1   The value of pro-environmental behaviour in mate choice

2   Daniel Farrelly

3   School of Psychology, University of Worcester, St John's Campus, Henwick Grove, Worcester,

4   WR2 6AJ, UK.

5

6   Manpal Singh Bhogal

7   Department of Psychology, University of Wolverhampton, Wolverhampton, WV1 1LY, UK.

8

9

12

13   Author Note

14   Correspondence concerning this article should be addressed to Daniel Farrelly, School of

15   Psychology, University of Worcester, UK, WR2 6AJ. Tel. no.: (+44)1905 542 345; E-mail:

16   d.farrelly@worc.ac.uk

17

1   Abstract

2   Previous research shows that prosocial behaviour such as altruism is important in mate choice. A

3   plethora of research shows that people are attracted to prosocial mates, and in turn, display

4   prosocial behaviours towards those they find attractive. However, most of this research has

5   focused on everyday forms of prosociality. Here, we apply this theoretical framework to pro-

6   environmental behaviours, which are important prosocial behaviours, considering there is a time

7   cost involved in engaging in such behaviours. In addition, encouraging people to engage in pro-

8   environmental behaviours has great implications for the protection of our planet. Here, across

9   two experiments, we successfully show that engaging in pro-environmental behaviours can

10   increase one's desirability in the mating market (experiment 1, n = 157) and that people display a

11   motivation to engage in pro-environmental behaviours in the presence of attractive, opposite sex

12   targets (experiment 2, n = 307). We therefore show that it could be possible to increase pro-

13   environmental behaviours via mate choice motivation and also demonstrate their positive role in

14   mate evaluation. These findings have implications for marketing and increasing environmental

15   behaviour through the lens of evolutionary theory. Note: data and materials for both experiments

16   are available on the Open Science Framework

17   (https://osf.io/g42bd/?view_only=916a807650ab4f77ae66b3fc56021752).

18   *Keywords*: Mate Choice, Relationship length, Pro-environmentalism, Prosociality,

19   Altruism

1   The value of pro-environmental behaviour in mate choice

2   One of the most important prosocial behaviours facing our species in the real world is

3   sustainability and pro-environmentalism. Pro-environmental behaviours can be defined as any

4   behaviour that does minimal harm to or indeed benefits the environment (Steg & Vlek, 2009)

5   and as such also tend to be costly acts to perform for an individual (e.g., sorting recycling, higher

6   costs of pro-environmental products) that can benefit others (e.g. less plastic waste) as well as

7   the actor. They are therefore commensurate with the altruistic behaviours that are explored in

8   previous literature on the role of altruism in mate choice (see Bhogal, Farrelly, & Galbraith,

9   2019, for a recent review). Furthermore, the need to understand the motivations for pro-

10   environmentalism from a psychological perspective are of paramount importance. The aim of the

11   current study was to do just this by exploring pro-environmentalism as an applied form of

12   prosocial behaviour and thus having a potential role in human mate choice.

13   Indeed, previous research has shown the value of exploring the prosocial characteristics of pro-

14   environmental behaviours. For example, Griskevicius, Tybur, & Van den Bergh, (2010) found that

15   individuals are more willing to invest in green products to increase their status, particularly when

16   it was made public. Similarly, Berger (2019) found that not only do people choose green products

17   in public (the *'green signalling hypothesis'*), but they are also then treated more positively by

18   others socially. Also, Borau, Elgaaied-Gambier, and Barbarosso (2020) showed that purchasing

19   green products can act as an honest signal of men's long-term mate value, and Palomo-Vélez,

20   Tybur and van Vugt (2021) showed such purchases are desirable for both short and long-term

21   partners in line with previous research supporting the view that a prosocial nature is an important

22   signal of good partner and parenting qualities (Farrelly, 2011; 2013, Farrelly, Lazarus & Roberts,

23   2016; Bhogal Farrelly, Galbraith, Manktelow, & Bradley, 2020). These findings offer a rationale

1   for exploring the role of mate choice motivation in pro-environment behaviour more generally

2   rather than concentrating solely on green consumption.

3   To understand pro-environmentalism as a prosocial or altruistic act, it is important to

4   consider why such acts occur from an adaptive perspective. Although initially considered by

5   (Darwin, 1871) to be problematic to his theory of natural selection, the adaptive importance of

6   altruistic behaviours in humans and other animals has since been explained extensively. For

7   example, there are early theories such as kin selection (Hamilton, 1964) and reciprocal altruism

8   (Trivers, 1971) as well as more contemporary theories that explain how individuals benefit

9   indirectly from behaving altruistically (Fehr & Fischbacher, 2003).

10   Recently, attention has turned to how prosocial behaviours, including altruism, can be

11   explained by sexual selection, referring to the process by which traits desirable in mate choice

12   evolve over time as they increase reproductive success (Farrelly et al., 2007; Miller, 2000; Zahavi,

13   1975). In other words, the benefit to an individual incurring the costs of helping others is increased

14   mating opportunities and success. In support of this, several studies have shown that altruistic

15   behaviours are both rated as more desirable in potential partners and displayed as a signalling tool

16   to potential mates of the opposite sex ((Bhogal et al., 2019).

17   Further investigation of the role of prosocial behaviours in mate choice has concentrated

18   on precisely what these behaviours can signal to potential partners. Research has consistently

19   shown when asked to rate potential prosocial partners for short or long-term relationships,

20   individuals prefer prosocial behaviours for long-term relationships compared to short-term

21   relationships (Barclay, 2010; Bhogal, Galbraith, & Manktelow, 2019; Ehlebracht, Stavrova,

22   Fetcehnhauer, & Farrelly, 2018; Margana, Bhogal, Bartlett, & Farrelly, 2019) and that prosociality

23   is valued by both men and women (e.g., Farrelly, 2013; Farrelly & King 2019). This suggests that

1   it is under mutual mate choice to act as a signal of good parent/partner qualities, rather than as a

2   signal of good genes. The possible reason for this is the importance of allo-parenting in human

3   evolutionary history (in other words, cooperative breeding provided by the mother's extended kin)

4   to ensure a high degree of offspring survival (Hrdy, 1999, 2009). Of most importance here is the

5   role of the mother and father, making such prosocial qualities a vital attribute for long term pair-

6   bonding. However, due to there still being asymmetries in parental investment in humans (Trivers,

7   1972) it is more important for women to choose long-term partners who display prosociality, and

8   as a result, their preference is often found to be stronger than that of men (e.g. Farrelly, 2013).

9   If this is indeed why prosociality is important in mate choice, then what psychological

10   characteristics that are beneficial in partners and parents are being signalled by the prosocial actor

11   to potential partners? Research has explored different forms of prosocial behaviour, such as

12   heroism (Bhogal & Bartlett, 2020; Margana et al., 2019), trustworthiness (Ehlebracht et al., 2018)

13   and fairness (Bhogal et al., 2020). These studies have shown consistencies in terms of the

14   desirability of prosocial behaviours (again, particularly for long-term relationships) but also

15   differences in terms of the types of the behaviour and of the context in which it can occur. This

16   suggests it is important for researchers to explore different ways that prosocial behaviours can

17   manifest in mate choice decision making. Furthermore, research has typically looked at the 'costs'

18   of prosocial traits such as altruism in purely financial terms, which can lead to a narrow focus, and

19   other research that focuses on real world scenarios or outcomes (e.g., Arnocky, Piche, Albert,

20   Oullette, & Barclay, 2017; Phillips Barnard, Ferguson, & Reader, 2008; Stavrova & Ehlebracht,

21   2015) or other currencies in prosociality such as time spent (Farrelly & Bennett, 2018; Farrelly,

22   Moan, White, & Young, 2015) and non-financial commodities (Bhogal, Bartlett, & Farrelly, 2019).

1   In a similar vein, gender differences in pro-environmental behaviours have also been examined,

2   and found, for example, that women engage in greater pro-environmental behaviours compared to

3   men (Xiao & McCright, 2015), which perhaps is partly due to such behaviours not being

4   considered 'masculine' (Swim, Gillis, & Hamaty, 2019). This is further supported by Landry,

5   Desrochers, Hodges-Simeon, & Arnocky (2019) who found that circulating testosterone levels and

6   masculinisation were negatively correlated with pro-environmental attitudes. However, if pro-

7   environmental behaviours are considered as prosocial behaviours that can have a role in mate

8   choice, then it should be expected that, in the right circumstances, men will be more inclined to

9   display more of such behaviours and/or more positive attitudes towards environmentally friendly

10   behaviours. This is indeed what has been found in the research described above (e.g. Griskevicius

11   et al., 2010; Berger, 2019; Borau et al., 2020).

12   Therefore, the aim of the present research was to further extend the topic of how prosocial

13   behaviours can be of value in human mate choice, by looking at pro-environmentalism as a specific

14   applied example of prosociality. As such it was anticipated that such behaviours would reveal

15   similar effects to findings from other prosocial and altruistic displays found in previous literature,

16   namely in terms of the increased desirability of pro-environmentalists and also the increased use

17   of pro-environmental behaviours in mate choice scenarios.

18   Therefore, this paper addressed two research questions; (1) do both men and women find pro-

19   environmental behaviours desirable, particularly for more long-term relationships? (Experiment

20   1), and (2) do men and women report engaging in pro-environmental behaviours more in the

21   presence of potential mates? (Experiment 2).

22   This leads to the following hypotheses which were tested; From Experiment 1,

23   heterosexual individuals would find opposite sex individuals who engage in pro-environmental

behaviour to be more desirable than individuals who do not (H1), this increased desirability

reported towards pro-environmentalists would be greater among women than men (H2), the effect

of being pro-environmental on desirability would be stronger when seeking long-term

relationships compared to short-term relationships (H3). From Experiment 2, heterosexual

individuals would report greater engagement in sustainable behaviours in the presence of members

of the opposite sex than in the presence of the same sex (H4), and this increased reported

engagement in sustainable behaviours in the presence of the opposite sex would be greater among

men than women (H5).

Experiment 1

Materials and Method

Participants. To guide our anticipated sample size, an a-priori power analysis was

conducted using G*Power (Faul, Erdfelder, Buchner, & Lang, 2009). To achieve 80% power, with

an alpha of .05, and effect size of .25 (comparable to Bhogal et al. 2019), G*Power recommended

68 men and 68 women. The final sample consisted of one hundred and fifty-seven heterosexual

participants (69 men, 88 women, mean age = 28.58 years old, *SD* = 10.76), recruited via

opportunity sampling, and consisted of undergraduate psychology students at a UK university

(*N*=110) as well as members of the general public (*N*=47). Participants completed the experiment

online, via Qualtrics which is an online survey builder. All data for this experiment and for

Experiment 2 was collected prior to data analysis occurring.

Design. We adopted a 2 (within subjects variable: environmental behaviour – low/ high) x

2 (between subjects factor: participants' sex – female/male) x 2 (within subjects variable:

relationship type - short-term/long-term) mixed design. The dependent variable (DV) was the

1   mean desirability rating (1 = very undesirable to 5, very desirable Likert scale, consistent with

2   Margana et al. 2019). This research was approved by the psychology department at a UK institution.

3   **Materials.** Twelve scenarios were designed, largely based on previous research (Farrelly

4   et al. 2016), including four scenarios depicting a target high in pro-environmental behaviour, four

5   scenarios depicting a target low in pro-environmental behaviour, and four neutral control scenarios.

6   Control scenarios were included to provide distractors from the true aims of the experiment for

7   participants, and to provide an anchor for the direction of the effects in high and low environmental

8   behaviours. Examples of the different scenarios include:

9   *Person A always sorts through their household/everyday waste so that it can be recycled*

10   *and re-used (metal, plastic, cardboard etc). Even though it is time consuming, they believe it is a*

11   *useful thing to do.* (high pro-environmental behaviour).

12   *When buying drinks, Person B always buys disposable coffee cups, and bottles of water*

13   *which they do not re-use.* (low pro-environmental behaviour).

14   *Person A goes for lunch in a local restaurant. They chose to have a chicken burger.* (control

15   behaviour).

16   **Procedure.** Once participants provided informed consent, they proceeded to the scenarios

17   where they were presented with definitions regarding relationship types (short-term: a person with

18   whom you would desire a brief affair or a one-night stand; long-term: a person with whom you

19   desire a committed long term romantic relationship) which were taken from previous research

20   (Farrelly et al. 2016). Participants were required to read each scenario before rating how desirable

21   the target was in each scenario for a short-term and long-term relationship (consistent with

1 previous research, e.g., Margana et al. 2019). All scenarios were presented in a randomized order

2 using the randomizer function on Qualtrics. After completion, participants were fully debriefed.

3 **Results**

4 A 2 (participant's sex: male, female) x 3 (environmental behaviour; high, control, low) x 2

5 (relationship type; short-term/long-term) mixed ANOVA was performed. Materials and data for

6 experiments 1 and 2 are available on the Open Science Framework

7 (https://osf.io/g42bd/?view_only=916a807650ab4f77ae66b3fc56021752)

8 There was a significant main effect of environmental behaviour[*1], F (1.42, 219.50) = 114.92,

9 $p < .001$, $\eta^2 = .42$, and subsequent Holm-Bonferroni pairwise comparisons revealed that high pro-

10 environmental targets were rated more desirable than low pro-environmental targets, $t = 14.91$, p

11 $< .001$, and control targets, $t = 5.08$, $p < .001$, and low pro-environmental target were rated less

12 desirable than control targets, $t = 9.83$, $p < .001$. All other main effects were non-significant. There

13 was a significant interaction between environmental behaviour and relationship type*, F (1.43,

14 222.29) = 29.68, $p < .001$, $n^2 = .02$. All other two-way interactions, and the three-way interaction

15 was non-significant.

16 Simple Holm-Bonferroni pairwise comparisons were conducted to further explore the

17 interaction between environmental behaviour and relationship type. They found that participants

18 rated high pro-environmental targets for long-term relationships as more desirable than when

19 rating high pro-environmental targets for short-term relationships, $t = 6.89$, $p < .001$. However,

20 participants rated low pro-environmental targets as more desirable for short-term relationships

---

[1] An Asterix is included where Sphericity was violated, and a Greenhouse-Geisser correction was applied.

1   compared to long-term relationships, $t = 4.74$, $p < .001$. There was no significant effect of

2   relationship length on the desirability of targets in the control condition, $t = .63$, $p = .99$.

3   Furthermore, for short-term relationships, participants did not rate high pro-environmental targets

4   as significantly more desirable than control targets, $t = 2.76$, $p = .09$, but did rate the former as

5   more desirable than low pro-environmental targets, $t = 10.05$, $p < .001$, and low pro-environmental

6   targets were rated less desirable than control targets, $t = 7.28$, $p < .001$. For long-term relationships

7   however, participants did rate high pro-environmental targets as significantly more desirable than

8   control targets, $t = 6.38$, $p < .001$ as well as compared to low pro-environmental targets, $t = 16.78$,

9    $p < .001$, and low pro-environmental targets were rated less desirable than control targets, $t = 10.39$,

10    $p < .001$.

11   Finally, the pattern of difference in ratings of desirability between different targets (high

12   pro-environmental > Control > low pro-environmental) was significant for both short-term (p

13    $< .001$) and long-term ($p < .001$) relationships.

14

1   Table 1

2   *Mean (SD) desirability by sex, environmental behaviour, and relationship type.*

Environmental behaviour	Relationship Type	Sex of participant	Mean	SD
Low	Short-term	Male	2.84	0.65
		Female	2.73	0.66
	Long-term	Male	2.63	0.73
		Female	2.55	0.63
Control	Short-term	Male	3.24	0.54
		Female	3.37	0.42
	Long-term	Male	3.30	0.58
		Female	3.37	0.44
High	Short-term	Male	3.44	0.76
		Female	3.57	0.75
	Long-term	Male	3.79	0.76
		Female	3.79	0.66

3

4   Experiment 1 showed that men and women were attracted to those who display environmentally

5   friendly behaviours compared to those who did not, particularly for long-term relationships where

6   high pro-environmental targets were rated higher than control targets (with no preference for long-

7   term relationships for control targets, and the opposite effect for low environmentally friendly

8   behaviours, inconsistent with Palomo-Vélez et al., [2021]), consistent with previous literature

9   exploring the desirability of prosociality in mate choice. Therefore, the purpose of experiment 2

1   was to build on these findings by exploring whether people also report engaging in pro-

2   environmental behaviours in the presence of attractive members of the opposite sex. Palomo-Vélez,

3   et al., (2021) conducted similar research with indirect priming of romantic contexts generally

4   found no effect on motivation to consume green products. subsequently it will be important to see

5   if the more direct effect of the perceived presence of a potential partner can lead to individuals to

6   be more likely to portray themselves as being pro-environmental. If engaging in pro-environmental

7   behaviour can be classed as a mating signal, then we should see (as a reminder of the above

8   hypotheses) that 1 individuals report greater engagement in pro-environmental behaviours in the

9   presence of members of the opposite sex than in the presence of the same sex (H4), and this

10   increased reported engagement in the presence of the opposite sex would be greater among men

11   than women (H5).

12   **Experiment 2**

13   **Materials and Methods**

14   **Participants.** To guide our anticipated sample size, an a-priori power analysis was

15   conducted using G*Power (Faul et al., 2009). To achieve 80% power, with an alpha of .05, and

16   effect size of .4 (comparable to Farrelly et al., 2016), G*Power recommended a total sample size

17   of 52 male and 52 female participants. This was surpassed as we recruited 307 heterosexual

18   participants (153 women and 154 men, mean age = 23.85 years old, SD = 7.2). Participants were

19   undergraduate psychology students at a UK university who took part via the departmental research

20   participation scheme (N = 166), members of the general public recruited via opportunity sampling

21   (N = 49), and crowdsourced from the Prolific website (www.prolific.co) (N = 92). Participants

22   completed the experiment online via www.esurveycreator.com which is an online survey builder.

1   **Design.** We adopted a 2 (between subjects variable: participant sex – female, male) x 2

2   (between subjects variable: target image – opposite sex/same sex) x 2 (within subjects variable:

3   relationship type - short-term/long-term) design. The dependent variable was the total reported

4   engagement in pro-environmental behaviours (for the four items). This research was approved by

5   the institutional ethics committee.

6   **Materials and procedure.** Participants were presented with a hypothetical scenario where

7   they were asked to imagine they had been approached by an individual who was running a large-

8   scale survey into the prevalence of sustainable and environmental behaviour. Participants were

9   then presented with an image of a named individual who was a sustainability researcher (e.g.

10   "*Georgia*" or "*Richard*") who had approached them to ask if the participant would complete the

11   survey. Below the image was an imaginary message from them to the participant (*"Thanks for*

12   *agreeing to participate, please answer the questions below!"*).

13   Participants were randomly allocated to conditions that either had an image of a male or

14   female target image, and in total there were three male and three female images that participants

15   viewed. All images were selected from the London Faces Database (DeBruine & Jones, 2017), and

16   all images used had attractiveness ratings above the mean reported for this data set. These images

17   were in color and of neutral expression.

18   Participants were then asked directly below this image how often they engaged in different

19   pro-environmental behaviours on a five-point scale (from 1 = "Never" to 5 = "Always"). An

20   example of such a behaviour is as follows:

21   *"How often do you spend the time and effort to prepare household waste for recycling*

22   *(e.g. cleaning plastic bottles and tinned cans or sorting paper and cardboard)?"*

1   In total there were four different behaviours participants were asked about (recycling, use of

2   disposable drink cups, use of paper printing, purchasing of more environmentally-friendly

3   options of products). Internal reliability between these items was calculated, with Cronbach's α

4   = .64 which suggests acceptable levels of consistency. At the end of the survey, the image of the

5   target individual was again presented along with a message that thanked the participant for their

6   help (*"Thanks very much, that has been really helpful to our research!"*).

7   **Results**

8   A 2 (participant sex: female vs male) x 2 (target image: opposite sex vs same sex)

9   between-subjects ANOVA was conducted.

10   There was a significant main effect of the target image, $F(1, 303) = 6.93$, $p = .009$, $n^2 = .02$,

11   whereby participants reported higher overall pro-environmental behaviours when being in the

12   presence of opposite sex targets ($M = 15.31$, $SD = 2.41$) than same sex targets ($M = 14.26$, $SD =$

13   2.92), a mean difference of .93 (95% CI [.23, 1.62]), see figure 1 below. There was a no significant

14   main effect of participant sex, $F(1, 303) = 2.39$, $p = .12$, $n^2 = .008$, nor was there a significant

15   interaction, $F(1, 303) = .9$, $p = .76$, $n^2 < .001$.
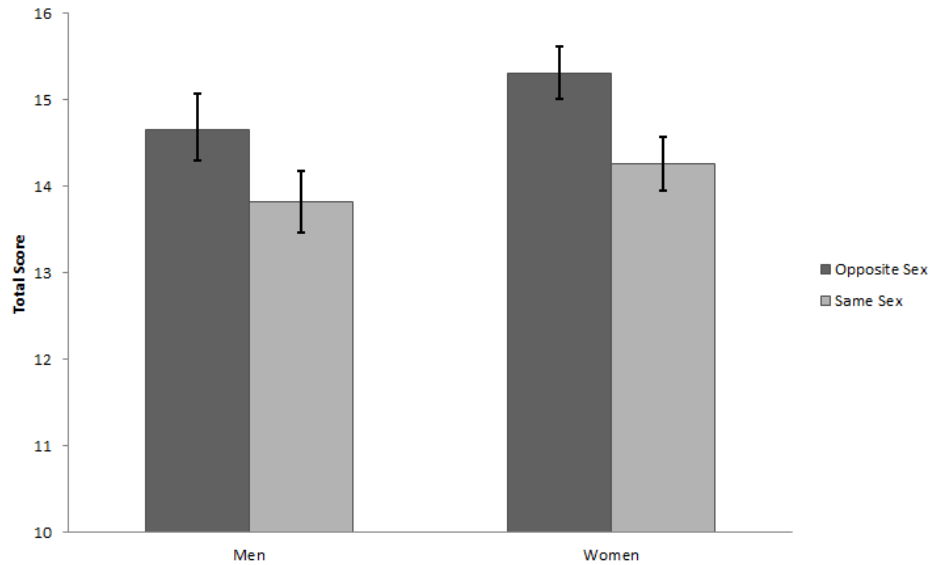
1

2   *Figure 1*. Total scores on pro-environmental behaviours (±S.E.) for both men and women in the

3   opposite sex and same sex target image conditions.

4

5   **Discussion**

6   The primary aim of both experiments was to explore whether 1) people find those who

7   behave pro-environmentally more desirable than those who do not, and 2) to explore whether

8   individuals are motivated to report being more pro-environmental in the presence of potential

9   mates. As previous literature has focused on more general prosocial traits such as altruism as a

10   desirable trait in mate choice, here we applied this well-established finding to understanding pro-

11   environmental behaviours as an important extension of the research area.

12   The findings of both experiments here therefore provide a novel take on our understanding

13   of pro-environmental behaviours by exploring different forms of such behaviour rather than

14   concentrating solely on consumption, and show clear and strong support for them having the

15   potential to be influenced by mate choice effects. Our findings also lend support for the role of

1   mutual mate choice in the desirability of prosocial behaviours, with this research now adding pro-

2   environmental behaviours to the body of previous literature showing prosociality is attractive to

3   both men and women. Of further importance are the findings of Experiment 1 that pro-

4   environmental behaviour was more desired for long-term relationships and in Experiment 2 that

5   both sexes displayed a greater motivation to report pro-environmental behaviour as potential

6   mating displays in the presence of opposite sex individuals. This is because it further contributes

7   to the existing large body of evidence that prosocial behaviours are important in human mate

8   choice as they signal the actor's quality as a partner and a parent, a key requirement in a species

9   such as ours where allo-parenting and cooperative breeding are so important (Hrdy, 1999; 2009).

10   Our findings have strong implications for understanding such an impactful and global

11   issue; environmental sustainability. Scientists in different disciplines have been working on ways

12   to decrease the negative effects of climate change, and psychologists are no different in that we

13   have a role to play in this. Here, we apply evolutionary thinking to understanding and promoting

14   environmentally friendly behaviours which can positively benefit us all. We show that prosociality,

15   in the form of pro-environmental behaviours, can have an adaptive role in romantic relationships.

16   It signals care for the environment and good character which are important in when choosing

17   partners (Kokko, 1998). This engagement in pro-environmental behaviours could also signal care

18   for future offspring, as environmental behaviour increases the chances of a better world for

19   ourselves and for future generations.

20   Our overall findings that mate choice factors can positively influence perceptions of and

21   motivations for pro-environmental behaviours suggest that there are clear avenues for future

22   researchers to explore in this area. For example, previous research has already shown that buying

23   sustainable or green products has status signalling benefits (see Griskevicius et al., 2010; Berger,

1   2019). Therefore, future researchers could explore the dynamics of how being green can influence

2   social status and reputation in mate choice contexts. Furthermore, it is important to look at

3   additional measures of pro-environmental behaviours and attitudes. As this is a rapidly growing

4   area of research in psychology, there are different ways of measuring this but also as this is a

5   relatively new area there is not yet clearly established and validated means of doing so (Lange &

6   Dewitte, 2019). By exploring only the reporting of previous sustainable behaviour, experiment 2

7   was reliant on a degree of impression management on behalf of individuals (in other words,

8   individuals were falsely self-reporting their previous behaviour in the presence of certain others)

9   which may partly account for the relatively small effect sizes observed in Experiment 2. However,

10   it would be of immense value to see if mate choice scenarios do indeed lead to changes in actual

11   future pro-environmental behaviour, which could be assessed in applied settings or in laboratory-

12   based conditions (e.g. Lange, Steinke, & Dewitte, 2018) or in actual real world behaviours. This,

13   as well as examining how more realistic mating opportunities can affect pro-environmental

14   behaviour (as opposed to imaginary scenarios as were used here), could potentially lead to much

15   greater observed effects of mate choice motivations on such behaviours.

16   There is additional value in future research exploring more precisely what pro-

17   environmentalism can signal to others in other contexts. Here we argue that pro-environmentalism

18   is a signal of prosociality and is thus valued in mate choice, however it is no doubt more nuanced

19   than this. For example, pro-environmentalism may signal 'virtue', which previous research has

20   shown to also be desired in mate choice (Brown, Westrich, Bates, Twibell, & McGrath, 2020), and

21   also potentially politic beliefs and identities. It may be that all these behaviours are indicators of

22   the same over-arching psychological trait of prosociality, however future research that examines

23   different forms of pro-environmental behavours will provide a clearer picture. Furthermore, the

1   current research does not explore motivations directly for pro-environmental behaviours (for

2   example, a lack of manipulation check in Experiment 2 is a limitation, although supporting

3   evidence was still found for mate choice as a motivator) so this is a potentially fruitful area for

4   subsequent research to fully understand how and why people are motivated to engage in pro-

5   environmentalism in everyday life.

6   As well as its academic importance, the findings of this paper are of importance to pro-

7   environmentalism as an overall worldwide movement. A key environmental task for policy makers

8   relates to promoting and increasing societal engagement with pro-environmental behaviour. Here,

9   we find that 1) people are attracted to those who engage in pro-environmental behaviours, and 2)

10   that mate choice motivation can promote pro-environmental behaviour in the form of

11   attractiveness. Therefore, these findings could be applied to actual real world environmental

12   behaviours and also advertising initiatives for companies wishing to maximise sales of green

13   products which aim to reduce our impact on our environment or policy makers wanting to promote

14   positive behavioural change in terms of issues such as sustainability. Finally, findings such as these

15   reflect clearly the value that is placed on pro-environmental individuals in the contemporary

16   society in which the research was conducted. This may either be unusual compared to other

17   societies, such as non-WEIRD ones, and/or be a recent cultural change that results from the

18   increased prominence of pro-environmentalism generally. As such, it can help shape the focus of

19   future research to understand perceptions of pro-environmental behaviour (and those that display

20   it) in a more global context.

References

Arnocky, S., Piche, T., Albert, G., Oullette, D., & Barclay, P. (2017). Altruism predicts mating success in humans. *British Journal of Psychology, 108*, 416-435.

Barclay, P. (2010). Altruism as a courtship display: Some effects of third-party generosity on audience perceptions. *British Journal of Psychology, 101*, 123-135.

Berger, J. (2019). Signaling can increase consumers' willingness to pay for green products. Theoretical model and experimental evidence. *Journal of Consumer Behaviour*, *18*, 233-246.

Bhogal, M. S., & Bartlett, J. (2020 Further support for the role of heroism in human mate choice. *Evolutionary Behavioral Sciences*. Advance online publication. https://doi.org/10.1037/ebs0000230

Bhogal, M. S., Bartlett, J., & Farrelly, D. (2019). The influence of mate choice motivation on non-financial altruism. *Current Psychology, 38*, 959-964.

Bhogal, M. S., Farrelly, D., & Galbraith, N. (2019). The Role of Prosocial Behaviours in Mate Choice: A Critical Review of the Literature. *Current Psychology, 38*, 1062-1075

Bhogal, M. S., Farrelly, D., Galbraith, N., Manktelow, K., & Bradley, H. (2020). The role of altruistic costs in human mate choice. *Personality and Individual Differences*. 160. 109939

Bhogal, M. S., Galbraith, N., & Manktelow, K. (2019). A Research Note on the Influence of Relationship Length and Sex on Preferences for Altruistic and Cooperative Mates. *Psychological Reports*, *122*, 550-517

Borau, S., Elgaaied-Gambier, & L., Barbarosso, C. (2020). The green mate appeal: Men's pro-environmental consumption is an honest signal of commitment to their partner. *Psychology and Marketing, 1-20.*

Brown, M., Westrich, B., Bates, F., Twibell, A., & McGrath, R.E. (2020). Preliminary evidence for virtue as a cue to long-term mate value. *Personality and Individual Differences, 167*

Darwin, C. (1871). *The Descent of Man, and Selection in Relation to Sex.* London: John Murray.

DeBruine, L., & Jones, B. (2017): Face Research Lab London Set. figshare. Dataset.

Ehlebracht, D., Stavrova, O., Fetchenhauer, D., & Farrelly, D. (2018). The synergistic effect of prosociality and physical attractiveness on mate desirability. *British Journal of Psychology, 109*, 517-537.

Farrelly, D. (2013). Altruism as an Indicator of Good Parenting Quality in Long-Term Relationships: Further Investigations Using the Mate Preferences Towards Altruistic Traits Scale. *The Journal of Social Psychology, 153*, 395-398.

Farrelly, D., & Bennett, M. (2018). Empathy leads to increased online charitable behaviour when time is the currency. *Journal of Community and Applied Social Psychology, 28, 42-46.*

Farrelly, D., Clemson, P., & Guthrie, M. (2016). Are women's mate preferences for altruism also influenced by physical attractiveness? *Evolutionary Psychology, 14*, 1-6.

Farrelly, D., King, L. (2019). Mutual mate choice drives the desirability of altruism in relationships. *Current Psychology, 38*, 977–981.

Farrelly, D., Lazarus, J., & Roberts, G. (2007). Altruists Attract. *Evolutionary Psychology, 5*, 313-329.

Farrelly, D., Moan, E., White, K., & Young. S. (2015). Evidence of an alternative currency for altruism in laboratory-based experiments. *Europe's Journal of Psychology, 11*, 100-111.

Faul, F., Erdfelder, E., Buchner, A., & Lang, A.-G. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behaviour Research Methods*, *41*, 1149–1160.

Fehr, E., & Fischbacher, U. (2003). The nature of human altruism. *Nature, 425*, 785-791.

Griskevicius, V., Tybur, J. M., & Van den Bergh, B. (2010). Going green to be seen: Status, reputation, and conspicuous conservation. *Journal of Personality and Social Psychology, 98*, 392–404

Hamilton, W. D. (1964). The Evolution of Altruistic Behaviour. *American Naturalist, 97*, 354-356.

Hrdy, S. (1999). *Mother Nature: A history of mothers, infants and natural selection*. New York: Pantheon Press.

Hrdy, S. (2009). *Mothers and others: The evolutionary origin of mutual understanding.* Cambridge, MA: Harvard University Press.

JASP Team (2018). JASP (Version 0.9) [Computer software]. Retrieved from https://jasp-stats.org/.

Kokko, H. (1998). Should advertising parental care be honest? *Proceedings of the Royal Society B: Biological Sciences*, *265*, 1871–1878.

Landry, N., Desrochers, J. E., Hodges-Simeon, C., & Arnocky, S. (2019). Testosterone, facial and vocal masculinization and low environmentalism in men. *Journal of Environmental Psychology*, *64*, 107-112.

Lange, F., & Dewitte, S. (2019). Measuring pro-environmental behavior: Review and recommendations. *Journal of Environmental Psychology, 63,* 92-100.

Lange, F., Steinke, A., & Dewitte, S. (2018). The Pro-Environmental Behavior Task: A laboratory measure of actual pro-environmental behaviour. *Journal of Environmental Psychology*, *56*, 46-54.

Margana, L., Bhogal, M. S., Bartlett, J. E., & Farrelly, D. (2019). The Roles of Heroism, Altruism, and Physical Attractiveness in Female Mate Choice. *Personality and Individual Differences, 137*, 126-130.

Miller, G. (2000). *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature*. New York: Penguin.

Palomo-Vélez, G., Tybur, J. M., & van Vugt, M. (2021). Is green the new sexy? Romantic of conspicuous conservation. *Journal of Environmental Psychology*, *73*, 101530.

Phillips, T., Barnard, C., Ferguson, E., & Reader, T. (2008). Do humans prefer altruistic mates? Testing a link between sexual selection and altruism towards non-relatives. *British Journal of Psychology, 99*, 555-572.

Stavrova, O., & Ehlebracht, D. (2015). A longitudinal analysis of romantic relationship formation: The effect of prosocial behaviour. *Social Psychological and Personality Science, 6*, 521-527.

Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behavior: An integrative review and research agenda. *Journal of Environmental Psychology*, *20*, 309–317.

Swim, J. K., Gillis, A. J., & Hamaty, K.J. (2020). Gender Bending and Gender Conformity: The Social Consequences of Engaging in Feminine and Masculine Pro-Environmental Behaviours. *Sex Roles, 82*, 363–385.

Trivers, R. L. (1971). The evolution of reciprocal altruism. *Quarterly Review of Biology, 46*, 35-57.

1   Trivers, R. L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.), *Sexual*

2   *selection and the descent of man: 1871–1971* (pp. 136-179). Chicago, Aldine.

3   Xiao, C., & McCright, A. M. (2015). Gender differences in environmental concern: Revisiting the

4   institutional trust hypothesis in the USA. *Environment and Behaviour, 47*, 17–37.

5   Zahavi, A. (1975). Mate selection-a selection for a handicap. *Journal of Theoretical Biology, 53*,

6   205-214.