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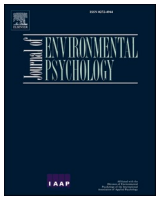

What about the children? The effectiveness of including children in environmental appeals

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ABSTRACT

Despite many environmental campaigns putting children front and center, the effectiveness of including children in environmental appeals has not been tested. Across four online experiments (N = 2,200), participants saw either an existing Friends of the Earth appeal or matching appeals that made children salient. All experiments assessed real donations to Friends of the Earth as a behavioral outcome measure. The results showed that making children salient elicited lower donations relative to the standard Friends of the Earth appeal, and this effect was partially explained by lower persuasiveness of arguments in the campaign text (despite the arguments being identical between conditions). The findings suggest that the inclusion of children in appeals can backfire, with important ramifications for environmental campaigning.

1. Introduction

Governments and other organizations need to effectively communicate environmental policies to the public to maximize support and elicit behavior change. An intuitive strategy is the use of information campaigns to convince the public of the reality of environmental damages (e.g., Pidgeon & Fischhoff, 2011). However, such campaigns are often insufficient to sway public opinion (Abrahamse et al., 2005) and can even backfire (Hart & Feldman, 2018), particularly among climate change sceptics (Bain et al., 2012). Growing evidence suggests that a more effective strategy to elicit widespread public support is to communicate the co-benefits of environmental action, such as benefits for public health (Petrovic et al., 2014; Walker et al., 2018), a better society (Bain et al., 2012, 2016), and personal finance (De Dominicis et al., 2017; Van de Vyver et al., 2018).

Another co-benefit of environmental action is the protection of children. The environmental crisis has severe consequences that are expected to accelerate over time and thus disproportionally affect children throughout their lifetime (Ebi & Paulson, 2007). Indeed, many campaigns allude to this co-benefit by putting children front and center, for instance in appeals for disaster relief (Donate to Africa, 2023) and environmental protection (Department of Energy and Climate Change, 2009). There are several reasons why including children in campaigns may be effective. Children are generally seen as positive and cute (Glocker et al., 2009; Wolf et al., 2023), and adults exert more effort to look at images of cute children (Hahn et al., 2013). Campaigns that feature children may hence receive more positive attention than campaigns that do not feature children. Children also elicit motivations of empathy and pro-sociality (Bleske-Rechek et al., 2010; Lishner et al., 2008). For example, images of Aylan Kurdi, a child who died during the 2015 Syrian refugee crisis, evoked intense reactions of empathy that sparked wider efforts to support refugees (Smith et al., 2018; Thomas et al., 2019). Moreover, Wolf et al. (2022) found that merely thinking about children increased adults' general prosocial motivation compared to making adults or no social category salient. In a follow-up naturalistic study, Wolf et al. (2022) found that when more children were present on a pedestrian street, adults made more donations to a charity that did not directly benefit children (i.e., a charity for research on bone marrow cancer). These effects of child salience on broad pro-social motivation and donations suggest that children's vulnerability and helplessness trigger a care-giving instinct in adults that extends *beyond* helping the salient child to helping others in general, perhaps because evolutionary pressures favored groups that not only cared for their own offspring but worked together to protect the group's well-being (Hrdy, 2007; Kringelbach et al., 2016). In light of such broad child salience effects, campaigns may not need to invoke a direct connection between children and

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a society-benefitting policy (e.g., directly asking the public to support a environmental policy because it helps protect children); a campaign might be more effective simply by inserting an image of children. It is also noteworthy that the child salience effects in Wolf et al.'s (2022) research emerged irrespective of participants' characteristics (e.g., age, gender, parenting status, attitudes towards children), suggesting that a child-focused campaign could elicit widespread support among the public.

However, there are also reasons to be cautious about including children in environmental campaigns. A UK government initiative, "bedtime story" (Department of Energy and Climate Change, 2009), which highlighted negative impacts of climate change on children, was met with significant public outrage (MacLeod, 2009). This initiative may have backfired because seeing children in danger might elicit a strong fear response, and according to the extended parallel process model (EPPM; Witte, 1992), fear appeals can be less effective or counterproductive if individuals perceive they cannot effectively deal with the threat (i.e., low efficacy; for meta-analyses, see (Peters et al., 2013; Tannenbaum et al., 2015). That is, based on the EPPM, the government initiative may have been effective in highlighting the threat of climate change, but when recipients' efficacy is low, they likely respond with withdrawal or anger. Another reason to be cautious about the inclusion of children in campaigns is that, despite the general positivity of children, children can also evoke negative perceptions (e.g., difficulty, stress; Wolf et al., 2023), and some people might bring to mind the significant environmental harm of having children (Wynes & Nicholas, 2017). These negative perceptions of children suggest that an appeal featuring children might not be effective for everyone.

Despite the frequent use of children in campaigns and this conflicting evidence base, there is limited evidence on the effectiveness of such child-focused appeals on environmental outcomes. Palomo-Veléz et al. (2020) found that pro-environmental intentions were higher when participants considered the consequences of environmental changes for their own children, compared to consequences for the planet, and this effect was explained by heightened parenting motivations. However, participants in this research considered only their own children, making it unclear whether any effects would generalize to considering children in general. Moreover, the research tested pro-environmental intentions, which often do not translate into behavior (Grimmer & Miles, 2017). Other research by Wang et al. (2017) showed that requests (e.g., "Recycling saves animals. Please recycle") are more effective in eliciting pro-environmental intentions when they feature images of baby animals rather than adult animals, but this effect only emerged among recipients who had strong general approach tendencies (i.e., highly responsive to rewarding cues in the environment). Past work suggests that images of cute animals can also evoke care-taking motivations (Sherman et al., 2009), and hence the mechanism in Wang et al.'s research may be similar to the one expected in the present research. However, Wang et al.'s research again considered pro-environmental intentions rather than behaviors, and it implied that the environmental intentions would help the displayed animals, as opposed to testing whether their salience might motivate more general pro-social or pro-environmental behaviors. To the best of our knowledge, no research has tested this question of whether an appeal encourages broad pro-environmental behavior when it makes children salient than when it does not. It is vital to answer this question because it can inform policymakers whether featuring children in their campaigns is indeed beneficial, with important implications for society and the achievement of Net Zero targets.

We conducted four online experiments with 2,200 adult UK participants to examine the impact of making children salient on donations to an environmental charity. We selected an existing appeal by Friends of the Earth (FotE), which described the role of trees in combating climate change and FotE's initiative to double tree cover in the UK. We used this appeal because it was relevant to our UK participants, and because it is a typical example of environmental campaigns. The campaign asked for real donations to FotE. To ensure the practical relevance of our research, we made only minimal changes to the campaign to make children salient. In Experiments 1 and 2, participants received either the standard FotE appeal which included a campaign text and two nature images, or a child salience appeal where the nature images were replaced with images showing children in nature (see Figs. 1 and 2). In Experiment 3, a third condition presented the child salience appeal but also explicitly mentioned the impact of environmental damages on children to test whether making a direct connection between children and the campaign would affect donations. Experiment 4 included a baseline condition where participants did not receive an appeal. At the end of each experiment, participants received a bonus payment and decided how much of their bonus they wanted to donate to FotE. Given the prior evidence on child salience effects (Palomo-Vélez et al., 2020; Wolf et al., 2022), we tentatively expected that the inclusion of children in an environmental appeal would elicit higher donations than a standard appeal.

The four experiments included several variables to explore the mechanism through which the inclusion of children in the messaging might affect donations. First, all experiments asked participants how persuasive they found the three central arguments from the campaign text describing benefits of reforestation. We included this measure of argument persuasiveness as a potential mediator to test whether any effects on donations could be attributed to a more persuasive campaign (rather than, for example, a sense of moral duty activated by the salience of children). Second, all experiments assessed the need for cognition as a potential moderator. The need for cognition describes individuals' tendency to engage in and enjoy effortful cognitive activity (Cacioppo & Petty, 1982). Within the framework of the elaboration likelihood model (ELM; Petty & Briñol, 2011), the need for cognition has been used to indicate whether individuals tend to process information more deeply (i.e., high need for cognition) or rely more on heuristics or simple cues (i.e., low need for cognition; Cacioppo et al., 1986). The incidental inclusion of children in the present research might be considered a heuristic such that the positivity of children might bias individuals low in need for cognition to respond more favorably to the appeal. We might therefore expect that those who are higher in need for cognition are less persuaded by the child salience appeal than those lower in need for cognition.

The ELM also suggests that another motivation to carefully process the strength of arguments comes from the personal relevance of the presented information to the recipients (Petty & Briñol, 2011). The topic of environmental changes is frequently reported in the UK media (Hopke, 2020), and the vast majority of UK citizens are aware of the dangers of environmental changes (Poortinga et al., 2018). Hence, rather than using the salience of children as a heuristic cue, the personal relevance of the environmental topic might motivate many participants to carefully process the campaign text. Under this high elaboration route, participants might consider the protection of children as an important and sound argument for environmental action and hence be more convinced by the child salience appeal. One way to test whether participants process the campaign text deeply is to assess the favorability of participants' thoughts about the campaign text (O'Keefe, 2013). According to the ELM (Petty & Briñol, 2011), when recipients process a message deeply, a message is more effective when it elicits predominantly favorable post-message thoughts rather than predominantly unfavorable post-message thoughts. We therefore included a measure of thought favorability as a potential mediator and tested whether effects of the child salience appeals on donations could be explained by greater thought favorability, indicating that participants carefully processed the campaign text.

Finally, consistent with Wang et al.'s (2017) findings that the salience of baby animals only increased environmental intentions when participants had high approach motivations, we included two approach-related moderators. Rather than general approach motivations, we considered variables more specific to the present research. First, we explored whether individual differences in the need for affect,

Fig. 1. The standard Friends of the Earth appeal.

or the tendency to seek out and enjoy emotion-inducing experiences and stimuli (Maio & Esses, 2001), would moderate the effectiveness of the child salience appeals. Adults' attitudes toward children have a predominantly emotional basis (Wolf et al., 2023) and those higher in the need for affect are more persuaded by messages that have an emotional focus (Haddock et al., 2008), suggesting that those higher in the need for affect may be more persuaded by a child-focused campaign. Similarly, prior work has shown that those high in need for affect have a more positive attitude toward stereotypically warm groups, including children, because they provide the emotional stimulation they desire (Wolf et al., 2017). Second, we also included a measure of attitudes toward children to test more directly whether individuals who view children more positively would be more persuaded by a child salience appeal. A more positive attitude toward children might suggest that participants feel a stronger approach motivation to an appeal that features children. Moreover, viewing children more positively might also mean that the salience of children functions as a more powerful heuristic (under the low elaboration route) or a stronger argument (under the high elaboration route). We included the attitudes towards children scale (Wolf et al., 2023), which measures individuals' affection for children and the perceived stress elicited by children. The child salience appeals may hence be stronger among those higher in the need for affect, and among those who report greater affection and lower stress towards children.

Following recommendations for multi-study articles (Lakens & Etz, 2017), we describe an internal meta-analysis across the four experiments to summarize the findings. The study materials and data described in this article are publicly available under https://doi.org/10.17605/OSF.IO/HSBRW. All studies reported here follow APA and BPS ethical standards and received ethical clearance from the ethical review committees of the respective universities.

2. Method

2.1. Participants

We conducted four online experiments on Prolific (prolific.co) between November 2020 and August 2021. To take part, participants had to be at least 18 years of age, a UK national, and fluent in English. These inclusion criteria were selected to ensure that the UK-focused campaign text was understandable and relevant to our participants. Participants were excluded from analyses if they failed a text recognition check (e.g., asking participants if they remembered correctly that a text excerpt was or was not part of the campaign text they read). We also excluded participants if they skipped the donation question without a response. These data quality checks were included to confirm that participants paid attention to the campaign text and completed the central donation measure. Across all experiments, 260 participants (10.6 %) did not pass these checks and were excluded. Table 1 shows the number of

Table 1
Experiment characteristics.

Experiment	*N* (after exclusions)	Mean Age (range)	Gender			Experimental Condition			
			Male	Female	Non-binary	Standard	Child salience	Explicit child salience	Baseline
Experiment 1	196	42.60 (18–79)	61	135	0	99	97	–	–
Experiment 2	462	41.51 (25–82)	105	356	1	237	225	–	–
Experiment 3	723	40.62 (18–75)	239	474	10	242	242	239	–
Experiment 4	819	38.13 (22–89)	242	574	3	207	207	203	202
Total	2200	40.06 (18–89)	647	1539	14	785	771	442	202

Note: Standard = Friends of the Earth appeal; Child salience = Friends of the Earth appeal with child images; Explicit child salience = Friends of the Earth appeal with child images and appeal text mentions children; baseline = no appeal.

participants and demographic statistics in each experiment after exclusions. Participants in Experiments 1 and 2 received 50p as compensation for a 5-min study, with an additional bonus payment between 0 and 50p, depending on how much of the bonus they decided to keep. Participants in Experiments 3 and 4 received £1 as compensation for a 5-10-min study, with an additional bonus payment between 0 and £1.

We conducted sensitivity analyses for two-tailed multinomial regressions with a significance level of 0.05 (see Table 1 for *N*s). For the comparison between the Friends of the Earth standard appeal and the child salience appeal, our samples provided 95% power to detect odds ratios of at least 0.72/1.38 (equivalent Cohen's $d = 0.18$). For the comparison between the standard appeal and the explicit child salience appeal, our samples provided 95% power to detect odds ratios of at least 0.65/1.54 (Cohen's $d = 0.24$).

2.2. Manipulations

The three appeal conditions presented images and text on two separate pages, and participants were only able to advance to the next page after 10 s had elapsed on each page.

2.2.1. Standard appeal

Participants in the standard appeal condition received the following text, together with two images of nature with the Friends of the Earth logo (see Fig. 1):

This is why, in 2020, Friends of the Earth is launching a campaign to double tree cover in every region of England, Wales and Northern Ireland. We want to encourage tree planting (right trees, right place), but also rewilding and lots of natural regeneration of our native trees. We're doing so partly because of what it will do for wildlife, air quality and wellbeing (studies show that trees are good for people's mental health). But we're also launching this campaign because doubling the number of trees could deliver annual carbon savings of around 37-50 MtCO2e (million tonnes of carbon dioxide equivalent) per year. That's equal to around 10% of the UK's current greenhouse gas emissions.

Trees will be our focus, but we're hoping to stimulate a much wider debate about why restoring nature is essential for tackling climate change.

Fig. 2. The child salience appeal where the nature images from the standard appeal were replaced with images of children in nature.

2.2.2. Child salience appeal

Participants received the same text as in the standard appeal, but the images of nature were replaced with images of children in nature (see Fig. 2):

2.2.3. Child salience explicit appeal

Experiments 3 and 4 added a third condition which used the same images as the child salience appeal but also explicitly mentioned impacts on children in the campaign text (changes highlighted in bold font):

"Trees play an incredible role in combating climate chaos by removing planet-wrecking emissions from the air around us. Despite their importance, just 13% of the UK's total land area has tree cover (compared to an EU average of 35%). Friends of the Earth wants to double UK woodland cover in order to tackle the climate emergency **and protect our children and future generations from harm**. But why does doubling tree cover help against climate change? To avoid runaway climate change and achieve net zero emissions (removing as many emissions as we produce) we need to stop burning fossil fuels, power our world on renewable energy, promote energy efficiency, decarbonise transport and so on. But we also need to restore the abundance of nature and its ability to regulate the climate. That's not just about stopping the loss of nature – including deforestation in the tropics – but also reversing that decline.

This is why, in 2020, Friends of the Earth is launching a campaign to double tree cover in every region of England, Wales and Northern Ireland. We want to encourage tree planting (right trees, right place), but also rewilding and lots of natural regeneration of our native trees. We're doing so partly because of what it will do for wildlife and **our children's well-being** (studies show that trees are good for mental health). But we're also launching this campaign because doubling the number of trees could deliver annual carbon savings of around 37–50 MtCO2e (million tonnes of carbon dioxide equivalent) per year. That's equal to around 10% of the UK's current greenhouse gas emissions. Trees will be our focus, but we're hoping to stimulate a much wider debate about why restoring nature is essential for tackling climate change **and improving the lives of our children and future generations**."

2.3. Materials

Argument persuasiveness. Immediately after the manipulation, participants were shown three central arguments from the campaign text describing benefits of reforestation (i.e., doubling tree cover will help stop climate change, restore nature/wildlife, and improve well-being). Participants were asked how convincing they personally found them and how convincing other people would find them, using a scale from 1 (not at all) to 5 (very much). The six responses were averaged to form a measure of argument persuasiveness.

2.3.1. Donations

After the measure of argument persuasiveness, participants answered an item asking whether a text excerpt had appeared in the previous campaign text. Irrespective of their answer, participants were told that they were correct and that they would receive a bonus (50p in Experiments 1 and 2, £1 in Experiments 3 and 4) for doing the study carefully. This was done to hide the true purpose of the bonus. Participants then decided how much of the bonus they wanted to keep and how much they wanted to donate to Friends of the Earth. Participants could select any number between 0 (keep all of the bonus) and 50 (donate all of the bonus) in Experiments 1 and 2 or between 0 and 100 in Experiments 3 and 4. The bonus was paid out according to participants' selections.

2.3.2. Thought-listing task

Following the donation measure, Experiments 3 and 4 presented an adapted thought-listing task (Cacioppo et al., 1997). Participants were asked to list their thoughts and impressions about the campaign, including anything they found interesting, how the appeal made them feel, or what they liked or disliked. They were asked to list at least two thoughts (up to eight) and to spend about 2 min on the task. Using the subject-rating procedure (Dixon & Hubner, 2018), participants then saw the thoughts they provided one by one, and rated how positive each thought was about Friends of the Earth or their campaign on a scale from 1 (very negative) to 5 (very positive). They could also mark thoughts as irrelevant. The ratings across all thoughts not marked as irrelevant were averaged into one composite score reflecting their positivity toward the campaign text.

2.3.3. Need for cognition

We used the six-item version of the need for cognition scale (NCS-6, Lins de Holanda Coelho et al., 2020). Participants responded to the items (e.g., "I really enjoy a task that involves coming up with new solutions to problems") on a 5-point scale from 1 (extremely uncharacteristic of me) to 5 (extremely characteristic of me).

2.3.4. Need for affect

We used the short version of the need for affect scale (NFA; Appel et al., 2012). Participants responded to five items assessing motivations to approach emotions (e.g., "I feel that I need to experience strong emotions regularly"; $\alpha = 0.80$) and five items assessing motivations to avoid emotions (e.g., "I do not know how to handle my emotions, so I avoid them"; $\alpha = 0.86$) on a 7-point scale from −3 (strongly disagree) to 3 (strongly agree).

2.3.5. Attitudes towards children

In Experiment 4, we included the attitudes towards children scale (ATC scale; Wolf et al., 2023). The ATC scale comprises 10 items across two subscales: affection towards children ("Children make me feel loving") and stress elicited by children ("Children make me feel anxious"). Participants responded to the items using a 7-point scale from −3 (strongly disagree) to 3 (strongly agree).

2.4. Procedures

2.4.1. Experiment 1

Participants reported their age and gender, completed the NFA-approach ($\alpha = 0.85$), NFA-avoidance ($\alpha = 0.76$), and NCS-6 ($\alpha = 0.85$) scales, and were then randomly assigned to either the standard appeal condition or the child salience appeal condition. After the manipulation, we assessed argument persuasiveness ($\alpha = 0.81$), the attention check, and finally donations.

2.4.2. Experiment 2

Experiment 2 used a similar procedure as Experiment 1. The NFA-approach ($\alpha = 0.83$), NFA-avoidance ($\alpha = 0.78$), NCS-6 ($\alpha = 0.84$), and argument persuasiveness ($\alpha = 0.80$) scales all showed good reliability.

2.4.3. Experiment 3

Experiment 3 used a similar procedure as Experiments 1 and 2 with two exceptions. One change was the addition of a third condition (i.e., explicit child salience appeal). Another change was that, after indicating donations, participants completed the thought listing technique. The NFA-approach ($\alpha = 0.86$), NFA-avoidance ($\alpha = 0.79$), NCS-6 ($\alpha = 0.86$), and argument persuasiveness ($\alpha = 0.82$) scales all showed good reliability.

2.4.4. Experiment 4

Experiment 4 used a similar procedure as Experiment 1–3, with two changes. One change was that we added a baseline condition where participants skipped any campaign text or images. Participants in the baseline condition were asked to evaluate the persuasiveness of the same three arguments as in the other condition (but without having seen these

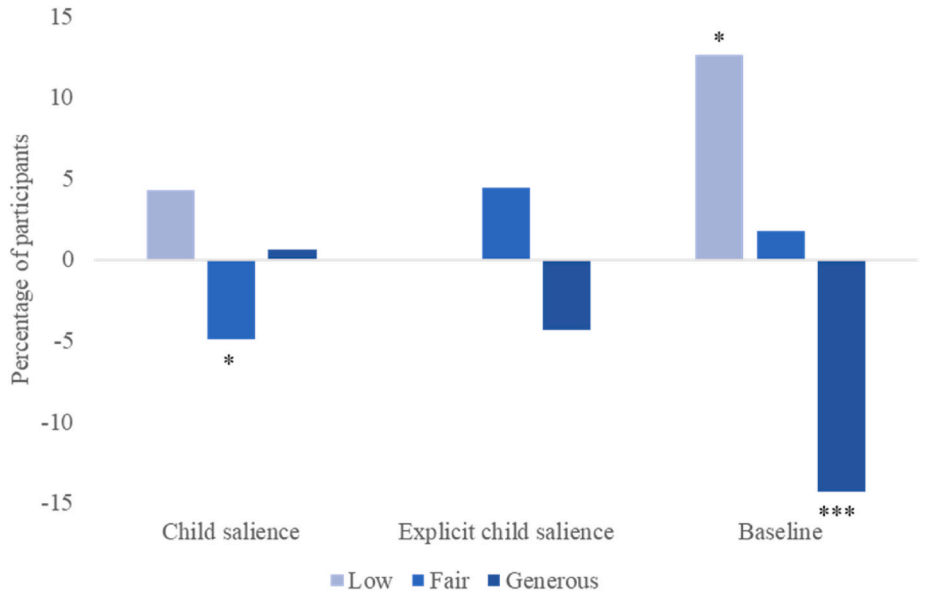

Fig. 3. Percentage of participants in the child salience, explicit child salience, and baseline conditions relative to the FotE standard appeal condition who made low, fair, or generous donations. * significant at 0.05, ** significant at 0.01, ***significant at 0.001.

Table 2
Multinomial logistic regression testing effects of appeal condition on donation.

Condition	*N*	*b*	*SE*	Wald	*df*	*p*	OR	*95% CI*
Fair vs low donation distribution*								
Baseline	151	−.30	.19	2.48	1	.115	0.743	[0.51, 1.07]
Child salience	461	−.31	.13	5.54	1	.019	0.734	[0.57, 0.95]
Explicit child salience	286	.14	.15	0.84	1	.360	1.147	[0.85,1.54]
Generous vs low donation distribution**								
Baseline	137	−.80	.20	16.65	1	<.001	0.448	[0.30,0.665]
Child salience	574	−.12	.12	0.99	1	.320	0.887	[0.70,1.12]
Explicit child salience	288	−.11	.15	0.60	1	.440	0.893	[0.67,1.19]
Generous vs Fair donation distribution***								
Baseline	116	−.51	.21	6.04	1	.014	0.603	[0.40, 0.90]
Child salience	507	.19	.12	2.30	1	.129	1.21	[0.95,1.55]
Explicit child salience	310	−.25	.14	3.09	1	.079	0.778	[0.59,1.03]

Note. Baseline, child salience, and explicit child salience conditions are compared to the standard Friends of the Earth appeal. *Standard appeal $N = 474$. **Standard appeal $N = 546$. ***Standard appeal $N = 550$. OR = odds ratio.

arguments previously). Another change was that we included measures of participants' affection towards children and their perceived stress from children using the attitudes towards children scale (Wolf et al., 2023). The NFA-approach ($\alpha = 0.83$), NFA-avoidance ($\alpha = 0.79$), NCS-6 ($\alpha = 0.84$), argument persuasiveness ($\alpha = 0.82$), ATC-affection ($\alpha = 0.94$), and ATC-stress ($\alpha = 0.83$) scales all showed good reliability.

3. Results

3.1. Manipulation check

Chi-square tests of independence were performed to examine whether participants in the child salience conditions mentioned children more often ("child/children, kid/kids, toddler/toddlers, baby/babies") in the thought-listing task than those in the standard appeal.[1] Participants in child salience condition were more likely to spontaneously mention children ($n = 39$) than participants in standard appeal condition ($n = 11$), χ^2 (1, $N = 848$) = 16.60, $p < .001$. Participants in the explicit child salience condition were also more likely to spontaneously mention children ($n = 50$) than participants in the standard appeal condition, χ^2 (1, $N = 830$) = 27.43, $p < .001$.

3.2. Comparing donations between appeals

Before analyzing the data, we assessed the normality of the donation responses. The normality assumption was clearly violated, with donations showing a trimodal distribution. Across the four experiments, most participants either decided not to donate (~29% of the sample), distributed the bonus equally between themselves and charity (~22%), or gave all their bonus to charity (~38%), with only ~11% of the sample choosing options between these three modes. We therefore transformed the donation variable into a discrete outcome with three levels: generous donations (67–100 percentile), fair donations (34–66 percentile), and low donations (0–33 percentile). We then used multinomial logistic regression to analyze the data. The results are depicted in Fig. 3. As expected, the standard appeal elicited more generous donations (vs fair or low donations) compared to baseline. More importantly, the child salience appeal elicited fewer fair (vs low) donations compared to the standard appeal, and the explicit child salience appeal showed a trend to elicit fewer generous (vs fair) donations compared to the standard appeal. All other comparisons were non-significant (for detailed results, see Table 2). These results indicate that the child salience appeals backfired, showing a tendency to elicit lower donations than the standard appeal.

[1] Note that the thought-listing task was presented after the donation measure, not immediately after the manipulation.

For robustness and to aid with interpretability, the supplement reports the results from linear regression analyses, using the continuous donation variable as the outcome. As shown in Table S1, this analysis also showed that the standard appeal elicited more donations than baseline, but no effects of child salience emerged. Fig. S1 in the supplement illustrates these results.

3.3. Mediation analyses

For the significant effect of condition (standard appeal vs child salience appeal) on low vs fair donations we tested whether argument persuasiveness or thought favorability functioned as mediators. Argument persuasiveness partially mediated this effect (Fig. 4), such that the

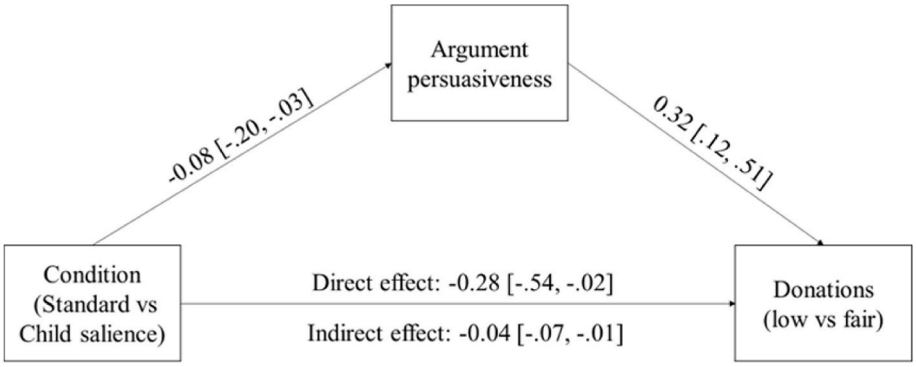

Fig. 4. Partial mediation of condition (standard appeal vs child salience appeal) on low vs fair donations through argument persuasiveness.

Table 3
Moderation analyses by age and gender.

	Condition: standard appeal vs child salience				Condition: standard appeal vs explicit child salience			
	Model 1 **Fair vs Low donations**				**Model 2** **Generous vs Fair donations**			
	R^2	*b*[CI 95%]	p	n	R^2	*b*[CI 95%]	P	n
Condition		−0.57[-1.51, 0.37]	.237			−0.41 [-0.93, 0.14]	.147	
Age		0.003[-0.04, 0.04]	.884			0.02 [-0.01, 0.04]	.134	
Condition*Age		0.01[-0.02, 0.03]	.597			0.01 [-0.01, 0.02]	.284	
Model	.01		.018	935	.02		<.001	860
	Model 3 **Fair vs Low donations**				**Model 4** **Generous vs Fair donations**			
	R^2	***b* [CI 95%]**	***p***	***n***	**R^2**	***b* [CI 95%]**	***P***	***n***
Condition		−0.82 [-1.89, 0.14]	.096			0.16 [-0.38, 0.71]	.556	
Gender		−0.18[-1.03, 0.66]	.673			0.52[-0.09, 1.12]	.096	
Condition*Gender		0.30 [-0.25, 0.84]	.285			−0.17 [-0.47, 0.14]	.286	
Model	.01		.017	935	.005		.090	860

Note. Models 1 and 2 examine moderations by age, models 3 and 4 examine moderations by gender. Models 1 and 3 test moderations of the comparison between the standard appeal and child salience appeal on fair vs low donations; Models 2 and 4 test moderations of the comparison between the standard appeal and explicit child salience appeal on generous vs fair donations.

Table 4
Moderation analyses by need for affect.

	Condition: standard appeal vs child salience				Condition: standard appeal vs explicit child salience			
	Model 1 **Fair vs Low donations**				**Model 2** **Generous vs Fair donations**			
	R^2	*b*[CI 95%]	p	n	R^2	*b*[CI 95%]	P	n
Condition		−0.81[-2.07, 0.46]	.212			−0.63 [-1.37, 0.10]	.092	
NFA approach		−0.14[-0.55, 0.27]	.503			−0.09 [-0.36, 0.19]	.535	
Condition*NFA approach		0.10 [-0.15, 0.35]	.430			0.10 [-0.04, 0.25]	.168	
Model	.005		.099	935	.005		.092	860
	Model 3 **Fair vs Low donations**				**Model 4** **Generous vs Fair donations**			
	R^2	***b* [CI 95%]**	***p***	***n***	**R^2**	***b* [CI 95%]**	***P***	***n***
Condition		0.32 [-0.41, 1.04]	.396			−0.16 [-0.54, 0.22]	.411	
NFA avoidance		0.21 [-0.09, 0.52]	.166			−0.06 [-0.27, 0.13]	.525	
Condition*NFA avoidance		−0.17 [-0.36, 0.02]	.073			0.01 [-0.09, 0.11]	.851	
Model	.01		.020	935	.003		.255	860

Note. Models 1 and 2 examine moderations by need for affect approach, models 3 and 4 examine moderations by need for affect avoidance. Models 1 and 3 test moderations of the comparison between the standard appeal and child salience appeal on fair vs low donations; Models 2 and 4 test moderations of the comparison between the standard appeal and explicit child salience appeal on generous vs fair donations.

Table 5
Moderation analyses by need for cognition.

	Condition: standard appeal vs child salience				Condition: standard appeal vs explicit child salience			
	Model 1				**Model 2**			
	Fair vs Low donations				**Generous vs Fair donations**			
	R^2	*b*[CI 95%]	p	n	R^2	*b*[CI 95%]	P	n
Condition		0.56[-0.61, 1.72]	.350			−0.45 [-1.13, 0.22]	.187	
NCS		0.46[-0.07, 0.99]	.089			−0.07 [-0.45, 0.30]	.694	
Condition*NCS		−0.26 [-0.59, 0.08]	.135			0.10 [-0.10, 0.29]	.325	
Model	.007		.035	935	.004		.174	860

Note. Models 1 and 2 examine moderations by need for cognition. Model 1 tests moderations of the comparison between the standard appeal and child salience appeal on fair vs low donations; Model 2 tests moderations of the comparison between the standard appeal and explicit child salience appeal on generous vs fair donations.

Table 6
Moderation analyses by prior knowledge of Friends of the Earth.

	Condition: standard appeal vs child salience				Condition: standard appeal vs explicit child salience			
	Model 1				**Model 2**			
	Fair vs Low donations				**Generous vs Fair donations**			
	R^2	*b*[CI 95%]	p	n	R^2	*b*[CI 95%]	P	n
Condition		−0.01[-0.80, 0.79]	.985			0.06 [-0.37, 0.48]	.793	
Knowledge		−0.09[-0.91, 0.72]	.826			−0.06[-0.63, 0.50]	.820	
Condition*Know-ledge		−0.21 [-0.73, 0.31]	.426			−0.13 [-0.41, 0.16]	.379	
Model	.01		.001	934	.01		.044	860

Note. Models 1 and 2 examine moderations by prior knowledge of Friends of the Earth. Model 1 tests moderations of the comparison between the standard appeal and child salience appeal on fair vs low donations; Model 2 tests moderations of the comparison between the standard appeal and explicit child salience appeal on generous vs fair donations.

Table 7
Moderation analyses by attitudes towards children.

	Condition: standard appeal vs child salience				Condition: standard appeal vs explicit child salience			
	Model 1				**Model 2**			
	Fair vs Low donations				**Generous vs Fair donations**			
	R^2	*b*[CI 95%]	p	n	R^2	*b*[CI 95%]	P	n
Condition		−0.71 [-1.59, 0.17]	.224			0.14 [-0.27, 0.55]	.499	
ATC stress		0.34[-0.41, 1.10]	.373			−0.37 [-0.94, 0.19]	.192	
Condition*ATC stress		−0.27 [-0.76, 0.21]	.268			0.20 [-0.04, 0.45]	.100	
ATC affection		−0.31 [-1.20, 0.58]	.500			0.07 [-0.61, 0.76]	.832	
Condition*ATC affection		0.14 [-0.42, 0.71]	.625			0.06 [-0.22, 0.34]	.658	
Model	.01		.437	265	0.02		.197	287

Note. Models 1 and 2 examine moderations by affection towards and perceived stress by children. Model 1 tests moderations of the comparison between the standard appeal and child salience appeal on fair vs low donations; Model 2 tests moderations of the comparison between the standard appeal and explicit child salience appeal on generous vs fair donations.

child salience appeal elicited fewer fair donations than the standard appeal in large part because participants found the arguments in the child salience appeal less persuasive (despite the arguments being identical across the conditions). The indirect effect through thought favorability was not significant, $b = -0.01$, 95% CI [−0.06, 0.02].

3.4. Moderation analyses across studies

We tested whether the effects of the child salience appeals (relative to the standard appeal) were moderated by a range of participant characteristics: age, gender (Table 3), need for affect approach and avoidance (Table 4), need for cognition (Table 5), prior knowledge of Friends of the Earth (Table 6), and affection and stress towards children (Table 7). Using PROCESS (Model 1, 5,000 iterations, logistic regressions; Hayes, 2017), one set of analyses entered condition (i.e., standard appeal vs. child salience) as the predictor, donations as the binary outcome (i.e., fair vs low donations), and then the respective moderators in separate analyses (see Tables 3–4, Models 1–2; Tables 5–7, Model 1). None of the interactions reached significance. A similar set of analyses entered condition (i.e., standard appeal vs. explicit child salience) as the predictor, donations as the outcome (i.e., generous vs fair donations), and then the respective moderators in separate analyses (see Tables 3–4, Models 3–4; Tables 5–7, Model 2). None of the interactions reached significance. As can be seen in the supplement, a similar pattern of results emerged when we used donation as a continuous variable (Tables S2–6).

4. Discussion

Despite many environmental campaigns putting children front and center, the effectiveness of including children in environmental appeals on behavior has not been tested. Across four experiments comparing an existing Friends of the Earth appeal to appeals that made children salient, we found that highlighting children in environmental campaigns can backfire. While Friends of the Earth's standard appeal was more effective in eliciting donations compared to baseline, the inclusion of children was counterproductive. Furthermore, our mediation analyses indicate that the lower donations are partly explained by greater skepticism about the arguments in the child salience appeal, even though the arguments in the child salience appeal were *identical* to those used in the standard appeal. In

addition, these lower donations emerged irrespective of participant age and gender, suggesting some generality of the effects.

One explanation for the backfiring effects of child salience could come from the extended parallel process model of fear appeals (EPPM; Witte, 1992). According to this framework, the child salience appeals might have been effective in eliciting greater threat perceptions of the loss of wooded areas in the UK, but participants may not have felt that they can effectively deal with this threat. Although we can assume that participants had generally high confidence in their ability to donate (i.e., self-efficacy), it is possible that participants doubted the effectiveness of their donation for promoting reforestation (i.e., response efficacy; Zemack-Rugar & Klucarova-Travani, 2018). The present research adopted a practice-oriented approach and therefore made minimal changes to the campaign text, but future research could present a child-focused campaign text together with efficacy statements (e.g., Armbruster et al., 2022) to potentially elicit more environmental behavior. It would also be beneficial to directly measure the components of the EPPM (e.g., perceived threat and efficacy, fear, and motivation) regarding a child-focused environmental campaign to gain better insight into why and when the inclusion of children can backfire.

While argument persuasiveness partially explained the effects of the child salience appeal on donations, thought favorability did not. One reason for this lack of a mediation effect may be that participants sometimes rated thoughts as negative (e.g., "Disappointed that we are falling short compared to other countries") although the thoughts may reflect a motivation to do more. Moreover, it is noteworthy that the thought-listing task was presented at the end of the experiments, after the donation measure, and may hence have been influenced by the donation decision. This order was chosen to keep the order of manipulation and measures consistent across all four experiments. Nevertheless, future research could consider replicating the present findings and including the thought-listing task immediately after the manipulation to gain more direct insights into the mechanism.

The effects of child salience were not moderated by participants' need for cognition. This lack of a moderation effect may suggest that the inclusion of children tended to hamper the effectiveness of the campaign, irrespective of whether children were used as a heuristic cue (i.e., among those low need for cognition) or considered carefully as an argument (i.e., among those high need for cognition). Alternatively, it is possible that the topic of environmental changes is of high personal relevance to the vast majority of our participants (Poortinga et al., 2018), and this high personal involvement led most participants to process the campaign text carefully, even those low in need for cognition (Luttrell, 2018; Luttrell et al., 2017). If most participants processed the campaign text carefully, it is conceivable that the inclusion of children backfired because children were seen as irrelevant and distracting from the arguments in the text. This explanation is in line with the lower ratings of argument persuasiveness in the child salience condition. Future research could consider varying the personal relevance of the campaign text to study experimentally whether the effects differ under conditions of high or low personal relevance (Luttrell, 2018). Moreover, whereas we would consider the central arguments in the presented campaign text as moderately strong, future research could include pre-tested strong and weak arguments to examine whether the inclusion of children can bias perceptions of argument strength.

The obtained effects of child salience also emerged irrespective of individuals' positivity toward children and individuals' general tendency to seek out emotions (i.e., need for affect). This lack of moderation effects might suggest that the inclusion of children in the present research failed to elicit a care-taking motivation in participants, where those with a stronger motivation might have responded more strongly to the child salience appeal. It is possible that participants did not carefully process the images accompanying the campaign text, especially in an online context where people might be more used to scrolling past content that does not have a direct relevance to the task at hand. Our method has the advantage of realism, by virtue of its resemblance to many everyday campaigns using images embedded within an online article. Nonetheless, another method could ask recipients a direct question about the presented images in the campaign text that requires them to process the content of the images. Yet another method may be to bring child-focused campaigns more in line with Wolf et al.'s (2022) naturalistic study where the actual presence of children elicited more donations. In this naturalistic study, it may not have been only the visual cue of children that elicited the effects, but hearing them and watching them interact, that made children more salient to passers-by. An attempt to emulate this approach within a campaign context could be to present videos of children. It could also be fruitful to assess with eye-tracking data how recipients attend to child-focused campaigns.

While we found that the effects did not depend on participant age and gender, other demographic characteristics such as parenthood could play a role. For instance, future research could examine whether parents are more likely to object to the use of children in campaigns or whether they are more supportive because parents are potentially more motivated to protect children from environmental changes. Moreover, research could also consider the role of political orientation and the cultural context because these variables are linked with different views on environmental dangers and potentially their impact on children (McCright et al., 2016). For instance, those who view tackling environmental dangers as a more pressing issue might object less to the use of children in environmental campaigns.

Finally, it is worth noting that we selected an environmental appeal that is relatively non-threatening to people's way of life (i.e., a request for a one-off donation). In contrast, organizations may also be interested in testing campaigns that ask for more drastic changes to people's life (e.g., changing diet, transport) and more sustained action. Future research and practice may benefit from testing a wider range of outcome behaviors and whether the salience of children can help with these campaigns. Nevertheless, by using a prototypical message with a commonplace request for donations, our findings have strong relevance to environmental campaigning. The present research suggests that more work is needed to better understand when the inclusion of children in environmental campaigns can be beneficial or harmful. Organizations may wish to avoid including children in their environmental campaigns unless they can identify a particular context in which these messages will not backfire.

Author contributions

Conceptualization: LW, CF, GM, GH.
Data curation: LW, MI.
Formal analysis: LW, MI.
Funding acquisition: GM, GH, CF.
Methodology: all authors.
Visualization: LW, MI.
Writing: LW.

Declaration of competing interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.jenvp.2023.102195.

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