Poetics 94 (2022) 101709

Contents lists available at ScienceDirect

Poetics

journal homepage: www.elsevier.com/locate/poetic

The effect of narratives on attitudes toward animal welfare and pro-social behaviour on behalf of animals: Three pre-registered experiments

Aino Petterson [a,*], Gregory Currie [b], Stacie Friend [c], Heather J Ferguson [a]

[a] School of Psychology, University of Kent, Canterbury, UK
[b] Department of Philosophy, University of York, York, UK
[c] Department of Philosophy, University of London, Birkbeck, UK

ARTICLE INFO

Keywords:
Narratives
Reading
Literary fiction
Animal welfare
Prosocial behaviour

ABSTRACT

We report three randomised and pre-registered experiments examining the effects of narrative fiction (*vs.* narrative non-fiction *vs.* expository non-fiction) on concern for animal welfare. In Experiment 1a (N = 363) there was no significant increase in concern for animal welfare or willingness to donate to an animal charity among participants who read a narrative fiction text about a monkey's plight (*vs.* narrative non-fiction or expository non-fiction texts about a monkey). In Experiment 1b (N =121) concern for animal welfare and willingness to donate was greater after reading the narrative fiction text compared to a narrative non-fiction text unrelated to animals. Experiment 2 (N =184) employed a simplified design and more severe depiction of animal abuse, but showed no beneficial effect of reading a narrative fiction text about a monkey's plight (*vs.* a narrative non-fiction text unrelated to animals) on either measure. Experiment 3 (N =290) compared a narrative fiction and a non-fiction text about a monkey or a lizard; participants who read a narrative fiction text, irrespective of the animal depicted, reported greater concern for animal welfare, monkey welfare, lizard welfare and nature (*vs.* a narrative non-fiction text). However, participants were no more willing to donate in the narrative fiction (*vs.* non-fiction) condition. These results suggest that reading a narrative fiction text about an animal's plight has a limited effect on concern for animal welfare.

1. The effect of narratives on attitudes toward animal welfare and pro-social behaviour on behalf of animals: three pre-registered experiments

The role of literary fiction in changing attitudes and behaviours, ranging from reducing prejudice to changing attitudes toward climate change, has been the subject of recent psychological investigations (Orellana et al., 2020; Schneider-Mayerson, 2020; Schneider-Mayerson, 2018; Vezzali et al., 2015). Comparatively little attention has been paid in the experimental literature to effects on attitudes towards animals (exceptions are Małecki et al., 2016; Małecki et al., 2018; Małecki et al., 2019). This is surprising, as

All studies were pre-registered and data will be made available on OSF (this is not included in the manuscript for anonymity purposes during the peer-review process). Experiment 1a: https://osf.io/ybjr6; Experiment 1b: https://osf.io/x8pkh; Experiment 2: https://osf.io/sk73m; Experiment 3: https://osf.io/ubq42.

* Corresponding author.
E-mail address: a.l.petterson@psykologi.uio.no (A. Petterson).

https://doi.org/10.1016/j.poetic.2022.101709
Received 1 February 2022; Received in revised form 1 July 2022; Accepted 2 July 2022
Available online 3 August 2022

literary history suggests that such effects are real. Anna Sewell's novel *Black Beauty*, written from the perspective of a working horse experiencing abuse and hardship, prompted bans on many common abusive practices; it is known as one of the most impactful anti-animal-cruelty novels (Mench & Bekoff, 1998). The present investigation builds on the studies by Małecki and colleagues. We aimed to conduct a conceptual replication with a UK sample, determine whether any effects are driven by the text's narrativity or fictionality, and to elucidate the likely mechanisms for any effects.

Two of the studies by Małecki and colleagues provide some evidence that reading literary fiction can influence attitudes towards animals. In the study conducted by Małecki (2016), participants were randomly assigned to read either an excerpt from a narrative fiction novel about an animal's plight, or an excerpt from the same novel unrelated to animals. Results showed that participants who read the excerpt about the animal reported more concern for animal welfare than those who read the excerpt unrelated to animals. Małecki et al. (2018) later replicated this pattern, demonstrating that participants who read a narrative fiction about an animal's plight displayed greater concern for animal welfare a week later than participants who read a narrative non-fiction about the discovery of the Higgs boson. However, the fiction text did not influence participants' concern two months later, nor did it affect their willingness to donate to an animal charity. These findings provide preliminary evidence that literary fiction can affect attitudes towards animal welfare, albeit over the short term. However, it remains unclear whether the observed effect is due to the specific qualities of narrative fiction, or whether narrative non-fiction could induce similar changes.

Empirical evidence for an effect of literary fiction on attitudes towards animal welfare has been inconsistent. Małecki et al. (2019) presented participants with one of four texts: a non-fiction essay drawing parallels between the plight of African Americans and non-human animals; a non-fiction text containing only the arguments against animal abuse from the original text; a manipulated text which contained only the narrative components of the original text; and a narrative non-fiction text unrelated to animals. The results showed no difference in concern for animal welfare between the three experimental texts and the unrelated narrative non-fiction text. The researchers suggested that this null-effect was due to the difficulty for ethnically Polish participants in identifying with the African-American narrator in the experimental texts. However, the influence of outgroup effects on narrative fiction was not directly tested.

It is unclear whether there is any cognitive differentiation between fictional and non-fictional narratives (Friend, 2008; Matravers, 2014). Both fiction and non-fiction texts can influence beliefs and evoke emotion. Narrativity may be more relevant to attitude change than fictionality, because it is the narrative qualities of a text that enable the reader to focus on the experiences of the subjects depicted. Consistent with this perspective, Mar (2018) argues that narrativity, not fictionality, is key to developing social cognition. It is said, though, that there are unique qualities of *fiction* that make it especially influential in eliciting attitude change; it may be afforded less critical scrutiny than non-fiction (Gerrig & Prentice, 1991), or more likely to encourage the reader to adopt the protagonist's perspective (Appel & Richter, 2007). However, there are good reasons to doubt that either effect is exclusive to fiction. For instance, *transportation* into the world of a story appears to decrease scrutiny and increase persuasion, with no difference between texts labelled 'fiction' and 'non-fiction' (e.g., Appel & Richter, 2010; Green & Brock 2000; Green et al., 2006). Many well-written memoirs, vivid histories and biographies immerse readers in the perspectives and experiences of other people. However, fictionality might be necessary for influencing concern for animal welfare, because we could not otherwise access perspectives and experiences from animals' point of view.

Another question so far unanswered is the mechanisms through which attitude change might occur. In the next section we suggest some potential mechanisms.

1.1. Identification, perspective-taking, and perceived similarity

One possible mechanism is identification with the attitudes and beliefs of a fictional character (Green, 2006). Narratives enable us to shift perspectives and simulate or imagine the experiences the character goes through; consequently the reader's own attitudes may align with those of the depicted character (Mar & Oatley, 2008). De Graaf et al. (2012) varied the character from whose perspective a story was told (the "focal character"); which character readers identified with was clearly affected by the choice of focal character. Further, increased identification with one character accounted for subsequent attitudes. Here we examine whether narrative texts, fiction or non-fiction, can increase identification with the animal described and whether this leads to increased concern for animal welfare compared to reading an expository text about an animal.

The issue of perspective-taking may be especially important where attitudes to animals are concerned. Simulating an animal's experiences might enable readers to take the animal's perspective and to endorse the notion that animals are capable of *experience* and *agency,* capacities which people consistently tend to devalue in animals (Epley et al., 2013; Loughnan et al., 2010; Niemysjka et al., 2018; Piazza & Loughnan, 2016). Importantly, research has shown that narratives told from a particular perspective tend to align subsequent attitudes with that perspective (Hoeken et al., 2016).

Narration from the perspective of an animal will often be achieved by depicting an animal's experiences and responses in human terms – as with nature documentaries that humanize animals by attributing familiar thoughts and feelings to them. This may increase our sense of similarity with animals and in turn affect attitudes towards animal welfare. Social psychological research has identified perceived similarity as important for affecting positive outgroup attitudes generally (Brown & Abrams, 1986; Hornsey & Hogg, 2000), and attitudes towards animals specifically (Hills, 1995). This point is important; while fictions and non-fictions can provide information about the minds of characters, only fiction is able to represent the perspectives of non-human animals.

Another relevant mechanism is inducing empathic concern. A story's ability to provoke affective reactions may facilitate readers' empathic abilities by strengthening affective reactions induced by a story (Mar, Oatley & Peterson 2009). However, these effects do not depend on fictionality; non-fiction stories can prompt affective reactions, mind-reading, and so on. Findings have been mixed in terms

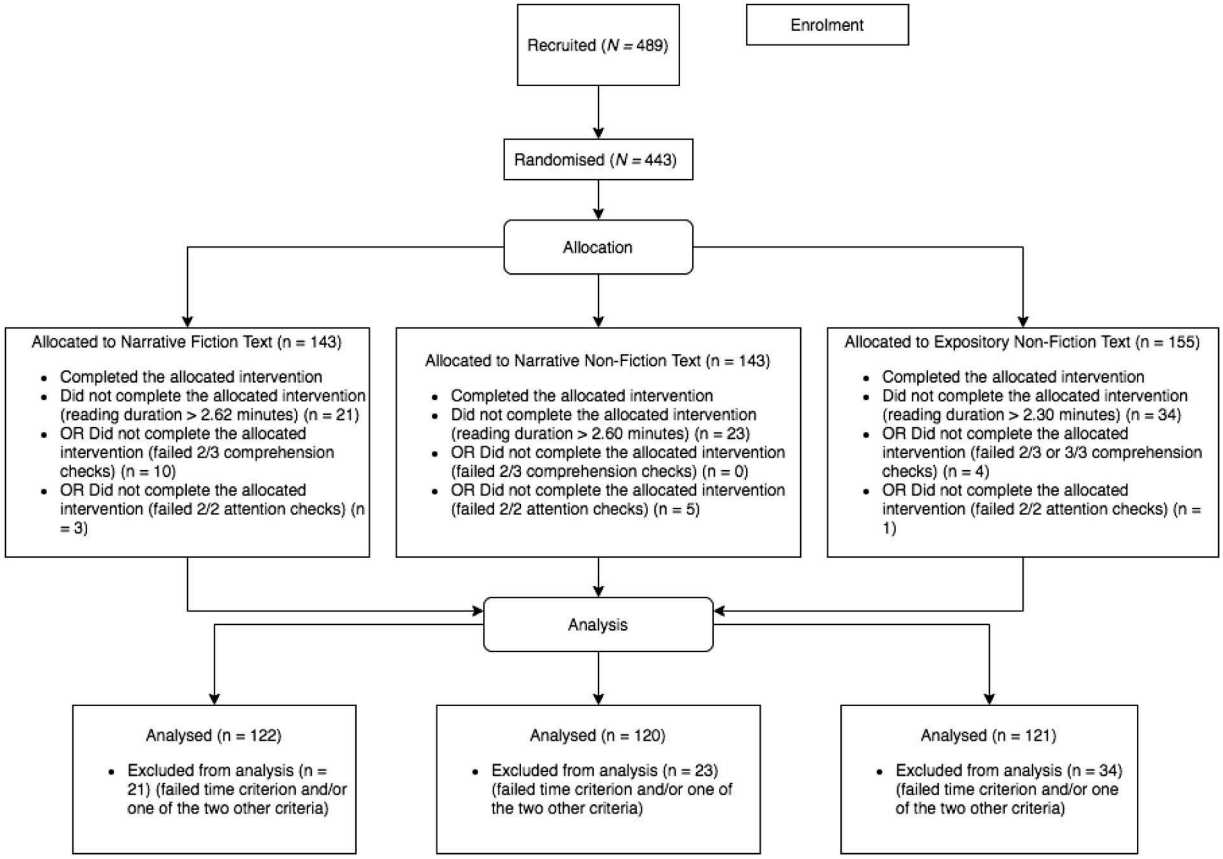

Fig. 1. Participant Sampling (Experiment 1a).

of the effects of narratives on general empathic capabilities (Panero et al., 2016; Samur et al., 2018; Wimmer et al., 2021). However, it may be that reading a narrative about a specific group increases empathic concern just toward that group (Wimmer et al., 2021). For instance, Johnson (2013) found evidence that reading a fictional narrative about a counter-stereotypical Arab-Muslim woman increased affective empathy towards Arab-Muslims compared to control conditions, and that empathy towards Arab-Muslims as a group mediated the effect of narrative on reducing prejudice. Małecki et al. (2019) provides indirect evidence that empathic concern plays a role narratives' effect on attitudes to animal welfare. In this study, participants who were instructed to engage empathetically with a text about an animal showed greater concern for animal welfare compared to participants who were asked to engage objectively with the same text. However, it is unclear whether reading the text without the experimental manipulation (instructions) would be sufficient to produce changes in empathic concern. If we are interested in whether narratives can induce empathic concern toward animals outside the lab, we must examine effects in the absence of explicit instructions to do so.

1.2. The current research

The aim of the present investigation is to 1) attempt the first pre-registered conceptual replication of the findings of Małecki et al. (2016, 2018) in a UK sample; 2) go further by examining the mechanisms through which narrative texts may influence attitudes towards animal welfare; and 3) improve upon previous research by distinguishing between effects of narrativity and fictionality and including an expository non-fiction text about an animal. Based on the literature described above and the findings of Małecki et al. (2016, 2018) we made several predictions (for brevity we have summarised our hypotheses within the following predictions; see full list of hypotheses in A.1).

Participants who read a narrative text (fiction or non-fiction) about a monkey would display greater concern for animal welfare and willingness to donate to an animal charity compared to participants who read the expository non-fiction text. Further, we expected that participants who read a narrative text about a monkey would display greater levels of identification, perceived similarity, empathic concern (for both the monkey and animals generally), perspective-taking and mind-attribution, compared to participants who read the expository non-fiction text. We also predicted that the effect of narrative (vs. expository) on attitudes toward animal welfare and willingness to donate to an animal charity would be mediated by increased levels of identification with the monkey, empathic concern towards animals, perspective-taking, and mind-attribution. Although we did not make specific predictions about differential effects of narrative fiction and narrative non-fiction, we explored whether they had different effects on the mediator and outcome variables.

Experiment 1. a:

2. Method

2.1. Participants and design

UK-based native English speakers were recruited from the online crowdsourcing platform Prolific Academic, paid £7.52 hourly rate. The study employed a randomised controlled design with one between-subjects factor with three conditions (narrative fiction *vs.* narrative non-fiction *vs.* expository non-fiction; see A.2 for additional method details). After exclusions $N = 363$ remained in the final sample; Narrative fiction = 122; 69.79% women; $M_{age} = 39.35$, $SD_{age} = 14.01$; narrative non-fiction = 120; 70% women; $M_{age} = 37.93$, $SD_{age} = 13.40$; expository non-fiction = 121; 66.1% women; $M_{age} = 37.75$, $SD_{age} = 13.25$); Fig. 1).

2.2. Procedure

Participants were randomly allocated to read one of the three texts, then they responded to the comprehension checks, then the measures listed below in randomised order, demographic questions, and answered the donation question. Average completion time was about 12 minutes.

2.3. Reading materials

Narrative Fiction. The narrative fiction text depicted a Capuchin monkey named Clotho being exploited and abused by humans, adapted from the Polish novel, *Władca Liczb* (*The Lord of the Numbers*) by Marek Krajewski. The original excerpt was used by Małecki et al. (2016), finding that it increased animal welfare concerns among Polish participants. The text was translated for this study by a professional translator to ensure that the narrative qualities of the original were preserved as well as possible (see A.3). To reduce confounds the text was also adapted to be more similar to the other texts in this study regarding the severity of the monkey's plight; the original novel portrayed much more extreme violence than the non-fiction texts.[1] The original Polish text comprised 947 words; the English translation was 1004 words (estimated reading time 5.02 minutes based on 200 words per minute).

Narrative Non-Fiction. The narrative non-fiction text was an adapted excerpt from the Canadian non-fiction book, *Woo, the Monkey Who Inspired Emily Carr: A Biography* by Grant Hayes-Menzies. Though factual, the book has strong narrative qualities, making it an ideal comparison to the narrative fiction. The plot has many parallels with the fiction text. The text tells the story of Woo, a Javanese macaque, suffering both abuse and exploitation by humans. For this experiment the text was changed to depict a Capuchin named Clotho instead, ensuring greater similarity between conditions (see A.4). This did not interfere with the other factual or narrative qualities of the text. The text consisted of 1001 words (estimated reading time 5.01 min based on 200 words per minute).

Expository Non-Fiction. The expository non-fiction text was adapted from a New England Primate Conservancy description of the Guianan Weeper Capuchin. This text allowed us to test whether merely learning about an animal is sufficient to induce concern for their welfare. The text provides factual information concerning the monkey's habitat, size, weight, behaviour, appearance and diet. To ensure similarity between conditions, the text was adapted to refer to one specific Capuchin monkey named Clotho (see A.5). The text comprised 998 words (estimated reading time 4.99 min based on 200 words per minute).

2.4. Proposed mediator variables

Identification. Extent of identification with the monkey was assessed with one item: "I identified with Clotho" (1 = *Strongly disagree*, 7 = *Strongly agree*).

Similarity. One item measured perceived similarity with the monkey: "I felt similar to Clotho" (1 = *Strongly disagree*, 7 = *Strongly agree*).

Empathic concern with the monkey. This was assessed with one item: "I imagined what it would be like to be in the position of Clotho." (1 = *Strongly disagree*, 7 = *Strongly agree*; adapted from de Graaf et al., 2012).

Empathic concern towards animals. This was measured using the seven-item measure of Niemyjska et al. (2018; adapted from Davis, 1980) Empathic Concern Scale; e.g. "I often have tender feelings and concern for animals suffering or living in bad conditions"; 1 = *Strongly disagree*, 7 = *Strongly agree;* $\alpha = .92$).

Perspective-taking. Three items were adapted from Vezzali et al. (2015; See also Stephan, 1999) to examine the effect on perspective-taking: "I think I understand the way animals experience the world"; "It's difficult for me to see things from the point of view of animals"; "In general I'm able to put myself in the place of animals to understand their experience" (1 = *Strongly Disagree*, 7 = *Strongly Agree;* $\alpha = .84$).

Mind-attribution. Participants mind-attribution indicated the perceived tendency of a monkey to experience different mental states. They answered the question: "To what extent does a monkey experience…" for mental states reflecting two dimensions,

[1] References to physical violence were changed to depict psychological violence (e.g. descriptions of the monkey being hooded and burnt by a cigarette were changed to the monkey being shouted at, and depictions of electrocuting the monkey were changed to using loud noises to scare the monkey).

Table 1
Mean Scores Across Each Condition (Experiment 1a-b).

Experiment 1a	Narrative Fiction(N = 122)	Narrative Non-Fiction(N =120)	Expository Non-Fiction(N =121)	Experiment 1b Narrative Non-Fiction Unrelated to Animals (N =121)
Attitudes Toward Animal Welfare	5.52(0.90)	5.42(0.93)	5.34(0.93)	5.20(0.94)
Identification with the Monkey	4.10(1.75)	3.78(1.63)	3.50(1.55)	N/I
Perceived Similarity with the Monkey	3.30(1.50)	3.01(1.35)	3.16(1.45)	N/I
Empathic Concern for the Monkey	5.80(1.11)	5.21(1.41)	4.79(1.65)	N/I
Empathic Concern for Animals	6.10(0.96)	6.05(0.94)	5.93(0.99)	N/I
Perspective Taking	4.44(1.33)	4.64(1.31)	4.32(1.21)	N/I
Mind Attribution	5.98(0.83)	5.91(0.77)	5.81(0.79)	N/I

Note. M(SD). N/I = Not Included.

Experience (e.g., hunger, fear) and *Agency* (e.g., self-control, morality) (1 = *Definitely does not experience*, 7 = *Definitely does experience;* $\alpha = .92$; Gray et al., 2012; Bastian et al., 2012).

2.5. Proposed moderator variable

Speciesism. The moral worth ascribed to animals was measured using the six-item Speciesism Scale (Caviola et al., 2019; e.g., "Morally, animals always count for less than humans"; 1 = *Strongly Disagree*, 7 = *Strongly agree;* $\alpha = .79$).

2.6. Outcome variables

Attitudes towards animal welfare. These attitudes were measured employing the scale used in Małecki et al. (2018; 2019). Seven items assess endorsement of animal welfare, e.g., "I feel personally responsible for helping animals in need" and "The low costs of food production do not justify maintaining animals under poor conditions" (1 = *Strongly disagree*, 7 = *Strongly agree;* $\alpha = .78$).

Donation to an animal charity. Participants were asked if they would donate £1 from their participation reward to an animal charity ostensibly endorsed by the University of Kent.

3. Results

[2]A one-way between-subjects ANOVA with condition as the grouping variable (narrative fiction *vs.* narrative non-fiction *vs.* expository non-fiction) and attitudes toward animal welfare as the outcome variable, showed that, contrary to our predictions, there were no significant differences in concern for animal welfare between the three conditions, $F(2, 360) = 1.06$, $p = .347$, $\eta 2 = .01$ (see Table 1).[3] Following this null effect, we did not test hypotheses concerning mechanisms for the effect of narratives on concern for animal welfare.[4]

For the dichotomous outcome variable willingness to donate we used a Kruskal-Wallis test. Contrary to predictions, willingness to donate was no greater after reading a narrative fiction text (mean rank of 185.31) than an expository non-fiction text (mean rank of 171.85), $\chi 2(2) = 2.27$, $p = .321$, $\varepsilon^2 = .00$.[5]

To test whether there were any significant differences between the three conditions in the levels of endorsement on the mediator variables: 1) Identification, 2) Perceived similarity, 3) Empathic concern towards the monkey, 4) Empathic concern toward animals, 5) Perspective-taking, and 6) Mind-attribution, we employed a series of one-way ANOVAs with condition as the grouping variable and each of the measures as outcome variable.

There was a significant difference in identification between the three reading conditions, $F(2, 360) = 4.09$, $p = .018$, $\eta 2 = .02$.[6] Planned contrasts revealed that, consistent with our predictions, participants reported greater identification with the monkey in the

[2] All analyses were pre-registered, and the full datasets and analyses are available on the Open Science Framework website (see https://osf.io/ybjr6). We adopted the standard significance level of $p<.05$ for all inferential tests.

[3] There was also no significant difference in concern for animal welfare between the conditions in an ANCOVA controlling for pet ownership, diet, or how interesting participants found the text, $F(2, 356) = 1.4$, $p = .246$, $\eta 2 = .01$.

[4] How artistic the text was rated was significantly different between conditions, $F(2, 360) = 24.49$, $p < .001$. The narrative fiction text was seen as more artistic ($M = 4.89$, $SD = 1.38$) than the narrative non-fiction text ($M = 4.27$, $SD = 1.47$) and expository non-fiction text ($M = 3.56$, $SD = 1.57$), all $ps < .01$.

[5] Effect size formula for epsilon square (Kruskal-Wallis test): H / [(n2 - 1) / (n+1)], where H is the K-W test statistic value, and n is the total number of observations. In this case 2.27/(362-1)/(362+1).

[6] This difference remained significant when pet ownership, diet, and how interesting participants found the text were adjusted for. Condition $F(2, 356) = 7.44$, $p = .043$, $\eta 2 = .02$.

narrative fiction (*vs.* expository non-fiction) condition, $t(238.05) = 2.84$, $p = .005$, $d = 0.36$. Participants did not report greater identification in the narrative non-fiction (*vs.* expository non-fiction) condition, $t(238.26) = 1.37$, $p = .174$, $d = 0.18$. There was also no significant difference between narrative fiction and narrative non-fiction conditions, $t(239.25) = 1.49$, $p = .138$, $d = 0.19$.

In line with our predictions, there was a significant difference between conditions in empathic concern for the monkey, $F(2, 360) = 26.34$, $p < .001$, $\eta 2 = .13$.[7] Participants reported greater empathic concern for the monkey in the narrative fiction (*vs.* expository non-fiction) condition, $t(209.55) = 7.25$, $p < .001$, $d = 0.72$; in the narrative non-fiction (*vs.* expository non-fiction) condition, $t(234.11) = 3.64$, $p < .001$, $d = 0.27$; and in the narrative fiction (*vs.* narrative non-fiction) condition, $t(225.12) = 3.59$, $p < .001$, $d = 0.46$. There were no significant differences between conditions in empathic concern toward animals, $F(2, 360) = 0.98$, $p = .375$, $\eta 2 = .01$, in perceived similarity, $F(2, 360) = 1.20$, $p = .301$, $\eta 2 = .01$, perspective-taking, $F(2, 359) = 2.45$, $p = .088$, $\eta 2 = .01$, or mind-attribution, $F(2, 360) = 1.36$, $p = .259$, $\eta 2 = .01$.[8]

4. Discussion

In Experiment 1a we utilised a well-powered, pre-registered design to test the prediction that reading a narrative text about the plight of an animal, regardless of its fictionality, would increase concern for animal welfare. This hypothesis was largely unsupported. After having read either a narrative fiction text, a narrative non-fiction text or a non-fiction expository text about a monkey, participants only differed in their identification with and empathic concern for the monkey depicted in the text. Participants showed the strongest identification and empathic concern in the narrative fiction text compared to the other texts. There were no significant differences between conditions in attitudes toward animal welfare or willingness to donate to an animal charity. Nor were there any differences in the levels of participants' perceived similarity with the monkey, empathic concern for animals, perspective-taking or mind-attribution.

The current results therefore do not support the proposition that reading fictional stories about animals can increase concern for animal welfare. It is unclear why this is the case. The present investigation employed a narrative fiction text that has been found to increase concern for animal welfare in Polish samples (Małecki et al., 2016, 2018). One possibility is that the effect observed in previous research is the result of a confound in the control texts. Earlier studies compared the narrative fiction text about an animal with either a narrative fiction or narrative non-fiction text unrelated to animals. Perhaps the effect on attitudes observed in previous research was the result of conceptual priming the topic of animals. We employed a more stringent comparison with narrative non-fiction and expository non-fiction texts about a monkey, to isolate the effects of narrativity and fictionality. In Experiment 1b we collected data for an additional narrative non-fiction text unrelated to animals to examine whether differences would emerge.

Experiment 1. b Additional Control Condition

We examined whether the effect of fiction found in previous research (Małecki et al., 2016, 2018) was the result of conceptual priming (due to a confound in the fiction/non-fiction texts used). Małecki et al. (2018) compared a narrative fiction text about a monkey's plight with a narrative non-fiction text unrelated to animals (about the Higgs boson). It is possible that Experiment 1a failed to uncover any significant differences between narrative fiction, narrative non-fiction and expository non-fiction texts regarding attitudes to animals because the topic was consistent across all conditions and thus all primed the concept of animals; this would suggest that Małecki et al.'s findings do not reflect a genuine effect of fictionality or narrativity.

To test this idea, we collected data for an additional condition, using a narrative text similar to that used in Małecki et al. (2018). Participants ($N = 121$; see Fig. 2 for sampling overview) read a magazine article about dark matter (see B.1 for text) and completed the attitudes toward animal welfare measure and control questions as in Experiment 1a (see B.2 for method).[9] This text condition enabled a comparison of the effect of narrative fiction *vs.* narrative non-fiction on an unrelated topic, replicating the design of Małecki et al. (2018). We expected that participants would display greater concern for animals and willingness to donate in the narrative fiction condition compared to the unrelated text. We examined the influence of topic and fictionality by looking for differences in attitudes toward animals between this narrative non-fiction, non-animal text and the narrative non-fiction and expository non-fiction texts used in Experiment 1a. If Małecki et al. (2018) original findings reflect an effect of fiction, irrespective of topic, we would expect no difference between these conditions, since they all comprise non-fiction. By contrast, finding that reading non-fiction texts about a monkey leads to greater concern and willingness to donate compared to a non-fiction, non-animal text would indicate that the effect observed in previous studies is not due to either fictionality or narrativity, but instead conceptual priming (e.g., Chartrand & Bargh, 1996; Yousaf & Popat, 2015).

In summary, we predicted the following (see B.3 for full list of hypotheses): Participants who read the narrative fiction text about a monkey would report greater concern for animal welfare and greater willingness to donate, compared to participants who read the unrelated narrative non-fiction text. Further, we predicted that participants who the read narrative non-fiction or expository non-

[7] This difference remained significant when pet ownership, diet, and how interesting participants found the text were adjusted for. Condition $F(2, 356) = 27.64$, $p < .0013$, $\eta 2 = .13$.

[8] The effect of condition remained non-significant when pet ownership, diet, and how interesting participants found the text were adjusted for. Concern Toward Animals: $F(2, 356) = 0.93$, $p = .395$, $\eta 2 = .01$; Perceived Similarity: $F(2, 356) = 0.74$, $p = .480$, $\eta 2 = .00$; Perspective-taking: $F(2, 356) = 2.64$, $p = .073$, $\eta 2 = .02$; Mind-attribution: $F(2, 356) = 1.21$, $p = .299$, $\eta 2 = .01$.

[9] Measures of identification, perceived similarity and empathic concern with/for the character in the text, mind-attribution, empathic concern towards animals, and speciesism were excluded from Experiment 1b.

fiction texts about a monkey would report greater concern for animal welfare and willingness to donate, compared to participants in the unrelated narrative non-fiction condition.

5. Results

[10]Participants who read the narrative fiction text showed greater concern for animal welfare than participants who read the narrative non-fiction text unrelated to animals (See Table 1), $t(241) = 2.66$, $p = .008$, $d = 0.35$. Participants did not display greater concern for animal welfare after having read the narrative non-fiction text compared to the unrelated narrative non-fiction text, $t(239) = 1.81$, $p = .071$, $d = 0.24$. Nor was there a significant difference in the concern for animal welfare between expository non-fiction and unrelated narrative non-fiction, $t(240) = 1.18$, $p = .241$, $d = 0.15$.[11]

A series of Mann Whitney *U* tests showed that, consistent with our predictions, participants who read a narrative fiction text about a monkey reported greater willingness to donate (mean rank = 128.63) than those who read an unrelated narrative non-fiction text (mean rank = 112.24), $U(n = 121, n = 119) = 6217$, $p = .023$, $r = -.15$.[12] In line with our predictions, participants who read a narrative non-fiction text about a monkey (mean rank = 128.80) were more willing to donate than those who read the unrelated narrative non-fiction text (111.12), $U(n = 120, n = 119) = 6083.50$, $p = .014$, $r = -.16$.[13] However, there was no significant difference in willingness to donate between participants who read the expository non-fiction text (Mean rank = 124.19) and the unrelated narrative non-fiction text (116.74), $U(n = 121, n = 119) = 6752.50$, $p = .735$, $r = .$[14]

6. Discussion

Experiment 1b showed that participants who read a narrative fiction text about a monkey reported greater concern for animal welfare than participants who read a narrative non-fiction text unrelated to animals. Reading a narrative non-fiction text or an expository non-fiction text about a monkey did not increase concern for animal welfare compared to narrative non-fiction text unrelated to animals, suggesting that conceptual priming alone cannot explain the effects on animal welfare concern in the narrative fiction condition. Compared to participants who read a narrative non-fiction text unrelated to animals, participants who read either the narrative fiction or narrative non-fiction text about a monkey reported greater willingness to donate. The inconsistency with earlier studies could be because we removed severe depictions of physical violence from the narrative fiction text. To rule out this explanation, we conducted a closer replication using the original version of the text in Experiment 2.

Experiment 2. :

Since Experiments 1a and b failed to find a consistent effect of either fictionality or narrativity, in Experiment 2 we sought to test whether the effect of narrative fiction on concern for animal welfare would emerge using a pre-registered, stripped-down research design that replicated the study used by Małecki et al. (2018). Experiment 2 compared the narrative fiction text about a monkey's plight with a narrative non-fiction text about an unrelated topic (see C.1 for full details of method). Further, we reverted to the translated narrative fiction text from Małecki et al. (2018), before we reduced the severity of suffering (for Experiment 1a-b; see C.2 for text). If the effect of narrative fiction on attitudes toward animal welfare emerged with the more violent text, it suggests that any effect of fiction-reading requires severe depictions of animal abuse and an unrelated non-fiction comparison text, to elicit increased concern for animal welfare.

We predicted that participants who read the narrative fiction text about a monkey would report greater concern for animal welfare and willingness to donate, compared to participants in the unrelated narrative non-fiction control condition (see C.3 for full list of hypotheses).

7. Method

7.1. Participants and design

Participants were UK-based, native English-speakers recruited from Prolific Academic, paid £7.52 hourly rate ($N = 184$ remained in

[10] All analyses were pre-registered, and the full datasets and analyses are available on the Open Science Framework website (see https://osf.io/x8pkh). We adopted the standard significance level of $p<.05$ for all inferential tests.

[11] The effect of condition on Attitudes Toward Animal Welfare remained non-significant, adjusting for pet ownership, diet and how interesting participants found the text in an ANCOVA, $F(3, 475) = 1.52$, $p = .210$, $\eta 2 = .01$.

[12] Z(-2.28)/square root of two conditions N = 249 (15.49).

[13] Z(2.45)/square root of two conditions N = 239 (15.46).

[14] Z(-1.08)/square root of two conditions N =240 (15.49).

the final sample; narrative fiction condition = 96; 76.50% women; $M_{age} = 39.91$, $SD_{age} = 15.51$; unrelated non-fiction condition = 86; 76.70% women; $M_{age} = 41.37$, $SD_{age} = 15.24$; see Fig. 3). The study employed a randomised controlled design with one between-subjects factor with two levels (narrative fiction *vs.* unrelated control text).[15]

8. Results

[16]Contrary to our predictions[17] there was no significant difference in the concern for animal welfare between participants who read the narrative fiction ($M = 5.46$, $SD = 0.84$) *vs.* the unrelated narrative non-fiction text ($M = 5.45$, $SD = 0.91$), $t(182) = 0.13$, $p = .896$, $d = .01$. [18] Further, participants were less willing to donate in the narrative fiction condition (mean rank 85.96) *vs.* the unrelated narrative non-fiction condition (mean rank 99.95), $U(n = 98, n = 86) = 3573.00$, $p = .017$, $r = -.18$.[19]

9. Discussion

In Experiment 2 we employed a pre-registered experimental design very close to Małecki et al. (2018)'s study to examine whether reading a short narrative fiction text about an animal's plight (*vs.* a narrative non-fiction text unrelated to animals) would increase concern for animal welfare and willingness to donate to an animal charity. These predictions were unsupported. There was no significant difference in the concern for animal welfare between the two conditions. Further, contrary to our predictions, participants who read a narrative non-fiction text unrelated to animals (vs. a narrative fiction text about a monkey) reported *greater* willingness to donate. Potential explanations are discussed in the General Discussion.

Experiment 3. :

This final experiment examined whether the lack of a consistent effect of narrativity or fictionality on attitudes toward animal welfare could be due to the high baseline mean scores of concern for animal welfare. Across experiments 1a-2, concern for animal welfare was high, $M = > 5.20$ (out of 7). Further, the animal texts in the previous studies depicted a monkey, which is afforded greater moral worth than most other animals (Bradley et al., 2020; Caviola, 2019). Thus, the lack of a consistent effect could be due to a combination of a ceiling effect on the concern for animal welfare measure and the chosen stimuli.

To address this possibility, Experiment 3 examined whether concern for animal welfare is influenced by the animal depicted in the text. We also sought a more in-depth investigation of the potential differential effects of narrativity and fictionality. Humans' empathy for animals is not universally applied across all species. Fictionality might be more important in inducing empathic concern for animals that are typically afforded lower moral regard, and species that exhibit physical, behavioural or cognitive similarities to humans are more likely to elicit positive affect than those which are less similar (Harrison, 2010; Prguda & Neumann, 2014).

Experiment 3 further explored the question of whether reading narrative fiction (*vs.* narrative non-fiction) about an animal's suffering increases concern for animal welfare or charitable behaviour, by manipulating the animal depicted in the text, so that fiction/non-fiction narratives either depicted a monkey (i.e. high perceived moral worth and similarity to humans) or a lizard (i.e. lower perceived moral worth and less similarity to humans; Bradley et al., 2020; Caviola, 2019). The study included both a general measure of attitudes toward animal welfare as well as animal-specific measures of welfare attitudes (see D.1 for full details of method). This design allowed us to test the specificity with which narrativity and fictionality influence attitudes towards animal welfare, and whether effects of narrative fiction can be elicited when ceiling effects on empathy for animals have been reduced (i.e. when the text depicts a lizard; see D.2-3 for texts). It also enabled us to examine the possibility that the texts may affect attitudes toward the specific animal depicted, but not animal welfare more broadly.

In summary, we predicted the following (see D.4 for full list of hypotheses): Reading a fictional story about an animal's suffering *vs.* reading a non-fictional story about the same animal would lead to increased concern for animal pain, for animal welfare in general, and willingness to donate. Further, although reading a fiction narrative (vs. a non-fiction narrative) about an animal will increase concern, this will be greater for the specific kind of animal depicted, as will identification, perceived similarity, and empathic concern for/with the specific animal.

We also included an alternative prediction that reading a fiction (*vs.* non-fiction) narrative about an animal increases concern for animal welfare (general), but the effect will be greater when the text depicts an animal held in higher regard (monkeys), compared to

[15] An a-priori Power analysis, using GPower analysis software (test family: t-tests; means: difference between two independent means; power: .80; probability: 0.05), showed that a sample size of $N = 128$ ($n = 64$ in each condition) was required to detect a medium effect size ($d = 0.5$; based on the effect size $n^2 = .07$ reported in Małecki et al., 2018). Following Bysbaert's (2019) recommendation to ensure sufficient power (especially after exclusions) we therefore recruited 240 participants (120 per condition). The same exclusion criteria as in Experiment 1a-b were applied. The target sample was achieved after 263 participants.

[16] All analyses were pre-registered, and the full datasets and analyses are available on the Open Science Framework website (see https://osf.io/n9kp5). We adopted the standard significance level of $p<.05$ for all inferential tests.

[17] Participants rated the narrative fiction text ($M = 4.69$, $SD = 1.59$) as more significantly more artistic than the unrelated control text ($M = 2.70$, $SD = 1.57$), $t(182) = 8.56$, $p < .001$, $d = 1.26$.

[18] There was no significant difference in concern for animal welfare between the narrative fiction condition and the unrelated control condition in an ANCOVA controlling for pet ownership, diet, and how interesting participants found the text. Condition $F(1, 179) = 0.08$, $p = .777$, $\eta 2 = .00$.

[19] Z(-2.39)/square root of two conditions $N = 184$ (13.56).

Table 2
Summary of means and standard deviations across conditions (Experiment 3).

	NF Monkey	NF Lizard	NNF Monkey	NNF Lizard
Attitudes Toward Animal Welfare	5.66(0.85)	5.72(0.87)	5.47(0.78)	5.27(0.92)
Attitudes Toward Monkey Welfare	5.47(0.92)	5.45(0.84)	5.23(0.87)	5.07(0.94)
Attitudes Toward Lizard Welfare	5.06(1.00)	5.30(0.90)	4.87(0.92)	4.78(0.97)
Attitudes Toward Nature	5.88(0.85)	5.86(0.85)	5.68(0.79)	5.58(088)
Identification with the animal	3.60(1.60)	3.62(1.51)	3.17(1.36)	3.14(1.44)
Empathic Concern for the animal	5.78(1.28)	5.92(1.08)	5.38(1.12)	4.95(1.53)

Note. N =290.

lower regard (lizards). Concern for a monkey would be equally high after reading a text about a lizard or a monkey. Exploratory analyses were included to examine whether narrative fiction (*vs.* non-fiction) leads to greater general concern for nature.

10. Method

10.1. Participants and design

Participants were UK-based and native English-speaking (Prolific Academic; paid £7.52 hourly rate; $N = 290$ remained in the final sample; 74.50% women; $M_{age} = 32.50$, $SD_{age} = 12.67$; See Fig. 4). The study employed a randomised controlled 2 (text: narrative fiction *vs.* narrative non-fiction) x 2 (animal: monkey *vs.* lizard) between-subjects design.[20]

11. Results

[21]We conducted four 2 (Text: narrative fiction *vs.* non-fiction) x 2 (Animal: monkey *vs.* lizard) between-subject factorial ANOVAs with attitudes toward 1) animal welfare, 2) monkey welfare, 3) lizard welfare, and 4) nature as the outcome variables (See Table 2). Consistent with predictions there was a significant main effect of Text on all outcome variables, such that participants who read a narrative fiction text (*vs.* a narrative non-fiction text) reported greater concern for animal welfare, $F(1, 286) = 10.02$, $p = .002$, $\eta 2 = .03$, monkey welfare, $F(1, 286) = 8.82$, $p = .003$, $\eta 2 = .03$, lizard welfare, $F(1, 286) = 10.08$, $p = .002$, $\eta 2 = .03$, and even nature, $F(1, 286) = 5.66$, $p = .018$, $\eta 2 = .02$.

Contrary to predictions, there was no main effect of Animal on any of the outcome variables; there was no difference between participants who read about a monkey or a lizard on concern for animal welfare, $F(1, 286) = 0.52$, $p = .471$, $\eta 2 = .00$, monkey welfare, $F(1, 286) = 0.66$, $p = .418$, $\eta 2 = .002$, lizard welfare, $F(1, 286) = 0.51$, $p = .476$, $\eta 2 = .00$, or nature, $F(1, 286) = 0.37$, $p = .542$, $\eta 2 = .00$. There were also no significant Text x Animal interaction effects on any of the outcome variables; animal welfare, $F(1, 286) = 1.66$, $p = .199$, $\eta 2 = .01$, monkey welfare, $F(1, 286) = 0.43$, $p = .514$, $\eta 2 = .00$, lizard welfare, $F(1, 286) = 2.18$, $p = .141$, $\eta 2 = .01$, or nature, $F(1, 286) = 0.18$, $p = .671$, $\eta 2 = .00$.

For willingness to donate, we used two Mann-Whitney U tests. In the first, text (narrative fiction *vs.* narrative non-fiction) was the grouping variable, while willingness to donate (yes/no) was the outcome variable. There was no difference in willingness to donate between participants who read a narrative fiction text (mean rank 148.00) and those who read a narrative non-fiction text (mean rank 143.00), $U(n = 145, n = 145) = 10150$, $p = .467$. Nor was there a difference between reading a narrative about a monkey (mean rank 145.00) and reading a narrative about a lizard (mean rank 146.00), $U(n = 145, n = 145) = 10440.00$, $p = .884$.

To test whether there were significant differences in the proposed mediator variables–1) Identification with the animal and 2) empathic concern for the animal – we conducted two 2 (Text: narrative fiction *vs.* narrative non-fiction) x 2 (Animal: monkey *vs.* lizard) between-subjects factorial ANOVAs with identification and empathetic concern as the outcome variables. In line with predictions, there was a main effect of Text, such that people reported greater identification, $F(1, 286) = 6.34$, $p < .011$, $\eta 2 = .02$, and greater empathic concern, $F(1, 286) = 21.44$, $p < .011$, $\eta 2 = .07$, after reading a narrative fiction text compared to a narrative non-fiction text. However, there were no differences in identification between participants who read about a monkey and those who read about a lizard, $F(1, 286) = 0.00$, $p = .983$, $\eta 2 = .00$, or empathic concern, $F(1, 286) = 0.98$, $p = .324$, $\eta 2 = .00$.

11.1. Exploratory mediation analysis

Since there was a significant main effect of text on concern for animal welfare, we wanted to test the pre-registered predictions in Experiment 1a with the new data. Since we did not make predictions about mechanisms in the pre-registration for Experiment 3, we refer to these as exploratory analyses, although directional predictions were made in an earlier pre-registration (see Experiment 1a).

[20] An a-priori Power analysis using GPower analysis software (Test family: F-tests; ANOVA: Fixed effects, special, and main effects; Power: .80; Probability: 0.05) showed that a sample size of $N = 280$ ($N = 70$ in each condition) was required to detect a medium effect size ($F = 0.25$). The same exclusion criteria as in Experiment 1-2 were applied. The target sample was achieved after 368 participants.

[21] All analyses were pre-registered, and the full datasets and analyses are available on the Open Science Framework website (see https://osf.io/ubq42). We adopted the standard significance level of p<.05 for all inferential tests.

To examine whether narrative fiction (*vs.* non-fiction) leads to greater concern for animal welfare because it increases empathic concern and identification with the character, we ran a mediation analysis using PROCESS (Hayes, 2017; Model 4).[22] As predicted in our earlier pre-registration, there was a significant indirect effect of Text through Empathic Concern, $B = .08$, $SE = .02$, [0.05, 0.12]. However, there was no indirect effect through Identification, $B = .01$, $SE = .01$, [-0.01, -0.03]. In a pairwise comparison, the indirect effect of Text on Concern for Animal Welfare through empathic concern was significantly larger than that of identification, $B = -.09$, $SE = .02$, [-0.14, -0.04]. The direct effect of Text on Concern for Animal Welfare was not significant, $B = .08$, $SE = .04$, [-0.01, 0.16], consistent with full mediation (see Fig. 5).

12. Discussion

Experiment 3 showed that participants who read a narrative fiction (*vs.* non-fiction) text reported greater concern for animal welfare, monkey welfare, lizard welfare, and nature. Participants also reported greater identification with and empathic concern for the animal depicted after reading a narrative fiction text (*vs.* narrative non-fiction) text. These results are consistent with our predictions that narrative fiction (*vs.* non-fiction) would enhance these measures. However, there was no significant effect of the type of animal depicted. Participants did not report greater concern for animals after having read a text about a monkey (*vs.* lizard), even though monkeys are typically thought to have greater moral worth than lizards.

This finding suggests that the influence of narrative fiction on attitudes towards animal welfare is general in nature, rather than specific to the animal depicted in the text. Finally, there was no evidence that reading narrative fiction influenced pro-social behaviour towards animals.

13. General discussion

The present investigation sought to provide the first conceptual replication of earlier experiments that have found enhanced animal welfare concern after reading a narrative fiction text (Małecki et al., 2016, 2018, 2019; Małecki et al., 2019). In addition, we aimed to differentiate the influence of narrativity and fictionality, and examine the potential mechanisms that underlie beneficial effects of reading on concern for animal welfare. Our investigation used a pre-registered, carefully controlled experimental design and provided mixed evidence for this claim (See Table 3 in E.1 for a summary of results across all experiments).

In Experiment 1a participants showed no increased concern for animal welfare or willingness to donate after reading a narrative fiction text about a monkey's plight compared to a narrative non-fiction or expository non-fiction text about the same animal. Experiment 1b tested an additional condition, in which participants read a narrative non-fiction text unrelated to animals, showing that concern for animal welfare and willingness to donate was greater among participants who read the narrative fiction text (*vs.* a non-fiction text unrelated to animals). Participants in the narrative non-fiction text condition also showed greater willingness to donate compared to those in the unrelated narrative non-fiction condition. There was no difference in concern for animal welfare between either the narrative non-fiction text or the expository non-fiction texts about a monkey and the unrelated narrative non-fiction text.

In Experiment 2 we employed a design that enabled a closer replication of Małecki et al. (2018), finding no difference in concern for animal welfare between the narrative fiction condition and the unrelated narrative non-fiction condition. A difference in willingness to donate appeared in the opposite direction than expected (narrative fiction < non-fiction unrelated to animals). Experiment 3 compared the same narrative fiction and narrative non-fiction texts about either a monkey or a lizard, showing that participants who read a narrative fiction (*vs.* narrative non-fiction) text reported greater concern for animal welfare, monkey welfare, lizard welfare and nature, regardless of whether the text was about a monkey or a lizard. There was no significant difference in willingness to donate between the texts or the types of animal depicted.

The present findings are partly inconsistent with Małecki et al. (2016) finding that reading a narrative fiction excerpt about a monkey's plight increased participants' concern for animal welfare. Using the same narrative fiction text, translated from Polish to English and with more stringent control conditions (i.e. including narrative non-fiction and expository non-fiction texts about the same animal), the present data suggest that if there is an effect of narrative fiction/non-fiction, it may be too small and/or too sensitive to unknown experimental design factors to be reliably measured.

In both Experiments 1b and 3, reading a narrative fiction text increased concern for animal welfare in general and toward specific animals. Further, in Experiment 1b participants in both the narrative fiction and narrative non-fiction conditions showed greater willingness to donate to an animal charity, than those in the unrelated narrative non-fiction condition. In contrast, narrative fiction had no effect on willingness to donate in Experiments 2 and 3. The absence of an effect of narrative fiction on pro-social behaviour towards animals in two out of three of the present experiments is consistent with previous research failing to find such an effect (Małecki et al., 2018). Together these results suggest that a short narrative fiction text is insufficient to affect pro-social behaviour on behalf of animals.

In general, the present inconsistent findings mirror inconsistencies in existing research on the effects of fiction on attitudes toward animals (Małecki et al., 2018; 2019). Małecki et al. (2018) found that a narrative fiction text (the same or similar to that used in the

[22] Text (1 = Narrative fiction, -1 = Narrative non-fiction) was entered as the predictor variable (X), Empathic Concern and Identification were entered as the mediators (M), Concern for Animal Welfare was entered as the outcome variable (Y), while Animal (1 = Monkey, -1 = Lizard) was entered as a covariate. All continuous predictor variables were standardized prior to analysis, and 95% confidence intervals with 5000 bootstrap resamples were used to assess significance.

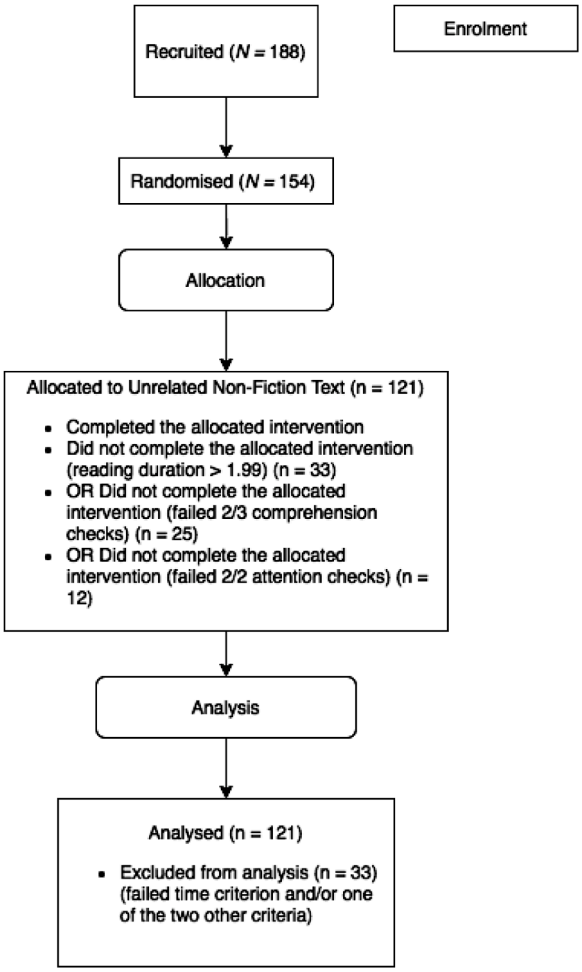

Fig. 2. Participant Sampling (Experiment 1b).

present experiments) led to increased concern for animal welfare in a sample of 62 Polish participants a week after exposure. However, two subsequent studies failed to find an effect after two months in a different sample of 410 participants, or on pro-social behaviour toward animals immediately after reading (Małecki et al., 2018). Part of the explanation is likely found in the design of these studies – the present investigation included. Asking participants to read a short text is unlikely to create lasting changes in attitudes. It is also possible that differences between studies in participant inclusion criteria influenced results; the current experiments employed strict exclusion criteria based on comprehension, attention and reading times which have not been applied in previous studies. The reliance on between-subjects designs both in the present studies and in the field more broadly might also contribute to the inconsistent findings due to differences between groups that are not controlled for.

One potential explanation for the inconsistency between the results for our Experiments 1-2 and Małecki et al. (2016) could be cultural variation in animal welfare concern. Participants scored well above the mid-point on the Attitudes Toward Animal Welfare measure, which is consistent with data showing that the UK public has a relatively high degree of animal welfare concern (e.g., Alonso et al., 2020; Blokhuis et al., 2013; Phillips et al., 2012). The mean score on this measure was higher in our UK sample ($Ms > 5.27$) compared to Małecki et al.'s Polish sample (2016; $Ms < 4.11$), suggesting that there might be cultural differences in the baseline concern.[23] A higher baseline score in concern for animals' welfare could have made it difficult to elicit additional increases consistently.

We also theorised about potential mechanisms that might underlie the effect of narratives. In Experiment 1a, the narrative fiction (*vs.* expository non-fiction) text led to increased identification with and empathic concern for the monkey, while the narrative non-fiction (*vs.* expository non-fiction) text led to greater empathic concern, but not identification. Experiment 3 showed that participants who read a narrative fiction (*vs.* non-fiction) text either about a monkey or a lizard reported greater identification with and empathic concern for the animal. In light of this, the present experiments invite further investigation. It seems that narrative fiction and

[23] *Note*. Both in Małecki et al., (2018) and our studies the measure was scored on a 7-point scale.

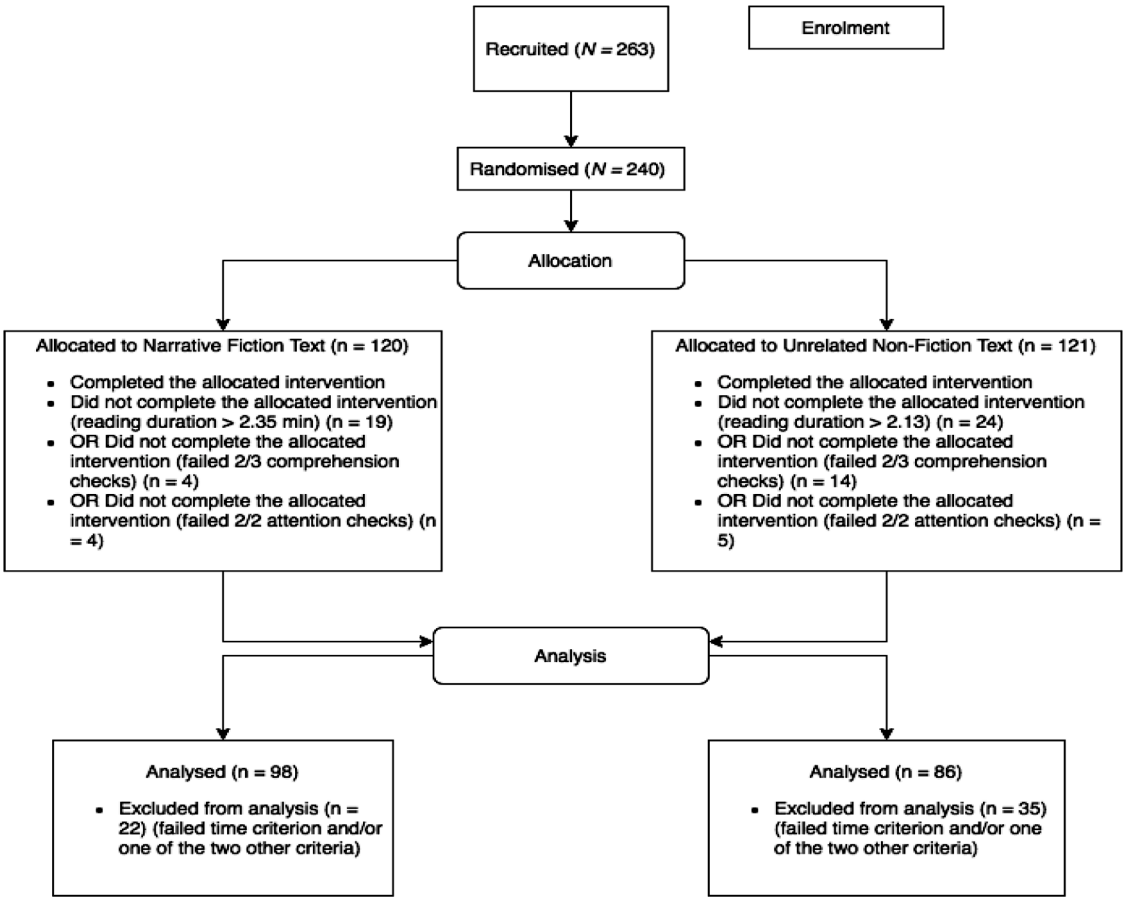

Fig. 3. Participant Sampling (Experiment 2).

non-fiction texts *can* affect identification and empathic concern for the animal depicted in the text more than an expository non-fiction text. However, these effects do not always translate into increased concern for animal welfare in general. Experiment 3 further suggests that the lack of a consistent effect of narratives in the present experiments is not because of high regard for monkeys in particular (Caviola & Caprano, 2020). Further research should examine potential factors in explaining these patterns.

These findings also speak to debates on the distinctive contributions of fictionality and narrativity. In Experiment 1, our narrative fiction and narrative non-fiction conditions differed only on identification with the character, with higher levels of identification reported in the narrative fiction condition. In contrast, Experiment 3 suggested a clear effect of fictionality, with participants displaying increased scores on all outcome and mediator measures, compared to those in the narrative non-fiction condition. It has been argued that taking on the perspective of a character in a text is crucial in order for the text to affect attitudes (Mar & Oatley, 2008). These results suggest that fictionality is particularly important in increasing identification with and empathic concern for a character. Further research is needed to test whether these patterns generalise beyond the specific texts used here, and whether they influence attitudes in other cases.

The present experiments employed naturalistic texts to ensure ecological validity (e.g., Kurby & Zacks, 2015; Molinari et al., 2011). Although great effort was made to match the texts on subject matter, length, focalization, key details and severity, the texts still differed in ways that may have introduced confounds. Most notably, the narrative fiction text used in Małecki et al. (2018) was translated from Polish to English, while the other texts were originally written in English by Canadian and American authors. Although the text was professionally translated, narrative qualities and cultural assumptions may still have differed from the original text. The texts were chosen by the researchers, either for the present studies or by Małecki et al. (2018). Although this is common practice, it increases the potential for experimenter bias.

To conclude, we sought to differentiate the role of fictionality and narrativity in influencing animal welfare concern. Building on previous research, we introduced a more stringent experimental paradigm comparing narrative fiction, narrative non-fiction and expository non-fiction about an animal, and employed a measure of attitudes towards animal welfare (as inMałecki et al. 2018, 2016) and a novel measure of charitable behaviour on behalf of animals. We tested several theory-driven hypotheses to elucidate potential psychological mechanisms through which narrative fiction and non-fiction might influence concern for animal welfare. The present findings suggest that although reading narrative fiction about animals may increase identification and empathic concern for the animal

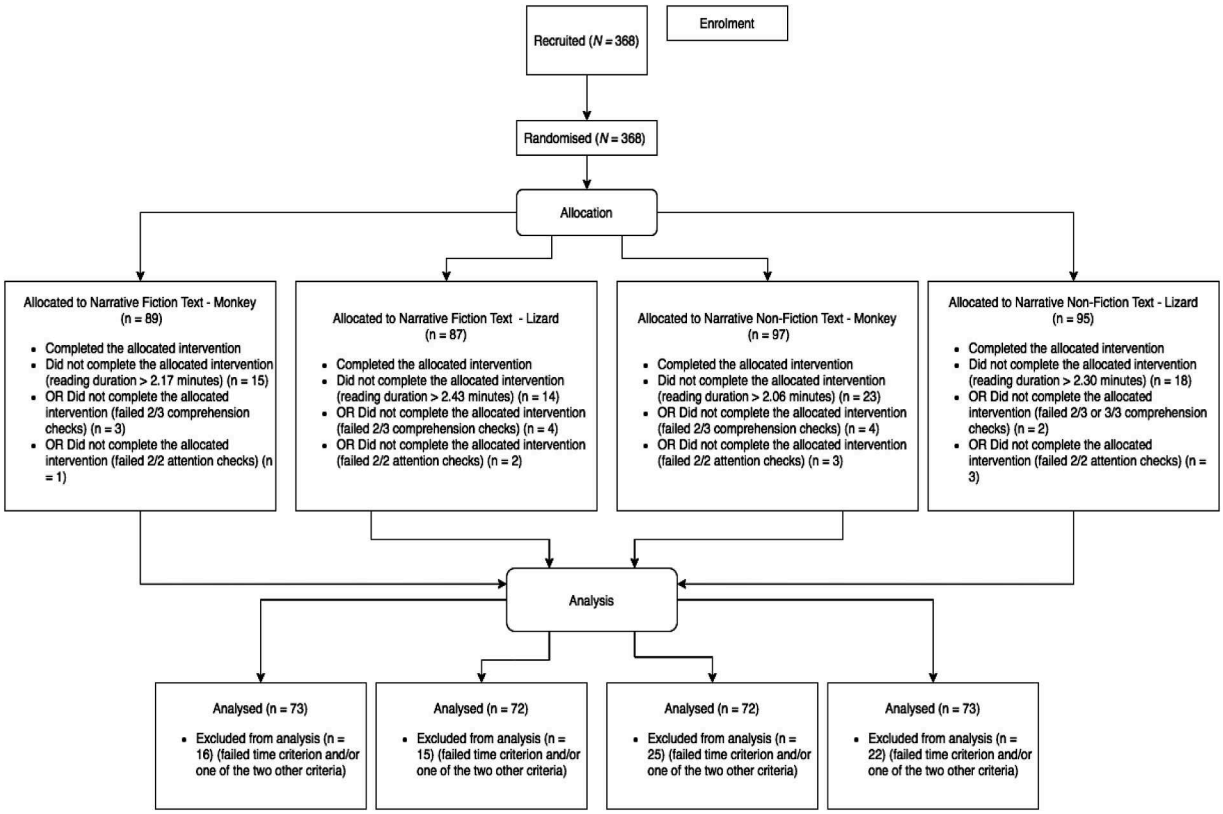

Fig. 4. Participant Sampling (Experiment 3).

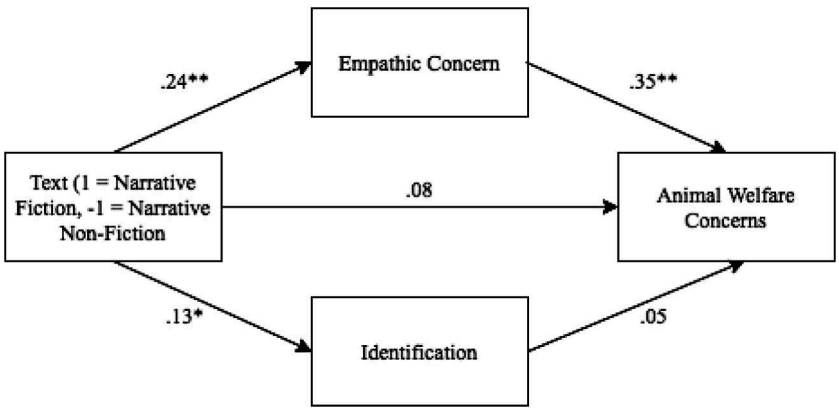

Fig. 5. Exploratory Mediation Analysis (Experiment 3).
Note. $N = 360$. Animal Welfare Concerns = ATAW. $p < .001$**. $P < .05$*.

depicted in the text, the effect on concern for animal welfare appears more modest in UK samples, which may be due to cultural differences in baseline levels of concern for animal welfare.

Funding

This work was supported by the Leverhulme Trust Research Grant [grant number RPG- 2017-365, 2017].

Declaration of Competing Interest

None.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.poetic.2022.101709.

References

Alonso, M. E., González-Montaña, J. R., & Lomillos, J. M. (2020). Consumers' concerns and perceptions of farm animal welfare. *Animals, 10*(3), 385.

Appel, M., & Richter, T. (2007). Persuasive effects of fictional narratives increase over time. *Media Psychology, 10*(1), 113–134.

Appel, M., & Richter, T. (2010). Transportation and need for affect in narrative persuasion: A mediated moderation model. *Media Psychology, 13*(2), 101–135.

Bastian, B., Loughnan, S., Haslam, N., & Radke, H. R. (2012). Don't mind meat? The denial of mind to animals used for human consumption. *Personality and Social Psychology Bulletin, 38*(2), 247–256.

Blokhuis, H. J., Miele, M., Veissier, I., & Jones, B. (Eds.). (2013). *Improving farm animal welfare: Science and society working together: The Welfare Quality approach.* Springer.

Bradley, A., Mennie, N., Bibby, P. A., & Cassaday, H. J. (2020). Some animals are more equal than others: Validation of a new scale to measure how attitudes to animals depend on species and human purpose of use. *PLoS One, 15*(1), Article e0227948.

Brown, R., & Abrams, D. (1986). The effects of intergroup similarity and goal interdependence on intergroup attitudes and task performance. *Journal of Experimental Social Psychology, 22*(1), 78–92.

Caviola, L., & Capraro, V. (2020). Liking but devaluing animals: emotional and deliberative paths to speciesism. *Social Psychological and Personality Science, 11*(8), 1080–1088.

Caviola, L., Everett, J. A., & Faber, N. S. (2019). The moral standing of animals: Towards a psychology of speciesism. *Journal of Personality and Social Psychology, 116*(6), 1011.

Chartrand, T. L., & Bargh, J. A. (1996). Automatic activation of impression formation and memorization goals: Nonconscious goal priming reproduces effects of explicit task instructions. *Journal of Personality and Social Psychology, 71*(3), 464.

Davis, M. H. (1980). A multidimensional approach to individual differences in empathy. *JSAS Catalog of Selected Documents in Psychology, 10*, 85.

de Graaf, A., Hoeken, H., Sanders, J., & Beentjes, J. W. (2012). Identification as a mechanism of narrative persuasion. *Communication research, 39*(6), 802–823.

Epley, N., Schroeder, J., & Waytz, A. (2013). Motivated mind perception: Treating pets as people and people as animals. *Objectification and (de) humanization* (pp. 127–152). New York, NY: Springer.

Friend, S. (2008). Imagining fact and fiction. *New waves in aesthetics* (pp. 150–169). London: Palgrave Macmillan.

Gerrig, R. J., & Prentice, D. A. (1991). The representation of fictional information. *Psychological Science, 2*(5), 336–340.

Gray, K., Young, L., & Waytz, A. (2012). Mind perception is the essence of morality. *Psychological Inquiry, 23*(2), 101–124.

Green, M. C. (2006). Narratives and cancer communication. *Journal of Communication, 56*, S163–S183.

Green, M. C., & Brock, T. C. (2000). The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology, 79*(5), 701.

Green, M. C., Garst, J., Brock, T. C., & Chung, S. (2006). Fact versus fiction labelling: Persuasion parity despite heightened scrutiny of fact. *Media Psychology, 8*(3), 267–285.

Harrison, M. A. (2010). Anthropomorphism, empathy, and perceived communicative ability vary with phylogenetic relatedness to humans. *Journal of Social, Evolutionary and Cultural Psychology, 4*, 34–48.

Hayes, A. F. (2017). *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach*. Guilford publications.

Hills, A. M. (1995). Empathy and belief in the mental experience of animals. *Anthrozoös, 8*(3), 132–142.

Hoeken, H., Kolthoff, M., & Sanders, J. (2016). Story perspective and character similarity as drivers of identification and narrative persuasion. *Human Communication Research, 42*(2), 292–311.

Hornsey, M. J., & Hogg, M. A. (2000). Subgroup relations: A comparison of mutual intergroup differentiation and common ingroup identity models of prejudice reduction. *Personality and Social Psychology Bulletin, 26*(2), 242–256.

Johnson, D. R., Jasper, D. M., Griffin, S., & Huffman, B. L. (2013). Reading narrative fiction reduces Arab-Muslim prejudice and offers a safe haven from intergroup anxiety. *Social Cognition, 31*(5), 578–598.

Kurby, C. A., & Zacks, J. M. (2015). Situation models in naturalistic comprehension. *Cognitive Neuroscience of Natural Language Use, 59*.

Loughnan, S., Haslam, N., & Bastian, B. (2010). The role of meat consumption in the denial of moral status and mind to meat animals. *Appetite, 55*(1), 156–159.

Mar, R. A. (2018). Stories and the promotion of social cognition. *Current Directions in Psychological Science, 27*(4), 257–262.

Mar, R. A., & Oatley, K. (2008). The function of fiction is the abstraction and simulation of social experience. *Perspectives on Psychological Science, 3*(3), 173–192.

Mar, R. A., Oatley, K., & Peterson, J. B. (2009). Exploring the link between reading fiction and empathy: Ruling out individual differences and examining outcomes. *Communications, 34*(4), 407–428.

Małecki, W., Pawłowski, B., Cieński, M., & Sorokowski, P. (2018). Can fiction make us kinder to other species? The impact of fiction on pro-animal attitudes and ehaviour. *Poetics, 66*, 54–63.

Małecki, W., Pawłowski, B., & Sorokowski, P. (2016). Literary fiction influences attitudes toward animal welfare. *PLoS One, 11*(12), Article e0168695.

Małecki, W., Pawłowski, B., Sorokowski, P., & Oleszkiewicz, A. (2019). Feeling for textual animals: Narrative empathy across species lines. *Poetics, 74*, Article 101334.

Małecki, W., Sorokowski, P., Pawłowski, B., & Cieński, M. (2019). *Human minds and animal stories: How narratives make us care about other species* (p. 200). Taylor & Francis.

Molinari Marotto, C., Barreyro, J. P., Cevasco, J., & Van den Broek, P. W (2011). Generation of emotional inferences during text comprehension: Behavioral data and implementation through the landscape model. *Escritos de Psicología, 4*(1), 9–17.

Niemyjska, A., Cantarero, K., Byrka, K., & Bilewicz, M. (2018). Too humanlike to increase my appetite: Disposition to anthropomorphize animals relates to decreased meat consumption through empathic concern. *Appetite, 127*, 21–27.

Orellana, L., Totterdell, P., & Iyer, A. (2020). The association between transgender-related fiction and transnegativity: Transportation and intergroup anxiety as mediators. *Psychology & Sexuality*, 1–12.

Panero, M. E., Weisberg, D. S., Black, J., Goldstein, T. R., Barnes, J. L., Brownell, H., & Winner, E. (2016). Does reading a single passage of literary fiction really improve theory of mind? An attempt at replication. *Journal of Personality and Social Psychology, 111*(5), e46.

Piazza, J., & Loughnan, S. (2016). When meat gets personal, animals' minds matter less: Motivated use of intelligence information in judgments of moral standing. *Social Psychological and Personality Science, 7*(8), 867–874.

Phillips, C. J. C., Izmirli, S., Aldavood, S. J., Alonso, M., Choe, B. I., Hanlon, A., & Rehn, T. (2012). Students' attitudes to animal welfare and rights in Europe and Asia. *Animal Welfare-The UFAW Journal, 21*(1), 87.

Prguda, A., & Neumann, D. L. (2014). Inter-human and animal-directed empathy: A test for evolutionary biases in empathetic responding. *Behavioural Processes, 108*, 80–86.

Samur, D., Tops, M., & Koole, S. L. (2018). Does a single session of reading literary fiction prime enhance mentalizing performance? Four replication experiments of Kidd and Castano (2013). *Cognition and Emotion, 32*(1), 130–144.

Schneider-Mayerson, M. (2018). The influence of climate fiction: an empirical survey of readers. *Environmental Humanities, 10*(2), 473–500.

Schneider-Mayerson, M., Weik von Mossner, A., & Małecki, W. P. (2020). Empirical ecocriticism: environmental texts and empirical methods. *ISLE: Interdisciplinary Studies in Literature and Environment, 27*(2), 327–336.

Stephan, W. G., & Finlay, K. (1999). The role of empathy in improving intergroup relations. *Journal of Social Issues, 55*(4), 729–743.
Vezzali, L., Stathi, S., Giovannini, D., Capozza, D., & Trifiletti, E. (2015). The greatest magic of Harry Potter: Reducing prejudice. *Journal of Applied Social Psychology, 45*(2), 105–121.
Wimmer, L., Ferguson, H., Currie, G., & Friend, S. (2021). Correlates of lifetime exposure to print fiction. *Imagination, Cognition and Personality*.
Yousaf, O., & Popat, A. (2015). The bolstering effect of conceptual priming on psychological help-seeking attitudes in men. *Journal of Mental Health, 24*(6), 347–350.

Dr. Aino Petterson: Former postdoctoral researcher in the School of Psychology working on a project entitled 'Learning from Fiction: A philosophical and psychological perspective', University of Kent. Her research interests are mainly in the field of social psychology, specifically, political ideology, intergroup relations and prejudice. She successfully defended her PhD in Social Psychology at the University of Kent in 2021. After completing her postdoctoral position at Kent, she joined the University of Oslo as a postdoctoral researcher in the Department of Psychology in March 2022.

Professor Gregory Currie: Educated at the London School of Economics and the University of California, Berkeley, Gregory Currie has taught at universities in Australia, New Zealand and the United States. He joined the Department of Philosophy at the University of York in 2013. He has published a number of articles and books, mostly on the arts and their relation to the mind. His most recent book is Imagining and Knowing (Oxford University Press, 2020).

Dr. Stacie Friend: Stacie Friend is a Reader in Philosophy, and the Director of Education and Undergraduate Programmes in Philosophy. She taught at Birkbeck from 2005 to 2007 and rejoined the department in 2014, having taught in between at Heythrop College, University of London. She previously lectured at Washington & Jefferson College in Washington, Pennsylvania (2003-05) and at the University of Michigan, Ann Arbor, as a Mellon Postdoctoral Fellow (2002-03). She received her PhD in Philosophy from Stanford University in 2002.

Professor Heather Ferguson: Professor Heather Ferguson completed her PhD in Cognitive Neuroscience and Psycholinguistics at the University of Glasgow in 2007, followed by a two-year postdoctoral research position at University College London. She was appointed as a Lecturer in Cognitive Psychology at the University of Kent in October 2009, and was subsequently promoted to Senior Lecturer in 2012, Reader in 2015, and Professor in 2018.

Over the last few years, Heather has been leading on several research grants, including a 3-year Leverhulme Trust research grant to examine whether and how reading fiction enhances our cognitive and social wellbeing.