Research Articles

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Measuring the Effectiveness of Value-Framing and Message Valence on Audience Engagement Across Countries

Katie Blake [1] , Takahiro Kubo [1,2] , Diogo Veríssimo [1]

[1] *Department of Biology, University of Oxford, Oxford, United Kingdom.* **[2]** *Biodiversity Division, National Institute for Environmental Studies, Tsukuba, Japan.*

Corresponding Author: Katie Blake, Department of Biology, 11a Mansfield Road, Oxford, OX1 3SZ, United Kingdom. E-mail: klblake25@gmail.com

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Abstract

Changing public behaviour is an essential step for successful conservation, and can be achieved through effective use of message framing. However, its use in the conservation sector is not well-studied. We first performed a content analysis to assess what types of framing styles environmental non-governmental organisations (ENGOs) often employ for their social media posts. We then ran a real-world online fundraising campaign to examine the influence of value-framing ('Intrinsic' and 'Extrinsic') and message valence ('Positive' and 'Negative') on audience engagement with the advertisements, across five countries. Altogether, ENGOs generally used 'Positive' framing for their posts significantly more often than 'Negative', but did not use one type of value-framing more than the other. For the fundraising campaign, there were significant differences between countries' engagement with the advertisements. However, click-through rates did not significantly differ when using types of value-framing nor message valence, and no donations were received to support the campaign. These results may show that message valence and value-framing alone have little influence on audience engagement, if any, at least in the context of social media. To enhance campaign success for the future, it is recommended that conservationists offer concrete information regarding fundraising outcomes, and activate social norms.

Keywords

Non-Technical Summary

Background

Environmental problems are largely caused by human actions; therefore, changing public behaviour is an essential step for successful conservation. To motivate public engagement with this issue, conservationists may use 'framing' (a communication device used to emphasise specific aspects of a message). Two approaches to this in conservation communications include using types of value-framing (where the extrinsic or intrinsic value of biodiversity is emphasised) and message valence (where the positive or negative outcomes of engaging with a subject are highlighted).

Why was this study done?

To date, the impact of using different types of value-framing and message valence to motivate pro-environmental behaviours is unclear. This could be due to a scarcity of experiments on this subject in the conservation sector, as well as methodological shortcomings of the existing research. As examples, studies would benefit from providing findings with increased external validity, including multinational comparison to avoid Western biases, and empirically gauging actual behavioural changes (rather than only attitudes and intentions). We therefore set out to address these limitations, to both provide more robust evidence on the use of framing for conservation communications, and help settle the debate on this matter.

What did the researchers do and find?

We first assessed what framing styles environmental non-governmental organisations (ENGOs) often employ for their social media posts. We then conducted a real-world online fundraising campaign (run across five countries, and focusing on the Western Ghats) on social media to examine how types of value-framing and message valence would influence user engagement with advertisements. Altogether, ENGOs used positive framing for their social media posts substantially more often than negative, but generally did not use one type of value-framing more than the other. For the fundraising campaign, there were significant differences between countries' engagement with the advertisements: notably, users in India were most likely to click on the advertisements, whilst users in Western countries (United Kingdom and United States of America) were least likely. However, users did not show any substantial preferences for types of value-framing nor message valence when clicking on advertisements. Furthermore, the campaign did not yield any donations.

What do these findings mean?

This is one of the more methodologically robust studies to assess the impacts of message framing for biodiversity conservation. The large disparities in engagement rates between

countries is an important finding, highlighting the need to account for differences between audiences when planning campaigns. Regarding the overall impact of framing, these results may show that message valence and value-framing alone have little influence on audience engagement, if any, at least in the context of social media. Finally, we discuss how other features of message design may promote the success of future online campaigns, such as providing concrete information regarding fundraising outcomes, as well as activating social norms.

Highlights

- ENGOs across countries prefer using types of message valence, but not value-framing.
- Engagement with conservation advertisements significantly differs across countries.
- Framing does not impact click-through rates, nor elicit donations, on social media.
- Engagement rates do not support ENGOs' preferred use of framing styles.
- The impact of message framing for conservation campaigns may be overstated.

Message Framing for Environmental Topics

Environmental problems are largely caused by humans, so changing public behaviour is essential for successful conservation (Reddy et al., 2017; Schultz, 2011). To attract public attention to environmental issues and motivate positive engagement, conservationists may employ 'message framing' – a communication device used to emphasise specific aspects of a message, and change how it is perceived (Kolandai-Matchett & Armoudian, 2020; Li & Su, 2018).

One common framing style that has received much attention is use of message valence (see Bolsen, 2011; Bortree et al., 2012; Özgen et al., 2015; Walker et al., 2019), where the positive or negative outcomes of engaging with a subject are highlighted (Li et al., 2021; Maheswaran & Meyers-Levy, 1990). Additionally, communications may include value-framing (see Blackmore et al., 2013; Maze et al., 2016; Pascual et al., 2022; Uggla, 2018) to outline the extrinsic or intrinsic value of nature and its protection. As examples, extrinsic framing may prioritise financial incentives, ecosystem services, or social image, whereas intrinsic framing could emphasise an appreciation for nature being beautiful or having value for its own sake (Blackmore et al., 2013; Pascual et al., 2022). Movements such as Earth Optimism (https://www.earthoptimism.cambridgeconservation.org/) and Conservation Optimism (https://conservationoptimism.org/) have promoted the use of positive framing to emphasise the value of nature, and the importance of conservation work. However, it has been suggested that messages are often not constructed based on robust evidence (Kidd, Garrard, et al., 2019).

To date, the impact of using different frames remains unclear (Florence et al., 2022; Li & Su, 2018; Stadlthanner et al., 2022). Although some studies on environmental topics

advocate the use of negative framing (see Gómez-Carmona et al., 2021; Li et al., 2021), others favour positive framing (see Chi et al., 2021; Spence & Pidgeon, 2010; Zubair et al., 2020). For biodiversity conservation specifically, some studies show that types of valence do not significantly differ in their influence on message recipients' behaviour (e.g., donating to conservation charities, plastic bag usage, and interactions with coral reefs and wildlife whilst snorkelling; Nelson et al., 2020; Nelson et al., 2021). Yet, others suggest audiences indeed respond best to positive-framed messages (e.g., improving opinions and tolerance of wildlife, as well as willingness to donate to environmental organisations; Ballejo et al., 2021; Casola et al., 2020; Jacobson et al., 2019). This contrasts with theories of negativity bias in information processing (Taylor, 1991), whereby individuals tend to exhibit loss aversion: when facing equivalent positive and negative messages, the impact of losses is more persuasive (Kahneman & Tversky, 1979), especially when recipients aim to minimise monetary or psychological losses (Tsai, 2007). Rather, it is arguable that people only have a limited capacity for concern (Nordhaus & Shellenberger, 2009), so they may deliberately avoid negative information, and thus psychological discomfort (i.e., the "ostrich effect" in economics; Karlsson et al., 2009). This could be particularly true for individuals who have low involvement with the message topic, and have less reason to fully evaluate the outcomes of how they respond (Meyers-Levy & Maheswaran, 2004). Therefore, conservation messages that emphasise loss may overall inhibit pro-environmental action (Jacobson et al., 2019).

A lack of consensus on the most effective employment of framing styles has also emerged for the use value-framing. Some researchers have found extrinsic frames effective to improve participants' pro-environmental attitudes, intentions, and behaviour (Ropret Homar & Cvelbar, 2021), such as for purchasing green products (Segev et al., 2015). Others have found no differences between the effectiveness of the frames for motivating target behaviours (Steinhorst et al., 2015), or recommended using a combination of both framing styles (Mueller & Maes, 2015). However, intrinsic framing has been favoured to motivate pro-environmental behaviour (Bayram, 2012; Blackmore et al., 2013; Pelletier & Sharp, 2008), and advocated for use to reflect traditional conservation principles (Fisher & Brown, 2014). The overjustification hypothesis (based on self-perception theory; Bem, 1967), may support this preference. If message recipients attribute their behaviour to the potential for extrinsic rewards (e.g., financial incentives), rather than intrinsic motivations, they may show less willingness to behave pro-socially in order to avoid perceiving themselves as greedy (Bénabou & Tirole, 2006; Bolderdijk et al., 2013). Therefore, even where both extrinsic and intrinsic benefits are legitimate motivations to improve pro-environmental behaviour, it may be more effective to focus on intrinsic framing, and leave obvious financial implications unsaid (Schwartz et al., 2015). In addition to the argument of self-perception theory, intrinsic framing may be more effective to use because pro-environmental behaviours often return to a baseline level when extrinsic motivators are no longer available (Lehman & Geller, 2004; van der

Linden, 2015). In contrast, intrinsic framing arguably leads to deeper engagement with, and processing of, message information (Vansteenkiste et al., 2006; Pelletier & Sharp, 2008), increased persistence with learning about a subject (such as recycling and ecology; Vansteenkiste et al., 2004), and behaviours linked to a genuine desire to protect the environment (Bayram, 2012).

Framing as a Knowledge Gap

Although practitioners may advocate positive and intrinsic framing, evidence regarding audience engagement with conservationists' communication strategies is scarce (Kidd et al., 2019b; Kusmanoff, 2017), and methodological approaches in the past literature may underpin debate on these framing styles. Firstly, research on this topic has typically not reached the level of rigour demonstrated in other fields where message framing is commonly implemented (such as public health; Kidd, Garrard, et al., 2019), and suffers from low statistical power and external validity (Reddy et al., 2020). Secondly, the field would benefit from more multinational comparisons (Badullovich et al., 2020), since attitudes and behaviours are context-contingent and can vary greatly between Western and non-Western cultures (Riemer et al., 2014). Finally, much of the current research evaluating the influence of message framing for environmental topics fails to empirically gauge behavioural changes (Badullovich et al., 2020; Ropret Homar & Cvelbar, 2021; Nelson et al., 2020). This is problematic, given that participants' attitudes and intentions are not necessarily indicative of their actual behaviours (Kollmuss & Agyeman, 2002; Seip & Strand, 1992). To address these limitations, it could be useful to advance recent work on how social media content may influence engagement (see Ballejo et al., 2021; Casola et al., 2020; Jacobson et al., 2019; Kubo et al., 2023; Shreedhar, 2021; Vu et al., 2019). Whilst previous research in this area has communicated messages using offline materials (e.g., posters and leaflets; Grazzini et al., 2018; Nelson et al., 2021; Salazar et al., 2022), audiences are increasingly sourcing information digitally (Jacobson et al., 2019). Therefore, using social media can efficiently expand the global reach of messages (Casola et al., 2020), easily supplying large sample sizes, allowing multinational comparisons, and improving external validity by observing recipients in a natural setting. Additionally, social media platforms facilitate measurements of behavioural changes, by tracking click-through rates and donations elicited by post content (Kubo et al., 2023; Shreedhar, 2021).

Altogether, it is clear that conservationists must generate more robust evidence on this matter, to better gauge the effectiveness of framing styles and therefore optimise their message designs (Kidd et al., 2019a; MacFarlane et al., 2022). The following research aims to accomplish this, to help settle the debate on the use of message framing in conservation communications. Two studies will be conducted. First, a content analysis to assess what framing styles environmental non-governmental organisations (ENGOs) are commonly employing for their social media posts. Second, an online field experiment to test which message frames ('Negative'/'Positive' and 'Extrinsic'/'Intrinsic') most effec-

tively engage audiences with real-world ENGO appeals, measured through click-through rates (CTRs) and donations received. Based on the literature discussed, the following hypotheses are made:

- **H1**: Advertisements will generally elicit higher CTRs when using 'Intrinsic' rather than 'Extrinsic' framing.
- **H2**: Advertisements will generally elicit higher CTRs when using 'Positive' rather than 'Negative' framing.
- **H3**: Advertisements will generally receive more donations when using 'Intrinsic' rather than 'Extrinsic' framing.
- **H4**: Advertisements will generally receive more donations when using 'Positive' rather than 'Negative' framing.

Study 1: Content Analysis

Method

To understand how ENGOs frame their messages on social media, we performed a content analysis on their Facebook posts. Studied organisations were members of the International Union for Conservation of Nature (IUCN); as of February 2022, 102 international ENGOs and 1,046 national ENGOs were Members. To allow multinational comparison, studied ENGOs were located across the following five countries: United Kingdom (UK), United States of America (USA), South Africa, India, and Brazil. The top five organisations (by number of Facebook followers) in each country were analysed, leading to a total of 25 ENGOs included in the content analysis (see Table A1 Appendix 1). Data collection was conducted between November 21, 2021 and January 28, 2022. For each organisation, the content included for analysis consisted of a maximum of 100 posts, uploaded within the previous 12 months, that predominantly used: either 'Intrinsic' or 'Extrinsic' value-framing *and* either 'Positive' or 'Negative' valence. In this context, the message frame styles were defined as:

- 'Intrinsic' (an entity is inherently valuable, regardless of any use it may have to others).
- 'Extrinsic' (an entity is valued, and therefore worth protecting, because it is valuable to others).
- 'Positive' (communicates the positive outcomes that could occur if audiences take action).
- 'Negative' (warns audiences about the potential negative implications of not taking action).

Posts were assessed by a single coder. Examples where the use of framing was ambiguous were discussed with a second coder. We performed Chi-Square Goodness of Fit Tests

to determine whether organisations' social media posts generally favoured 'Intrinsic' or 'Extrinsic' frames, as well as 'Positive' or 'Negative' valence. Tests were performed using R (v4.2.2; R Core Team, 2022) in RStudio (Posit Team, 2022), with packages *rcompanion* (v2.4.18; Mangiafico, 2022) and *DescTools* (v0.99.47; Andri et al. 2022).

Results

The usage of message frame styles by country is shown in Table A2 (Appendix 2). The sample included 2,074 Facebook posts, with content from: the UK (20.11%), USA (16.20%), South Africa (24.11%), India (18.61%), and Brazil (20.97%).

Figure 1

Usage of the Four Message Frame Styles Across the Five Countries
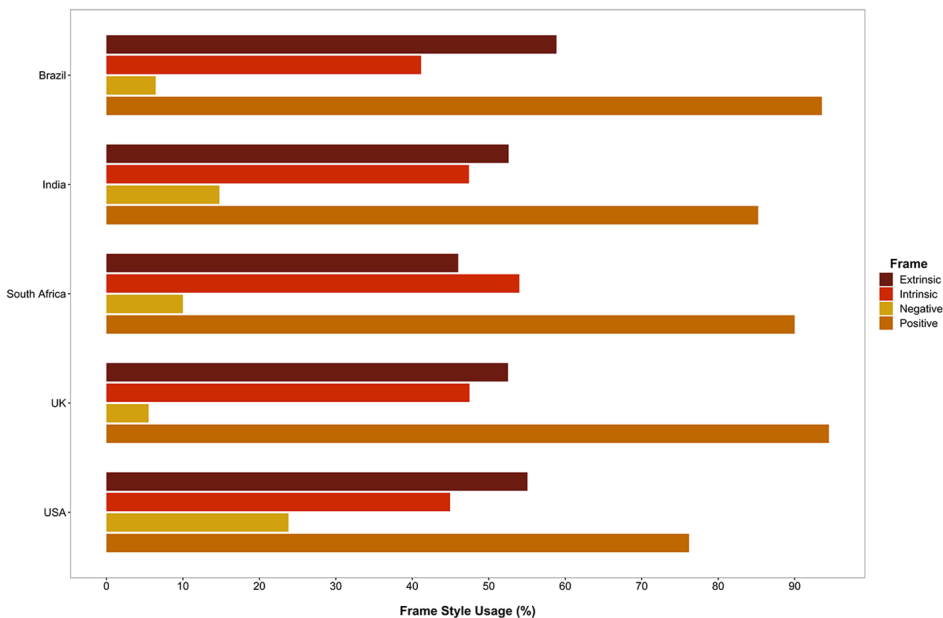
Note. The four message frame styles are Extrinsic, Intrinsic, Negative, Positive. Usage is measured as a percentage.

Figure 1 shows how often framing styles were used within countries. Besides South Africa, countries more frequently focused on 'Extrinsic' than 'Intrinsic' framing for their posts. Only Brazil showed a significant difference in their use of value-framing (see Table 1 for statistics), but the effect size was small (Cohen, 1988). Compared to other countries, Brazil used 'Extrinsic' framing the most often (and 'Intrinsic' the least). 'Positive' frames were used significantly more often than 'Negative' by the UK, USA, South Africa, India,

Table 1

Chi-Square Goodness of Fit Test Results for the Usage of Message Frame Styles Across All Five Countries

Country	N	X^2	df	95% CI[a]		Cramer's V
				Extrinsic/Negative	Intrinsic/Positive	
				Value-framing		
Brazil	435	13.63***	1	[54.25, 63.78]	[36.55, 46.08]	.18
India	386	1.04	1	[47.67, 57.96]	[42.49, 52.78]	.05
South Africa	500	3.20	1	[41.60, 50.65]	[49.60, 58.65]	.08
UK	417	1.06	1	[47.72, 57.63]	[42.69, 52.60]	.05
USA	336	3.44	1	[49.70, 60.66]	[39.58, 50.54]	.10
				Message valence		
Brazil	435	330.21***	1	[4.37, 8.64]	[91.49, 95.77]	.87
India	386	191.67***	1	[11.40, 18.21]	[81.87, 88.68]	.70
South Africa	500	320.00***	1	[7.60, 12.59]	[87.60, 92.59]	.80
UK	417	330.07***	1	[3.60, 7.63]	[92.57, 96.60]	.89
USA	336	92.19***	1	[19.35, 28.36]	[71.73, 80.74]	.52

[a]95% CIs for extrinsic versus intrinsic value-framing, and negative versus positive message valence.
*p < .05. **p < .01. ***p < .001.

and Brazil, with all countries showing large effect sizes (Cohen, 1988). 'Positive' framing was used most often in the UK, and least often in the USA (where 'Negative' framing was used the most often compared to the other four countries). Overall, 'Extrinsic Positive' was the most employed framing style combination, followed by 'Intrinsic Positive', 'Intrinsic Negative', then 'Extrinsic Negative' (see Figure A1 Appendix 3).

Study 2: Online Field Experiment

Method

To test how message framing can influence audience engagement and donation behaviour, we designed four advertisements for a British ENGO's campaign to help protect the Western Ghats (one of the planet's biodiversity hotspots; Sreekumar et al., 2020). Aside from exceptional natural beauty, the Western Ghats is home to many threatened species endemic to this region, including the Lion-Tailed Macaque (*Macaca silenus*), as well as some of the largest remaining populations megafauna, such as the Asian Elephant (*Elephas maximus*) and Tiger (*Panthera tigris*). The Western Ghats is also immensely

valuable for sustaining the livelihoods of over 200 million people, by providing essential natural resources for medicine and sustenance (Sreekumar et al., 2020), alongside ecosystem services that maintain water security in the peninsular Indian states (Ramachandra & Bharath, 2020). Despite the abundance of reasons to preserve this landscape, only 10% of the Western Ghats is legally protected (Ramachandra & Bharath, 2020). Consequently, ongoing threats to this region (e.g., deforestation) pose social, economic, and ecological implications for all species who depend on it (Jha et al., 2000). Altogether, the four advertisements (see Figure 2 and Blake et al., 2023c) used this information to combine either 'Extrinsic' or 'Intrinsic' value-framing with 'Negative' or 'Positive' message valence. The presentation and organisation of text and visuals was inspired by materials used in previous research on framing environmental topics, such as plastic usage and protecting marine life (see Grazzini et al., 2018; Nelson et al., 2020; Nelson et al., 2021). All advertisements were 12 seconds in length, and used identical visuals and composition (with only the four types of framing styles differentiating them). Additionally, advertisements were available with both 4:5 and 9:16 aspect ratios to ensure the messages could be correctly displayed across devices and social media platforms. A 'Donate Now' button was embedded into each advertisement, made using a JustGiving.com plugin. When clicking this button, a pop-up window opened to provide options for users to financially support the campaign.

The research design was a 2 x 2 between-subjects experiment, using voluntary sampling. To strive to create more comparable sample sizes across conditions, we set up all four campaigns on a web—"traffic"—objective (where advertisements are shown to users most likely to click on them), based on the auction buying type with the same budget. The advertisement delivery was optimised for link clicks with no cost-per-result goal. In order to test a sample as representative as possible of potential donors, the target audience for all campaigns was selected to be adults (at least 18 years old) of all demographics, interests, and behaviours. Users' personal information was not collected, so a more extensive sample description is not available. Advertisements were presented in English when shown in the USA, UK, India, and South Africa, and in Portuguese when shown in Brazil. Advertisements were run from March 21 to 30, 2022; placements where advertisements were displayed were selected manually in the standard inventory, and excluded those available outside of Facebook and Instagram (as well as Facebook Right Column, Instagram Shop, Messenger Inbox, and Facebook Group Feed). To ensure that the adverts were displayed in equivalent environments, they were presented on: Facebook's Feed, Marketplace, Stories, Instant Articles, Video Feed, and Messenger Stories, as well as Instagram's Feed, Explore, Stories, and Reels. Furthermore, advertisements could be seen on both social media platforms' in-stream (as skippable ads in videos), or found using the Search bars. The total budget allocated to this campaign was divided between the four advertisements; these were removed from both Facebook and Instagram once all money was spent, and data collection ended.

PsychOpen GOLD

Figure 2

Screenshots of the Advertisements Using Types of Message Valence (X-Axis) And Value-Framing (Y-Axis)
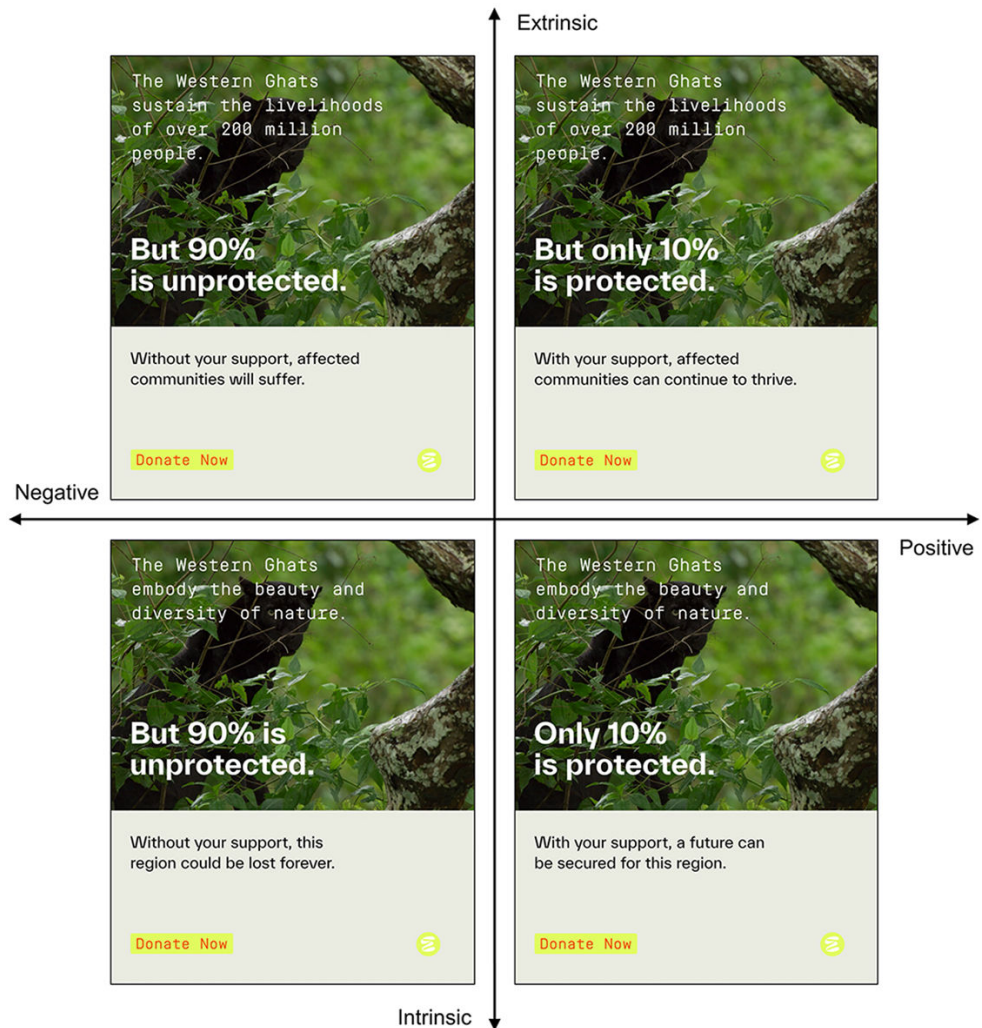
The dataset was obtained using Meta Ads Manager. For each of the four advertisements, the key outcome variables collected for analysis were click-through rates (CTRs) and donations (the total financial value of donations received from users). To calculate CTRs, clicks to website (the number of times users followed a hyperlink to go to the donation webpage) were divided by impressions (the number of times adverts were

presented on-screen to users). This engagement behaviour was measured because link clicks on advertisements could be interpreted as donation intentions (Jilke et al., 2019). To calculate the overall CTR for advertisements using 'Extrinsic' framing, we combined the results for 'Extrinsic Negative' and 'Extrinsic Positive'. To calculate the overall CTR for advertisements using 'Negative' framing, we combined the results for 'Extrinsic Negative' and 'Intrinsic Negative'. The same processes were used for 'Intrinsic' and 'Positive' framing. Other variables regarding users' social actions were also measured (see Table A3 Appendix 4).

We used beta regression to test the hypotheses and predict the effect of framing across countries. Dummy variables were created for message valence, value-framing, and country; the reference levels used for comparison were 'Positive' framing, 'Intrinsic' framing, and the USA, respectively. Beta regression was performed using R (v3.6.0 Mangiafico, 2022) in R Studio (Posit Team, 2022).

Results

The number of impressions and clicks to website for the frames across each country can be seen in Table A4 (see Appendix 5). The predicted effects of framing styles on CTRs across countries, according to the regression analysis, can be seen in Figure 3, Table 2, and Table 3. A significant main effect of country on CTRs was found: CTRs were significantly highest in India, and lowest in the UK (followed by the USA). Results for Brazil and South Africa did not significantly differ from each other. The influence of frames on CTRs within countries varied, but there were not any significant differences in the effectiveness of message frames (except in India, where 'Intrinsic Positive' messages yielded significantly higher CTRs than 'Extrinsic Negative'). Although CTRs were generally higher when advertisements used 'Intrinsic' and 'Positive' framing, there were not significant main effects of value-framing nor message valence on CTRs. Therefore, hypotheses H1 and H2 (that advertisements would elicit higher CTRs when using 'Intrinsic' rather than 'Extrinsic', and 'Positive' rather than 'Negative', framing) were not supported.

Regardless of the differences in CTRs for each of the adverts across all five countries, no donations were received in response to any of the advertisements to support the Western Ghats campaign. As such, neither hypothesis H3 nor H4 (regarding a greater effect being found for 'Intrinsic' value-framing and 'Positive' message valence to attract donations) was supported.

Figure 3

A Point Plot Showing the Predicted Effect of Four Types of Message Frames on CTRs (With Error Bars), Across the Five Countries
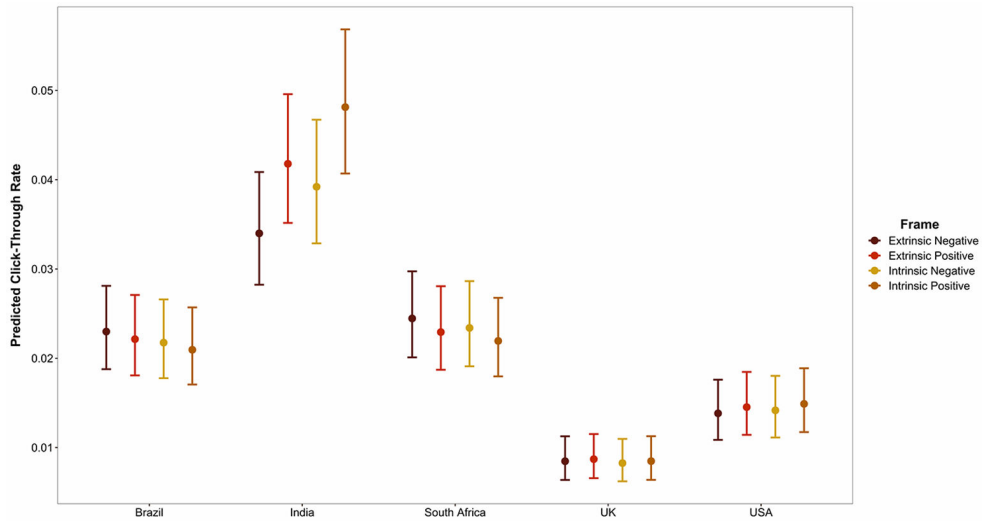

Table 2

Regression Results Showing the Predicted Click-Through Rates for Adverts Shown Across the Five Countries

	Message Frame Style							
	Extrinsic Negative		Extrinsic Positive		Intrinsic Negative		Intrinsic Positive	
Country	Pred.	95% CI	Pred.	95% CI	Pred.	95% CI	Pred.	95% CI
Brazil	0.02	[.02, .03]	0.02	[.02, .03]	0.02	[.02, .03]	0.02	[.02, .03]
India	0.03	[.03, .04]	0.04	[.04, .05]	0.04	[.03, .05]	0.05	[.04, .06]
South Africa	0.02	[.02, .03]	0.02	[.02, .03]	0.02	[.02, .03]	0.02	[.02, .03]
UK	0.01	[.01, .01]	0.01	[.01, .01]	0.01	[.01, .01]	0.01	[.01, .01]
USA	0.01	[.01, .02]	0.01	[.01, .02]	0.01	[.01, .02]	0.01	[.01, .02]

Note. Pred. = Predicted.

Table 3

Regression Results for the Effect of Message Framing and Country on Click-Through Rates

Variable	Coefficient
Negative	-0.05 (0.11)
Extrinsic	-0.02 (0.11)
Brazil	0.35** (0.12)
India	1.21*** (0.12)
South Africa	0.39*** (0.12)
UK	-0.57*** (0.15)
Negative x Brazil	0.09 (0.14)
Negative x India	-0.16 (0.13)
Negative x South Africa	0.12 (0.14)
Negative x UK	0.02 (0.18)
Brazil x Extrinsic	0.08 (0.14)
India x Extrinsic	-0.12 (0.12)
South Africa x Extrinsic	0.07 (0.14)
UK x Extrinsic	0.05 (0.18)

Note. Standard errors reported in parentheses.

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

Discussion

This research explored the use of framing in conservation advertisements across countries, and contributes to the ongoing debate about the impact of framing styles to influence public support for biodiversity conservation. Overall, the content analysis revealed no significant preferences in ENGOs' use of value-framing (besides in Brazil), but 'Positive' message valence was favoured across all countries. Regarding the online campaign, although advertisements using 'Intrinsic' and 'Positive' framing received higher CTRs than those using 'Extrinsic' and 'Negative' framing, these differences were not statistically significant. Furthermore, no donations were received.

The Use of Frames for Conservation Messages

Differences Across Countries

In contrast to past literature on conservationists' use of framing (e.g., Blackmore et al., 2013; Bolsen, 2011; Bortree et al., 2012; Pascual et al., 2022), our content analysis revealed that ENGOS across all countries overwhelmingly favoured use of 'Positive' message valence, but typically did not strongly prefer either 'Intrinsic' or 'Extrinsic' value-framing. This finding may partially support claims that conservation messages are

often not constructed based on robust evidence (Kidd, Garrard, et al., 2019), as differences in CTRs were not statistically significant, and no donations were received for any of the advertisements. Thus, perhaps these framing styles make little difference on audience engagement, and do not support the disproportionate use of 'Positive' over 'Negative' framing by all countries.

Although the use of framing styles across countries was generally similar, it can also be helpful to understand how the effectiveness of framing differs for audiences across geographical and cultural contexts (Vu et al., 2019). This is strategic when planning future campaigns, given their substantial cost implications. Because many experimental studies on environmental framing have focused primarily on Western countries (Badullovich et al., 2020; Florence et al., 2022), the inclusion of multinational comparison was a strength of our study, and the following could explain the results. Firstly, Western cultures (notably, the USA and UK) have often shown self-interest and independence (Kohls, 1984; Schultz & Zelezny, 2003; Triandis, 1996), whereas Eastern cultures instead promote interdependence and relatedness to others (Markus & Kitayama, 1991). If such values persist today, perhaps this partly underpins why the UK and USA had comparatively lower CTRs than other countries. Adding to this, perceptions of conservation actions could be linked to the extent that they impact the lives of local residents (Sandbrook et al., 2019), and engagement with messages on climate change has been higher when focusing on local rather than global consequences (Scannell & Gifford, 2013). Taken together, perhaps this explains why lower-income countries (i.e., Brazil, South Africa, and India) showed significantly higher CTRs than higher-income countries (i.e., UK and USA). Furthermore, users' closer proximity to the Western Ghats may explain why CTRs were highest in India.

Differences Between Frames

The results for CTRs are consistent with past literature on this subject, where engagement with conservation messages was not significantly influenced by using different types of message valence (see Nelson et al., 2020; Nelson et al., 2021), nor value-framing (see Steinhorst et al., 2015). On the one hand, these null results support recent suggestions that the impact of framing is extremely small, if existent (Szaszi et al., 2022). Perhaps, as Li and Su (2018) considered, the influence of message framing on outcome variables has been overstated due to publication bias—where social science experiments with statistically significant results can be as much as three times more likely to be published in peer-reviewed journals than those with null results (Franco et al., 2014). Alternatively, it should be acknowledged that the number of repeated exposures needed for advertisements to be effective can vary (Schmidt & Eisend, 2015), so under-scaled studies may explain non-significant influences on behaviours (Doughty et al., 2021). Since the results did move in the expected direction (where 'Intrinsic' and 'Positive' framing led to higher CTRs than the alternative framing styles), perhaps repeating this

experiment for a longer time period could provide a larger sample size and enhance the frequency of exposures recipients have to messages, to potentially uncover small but statistically significant effects. To further reflect on our research design, even though field experiments can enhance the external validity of findings (Borah & Xiao, 2018), future work could benefit from being complemented by laboratory studies (as seen in Grazzini et al., 2018). Thus far, there appears to be almost twice as many observational than experimental studies on framing environmental topics (see Badullovich et al., 2020). Yet, controlled settings can allow researchers to better understand the mechanisms that drive effects (Gneezy, 2017), such as differences in audience demographics and cognition. Specific to our research, follow-up studies would benefit from including a control group which is exposed to an advertisement that does not use message framing. As seen in the experiments by Nelson et al. (2020) and Nelson et al. (2021), this would offer insight into whether using any framing styles (even if they do not significantly differ from each other) is clearly more effective at influencing target behaviours than not using framing styles at all.

It is also important to explore why no donations were received (given that link clicks on advertisements can signify donation intentions; Jilke et al., 2019). This result has similarities with other recent studies: Shreedhar (2021) found that conservation campaigns on social media may not attract donations regardless of differences in CTRs, whilst a similar study by Kubo et al. (2023) received a very low amount in donations relative to their number of impressions and donation page views. CTRs have therefore been judged as inappropriate proxies for behaviours such as donations (Kubo et al., 2023; Shreedhar, 2021); because intentions are not necessarily indicative of actual behaviours (Kollmuss & Agyeman, 2002; Seip & Strand, 1992), relying solely on such metrics can result in misleading overestimates of message impacts (Doughty et al., 2021). Hence, measuring donations was a strength of this research: a multi-pronged evaluation of impacts allows for more accurate interpretation of whether messages were successful (Doughty et al., 2021). From such an approach it can clearly be deduced that regardless of how types of message valence or value-framing may differ in their appeal, more needs to be done to strategically enhance the success of conservation messages across countries, and transform CTRs into actual donations. The use of multinational comparison also reinforces this conclusion: despite the main effect of country for message engagement (where India yielded significantly higher rates than other countries), proximity to the Western Ghats also did not motivate monetary support.

How Conservation Messaging Could Be Improved

Our investigation addresses frequently stated limitations of past studies (particularly, by including measurements of actual behaviours rather than attitudes or intentions). Notably, it benefitted from evaluating the impact of a real online campaign across multiple countries; the use of online advertising is an increasingly important means for

fundraising, and the potential revenue from this is set to rise (Lacetera et al., 2016). However, given that successful fundraising is essential for conservation efforts, it must be explored why the advertisements in this experiment did not attract monetary support. It is plausible that this occurred because the advertisements primarily focused on raising audiences' awareness about the value of the Western Ghats—consistent with a traditional and commonly employed communication strategy, based on the 'knowledge-deficit model' (Kidd, Garrard, et al., 2019). This approach is predicated on the assumption that message recipients will change their behaviour if given the right information (Schultz, 2002). Whilst it is reasonable to expect that raising awareness about biodiversity is an important part of conservation messaging (Kidd, Garrard, et al., 2019), the evidence presented here supports arguments that conservationists should not solely depend on this model (see Schultz, 2002; Schultz, 2011; Toomey et al., 2017). Therefore, in addition to raising public awareness about biodiversity using types of value-framing and message valence, these findings demonstrate that conservationists must consider what *else* these messages need to be effective.

One approach to improve audiences' responses to conservation messages could be using more concrete, rather than abstract, information. Simply put, this refers to *how* someone may take action, rather than *why* they should take action, respectively (Grazzini et al., 2018; Zhu et al., 2017). Concrete messages that transparently provide detailed information on how donations will be implemented are perceived as more credible, and are associated with increased message and organisational trustworthiness (Xiao et al., 2022). Given that source trustworthiness is a critical antecedent to donation intentions (Wiencierz et al., 2015), fundraising initiatives should provide potential donors with concrete information. Past research has shown that messages with more detailed fundraising outcomes (i.e., specific details on how donations could help to provide support for families fighting cancer) led to greater intentions to donate than those with more abstract information (Xiao et al., 2022), and that the influence of message valence becomes more pronounced when using concrete information (Grazzini et al., 2018). The advertisements designed for the Western Ghats campaign arguably focused considerably more on abstract information, and the donation page on JustGiving.com did not offer any details on how donations would be used. Combined, perhaps the lack of detailed information regarding fundraising outcomes contributed to why no donations were received. For future research, conservationists should consider the role that such approaches may have for the effectiveness of message designs, especially when striving to accomplish more than raising awareness on a subject.

A second explanation for the lack of donations stems from the use of social media. The effectiveness of messaging could be leveraged using social influence (White et al., 2019), as people may engage in pro-social behaviours due to concerns regarding their social image (Kristofferson et al., 2014). However, social media offers costless opportunities to show support for campaigns: exhibiting an "illusion of activism", users can

support a cause by "liking" or "favouring" Facebook or Twitter posts, without needing to donate or engage further (Kristofferson et al., 2014; Lacetera et al., 2016). Indeed, this issue was evidenced in a large-scale study by Lacetera et al. (2016), as well as the current research (where advertisements did not attract donations, but received a substantial number of social actions such as "likes", especially in India). Nevertheless, effective use of social influence could prove an asset for enhancing message success on social media. As examples, participants have generated more charitable donations (via clicks on a keyboard) when required to publicly announce how many times they clicked (Ariely et al., 2009), and have been more likely to support a cause when knowing others' contributions (Kubo et al., 2018). Moreover, 'seed money' frames, where messages announce what percentage of a fundraising target has already been reached, have been particularly effective at attracting donations for real-world campaigns (Kubo et al., 2018; Kubo et al., 2023). It has been suggested that progress bars for fundraising and deadlines can allow donors to gauge the success of campaigns and motivate donations (Choy & Schlagwein, 2016), and their use has therefore been recommended for fundraising on social media (Yoganathan et al., 2021). This research did not aim to test impacts of social influence, but it would be advantageous for future investigations to focus on this. For instance, conveying descriptive social norms (telling people what others do) may provoke conformity (Kubo et al., 2023; List & Lucking-Reiley, 2002), whilst expressing injunctive social norms (indicating what is commonly approved or disapproved of) could activate a sense of social responsibility to motivate target conservation behaviours (Thompson et al. 2015).

Using 'Positive' and 'Intrinsic' Framing

Given our findings, it could be beneficial for practitioners and future research to prioritise other framing styles and contextual information when communicating about biodiversity conservation. As examples, appealing to emotions, morality, public health, societal versus personal outcomes, or spatial and temporal distance from environmental issues has been popular in the literature on message framing (Kolandai-Matchett & Armoudian, 2020; Li & Su, 2018; Ropret Homar & Cvelbar, 2021). Nevertheless, exploring how to successfully employ 'Intrinsic' versus 'Extrinsic' value-framing and 'Positive' versus 'Negative' message valence is arguably still worthwhile. Messages about conservation that emphasise loss can inhibit pro-environmental action (Jacobson et al., 2019), perhaps because recipients may deliberately avoid negative information that would otherwise lead to psychological discomfort (Karlsson et al., 2009). In contrast, optimistic messages can be unifying and empowering—inspiring hope and collective action to achieve pro-environmental outcomes (de Lange et al., 2022; McAfee et al., 2019). Such an idea is fundamental to Common Cause (Blackmore et al., 2013), an organisation who advised that ENGOs should strive to promote collective activism and avoid disempowering messages that reduce recipients to merely passive sources of income. However, it should

be noted that optimistic appeals can risk complacency, where message recipients may deduce that there is less need for personal action (Hornsey & Fielding, 2016; Salazar et al., 2022). Conservationists have been advised to be clear that individual and collective support for conservation efforts remains vital (Brosch, 2021), but further research on this matter is needed to better understand the effectiveness of such an approach.

Regarding value-framing, conservationists have been criticised for prioritising the value of ecosystem services and economic growth to attract support for funding and policymaking (Fisher & Brown, 2014; Redford & Adams, 2009). Specifically, appealing to financial motivations could be problematic because this may transform moral or social issues into an economic trade-off (rather than being about the greater good; Handgraaf et al., 2013). Conservationists have therefore been encouraged to instead base their messages on the intrinsic value of the natural world (Blackmore et al., 2013), to elicit behaviours linked to a genuine desire to protect the environment (Bayram, 2012). However, the cultural heterogeneity in how audiences respond to environmental messages must be recognised (Sandbrook et al., 2019), where there can be varying tendencies to prefer self-transcendent (biospheric or altruistic), or self-enhancing (egoistic) value orientations (see De Groot & Steg, 2007; Schultz & Zelezny, 2003). Our experiment did not address this, so future research could assess this effect using framing styles detailed by Common Cause. As examples, messages may inspire action based on peoples' connection to nature and each other, or an appreciation of nature's beauty and potential for discovery (Blackmore et al., 2013). Although Common Cause argued that messages should avoid using extrinsic motivators related to organisations' and individuals' power or image, we again propose that it could be beneficial to explore whether activating social norms further affects message engagement. For example, farmers have been more willing to show pro-environmental behaviours, without monetary payment, when driven by social influence (Vaske et al., 2020). Unlike financial incentives, using social influence is advantageous here because social rewards do not require environmental groups to be better funded, nor do they crowd out intrinsic motivations (Handgraaf et al., 2013). Therefore, this provides an opportunity for conservationists to spread awareness of the inherent value of biodiversity, whilst also appealing to those who may be more influenced by extrinsic motivators like self-enhancement.

Conclusion

Framing is often employed to influence engagement with environmental messages, but there is ongoing debate regarding its effectiveness. Our investigation contributes novel evidence on this matter, whilst simultaneously addressing a variety of limitations presented in past studies. Overall, our results showed that ENGOs generally favoured 'Positive' framing for their posts over 'Negative', but did not use one type of value-framing significantly more often than the other. However, despite significant differences in how countries engaged with the advertisements, the results did not reveal significant differ-

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ences in the effectiveness of types of value-framing nor message valence for audience engagement with the online fundraising campaign. This research offers strategies for practitioners to consider when using these framing styles in the future. Conservationists are encouraged to further explore this field: it is critical that messages are optimally designed to attract public support for efforts that address ongoing ecological devastation.

Openness and Transparency Statements

The present article has been checked by its handling editor(s) for compliance with the journal's open science and transparency policies. The completed *Transparency Checklist* is publicly available at:
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Katie Blake: Methodology. Resources. Investigation. Formal analysis. Visualization. Writing – original draft.
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Diversity Statement. In the list below, the check mark (☑) indicates which steps were taken to increase diversity within the context of this paper. Steps that were not taken or did not apply are unmarked (☐).

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- ☑ Early career author(s)
- ☑ Degree of privilege/marginalization considered in authorship order
- ☐ Author(s) from sampled population (avoiding 'helicopter science')

Supplementary Materials. The following table provides an overview of the accessibility of supplementary materials (if any) for this paper.

Type of supplementary materials	Availability/Access
Data	Blake et al., 2023a
Code	Blake et al., 2023b
Material	Blake et al., 2023c
Study/Analysis preregistration	The reported studies were not preregistered.

Badges for Good Research Practices.

Open data: YES.

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Appendices

Appendix 1

Table A1

List of Environmental Non-Governmental Organisations Included for the Content Analysis, for Each Country

Country	Organisation
UK	Chester Zoo (North of England Zoological Society)
	Royal Society for the Protection of Birds RSPB
	The World Parrot Trust
	Twycross Zoo (East Midland Zoological Society)
	World Wide Fund for Nature (WWF UK)
USA	Center for Biodiversity and Conservation (American Museum of Natural History, New York)
	San Diego Zoo Global
	The Nature Conservancy
	World Surf League PURE
	World Wildlife Fund (WWF US)
South Africa	BirdLife South Africa
	Endangered Wildlife Trust
	Southern African Foundation for the Conservation of Coastal Birds
	Wildlife ACT Fund Trust
	World Wide Fund for Nature (WWF South Africa)
India	Balipara Tract & Frontier Foundation
	Bombay Natural History Society
	Wildlife Conservation Trust
	Wildlife Trust of India
	World Wide Fund for Nature (WWF India)
Brazil	Fundação o Boticário de Proteção à Natureza
	Instituto Conservation International do Brasil
	Instituto de Desenvolvimento Sustentável Mamirauá
	Instituto de Pesquisas Ecológicas
	World Wide Fund for Nature (WWF Brasil)

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Appendix 2

Table A2

The Total Usage of Message Frame Styles Across the Five Countries and All Countries Combined

Message Frame Styles	UK	USA	South Africa	India	Brazil	All Countries
Extrinsic	219	185	230	203	256	1,093
Intrinsic	198	151	270	183	179	981
Negative	23	80	50	57	28	238
Positive	394	256	450	329	407	1,836
Extrinsic Negative	10	33	27	27	18	115
Extrinsic Positive	209	152	203	176	238	978
Intrinsic Negative	13	47	23	30	10	123
Intrinsic Positive	185	104	247	153	169	858

Appendix 3

Figure A1

Usage of the Four Message Frame Styles ('Extrinsic Negative', 'Extrinsic Positive' 'Intrinsic Negative', 'Intrinsic Positive') Across the Five Countries
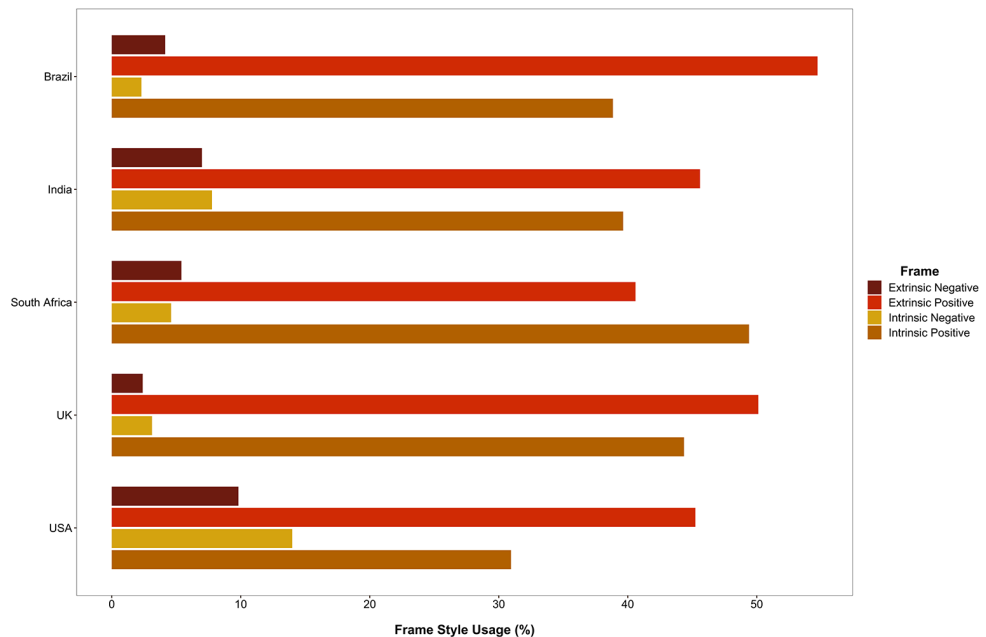
Note. Usage is measured as a percentage.

Appendix 4

Table A3

Total Frequencies for Social Actions Received for Each of the Four Advertisements Across the Five Countries

Message Frame Styles	Country	Post Likes	Post Comments	Post Shares	Post saves
Extrinsic Negative	Brazil	188	7	14	3
	India	1,078	6	10	4
	South Africa	111	2	2	2
	UK	23	0	3	1
	USA	34	5	6	1
Extrinsic Positive	Brazil	191	3	26	4
	India	1,447	8	6	9
	South Africa	102	4	3	5
	UK	30	2	0	1
	USA	25	0	1	2
Intrinsic Negative	Brazil	203	6	11	2
	India	909	6	9	3
	South Africa	87	4	2	5
	UK	29	3	2	1
	USA	70	4	4	2
Intrinsic Positive	Brazil	220	5	15	5
	India	783	6	9	3
	South Africa	98	1	4	3
	UK	31	1	5	1
	USA	60	3	7	2

Appendix 5

Table A4

Total Number of Clicks to Website and Impressions Made for Each of the Message Frame Styles Across the Five Countries

Message Frame Styles	Countries	Clicks to website	Impressions
Extrinsic	Brazil	23,476	1,006,906
	India	129,844	3,794,878
	South Africa	15,056	646,463
	UK	2,048	279,375
	USA	2,069	171,717
Intrinsic	Brazil	20,685	1,006,147
	India	142,716	3,771,503
	South Africa	14,912	639,523
	UK	2,042	288,576
	USA	2,120	163,196
Negative	Brazil	21,331	1,013,359
	India	131,869	4,086,948
	South Africa	15,379	629,464
	UK	2,039	279,613
	USA	2,144	173,394
Positive	Brazil	22,830	999,694
	India	140,691	3,479,433
	South Africa	14,589	656,522
	UK	2,051	288,338
	USA	2,045	161,519
Extrinsic Negative	Brazil	11,338	503,547
	India	66,222	2,164,877
	South Africa	7,754	350,366
	UK	1,076	141,257
	USA	1,071	89,654
Extrinsic Positive	Brazil	12,138	503,359
	India	63,622	1,630,001
	South Africa	7,302	296,097
	UK	972	138,118
	USA	998	82,063
Intrinsic Negative	Brazil	9,993	509,812
	India	65,647	1,922,071
	South Africa	7,625	279,098
	UK	963	138,356
	USA	1,073	83,740

Message Frame Styles	Countries	Clicks to website	Impressions
Intrinsic Positive	Brazil	10,692	496,335
	India	77,069	1,849,432
	South Africa	7,287	360,425
	UK	1,079	150,220
	USA	1,047	79,456

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