Title

Perceived Attractiveness of Two Types of Altruist.

Abstract

Empirical evidence has demonstrated that in long-term romantic contexts altruists are favoured over non-altruists. Costly signalling theory suggests that altruism informs observers that cooperating with the altruist is beneficial. This paper distinguishes between types of altruism to investigate if there is a differential effect on desirability across types. Using dating advertisements, participants (observers) received information about a considerate altruist, heroic altruist or neutral character and then rated their attraction to the character in a range of romantic and non-romantic contexts. It was hypothesised that both considerate and heroic characters would be rated by observers as more desirable than the neutral advert in long-term romantic contexts and that there would be a difference in desirability scores between the considerate and heroic characters. The results of study 1 showed that considerate altruists were significantly more desirable than the neutral advert in long-term romantic contexts, but heroic altruists did not differ significantly from neutral or considerate characters. Study 2 did not find the same pattern of results across the whole sample – but younger participants did demonstrate the same preference for considerate altruists over a neutral character in long-term romantic contexts. The findings are discussed in the context of the sex difference in mate preferences where females more than males desire qualities that signal resource acquisition. Overall, these findings suggest that considerate altruism signals good character traits to observers, such as kindness, which could indicate parenting ability and characters who signal these traits will have increased reproductive success because they are more desirable and therefore have access to more/better quality reproductive mates. Furthermore, the results suggest that considerate and heroic altruism may be distinct, and that considerate altruism is the more desirable type of altruism.

Keywords: Costly Signalling, Altruism, Attraction, Heroism, Considerate

Acknowledgements

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Introduction

Altruism has been described as an evolutionary puzzle (Van Vugt and Van Lange 2006), because a behaviour that is costly for the survival of the actor, but beneficial for the survival of the recipient should not have evolved, considering the forces of natural selection (Trivers 1985; Clamp 2001; Stich 2016). Altruism towards genetically related individuals can be explained by Hamilton's (1964) theory of inclusive fitness, which explains how altruistic acts carried out towards close relatives are adaptive because the cost is offset by the benefits being bestowed upon an individual with a similar genetic make-up as the altruist, therefore the altruistic gene can pass to future generations despite it negatively impacting on the survival of the altruist, because the relative likely shares the same altruistic gene. Furthermore, Trivers's (1971) theory of reciprocal altruism, offers an explanation for how altruism could have evolved amongst groups of unrelated individuals, as altruistic acts simply need to be reliably and consistently repaid. When humans interact over time, if the benefits of cooperation are greater than the costs, then helping can evolve if reciprocated (Axelrod and Hamilton 1981). This type of altruism would occur when the cost to the altruist is low but the benefit to the recipient is high, so that when the "investment" is repaid, both parties receive greater benefits than costs (Hampton 2009). However, as the altruist in this situation is actually trying to maximise pay-offs it is misleading to refer to this form of social-exchange as altruism (Becker 1976; Khalil 2004). Therefore, the current puzzling aspect of altruism, is how individuals could have evolved to behave altruistically towards strangers who are unlikely to reciprocate?

Altruism towards strangers can be explained, by reputational gains (Kurzban et al. 2015). These gains then increase fitness benefits from indirect cooperation partners (friends, colleagues, romantic partners), who are encouraged to cooperate (i.e. give up their time/resources to help) because of the altruist's desirable reputation (Nowak and Sigmund 2005), which indicates that they will be beneficially reimbursed for their cooperation. These increased fitness benefits offset the cost of altruism for the actor (the individual behaving altruistically). Costly signalling theory (CST) formalises these ideas and posits that altruism is a costly signal of a desirable underlying quality, which would otherwise be unknown without altruism (Zahavi 1977, 1975; Kafashan et al. 2016). Behaving altruistically ultimately increases the fitness of the actor, because the desirable quality attracts more, and higher quality, cooperative partners. Furthermore, CST can be coupled with sexual selection theory, where the cooperative partners would be reproductive mates (Zahavi 1975; Kafashan et al. 2016). If altruism signals that the actor has an underlying desirable quality, then the actor will attract more mates (or mates of a higher quality), increasing the actor's reproductive success compared to a non-altruist (Miller 2007). Therefore, the cost of altruism is offset by the increased reproductive benefits. The fact that signalling altruism is costly for the actor ensures that the signal is honest (Zahavi 1977, 1975) and dishonest signallers would fail to bear the cost of altruism should they try and 'cheat' by signalling high quality when they are actually low quality (Lotem et al. 2003), which would be detrimental to their survival (Barclay 2010). The act does not in fact, need to be costly to the individual who actually possesses the underlying quality, but punishment must be incurred by dishonest signallers (Getty 1998; Számadó 2011, 1999) to maintain the reliability of signalling (Kafashan et al. 2016).

When altruism is observed, the altruist will become more desirable compared to non-altruists in the eyes of observers, according to CST (Zahavi 1977, 1975). As predicted, men and women are more willing to have friendships with altruists (Barclay 2010; Bereczkei et al. 2010), lend money to altruists (Barclay 2010) and women prefer colleagues who are altruistic (Barclay 2010) compared with neutral individuals. Bereczkei et al.

(2010) also found that individuals who publicly displayed intentions to help strangers, were perceived as more popular, were more likely to be called upon in a crisis and people preferred to spend time with them, compared to those who did not publicly display altruistic intentions. Altruists are more desirable as romantic partners, as expected by CST and sexual selection theory (Barclay 2010; Farrelly et al. 2007; Margana et al. 2019; Farrelly et al. 2016). This is particularly the case for long-term romantic relationships, as opposed to short-term sexual relationships (Barclay 2010; Farrelly 2013, 2011; Bhogal et al. 2018; Margana et al. 2019; Farrelly et al. 2016; Ehlebracht et al. 2018; Farrelly and King 2019). This suggests that altruism signals good character rather than good genes (Barclay 2010). A long-term context is necessary to fully benefit from cooperation with an altruist of good character, because repeated interactions multiply the benefits (Barclay 2010). Either short or long-term contexts would allow an individual to benefit from cooperation with an altruist who was signalling good genes, as benefits would occur via reproduction. Research also shows that men (Griskevicius et al. 2007; Van Vugt and Iredale 2013; Iredale et al. 2008; Farrelly et al. 2007) and women (Griskevicius et al. 2007; Farrelly et al. 2007), will act altruistically to attract mates in romantic contexts and that members of the same sex recognise that altruistic rivals are viewed as more desirable than non-altruists by potential romantic partners (Barclay 2010; Kelly and Dunbar 2001). Furthermore, research shows altruism predicts mating success (Arnocky et al. 2017).

Although the theoretical predictions of costly signalling theory and sexual selection theory have been supported, few studies have compared different helping behaviours to see whether some altruistic acts are more desirable than others. If altruism is a costly signal of a desirable quality, such as good character, different behaviours may signal different qualities or differ in reliability. Griskevicius et al. (2007) did compare different altruistic behaviours and found that when romantically primed, men were more likely than women to publicly volunteer for heroic behaviours, whilst women were more likely than men to display intentions to carry out considerate behaviours, such as "help at a homeless shelter" (Griskevicius et al. 2007, p88). This suggests considerate and heroic altruistic behaviours may be distinct strategies that men and women adopt when attracting a mate.

Kelly and Dunbar (2001) utilised vignettes to compare altruistic, brave and heroic (i.e., altruistic and brave) individuals, to see who was more desirable in short and long-term romantic relationship contexts. They concluded bravery was more desirable than altruism across all relationship contexts, but a brave and altruistic individual was most desirable. Further evidence shows women find brave *and* altruistic men more attractive than risk-avoiders, but did not show bravery without altruism is more desirable, as women demonstrated a preference for risk-avoiders over non-heroic risk-takers (Farthing 2005). Risk-avoiders are only preferred to non-heroic risk-takers when the risk is high, for medium risk situations the non-heroic risk-taker was preferred (Farthing 2007). However, only heroic risk-takers (i.e. those that are brave and altruistic) were perceived as more attractive than risk-avoiders (Farthing 2007). Furthermore, war heroes produce more offspring and are rated as significantly more attractive than regular veterans but the same was not found for heroes in the realms of sport or business (Rusch et al. 2015). The ability-based pathway to risk-taking suggests that individuals carry out risk-taking when they possess the abilities to succeed in a specific risky situation or the situation provides the opportunity to showcase such abilities which have signalling value (Mishra et al. 2017; Barclay et al. 2018). Therefore, ability-based risk-taking is likely to increase the desirability of the risk-taker (Barclay et al. 2018). More recently, Margana et al. (2019) found that women rated individuals displaying high levels of altruism and heroism as more desirable compared to individuals who displayed low levels of these traits, but found no

difference between the desirability of altruism and heroism. While Kelly and Dunbar (2001) conclude that bravery was the most influential variable in determining desirability, it is possible that the descriptive vignettes used were insufficiently comparable between altruistic, brave and heroic conditions. This paper borrows from the Kelly and Dunbar (2001) paradigm, however the profiles created will be matched except for the information which depicts whether the individual is a considerate altruist, heroic altruist or neutral.

The current research examines how desirable considerate altruists, heroic altruists and a neutral individual are perceived to be, in a number of relationship contexts, by implementing an online dating advertisement design. Hypothesis 1 predicts that both considerate and heroic altruists will be more desirable than a neutral individual in long-term relationship contexts but not short-term sexual contexts. Hypothesis 2 predicts that there will be a significant difference between the desirability of considerate and heroic altruists – however, the direction of this prediction is uncertain due to previously mixed findings which suggest that bravery is more influential in determining desirability than altruism (Kelly and Dunbar 2001), that risk-avoiders are preferred to risk-takers when the risk is not associated to altruism (Farthing 2005) and that there is no difference in desirability between altruists and heroes (Margana et al. 2019). Hypothesis 3 predicts that both considerate and heroic altruists will be more desirable than the neutral individual as friends, colleagues and cooperative partners.

Participants

Ninety three heterosexual females who were enrolled on an undergraduate psychology degree at the University of East Anglia were recruited to complete an online dating advertisement study for course credit. The age range of the sample was 18-45 (M = 20.30, SD = 4.09) and 81.7% of the sample self-defined as being White, 8.6% as Asian, 3.2% as Mixed Race, 1.1% as Black and 5.4% listed their ethnicity as other.

Measures

A repeated measures design was implemented and three critical advertisements and seven filler advertisements were produced, of which all 10 were viewed by each participant. The three critical adverts represented the considerate altruist, heroic altruist and neutral individual. Each advert contained a photograph of a man with an open mouthed smile, which was taken from the Chicago Face Database (Ma et al. 2015). A pre-rating study was conducted in order to determine which photographs would be used for the three critical profiles (see figure 1). Twenty seven individuals (18 females and 9 males) rated 15 male faces from the Chicago Face Database (Ma et al. 2015) for attractiveness on a 7 point scale, which ranged from "not at all attractive" to extremely attractive". The faces were also rated for perceived age. Photo 1 had a mean attractiveness score of 3.04 (SD = 1.43) and a perceived age range of 17-30 (M = 23.48, SD = 3.41). Photo 2 had a mean attractiveness score of 2.96 (SD = 1.32) and a perceived age range of 18-34 (M = 25.07, SD = 3.92). Photo 3 had a mean attractiveness score of 2.93 (SD = 1.30) and a perceived age range of 17-33 (M = 25.23, SD = 3.92) (See figure 1). These three photos were selected as they had similar attractiveness scores which fell towards the middle of the range so as to avoid floor/ceiling effects. Despite the three photographs being closely matched for perceived age and attractiveness, they were still counterbalanced across the three critical profiles. Each photograph was followed by a dating profile, which provided participants with information such as the age, height, body type, education level and hobbies of the person in the dating advert.

To manipulate altruism-type, the last item included in the dating profile was "Thing you are most proud of", the considerate altruist answered this by saying "I volunteer at a children's hospital", the heroic altruist answered by saying "I once helped a woman fight off an attacker when I was walking home after a night out" and the neutral individual answered by saying "Completing my undergraduate degree". A post-experiment manipulation check was carried out, to insure that the altruistic behaviours were perceived as anticipated by the researchers. The check found that 141 female participants perceived the individual carrying out the heroic behaviour to be more courageous and the individual carrying out the considerate behaviour to be more kind, as anticipated (see supplementary materials: appendix 1). The rest of the information presented for the three critical profiles was identical, apart from the photograph and name, which appeared equally often for each of the three conditions (i.e. in nine combinations, see supplementary materials: appendix 2).

To measure desirability, participants responded to 8 statements, which reflected the extent to which they would want to partner with the individual from the dating advert in 4 different relationship contexts; long-term romantic relationship, short-term sexual relationship, as a friend, and as a colleague. For example, responses to the statement "I would want to collaborate with Mike in a work environment", indicate the extent to which participants find Mike a desirable colleague, whilst responses to the statements "Mike does not seem

like the type of person I'd want to settle down with" and "If Mike approached me on a night out, I'd go home with him" indicate the extent to which Mike was desirable to participants for long-term romantic and short-term sexual relationships respectively. Additionally, 2 statements were included which measured the extent to which participants would cooperate with the individual depicted in the dating advert (see supplementary materials: appendix 2 for all statements). For example, "If Mike asked me for help, I'd make an excuse as to why I was not able to". All statements were responded to using a 7 point Likert scale, ranging from strongly disagree to strongly agree and were presented to participants in the same order.

Fig 1. Photographs from the Chicago Face Database (Ma et al. 2015) used for the 3 critical dating profiles, from left to right, photo 1, photo 2 and photo 3.

Procedure

Participants were directed to an online survey which was created in Qualtrics (https://www.qualtrics.com/uk/), where they viewed 10 dating adverts. The adverts were presented in the following order, adverts in positions 1, 2, 4, 5, 7, 8 and 10 were filler adverts and adverts in position 3, 6 and 9 were the critical adverts. The considerate, heroic and neutral adverts were counterbalanced across position 3, 6 and 9. Participants would first see the photograph of a man and then the dating advert beneath. Immediately after each dating advert, participants would respond to the 10 statements which measured desirability and willingness to cooperate, the dating adverts were still visible to participants whilst they responded to these statements. After all dating adverts were viewed, participants were debriefed as to the purpose of the study and were given a final chance to withdraw their data.

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Study 1: Results and discussion

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A 3 (considerate, heroic, neutral) x 2 (long-term romantic vs short-term sexual) ANOVA was conducted, to explore the desirability of the individuals in the dating adverts for romantic contexts (see figure 2). There was a significant main effect for the type of relationship on ratings of desirability. The mean desirability score for the long-term romantic relationship type was 3.71 (SE = 0.15) and 3.04 (SE = 0.14) for the short-term sexual relationship type, $F(1, 92) = 48.70$, $p < .001$, $\eta_p^2 = 0.35$ (large effect), which shows that independent of altruism-type, dating adverts were rated as significantly more desirable in long-term romantic contexts compared to short-term sexual contexts and a large amount of the variance is uniquely explained by relationship

type. There was no significant main effect for altruism-type, $F(2, 184) = 1.57$, $p = .209$, $\eta_p^2 = 0.04$, (small effect), suggesting that ratings of desirability did not differ for the considerate, heroic or neutral individual.
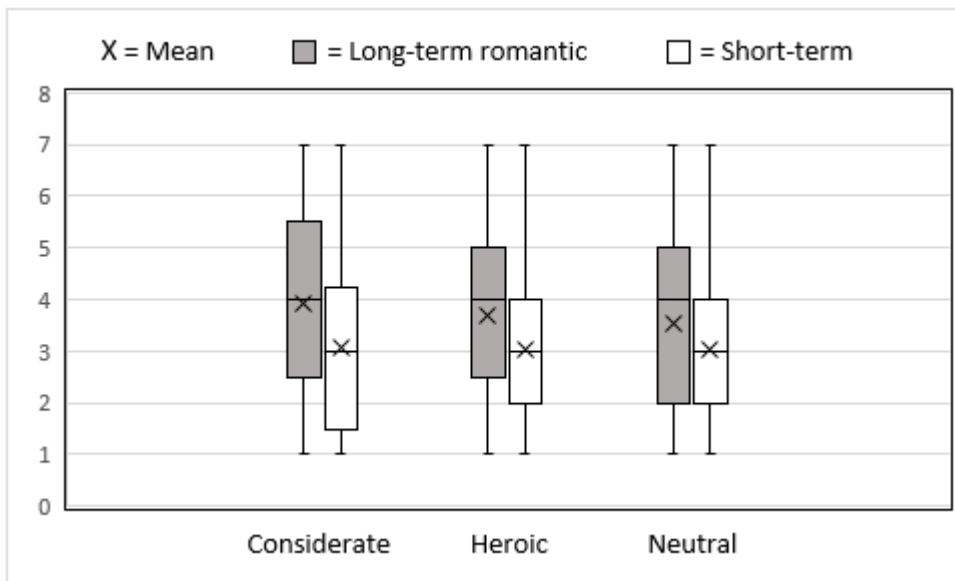
Fig 2. Boxplot displaying the mean, median, range and standard deviation of desirability scores for considerate, heroic and neutral dating adverts for romantic relationship contexts.

There was a significant interaction effect between the altruism-type and the type of relationship depicted, $F(2, 184) = 5.09$, $p = .007$, $\eta_p^2 = 0.05$ (small effect) (see figure 2). This indicates that altruism-type had different effects on people's ratings of desirability in relation to the type of relationship they were contemplating and that a small amount of the variance in responses can be explained by a combination of altruistic condition and type of relationship. Simple effects analysis revealed that mean desirability scores for long-term romantic relationships were significantly higher for the considerate altruism advert ($M = 3.93$, $SE = 0.17$) compared to the mean desirability scores for the neutral advert ($M = 3.53$, $SE = 0.17$), $p = .003$. There was no significant difference between the mean desirability scores for the considerate altruism advert and the heroic altruism advert ($M = 3.68$, $SE = 0.16$) in long-term relationship contexts, but there was a trend towards significance, $p = .087$. If the effect is in fact true, it would be a small effect. The mean desirability scores for the heroic altruism and neutral adverts in long-term romantic contexts did not differ significantly, $p = .276$. Therefore, there is partial support for hypothesis 1, as the considerate altruist is more desirable than the neutral individual in long-term romantic contexts, but the desirability of the heroic altruist did not differ significantly from the neutral individual in the same context. The findings do not support hypothesis 2, as there is no significant difference between the desirability ratings of the considerate vs heroic altruist in long-term romantic contexts, although the considerate altruist is descriptively more desirable. The mean desirability scores for considerate altruism ($M = 3.07$, $SE = 0.17$), heroic altruism ($M = 3.02$, $SE = 0.16$) and the neutral advert ($M = 3.03$, $SE = 0.16$) in short-term sexual relationship contexts did not differ significantly from each other.

A 3 (considerate, heroic, neutral) x 3 (friend, colleague, co-operator) ANOVA was conducted to explore the desirability of the individuals in the dating adverts for non-romantic contexts. There was a

significant effect for the type of relationship on ratings of desirability. The mean desirability score was 5.45 (SE = 0.08) for the friendship context, 5.45 (SE = 0.09) for the cooperation context and 5.22 (SE = 0.08) for the colleague context, $F(2, 184) = 8.03$, $p < .001$, $\eta_p^2 = 0.08$ (small-medium effect), which shows that desirability was higher in friendship and cooperation contexts compared with the colleague context and that a small to moderate amount of the variance in participant responses was uniquely explained by the type of relationship. There was no significant main effect for altruism-type, $F(2, 184) = 0.90$, $p = .408$, $\eta_p^2 = 0.01$ (small effect), suggesting that ratings of desirability did not differ for the considerate, heroic or neutral individual. There was no significant interaction effect between the altruism-type and the type of relationship depicted, $F(3.58, 329.55) = 1.005$, $p = .400$, $\eta_p^2 = 0.01$ (small effect).

Study 2

To further investigate whether both considerate and heroic altruists are more desirable than a neutral individual in long-term romantic contexts but not short-term sexual contexts (hypothesis 1) and to examine whether there is a significant difference between the desirability of considerate vs heroic altruists (hypothesis 2) study 2 refines the design of study 1, by using an independent measures design. Participants only view one dating advert, which represents either the considerate altruist, the heroic altruist or the neutral individual. This removes any order effects, any effects that occurred because of the filler adverts (such as boredom) and any effects that occurred because of different photos being attached to the dating adverts (despite randomisation). Furthermore, the data was collected using the online participant pool, Prolific academic, which allows for a wider demographic to be sampled.

Study 2: Method

Participants

Two hundred female participants were recruited from prolific (https://prolific.ac) to participate in the study. The age range of the participants was 19-36, with a mean age of 27.96 (SD = 4.44). In relation to ethnicity, 88% of the sample self-defined as being White, 6% as Asian, 2% as Mixed Race, 1.5% as Black and 2.5% listed their ethnicity as other. In relation to level of education, 9.5% of the sample identified as having an education level less than A-level, 24.5% had A-levels or equivalent, 19% had some college education but not a completed degree, 35.5% had completed a bachelor's degree and 11.5% had completed a graduate degree. Participants were paid £0.50 to complete the 5 minute study online.

Measures

An independent measures design was used in study 2. The same three critical profiles that were used for study 1 were used again for study 2, but because participants would only view one dating advert, there was no need for the filler profiles. Nor were 3 different photos attached, instead 'photo 3' from figure 1, was presented alongside all 3 profiles.

Desirability was measured in the same way as in study 1, but this time only desirability for long-term romantic relationships and short-term sexual relationships were measured as this was the area of interest after

study 1.

Procedure

The procedure for study 2 was the same as study 1, apart from instead of viewing 9 dating adverts, participants only looked at one dating advert. After looking at the dating advert they then indicated how desirable they found the individual in the dating advert as a long-term romantic or short-term sexual partner.

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Study 2: Results and discussion

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A 3 (considerate, heroic, neutral) x 2 (long-term romantic vs short-term sexual) mixed ANOVA was conducted. There was a significant main effect for the type of relationship on ratings of desirability. The mean desirability score for the long-term romantic relationship type was 4.14 (SE = 0.16) and 2.98 (SE = 0.10) for the short-term sexual relationship type, $F(1, 197) = 132.09$, $p < .001$, $\eta_p^2 = 0.40$ (large effect), which shows that independent of altruism-type, profiles were rated as significantly more desirable in long-term romantic contexts compared to short-term sexual contexts and that a large amount of this variance is uniquely explained by relationship type. There was no significant interaction effect between relationship type and altruism-type, $F(2, 197) = 1.09$, $p = .338$, $\eta_p^2 = 0.01$ (small effect), suggesting that ratings of desirability did not differ for the considerate, heroic or neutral individual. Because of the findings of study 1, where the considerate altruist was significantly more desirable than the neutral individual but not the heroic altruist, in the long-term romantic relationship context, planned comparisons investigated this in study 2, but found no significant difference between the mean desirability score (M = 4.26, SE = 0.19) of the considerate altruist and the mean desirability score (M = 3.90, SE = 0.18) of the neutral individual in the long-term romantic context ($p = .175$). The mean desirability score (M = 4.26, SE = 0.19) given to the heroic altruist in the long-term romantic context was identical to that of the considerate altruist, and therefore also was not significantly different to the neutral individual.

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General discussion

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The results of study 1 show that a considerate altruist is more desirable than a neutral individual in long-term romantic contexts. This provides partial support for hypothesis 1, which predicted that both considerate and heroic altruists would be more desirable to participants than a neutral individual in long-term but not short-term romantic contexts. In study 1, the heroic altruist did not differ significantly from the neutral individual. However, the results of study 2, found that there was no significant difference between the considerate and neutral dating adverts. Furthermore, neither study 1 nor study 2 found support for hypothesis 2, which predicted that there would be a significant difference between the mean desirability scores of the considerate and heroic altruists. Whilst considerate altruists were rated as more desirable than heroic altruists in study 1, the difference between them was never significant. These findings are consistent with previous research that found that altruism and heroism were equally desirable (Margana et al. 2019) and inconsistent with Kelly and Dunbar's (2001) finding that bravery is the most significant factor contributing to attractiveness, even in the absence of altruism.

The lack of support for hypothesis 1 (that altruists will be more desirable than non-altruists) is contrary to numerous studies in which an altruistic individual is more desirable than a neutral individual (Barclay 2010;

Margana et al. 2019; Farrelly 2013; Farrelly et al. 2007; Bhogal et al. 2018; Kelly and Dunbar 2001; Farrelly et al. 2016; Bereczkei et al. 2010). The materials used in studies 1 and 2 could explain why this robust finding wasn't replicated in the present research. Whilst the neutral dating advert did not depict an altruistic individual, it did highlight the individual's proudest moment as "completing my undergraduate degree", which is a potentially desirable quality. Buss and Barnes (1986) found women desired partners who showed good earning potential and were college educated. There is strong evidence that women desire mates who display qualities linked to resource acquisition (Buss 1989; Sprecher et al. 1994; Wiederman 1993; Furnham 2009; Shackelford et al. 2005; Bech-Sørensen and Pollet 2016; Souza et al. 2016). Therefore, by highlighting a desirable correlate of earning potential (level of education, Woodhall 1987) in the neutral dating advert, the neutral advert we used may have been as desirable as the altruistic adverts, but for different reasons. Although the two altruistic individuals were reported as having the same level of education, this was reiterated twice in the neutral advert as it was used as the proudest moment.

In study 1, the considerate altruist was still significantly more desirable than the neutral individual. This was not replicated in study 2, where the mean age of participants increased from 20.30 to 27.96. Research on women's mate preferences found that as women get older they become less willing to marry someone that earns less than them (Sprecher et al. 1994). Given that there is a well-established link between educational level and earning potential (Woodhall 1987) and evidence that women educated to degree level earn less than men educated to the same level (DiPrete and Buchmann 2006) it might be that older women in our sample are more attracted to the (university educated) neutral individual than younger women, meaning older women's desirability for the neutral and altruistic individuals are more closely matched. Additional data analysis (see supplementary information: appendix 3) revealed that participants aged 19-25 did desire the considerate altruist to a greater extent than the neutral individual in long-term romantic contexts ($p = .049$), which replicates the finding of study 1. This effect was not found for female participants aged 26-36. For younger women, altruism may have more of an impact on a potential mate's desirability than cues linked to earning potential, whilst for older women, altruism and cues linked to earning potential are seen as equally desirable.

The finding that considerate altruism is more desirable than a neutral individual in long-term romantic contexts but not short-term sexual contexts supports the idea that altruism signals good character to observers (Barclay 2010; Farrelly 2013, 2011; Margana et al. 2019; Bhogal et al. 2018). This is because for desirability to increase for a type of altruism, that type of altruism must convey to an observer that cooperating with the altruist will benefit them. Because desirability only increases in long-term romantic contexts, the potential benefits must require repeated interactions. Good character is therefore a likely candidate for what is being signalled to observers via altruistic acts, as if it were good genes alone that altruism signalled, the benefits of cooperating with the altruist could potentially be achieved in a single interaction. However, what good character refers to is less clear. It has been theorised that the good character signalled by altruism could relate to willingness and ability to be a good parent (Tessman 1995; Farrelly 2013, 2011; Griskevicius et al. 2007), cooperativeness (Barclay and Willer 2007; Bereczkei et al. 2010), kind, helpful and sympathetic personality traits (Griskevicius et al. 2007; Miller 2007; Farrelly 2011), trustworthiness (Barclay 2004; Fehrler and Przepiorka 2013), competitive ability (Smith and Bird 2000), and finally, courage (Zahavi and Zahavi 1999). Based on the current finding that considerate altruists are significantly more desirable than a neutral individual in long-term romantic contexts but heroic altruists are not, it is more likely that prosocial personality characteristics (kindness,

helpfulness, cooperativeness etc.) that link to parenting ability are being signalled, rather than courage or competitive ability. Furthermore, research has shown that long-term relationships are rated as more satisfactory based on small acts of kindness rather than grand gestures (Gabb et al. 2013), which could explain why considerate altruists are viewed as more desirable than a neutral individual in long-term romantic contexts, whilst heroic altruists are not. However, the distinction between considerate and heroic altruism is still unclear.

In relation to the friendship, colleague and general cooperation partner relationship contexts, neither the considerate altruist, heroic altruist nor neutral individual were favoured by participants. This is counter to findings from Barclay (2010) who found that women preferred altruistic individuals over neutral individuals in all of these contexts. Kelly and Dunbar (2001), alternatively found that when women rated altruistic, brave and neutral profiles for attractiveness on short-term sexual, long-term romantic and friendship dimensions, women were much less choosey on the friendship dimension as demonstrated by them rating profiles as more attractive when contemplating friendship. These findings taken into account with the current findings may suggest that altruism is an important quality for potential romantic partners to pay attention to, but in other relationship contexts the importance of altruism is diminished.

There are certain limitations that need to be discussed in relation to the current research. Firstly, the use of dating advertisements was utilised because of the real world link to popular dating apps, which increases ecological validity. However, this may have caused participants to base their ratings primarily on the photograph attached to the profile rather than the content of the dating advertisement; given that the photographs were matched for age and attractiveness and counterbalanced this could explain why there were not consistent significant differences between conditions. Secondly, the altruistic act that represented considerate altruism (volunteering at a children's hospital) may convey greater levels of commitment than the altruistic act that was used to represent heroic altruism (helping a woman fight off an attacker), as it is clear that the heroic act is a one off act, whereas there is ambiguity as to whether the considerate act is a continuous behaviour. Thirdly, the considerate and heroic altruists were represented using only one operationalisation of the behaviour, which could mean that the findings are not generalizable to all considerate and heroic acts, but are instead specific to just the two behaviours used in this study. Further research should be conducted which uses a variety of considerate and heroic behaviours to see if similar findings emerge. Finally, the current research only examined the extent to which female participants desired a considerate, heroic or neutral individual, meaning we are unable to shed light on whether males perceive such individuals as more or less desirable in relation to each other. Future research should examine considerate vs heroic altruism without using dating adverts, in case this paradigm led to participants basing their ratings predominantly on the photographs attached to the adverts, rather than the content of the advert itself and should include male participants in order to examine this line of enquiry. Additionally, further exploration of how different types of altruism impact upon mate desirability when other desirable factors are present would also increase our understanding of how important altruism is in determining mate value.

To conclude, considerate altruists are shown to be more desirable than a neutral individual in long-term romantic contexts in two studies, however, to determine the robustness of this finding, more research may be required. The preference for considerate altruists over neutral individuals in long-term romantic contexts but not short-term sexual contexts, supports the idea that considerate behaviours signal to observers that the altruist has a good character which increases their attractiveness, however, we do not currently know what these good

character traits are and future studies could explore this by asking participants to indicate what characteristics they perceive a considerate or heroic altruist to have. The main finding of this research is that behaving in a considerate manner, such as volunteering, donating or campaigning to help others, increases the desirability of an actor in the eyes of prospective long-term mates significantly more than a neutral individual, but this only occurs consistently for younger females, who place less emphasis on earning potential and more emphasis on altruism when considering a potential mate.

Compliance with Ethical Standards

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Data Availability

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

Conflict of Interest Statement

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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