would make a good pet, though?*

78 *- Pro Narrative*

79

80 *Adorable! I'm not so sure a monkey's place is in a human home, though.*

81 *- Pro Narrative*

82

83

84 This theme was contrasted with 'aggression to poster' where the participant left a response which  
85 could be considered openly hostile, attacking the commenter's beliefs or attempting to provoke a  
86 response.

87 *You are an idiot.*

88 *- Pro Narrative*

89

90 *Do they taste delicious?*

91 *- Anti Narrative*

92 Interestingly, there was no significant difference in the number of commenters who responded  
93 aggressively between contexts, but 'reservation' was more commonly observed in the Pro narrative  
94 participants ( $\chi^2(1, N = 211)=15.9, p<0.001, OR = 12$ ). There was also no significant differences  
95 between age groups and their likelihood to respond with reservations.

96

97 Unsurprisingly, stating the cuteness of the monkey was more common in the Pro Narrative ( $\chi^2(1, N =$   
98  $211)=11.53, p<0.001, OR = 7$ ). Cuteness, however, could be considered independently of the  
99 primate's 'pet' status.

100 *Adorable! I wish I could have one.*

101 *-Pro Narrative*

102

103 *Very cute but beware because it is still a wild animal and its actions are unpredictable.*

104 *-Pro Narrative*

105

106 Across both the narratives, there were comments which were concerned about the level of care the  
107 primate would require. There was no significant difference in the proportions of comments across  
108 contexts, but there was often a connection between this theme and the idea of 'reservation', with  
109 participants querying how the primate would be cared for.

110 *Are you equipped to care for him? Is your house safe for him? Is where you're living similar to*  
111 *where he's from? Can he survive outside of his normal habitat?*

112 *-Pro Narrative*

113

114 *If properly cared for, monkeys can make great pets!*

115 *-Anti Narrative*

116 There were also participants who explicitly considered the keeping of primates to be dangerous,  
117 either to the owner or the public.

118 *You will never be able to control a wild animal.*

119 *-Anti Narrative*

120

121 *Scary*

122            *-Pro Narrative*

123    Curiously, participants who liked the idea of monkeys as a pet appeared to respond differently based  
124    on context. Across both narratives, eight participants responded they would like a monkey as a pet,  
125    and there was no difference in proportion across narratives. However, within the Anti context only,  
126    there was a style of comment defending the practice of keeping monkeys generally, while not  
127    expressing a personal desire to keep monkeys. This type theme was not expressed by participants in  
128    the Pro narrative.

129

130            *Responsible owners can raise exotics pets, yes most people would not be capable but that*  
131            *doesn't mean everyone*

132            *-Anti Narrative*

133

134            *People have had monkeys as pets for years, never really been an issue. Why now?*

135            *-Anti Narrative*

136

137

138 **Discussion**

139 ***The Effect of Social Media on Animal Welfare Attitudes***

140 This study had two main hypotheses: that participants exposed to a Pro-primate pet keeping  
141 Facebook group would have more favourable attitudes primate pet keeping than those exposed to  
142 Anti-primate pet keeping Facebook group; and that participants exposed to posts with a high social  
143 loading would express stronger opinions than those exposed to posts with a low social loading.

144 In this study, the significant differences were mainly between the context of the narrative (Pro vs  
145 Anti) and Loading (high vs low) was less important. Previous work has indicated that a desire for  
146 'likes' and 'shares' (hereafter 'engagements') encourage sharing on social networks (Malik et al.,  
147 2016), and this behaviour is strongly associated with a sharer's narcissistic traits (Kapidzic, 2013),  
148 which was not measured in the present study. It is presently unknown how engagements influence  
149 users' knowledge-gathering behaviour. Acquisti & Gross (2006) found that users often  
150 underestimated how many people would see their information, so it is possible that users may not  
151 recognise that a high engagement post means more people have seen the content.

152 The Pro/Anti narrative affected how the participants rated the primate's emotional state.  
153 Participants exposed to the Pro narrative were almost three times more likely to agree the primate  
154 was stressed. This indicates that participants' beliefs about the primate's welfare were very much  
155 affected by the editorial information on the page. This fits with previous work which explored how  
156 participants rated the moods of chimpanzees and found that chimpanzees pictured with humans  
157 were rated as being more stressed or scared (Leighty et al., 2015). However, the results of the  
158 present study did not demonstrate that a Pro narrative made participants more likely to want a  
159 primate as a pet.

160 The commentary and social response statements showed significant differences between the Pro  
161 and Anti narratives, with statements containing Anti-primate pet keeping sentiments consistently  
162 being rated as more knowledgeable about animals and coming from better pet owners.

163

#### 164 ***Engaging in Animal Welfare Debates***

165 In their responses to the discussion of the social network, participants were overall more likely to be  
166 critical of keeping wild primates captive. However the qualitative comments revealed that a user's  
167 behavior may not always reflect their beliefs. Del Vicario et al. (2016) discussed the formation of  
168 homogenous clusters in social networks, colloquially referred to as 'echo chambers', where the same  
169 opinions are expressed repeatedly. In this study we showed how echo chambers may begin to form  
170 as participants elected not to respond, or to mask their true feelings. The 'reservations' comment is  
171 a demonstration of this. Instead of agreeing with the original post and the fictional commenters,  
172 these participants suggest a new perspective, but in a tone intended to be constructive. The  
173 participants saw a static set of comments, but in a real social network those participants' comments  
174 would have been seen by other users, further reinforcing the echo chamber.

175 Nekaris et al. (2013) studied comments on a particular memetic video, and found that as  
176 understanding of conservation issues entered the public narrative, significantly fewer commenters  
177 expressed a desire to keep a slow loris as a pet. During the same period, the proportion of  
178 references to the illegality of trade or painful procedures remained the same. They also highlighted  
179 that some commenters on the video considered the video to raise awareness of these conditions,  
180 although the trends in the comments did not necessarily support this. By contrast, in this study  
181 several participants within the Anti narrative were driven to defend the practice of keeping monkeys  
182 without expressing a desire to keep one themselves. The content of participants' responses did not  
183 always reflect the attitudes we observed in the quantitative aspect of the study. This is similar to  
184 Kramer, Guillory, & Hancock's (2014) finding that Facebook users changed the words they used



185 when presented with more content of a certain emotional context. In Kramer et al's study,  
186 participants who were exposed to content with a negative emotional valence began to use more  
187 negative wording. Kramer et al's study was heavily criticised for manipulating the feeds of Facebook  
188 users without their knowledge (Harriman & Patel, 2014; Kleinsman & Buckley, 2015) and reflects the  
189 evolving nature of research ethics in these digital spaces, which is a topic of heated debate (Shilton  
190 & Sayles, 2016). Our study deliberately chose to recruit participants to a scenario which was  
191 obviously a study, instead of creating fake Facebook pages and observing real-world behavior, as a  
192 result of ethical concerns, but this work suggests that it may be worth exploring a larger dataset  
193 collected from real world data to see if these effects persist outside of an experimental  
194 environment. If so, SMS platforms may need to do more to police content on their sites which may  
195 affect animal welfare. In late 2017, the influential site Instagram, owned by Facebook, implemented  
196 a tone policing policy for wildlife trade (Instagram, 2017), where hashtags associated with animal  
197 abuse or wildlife trade will alert the user that animal exploitation is against Instagram's Terms of  
198 Service. It is not yet known how impactful such interventions are. At present Facebook's moderation  
199 policy is 'upon report', not using policed hashtags. A 2017 leak of Facebook training material  
200 suggested that Facebook actively allowed imagery of animal abuse restricting only cases of sadism  
201 and celebration (Guardian, 2017), however Facebook's policy on content policing remains highly  
202 controversial, with inaccurate or damaging content only being grounds for review, not a breach of  
203 terms of service (Dreyfuss, 2018). Given the high profile 'fake news' scandals (see Alcott and  
204 Gentzkow, 2017), content around animal welfare may not be addressed for some time.

205

### 206 ***Human-Animal Interactions in Digital Spaces***

207 The present study builds on a body of work exploring how specific platforms may 'tone police'  
208 animal welfare challenges within their community.

209

210 This study found some limited evidence that the content of SMS can moderate attitudes to animal  
211 welfare issues, particularly in how users might respond in line with an existing community's norms.  
212 There are a number of factors still to be considered, for example whether gender influences  
213 attitudes to animal welfare (Herzog, Betchart, & Pittman, 1991) and mediates SMS usage  
214 (Kimbrough, Guadagno, Muscanell, & Dill, 2013). While there was no effect of gender observed in  
215 this study, a larger sample may find otherwise. In addition, while there was no observed effect of  
216 educational status in this study, previous research has shown that exposure to animal related  
217 courses influences attitudes to animals (Lord, Walker, Croney, & Golab, 2010). Further work should  
218 also explore past animal experiences, including experiences with companion animals, and their  
219 influences on these behaviours. The most important finding of this study is its implications. We  
220 suggest future studies of HAI consider the specifics of digital culture research to understand how HAI  
221 are represented and codified, and the impacts this may have on both human and non-human agents.

222

## 223 **References**

- 224 Acquisti, A., & Gross, R. (2006). Imagined communities: Awareness, information sharing, and privacy  
225 on the facebook. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in*  
226 *Artificial Intelligence and Lecture Notes in Bioinformatics)*, 4258 LNCS, 36–58.  
227 [https://doi.org/10.1007/11957454\\_3](https://doi.org/10.1007/11957454_3)
- 228 Allcott, H., & Gentzkow, M. (2017). Social media and fake news in the 2016 election. *Journal*  
229 *of economic perspectives*, 31(2), 211-36.
- 230 Bryer, J., & Speerschneider, K. (2016). *likert: Analysis and Visualization Likert Items*. CRAN.
- 231 Charmaz, K. (2006). Constructing grounded theory: a practical guide through qualitative analysis. In  
232 *Book* (Vol. 10). <https://doi.org/10.1016/j.lisr.2007.11.003>
- 233 Del Vicario, M., Bessi, A., Zollo, F., Petroni, F., Scala, A., Caldarelli, G., ... Quattrociocchi, W. (2016).  
234 The spreading of misinformation online. *Proceedings of the National Academy of Sciences*,  
235 113(3), 554–559. <https://doi.org/10.1073/pnas.1517441113>
- 236 Dreyfuss, E. (2018). Facebook's Fight Against Fake News Keeps Raising Questions | WIRED. Retrieved  
237 August 30, 2018, from Wired website: [https://www.wired.com/story/facebook-fight-against-](https://www.wired.com/story/facebook-fight-against-fake-news-keeps-raising-questions/)  
238 [fake-news-keeps-raising-questions/](https://www.wired.com/story/facebook-fight-against-fake-news-keeps-raising-questions/)
- 239 Dynel, M. (2016). "I Has Seen Image Macros!" Advice Animal Memes as Visual-Verbal Jokes.  
240 *International Journal of Communication*, 10, 660–689. [https://doi.org/1932-](https://doi.org/1932-8036/2016FEA0002)  
241 [8036/2016FEA0002](https://doi.org/1932-8036/2016FEA0002)
- 242 Garland, R. (1991). The mid-point on a rating scale: Is it desirable? *Marketing Bulletin*, 2, 66–70.  
243 <https://doi.org/citeulike-article-id:4775464>

- 244 Gere, C. (2008). *Digital Culture* (Expanded S). London: Reaktion Books.
- 245 Patrick Giraudoux (2018). pgirmess: Spatial Analysis and Data Min  
246 ing for Field Ecologists. R package version 1.6.9.  
247 <https://CRAN.R-project.org/package=pgirmess>
- 248
- 249 Greenberg, J. (2016). Zuckerberg Really Wants You to Stream Live Video on Facebook | WIRED.  
250 Retrieved July 17, 2018, from WIRED Magazine website:  
251 <https://www.wired.com/2016/04/facebook-really-really-wants-broadcast-watch-live-video/>
- 252 Greenwood, S., Perrin, A., & Duggan, M. (2016). Social Media Update 2016. In *Pew Research Center*.  
253 Guardian. (2017). Facebook's rules on showing cruelty to animals | News | The Guardian. Retrieved  
254 August 30, 2018, from The Guardian website:  
255 [https://www.theguardian.com/news/gallery/2017/may/21/facebook-rules-on-showing-](https://www.theguardian.com/news/gallery/2017/may/21/facebook-rules-on-showing-cruelty-to-animals)  
256 [cruelty-to-animals](https://www.theguardian.com/news/gallery/2017/may/21/facebook-rules-on-showing-cruelty-to-animals)
- 257 Harriman, S., & Patel, J. (2014). The ethics and editorial challenges of internet-based research. *BMC*  
258 *Medicine*, 12(124), 1–4.
- 259 Herzog, H. A., Betchart, N. S., & Pittman, R. B. (1991). Gender, sex role orientation, and attitudes  
260 toward animals. *Anthrozoos: A Multidisciplinary Journal of The Interactions of People &*  
261 *Animals*, 4(3), 184–191. <https://doi.org/10.2752/089279391787057170>
- 262 Hughes, D. J., Rowe, M., Batey, M., & Lee, A. (2012). A tale of two sites: Twitter vs. Facebook and the  
263 personality predictors of social media usage. *Computers in Human Behavior*, 28(2), 561–569.  
264 <https://doi.org/10.1016/j.chb.2011.11.001>
- 265 Ingram, D. (2017). Facebook hits 2 billion-user mark, doubling in size since 2012. Retrieved July 31,  
266 2018, from Reuters website: [https://www.reuters.com/article/us-facebook-users/facebook-](https://www.reuters.com/article/us-facebook-users/facebook-hits-2-billion-user-mark-doubling-in-size-since-2012-idUSKBN19I2GG)  
267 [hits-2-billion-user-mark-doubling-in-size-since-2012-idUSKBN19I2GG](https://www.reuters.com/article/us-facebook-users/facebook-hits-2-billion-user-mark-doubling-in-size-since-2012-idUSKBN19I2GG)
- 268 Instagram. (2017). Protecting Wildlife and Nature from Exploitation. Retrieved December 19, 2017,  
269 from Instagram Press website: [https://instagram-press.com/blog/2017/12/04/protecting-](https://instagram-press.com/blog/2017/12/04/protecting-wildlife-and-nature-from-exploitation/)  
270 [wildlife-and-nature-from-exploitation/](https://instagram-press.com/blog/2017/12/04/protecting-wildlife-and-nature-from-exploitation/)
- 271 Izuma, K. (2012). The social neuroscience of reputation. *Neuroscience Research*, 72(4), 283–288.  
272 <https://doi.org/10.1016/j.neures.2012.01.003>
- 273 Kapidzic, S. (2013). Narcissism as a predictor of motivations behind Facebook profile picture  
274 selection. *Cyberpsychology, Behavior and Social Networking*, 16(1), 14–19.  
275 <https://doi.org/10.1089/cyber.2012.0143>
- 276 Kimbrough, A. M., Guadagno, R. E., Muscanell, N. L., & Dill, J. (2013). Gender differences in mediated  
277 communication: Women connect more than do men. *Computers in Human Behavior*, 29(3),  
278 896–900. <https://doi.org/10.1016/j.chb.2012.12.005>
- 279 Kleinsman, J., & Buckley, S. (2015). Facebook Study: A Little Bit Unethical But Worth It? *Journal of*  
280 *Bioethical Inquiry*, 12(2), 179–182. <https://doi.org/10.1007/s11673-015-9621-0>
- 281 Knight, S., & Herzog, H. (2009). All creatures great and small: New perspectives on psychology and  
282 human-animal interactions. *Journal of Social Issues*, 65(3), 451–461.  
283 <https://doi.org/10.1111/j.1540-4560.2009.01608.x>
- 284 Kramer, A. D. I., Guillory, J. E., & Hancock, J. T. (2014). Experimental evidence of massive scale  
285 emotional contagion through social networks. *Proceedings of the National Academy of*

- 286 *Sciences*, 111(24), 8788–8790. <https://doi.org/10.1073/pnas.1412469111>
- 287 Leighty, K. A., Valuska, A. J., Grand, A. P., Bettinger, T. L., Mellen, J. D., Ross, S. R., ... Ogden, J. J.  
288 (2015). Impact of visual context on public perceptions of non-human primate performers. *PLoS*  
289 *ONE*, 10(2), 1–6. <https://doi.org/10.1371/journal.pone.0118487>
- 290 Lenhart, A., Purcell, K., Smith, A., & Zickuhr, K. (2010). Social Media & Mobile Internet Use among  
291 Teens and Young Adults. In *Pew Internet & American Life Project* (Vol. 01).  
292 <https://doi.org/10.3898/NEWF.78.02.2013>
- 293 Lord, L. K., Walker, J. B., Croney, C. C., & Golab, G. C. (2010). A comparison of veterinary students  
294 enrolled and not enrolled in an animal-welfare course. *Journal of Veterinary Medical Education*,  
295 37(1), 40–48. <https://doi.org/10.3138/jvme.37.1.40>
- 296 Malik, A., Dhir, A., & Nieminen, M. (2016). Uses and Gratifications of digital photo sharing on  
297 Facebook. *Telematics and Informatics*, 33(1), 129–138.  
298 <https://doi.org/http://dx.doi.org/10.1016/j.tele.2015.06.009>
- 299 Markham, A., & Buchanan, E. (2012). Ethical Decision-Making and Internet Research  
300 Recommendations from the AoIR Ethics Working Committee. In *Recommendations from the*  
301 *AoIR Ethics Working Committee (Version 2.0)*. [https://doi.org/Retrieved from www.aoir.org](https://doi.org/Retrieved%20from%20www.aoir.org)
- 302 Morris, M. R., Teevan, J., & Panovich, K. (2010). What Do People Ask Their Social Networks, and  
303 Why?: A Survey Study of Status Message Q&A Behavior. *Proceedings of the SIGCHI Conference*  
304 *on Human Factors in Computing Systems SE - CHI '10*, 1739–1748. [https://doi.org/doi:](https://doi.org/doi:10.1145/1753326.1753587)  
305 [10.1145/1753326.1753587](https://doi.org/doi:10.1145/1753326.1753587)
- 306 Neier, S., & Zayer, L. T. (2015). Students' Perceptions and Experiences of Social Media in Higher  
307 Education. *Journal of Marketing Education*, 37(3), 133–143.  
308 <https://doi.org/10.1177/0273475315583748>
- 309 Nekaris, B. K. A. I., Campbell, N., Coggins, T. G., Rode, E. J., & Nijman, V. (2013). Tickled to Death:  
310 Analysing Public Perceptions of “Cute” Videos of Threatened Species (Slow Lorises - *Nycticebus*  
311 *spp.*) on Web 2.0 Sites. *PLoS ONE*, 8(7), 1–10. <https://doi.org/10.1371/journal.pone.0069215>
- 312 Pang, J., & Zhang, Y. (2015). A new access control scheme for Facebook-style social networks.  
313 *Computers & Security*, 54, 44–59. <https://doi.org/10.1016/j.cose.2015.04.013>
- 314 Passariello, P. (1999). Me and my totem: cross-cultural attitudes towards animals. In F. L. Dolins  
315 (Ed.), *Attitudes to Animals: Views in Animal Welfare* (pp. 12–25). Cambridge: Cambridge  
316 University Press.
- 317 R Core Team (2019). R: A language and environment for statistical  
318 computing. R Foundation for Statistical Computing, Vienna,  
319 Austria. URL <https://www.R-project.org/>.  
320
- 321 Raacke, J., & Bonds-Raacke, J. (2008). MySpace and Facebook: Applying the Uses and Gratifications  
322 Theory to Exploring Friend-Networking Sites. *CyberPsychology & Behavior*, 11(2), 169–174.  
323 <https://doi.org/10.1089/cpb.2007.0056>
- 324 Ross, S. R., Vreeman, V. M., & Lonsdorf, E. V. (2011). Specific image characteristics influence  
325 attitudes about chimpanzee conservation and use as pets. *PLoS ONE*, 6(7), 1–5.  
326 <https://doi.org/10.1371/journal.pone.0022050>
- 327 Ruths, D., & Pfeffer, J. (2014). Social media for large studies of behavior. *Science*, 346(6213), 1063–  
328 1064. <https://doi.org/10.1126/science.346.6213.1063>

329 Schroepfer, K. K., Rosati, A. G., Chartrand, T., & Hare, B. (2011). Use of “entertainment” chimpanzees  
330 in commercials distorts public perception regarding their conservation status. *PLoS ONE*, 6(10),  
331 1–8. <https://doi.org/10.1371/journal.pone.0026048>

332 Shilton, K., & Sayles, S. (2016). We aren’t all going to be on the same page about ethics: ethical  
333 practices and challenges in research on digital and social media. *Proceedings of the Annual*  
334 *Hawaii International Conference on System Sciences, 2016-March*, 1909–1918.  
335 <https://doi.org/10.1109/HICSS.2016.242>

336 Smith, C. (2016). The Conceptual Incoherence of “Culture” in American Sociology. *American*  
337 *Sociologist*, 47(4), 388–415. <https://doi.org/10.1007/s12108-016-9308-y>

338 Stinson, elizabeth. (2016). Facebook Reactions, the Totally Redesigned Like Button, Is Here | WIRED.  
339 Retrieved July 17, 2018, from WIRED Magazine website:  
340 <https://www.wired.com/2016/02/facebook-reactions-totally-redesigned-like-button/>

341 Vickery, J. R. (2014). The curious case of Confession Bear: The reappropriation of online macro-image  
342 memes. *Information Communication and Society*, 17(3), 301–325.  
343 <https://doi.org/10.1080/1369118X.2013.871056>

344 Zickuhr, K., & Madden, M. (2012). For the first time , half of adults ages 65 and older are online. *PEW*  
345 *Internet and American Life Project*, 23. Retrieved from  
346 [http://www.pewinternet.org/~media/Files/Reports/2012/PIP\\_Older\\_adults\\_and\\_internet\\_us](http://www.pewinternet.org/~media/Files/Reports/2012/PIP_Older_adults_and_internet_us)  
347 [e.pdf](http://www.pewinternet.org/~media/Files/Reports/2012/PIP_Older_adults_and_internet_us)

348  
349  
350  
351