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Cooperative Behavior and Perceived Relationship Longevity: An Observer Based Study

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Humans routinely evaluate the romantic relationships of others, a capacity that carries adaptive value for social learning, mate assessment, and coalition management. The present study examined how two cooperative norms, fairness and altruism, shape third party judgements of perceived relationship longevity, and whether these judgements vary according to relationship context and observer sex. Using an observer based experimental design, undergraduate participants viewed a short video of a couple engaged in a resource allocation task, framed as being in either a short term or long-term relationship. One partner behaved either fairly by dividing resources equally or altruistically by giving a greater share to the partner. Participants then rated how likely they believed the relationship was to last. Results revealed a significant three-way interaction between cooperative behavior, relationship length, and participant sex. Fair behavior was associated with greater perceived longevity in short term relationships, whereas altruistic behavior was associated with greater perceived longevity in long term relationships, particularly among female observers. These findings indicate that cooperative behaviors are interpreted in context sensitive ways, and that the capacity to infer relationship stability from cooperative cues may serve evolutionarily relevant functions for observers.

Keywords
altruism, observer effects, relationships, cooperation, fairness, mate copying

Introduction

Romantic relationships do not exist in social isolation. They are observed, evaluated, and judged by others, and the capacity to form accurate inferences about the quality and likely durability of others' relationships may itself be evolutionarily significant. From a social learning perspective, individuals who can accurately identify stable, high-quality partnerships from observable cooperative cues gain informational advantages for their own mate choice decisions, a process formalized as mate copying (Galef & White, 1998; Waynforth, 2007). Observing which relationships are likely to persist, and what behavioral signals predict this, allows individuals to update their assessments of potential partners without the cost and risk of direct evaluation. Third party judgements of relationship longevity are therefore not merely reflections of dyadic dynamics; they are adaptive cognitive outputs with downstream consequences for the observer's own reproductive and social decisions.

Beyond mate copying, accurately reading others' relationship stability has relevance for reputation-based cooperation and coalition management. Individuals embedded in stable, cooperative partnerships are likely to be more reliable long term social allies and less likely to defect from cooperative arrangements (Nowak & Sigmund, 2005). Observers who correctly identify cooperative individuals through their relational behavior can therefore make more informed decisions about who to affiliate with, assist, or invest in. This is consistent with work demonstrating that altruistic behavior within visible social contexts enhances the actor's broader social reputation (Barclay, 2010; Oda et al., 2009), and that observers track cooperative signals as cues to individual quality beyond the romantic domain. Third party evaluation of relationship quality sits at the intersection of mate assessment and social network management, both of which are evolutionarily consequential.

Two cooperative norms that have received particular attention in this literature are fairness and altruism. Fairness is commonly understood as the equitable distribution of resources (Baumard et al., 2013), whereas altruism involves providing benefits to others at some personal cost (Trivers, 1971). Both norms are generally evaluated positively, but they may convey different relational signals depending on contextual factors such as commitment level, relationship duration, and expectations of reciprocity (Bhogal et al., 2020). A large body of work on mate preferences consistently shows that altruism is valued more strongly in long term relational contexts and is judged more favorably by women, whereas reciprocity and fairness may be more salient in early or less committed relationships (see Boog et al., 2024 for a review). However, these findings largely concern how individuals evaluate potential partners for themselves. Much less is known about how observers evaluate existing relationships using the same cooperative cues, and whether the context sensitivity observed in mate preference research extends to third party longevity judgements.

Relationship research provides a complementary framework for understanding how observers make these inferences. Romantic relationships are typically characterized as communal, in which partners provide benefits in response to need rather than with the expectation of immediate repayment (Clark & Mills,

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1993). As commitment deepens, strict accounting of inputs and outputs becomes less appropriate, and willingness to incur costs for a partner signals relational depth rather than naive generosity. In contrast, in early-stage relationships, fairness and proportionality serve as indicators of mutual respect and low exploitation risk. Observers aware of these relational norms may therefore interpret cooperative behavior differently depending on relationship stage, using contextual information to calibrate their inferences about likely longevity.

There is also consistent evidence that women are more sensitive than men to cues of cooperation, equity, and commitment within romantic contexts (Farrelly et al., 2007; Kenrick et al., 1993). These differences have been attributed to sex differentiated parental investment, variation in relational goals, and heightened sensitivity to signals of cooperative intent in long term partners. If this sensitivity extends to third party judgements, female observers may show stronger and more context sensitive inferences about relationship stability from cooperative cues than male observers.

The present study examined how observers use cooperative behavior to infer the likely longevity of romantic relationships. Participants viewed a couple engaged in a resource allocation task in which one partner behaved either fairly or altruistically, with the relationship framed as either short term or long term. Two hypotheses were proposed. First, fair behavior was expected to be associated with greater perceived longevity in short term relationships, particularly among female observers. Second, altruistic behavior was expected to be associated with greater perceived longevity in long term relationships, again especially among female observers. These hypotheses reflect the proposition that observers use contextual relational information when inferring stability from cooperative cues, and that this capacity carries adaptive relevance for the observer's own social and mating decisions.

Method

Participants

Two hundred and seventy-five undergraduate students took part (126 males, 149 females; mean age = 19.36 years, *SD* = 1.72). Participants were recruited from a UK university using opportunity sampling via the department's research participation scheme. All participants reported being single at the time of participation. Ethical approval was obtained from the host institution's psychology ethics committee, and all participants provided informed consent prior to participation.

A retrospective power analysis was conducted using G*Power (Faul et al., 2007). Based on the observed effect size for the critical three-way interaction ($\eta^2 = .04$, $f = .20$), with $N = 275$ and $\alpha = .05$, the achieved power was .92, indicating the study was adequately powered to detect the primary effect of interest.

Design

The study employed a 2 × 2 × 2 between-subjects factorial design. The independent variables were cooperative behavior (fair and altruistic), relationship context (short term and long term), and participant sex (male and female). The dependent variable was perceived relationship longevity.

Materials

Stimuli consisted of a short video depicting two individuals engaged in a resource allocation task. One individual was designated as the allocator and given £100 to distribute between themselves and their partner. The money was used as a prop and returned after filming. In fair conditions, the allocator divided the resources equally (£50 each). In the altruistic conditions, the allocator gave £80 to the partner and retained £20. Videos were adapted from Bhogal et al. (2020). The same pair of confederates were used across all conditions to control for variation in appearance, demeanor, and interaction style. The allocator was either male or female; when the allocator was male, the recipient was female, and vice versa.

Procedure

Participants took part in small groups. Upon arrival, they provided informed consent. Participants were randomly assigned to one of the experimental conditions. Before viewing the video, participants were informed that the individuals depicted were a romantic couple. Consistent with Farrelly et al. (2013), in the short-term relationship condition, participants were told the couple had engaged in a one-night stand or short sexual encounter. In the long-term relationship condition, participants were told the couple were in a long standing committed romantic or sexual relationship. This information provided the relationship context manipulation. Participants then viewed the video and completed a brief questionnaire.

Perceived relationship longevity was assessed using a single item asking participants how likely they believed the relationship was to last, rated on a five-point Likert scale from 1 (very unlikely to last) to 5 (very likely to last). Several filler items were included to reduce demand characteristics. Participants were fully debriefed following the questionnaire and given the opportunity to withdraw their data.

Results

A three way between subjects ANOVA was conducted with allocation (fair, altruistic), relationship context (short term, long term), and participant sex (male, female) as independent variables. Results are summarized in Table 1. A visual representation of the data is provided in Figure 1. Descriptive statistics for all conditions are presented in Table S1, which is provided in the Supplementary Materials.

The analysis revealed a significant main effect of relationship context, $F(1, 267) = 17.39$, $p < .001$, $\eta^2 = .06$, indicating that long term relationships were judged as more likely to last than short term relationships. A significant main effect of participant sex also emerged, $F(1, 267) = 37.90$, $p < .001$, $\eta^2 = .12$, such that female participants provided higher longevity ratings overall. The main effect of cooperative behavior did not reach statistical significance, $F(1, 267) = 3.72$, $p = .06$, $\eta^2 = .01$.

These main effects were qualified by a significant two-way interaction between cooperative behavior and participant sex, $F(1, 267) = 48.93$, $p < .001$, $\eta^2 = .16$, and

Figure 1
Mean perceived relationship longevity as a function of participant sex, relationship length, and allocation. Error bars represent 95% confidence intervals.

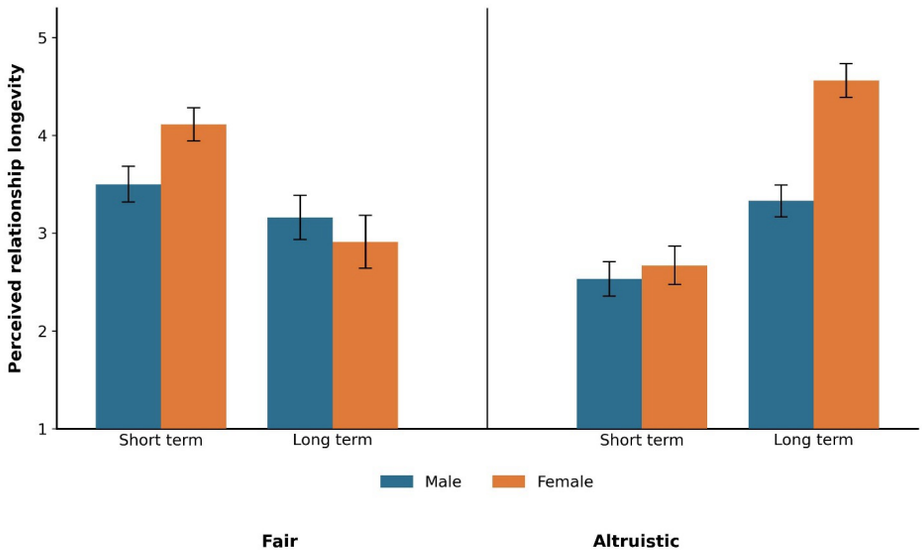

Table 1
Results of the 3-way ANOVA on perceived relationship longevity

Effect	Factor	$F(df = 1, \text{error} = 267)$	p	η^2
Main effects	Allocation	3.72	.06	.01
	Relationship length	17.39	< .001	.06
	Sex of participant	37.90	< .001	.12
2-way interactions	Allocation × length	217.91	< .001	.45
	Allocation × sex	48.93	< .001	.16
	Length × sex	0.47	.49	.00
3-way interaction	Allocation × length × sex	11.73	< .001	.04

a significant interaction between relationship context and participant sex, $F(1, 267) = 217.91$, $p < .001$, $\eta^2 = .45$. A significant three-way interaction emerged between cooperative behavior, relationship context, and participant sex, $F(1, 267) = 11.73$, $p = .04$, $\eta^2 = .04$.

Simple contrasts examining sex differences within each condition are reported in Table 2. In the short-term relationship condition, female participants judged fair behavior as indicative of greater relationship longevity than male participants, $F(1, 267) = 19.69$, $p < .001$. No significant sex difference emerged for altruistic behavior in short term relationships, $F(1, 267) = 0.97$, $p = .33$. In the long-term relationship condition, female participants judged altruistic behavior as indicative of greater relationship longevity than male participants, $F(1, 267) = 78.45$, $p < .001$. No significant sex difference was observed for fair behavior in long term relationships, $F(1, 267) = 2.97$, $p = .09$.

Discussion

The present study examined how third-party observers use cooperative behavior to infer the likely longevity of romantic relationships. The key finding was a significant three-way interaction: Fair behavior was perceived as more stabilizing in short term relationships, whereas altruistic behavior was perceived as more stabilizing in long term relationships, with effects particularly pronounced among female observers. These findings not only demonstrate that observers are sensitive to cooperative norms and relational context but also speak to the broader question of why such a capacity would be evolutionarily meaningful for the observer themselves.

A central contribution of the present research is its framing of third-party evaluation as an adaptive behavior. Accurately reading the cooperative dynamics of others' relationships has clear functional value across several evolutionarily relevant domains. First, it enables social learning about what cooperative signals predict relationship stability, information that can be applied

Table 2
Simple contrasts for perceived relationship longevity by participant sex, relationship length, and allocation

Allocation	Length	Sex (1)	Sex (2)	Mean diff.	Std. error	*F*	*p*	η^2
Fair	Short term	Male	Female	−0.64	0.15	19.69	< .001	.07
	Long term	Male	Female	0.26	0.15	2.97	.09	.01
Altruistic	Short term	Male	Female	−0.14	0.14	0.97	.33	.00
	Long term	Male	Female	−1.23	0.14	78.45	< .001	.23

Note: All contrasts conducted with $df = 1$, error = 267.

directly to one's own mate assessment decisions without the costs of trial and error. This is consistent with the mate copying literature, which shows that individuals use observations of others' partner choices to calibrate their own preferences (Galef & White, 1998; Waynforth, 2007). Second, observing that a partner exhibits altruistic or fair behavior within their existing relationship contributes to their broader social reputation as a cooperative individual (Barclay, 2010; Oda et al., 2009), which is itself relevant for decisions about coalition formation, reciprocal exchange, and social investment. Third, for kin of one of the partners, accurately assessing whether a sibling's or relative's relationship is stable has direct inclusive fitness implications, particularly if shared resources or childcare are involved. Taken together, the capacity to infer relationship longevity from cooperative cues is not incidental; it is precisely the kind of social intelligence that would be expected to have been subject to selection.

In short term relationships, fair behavior was associated with greater perceived relationship longevity. This aligns with equity-based models of early-stage relationships, which propose that balance and proportionality are especially salient when commitment is low or uncertain (Hatfield et al., 1985, 2012). Observers may interpret fairness as a signal that partners are engaging in reciprocal and mutually respectful exchanges, thereby reducing the perceived risk of exploitation. From an adaptive standpoint, an observer considering whether to affiliate with or invest in one of the partners would correctly infer that a fair, reciprocal dynamic in a new relationship signals good cooperative intent and lower defection risk (Clark & Mills, 1993).

In contrast, altruistic behavior was associated with greater perceived longevity in long term relationships, particularly among female observers. This is consistent with research showing that altruism is valued more strongly in established relational contexts and interpreted as a signal of deep commitment and cooperative intent (Farrelly, 2013; Oda & Hiraishi, 2015). Within communal relationships, willingness to incur costs for a partner signals that partners have transitioned from exchange-based norms to communal norms, in which responsiveness to the partner's needs takes precedence over strict reciprocity (Clark & Mills, 1993). From the perspective of an observer considering a couple as potential cooperative allies or kin by marriage, a partner who gives generously in an established relationship provides strong evidence of sustained cooperative intent, which is precisely the kind of information that would be valuable for long term social planning.

The pronounced sex differences observed, particularly female observers' stronger sensitivity to the alignment of cooperative behavior and relationship context, are consistent with evolutionary accounts of sex differentiated relational cognition (Gaulin & McBurney, 2001; Kenrick et al., 1993). Women's heightened sensitivity to signals of cooperative intent and long-term commitment has been extensively documented in mate preference research (Boog et al., 2024; Farrelly et al., 2007), and the present findings suggest that this sensitivity extends to third party evaluations of others' relationship stability. This makes adaptive sense: If accurate mate assessment is especially consequential for the sex bearing higher parental investment costs, heightened calibration of cooperative signals, whether in direct partner evaluation or in observational learning about others' relationships, would carry fitness benefits for women.

Several limitations warrant acknowledgement. The sample consisted of young undergraduate students, which may limit generalizability to older or more experienced populations. Cooperative behavior was operationalized via a resource allocation task, which provides a controlled but simplified representation of real-world cooperation. The study also relied on a single item measure of perceived relationship longevity and did not include manipulation checks. Future research should incorporate multi-item measures, explicit manipulation checks, and more ecologically valid paradigms. Examining whether third party longevity judgements inform subsequent mate copying or coalition decisions would more directly test the adaptive function proposed here.

In conclusion, the present study demonstrates that fairness and altruism play distinct and context sensitive roles in observer judgements of relationship longevity. Beyond describing patterns of social perception, these findings point to the adaptive utility of third-party relationship evaluation: Accurately inferring relationship stability from cooperative cues provides observers with socially actionable information relevant to their own mating, coalition, and social learning decisions. The capacity to read others' cooperative dynamics is not merely an incidental social skill but a plausible target of selection operating through the benefits conferred on the observing individual.

Author Contributions

Manpal Singh Bhogal: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Project administration, Visualization, Writing – original draft (lead), Writing – review and editing. **Niall Galbraith:** Conceptualization, Formal analysis, Methodology, Supervision, Writing – review and editing. **Ken Manktelow:** Conceptualization, Supervision, Methodology, Writing – review and editing.

Ethical statement

This study was conducted in accordance with the Declaration of Helsinki. Ethical approval was granted by University of Wolverhampton (approval number: P37586). All participants provided informed consent and were informed of their right to withdraw at any time without penalty.

Supplementary material

Electronic supplementry materials are available online.

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