

Altruistic Tendencies are Sensitive to Sex-specific Mate Selection Criteria

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ABSTRACT

Natural selection and sexual selection are usually seen as either two different and separate processes or with sexual selection being a subset of natural selection but distinct from other processes such as kin selection. In this paper, we investigate the possibility of a connection between discriminatory altruistic behaviors consistent with kin selection and the sex-specific criteria that men and women are evaluated on by potential partners in the process of mate selection. Many studies document discriminatory altruistic behaviors consistent with kin selection, including tendencies to favor closely related family members for costly assistance. Considerable research also demonstrates the existence of sex-specific mate selection criteria. When selecting a suitable mate, men show a preference for fecundity cues in women, such as the waist-to-hip ratio, which indicates a woman's ability to conceive and bear children. Women show a preference for high resource potential and high social status in men, indicating a man's ability to provide resources for the woman and offspring. We tested whether sex-specific mate selection criteria influences patterns of assistance and whether nepotistic tendencies are stronger for each sex within the domains in which women and men are differentially valued. Undergraduate students reported altruistic behaviors that benefited another individual's social status, resource potential, or physical attractiveness, as well as the relationship between the participant and whom he or she helped. We did not find evidence for nepotistic tendencies indicative of kin selection. Results did provide moderate support for the hypothesis that sex specific mate selection criteria influences the type of altruistic behavior, although both male and female participants were more likely to provide assistance to those of the same sex overall.

KEYWORDS

Altruism, Evolution, Mate Selection Criteria, Kin Selection

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This paper considers how sex-specific mate selection criteria may influence nepotistic tendencies for costly forms of assistance that are indicative of kin selection. Humans select mates based on criteria that are generally consistent across cultures. There are many characteristics that both sexes value in a mate, such as kindness, understanding, and intelligence (Kenrick & Simpson, 1997). However, sex-specific mate selection criteria are well documented in studies such as Buss' (1989) survey of 37 different cultures, conducted to determine if universal mate selection criteria exist. The study found that men more often reference cues of fecundity, such as physical attractiveness, to judge the suitability of a mate, whereas women reference high social status, reputation, and amount of financial wealth to judge the attractiveness of a mate-cues of resource provisioning potential.

These sex-specific criteria relate to the different roles each sex commonly plays in human reproduction. Across mammalian and most other animal species, females are the limiting factor in reproduction because of their greater physiological investment. Thus, females are more selective than males in mating, and males expend comparatively more effort to obtain mates (Bateman, 1948; Trivers, 1972). Compared to other mammalian species, human male parental investment is relatively high (Buss & Schmitt, 1993; Geary & Flinn, 2001). Human children develop very slowly and require high levels of investment (Geary & Flinn, 2001). Paternal investment improves chances of survival (Hill & Hurtado, 1996) and may enhance the offspring's reproductive success (Geary, 2005). Males who can reliably provide such support will be favored in partner choice, so males who display wealth and high social status may facilitate their success in mating competition. During ancestral times, men with greater resource control married younger women, married more women, and produced offspring earlier (Low, 1998). A recent review of research across a wide variety of societies found that males with higher social status and greater economic power consistently have higher reproductive success (Hopcroft, 2006). Even when women in modern post-industrial societies hold positions of high status and economic power their preferences for high status men are consistent and can actually appear to increase in strength (Buss, 1989; Townsend, 1989; Wiederman & Allgeier, 1992).

Women's fecundity, the ability to physically bear and raise offspring, declines with age beginning in the late twenties and especially so in the thirties (DeCherney & Berkowitz, 1982). Women attract and compete for partners through signals of fecundity and suggestions of sexual access (Cunningham, 1986; Tesser and Martin, 1996). Men in all cultures tend to seek mates near their own age when they are young and seek progressively younger women as they age. Yet, contrary to socio-cultural power explanations for mate selection criteria, teenage males are attracted to substantially older women (Kenrick & Simpson, 1997). Ardener, Ardener, & Warmington (1960) studied cultures where women had more economic resources than men. They concluded that men still used fecundity cues and women still used material wealth and social status as mate selection criteria. Thus, the evolutionary perspective explains the universality of mate selection criteria as one that developed from an ancestral culture and continues in contemporary cultures.

Nepotistic tendencies when providing costly forms of assistance is another highly documented human phenomenon (Essock-Vitale & McGuire, 1985; Shavit, Fischer, & Koresh, 1994) predicted by evolutionary theory. Hamilton's inclusive

fitness theory predicts that selection will reinforce a genetic disposition for altruism favoring those more likely to share such genes, e.g., close kin (Hamilton, 1964). Burnstein, Crandall, and Kitamaya (1997) demonstrated that certain qualities affect nepotistic tendencies towards kin at equivalent genetic distance. Burnstein et al. (1997) found that respondents would more likely help infants and the elderly in everyday situations but would be more likely to save young targets (1, 10, and 18 years) than older targets (45 and 75 years) in life-or-death situations and would more likely save 10 and 18 year olds than those of other ages in famine conditions. Participants were more likely to help kin in poor health in everyday situations, but healthy kin in life-or-death situations, and more likely to help poor kin in everyday situations but wealthy kin in life-or-death situations, showing that differential reproductive potential and survivability affects kin selecting tendencies in extreme circumstances. Thus, individuals consider other factors when allocating costly assistance to close relatives.

We propose that people also take sex-specific mate selection criteria into account when allocating costly assistance and also that nepotistic tendencies will be stronger for each sex on the characteristics that each is differentially valued for in mate selection. Tendencies to selectively allocate assistance in such a sex-specific way, enhancing social status and resource provisioning potential for men and perceptions of physical appearance for women, would be more efficient and effective in promoting the recipients' reproductive success. Nepotistic tendencies contingent on sex-specific mate selection criteria would further promote inclusive fitness and strengthen kin selection. Evidence for such tendencies is apparent for other species.

Male lions form coalitions, often among siblings, to enable reproductive access to females. Compared to single lions and pairs, groups of three or more males have better abilities to secure reproductive control of female prides, retain their tenure for longer periods, mate with more females, and produce more surviving offspring (Bygott, Bertram, & Hanby, 1979). In chimpanzees, males partly rely on coalitions to enhance their social rank and thus reproductive success. High-ranking males will reward social allies by allowing them preferential access to female mates (Duffy, Wrangham, & Silk, 2007). Chimpanzee males remain in their natal group their entire life, thus the allies are likely to be brothers or other close relatives. Female chimpanzees also engage in dominance hierarchies, which (Pusey, Williams, & Goodall, 1997) showed to correlate to earlier maturation of daughters, greater reproductive success, and longer life for female chimpanzees of higher ranking at birth. Surprisingly, young female chimpanzees often disperse to other communities (Pusey et al., 1997), making it less effective to have strong relationships with kin when these relationships will end with the dispersion of young female chimpanzees. This may provide evidence for the greater importance of effective relationships between female chimpanzee peers over kin, as the latter rarely interact after the dispersion.

As noted above, there is considerable evidence for evolved nepotistic tendencies facilitating kin selection. Of course, for these tendencies to be evolutionarily successful, potential altruists must be able to distinguish (consciously or subconsciously) between kin and non-kin (Schroeder, Dovidio & Piliavin, 1995). Kin recognition processes operate through visual (Porter, Cernoch, & Balogh, 1984),

olfactory (Porter, Cernoch & Balogh, 1985), and social cues (Sherman, 1985). There appears to be critical developmental period for kin recognition across species. Unrelated children raised together do not typically develop romantic attractions to each other, reflecting an adaptation to promote outbreeding (Wolf, 1970). Helping behaviors based on kin recognition can also be influenced social conventions of relationship status (Hawkes, 1983).

It is possible that both women and men learn what each sex is valued for in the mating market and thus differentially provide assistance enhancing these domains. The recognition of properties related to mate value may also be a product of evolved adaptations. Even at 10 months old, human infants can recognize social dominance and hierarchy (Thomsen, Frankenhuys, Ingold-Smith, & Carey, 2011). Human infants only a few days old prefer to look at faces that adults consider physically attractive, whether or not the faces are of kin (Quinn, Kelly, Lee, Pascalis, & Slater, 2008). It is possible nepotistic tendencies reflecting the recognition of sex-specific mate selection criteria has an evolved genetic basis, although strong evidence would be needed to support this hypothesis. It is also theoretically possible that people would assist others consistent with our predictions, but without a conscious recognition of the role that the relevant attributes play in mate selection. We consider this last explanation unlikely, as sex-specific mate selection preferences are consistent across cultures and historical time (Buss, 1989; Buss, Shackelford, Kirkpatrick, & Larsen, 2001).

We predict that 1) people also take sex-specific mate selection criteria into account when allocating costly assistance, and 2) that nepotistic tendencies will be stronger for each sex on the characteristics that each is differentially valued for in mate selection. We examine our hypotheses by systematically examining the helping experiences of university undergraduates. Because we are investigating these behaviors in college students at residential universities, we may see greater frequencies of helping for friends than for relatives because of social proximity. Similar to chimpanzees, ancestral human groups were likely based around male kin networks (de Waal, 2006). Thus, social proximity was reliably associated with genetic relatedness for much of human evolution. Thus, we will also examine the perceived costs and benefits of helping actions to see if these more closely follow genetic relatedness. Our other specific predictions are that men will be more likely both to help and to be helped with assistance enhancing social status/reputation and finances/material goods. Women will be more likely both to help and to be helped with assistance enhancing physical attractiveness. We also expect that the degree of benefit received by the recipient will influence the closeness of the relationship between the individuals, the greater the benefit the closer the relationship will become. This effect should also occur following sex-specific mate selection criteria; we expect the associations to be stronger for men in the domains of social status/reputation and finances/material goods and for women in physical attractiveness.

METHODS

Participants

Undergraduate participants ($N = 341$; 230 female, M age = 19.8, SD age = 2.7) at two public universities in Michigan completed anonymous surveys at their convenience over the Internet to fulfill a course requirement. There was no significant sex difference in age, thus any sex differences could not be an artifact of older ages - e.g., men are more likely to provide financial support because they are more advanced in their careers and have more resources to offer. Participants described their ethnic descent as White/Caucasian (89%), Hispanic (3%), African American (2%), Asian (2%), Native American (1%), Pacific Islander (one participant), and Other (3%). Respondents identified themselves as Christian (62%), including Catholic (40%), Protestant (14%), Evangelical (4%), Orthodox (4%), no religious affiliation (19%), Jewish (4%), Buddhist (1%), Latter Day Saints (one participant), and Other religious affiliation (14%).

Procedure

The survey contained three similar parts, which addressed different sex specific mate selection criteria. The initial questions in each section were: "Have you ever done something for someone else that enhanced his/her social status and/or reputation?", "Have you ever done something for someone else that enhanced his/her physical attractiveness to other people?", and "Have you ever done something for someone else that substantially enhanced his/her finances or material goods?" Response options were: No, Never; Yes, once or twice; Yes, a few times; and Yes, I do this quite often.

Participants who responded having helped at least once gave a brief description of the most recent event and indicated how they knew the person who benefitted with the response options: same sex friend; opposite sex friend; same sex relative; opposite sex relative; romantic partner; someone you wanted as a romantic partner; same sex acquaintance; opposite sex acquaintance; same sex stranger; opposite sex stranger; and other. For each section, respondents rated their perceptions of how large the cost was to themselves and how large the benefit was to the other person (none or almost none, small, moderate, large, very large). Participants reported their perceptions for how the closeness of their relationship with the other person was affected by the helping action (became much less close, became somewhat less close, about the same, became somewhat more close, became much more close).

We conducted a 3 (type of assistance) \times 2 (participant sex) Analysis of Variance for Mixed Designs to examine sex differences for frequencies of helping across domains, the magnitude of the cost of assistance, and the magnitude of the benefit of assistance. Because an individual's examples of helping may involve different recipients for each of the domains, we conducted separate analyses for other variables within each domain (e.g., recipient sex). We examined whether there

were differential tendencies to aid kin in each domain, along with the influences of participant sex and target sex with Chi-square tests.

RESULTS

There were significant differences in participants' reports of the frequency of helping by type of assistance ($F(2, 678) = 222.99, p < .001$). Actions enhancing target's social status and/or reputation were the most common, followed by actions enhancing target's attractiveness. Actions enhancing target's finances or material goods were the least common. There was no overall difference in frequency of helping by participant sex ($F(1,339) = 1.68, p = .196$), however there was a significant interaction between participant sex and type of assistance ($F(2, 678) = 5.92, p = .003$). Males were more likely than females to provide assistance enhancing target's social status/reputation ($t(339) = 2.72, p = .007, d = .31$), though there were no sex differences in reported tendencies to provide assistance enhancing target's physical attractiveness ($t(339) = 1.16, p = .246, d = .08$) or finances/material goods ($t(339) = 1.26, p = .209, d = .13$, See Figure 1).

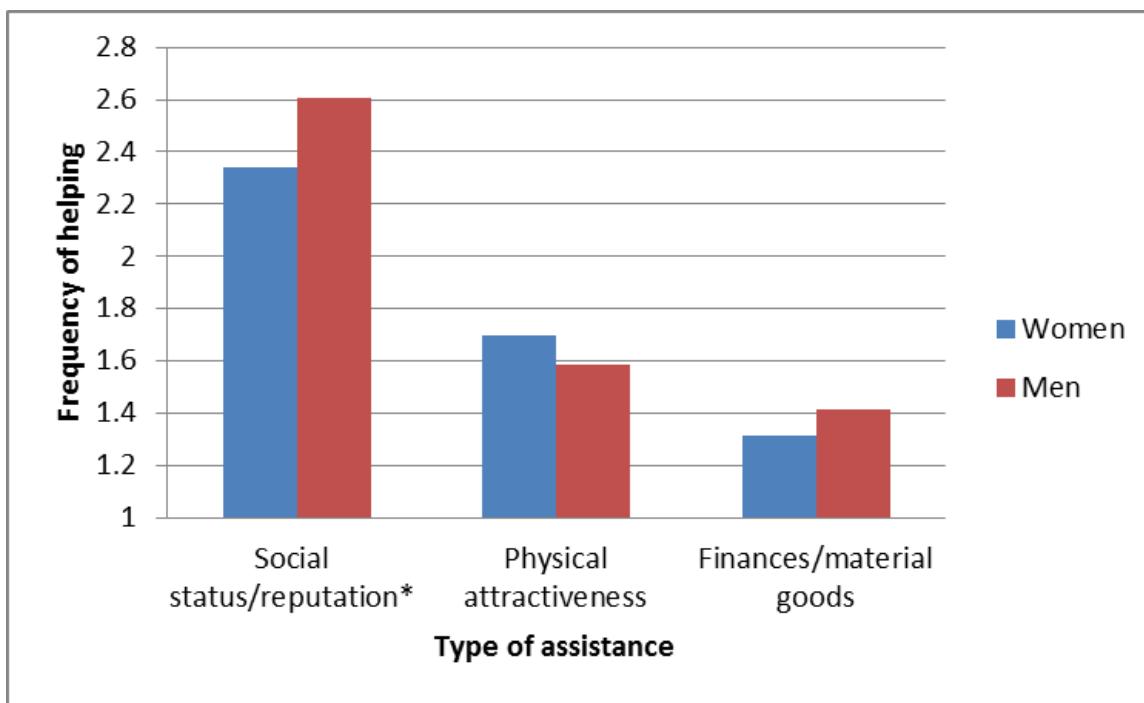


Figure 1. Frequency of help given as a function of participant sex and type of assistance. * indicates $p < 0.01$.

Assistance benefitting targets' finances/material goods was rated as both the most costly to participants ($F(2, 96) = 6.58, p = .002$) and the most beneficial to targets ($F(2, 96) = 4.64, p = .012$, see Table 1). There was also a significant interaction of type of assistance and participant sex for the degree of benefit to

targets ($F(2, 96) = 3.86, p = .024$). There were no other significant effects or interactions with participant sex or target sex.

Table 1. Estimated Costs and Benefits for Each Type of Assistance

	Cost of assistance		Benefit of assistance	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Social status/reputation	1.69	0.32	2.94	0.84
Physical attractiveness	1.64	0.84	2.83	0.96
Finances/material goods	2.26	1.07	3.25	0.92

Males had a tendency to favor other males for each type of assistance: social status/reputation ($\chi^2(1) = 23.75, p < .001$); physical attractiveness ($\chi^2(1) = 10.76, p < .001$); and finances/material goods ($\chi^2(1) = 9.76, p = .002$, See Figure 2). Females had a tendency to favor other females for social status/reputation ($\chi^2(1) = 9.59, p = .002$) and physical attractiveness ($\chi^2(1) = 28.00, p < .001$), but showed no differences by recipient sex for assistance related to finances/material goods ($\chi^2(1) = 0.56, p = .456$, see Figure 2). Females' tendencies to favor other females for physical attractiveness assistance was stronger than their tendencies to favor other females for social status/reputation ($\chi^2(1) = 5.77, p < .025$).

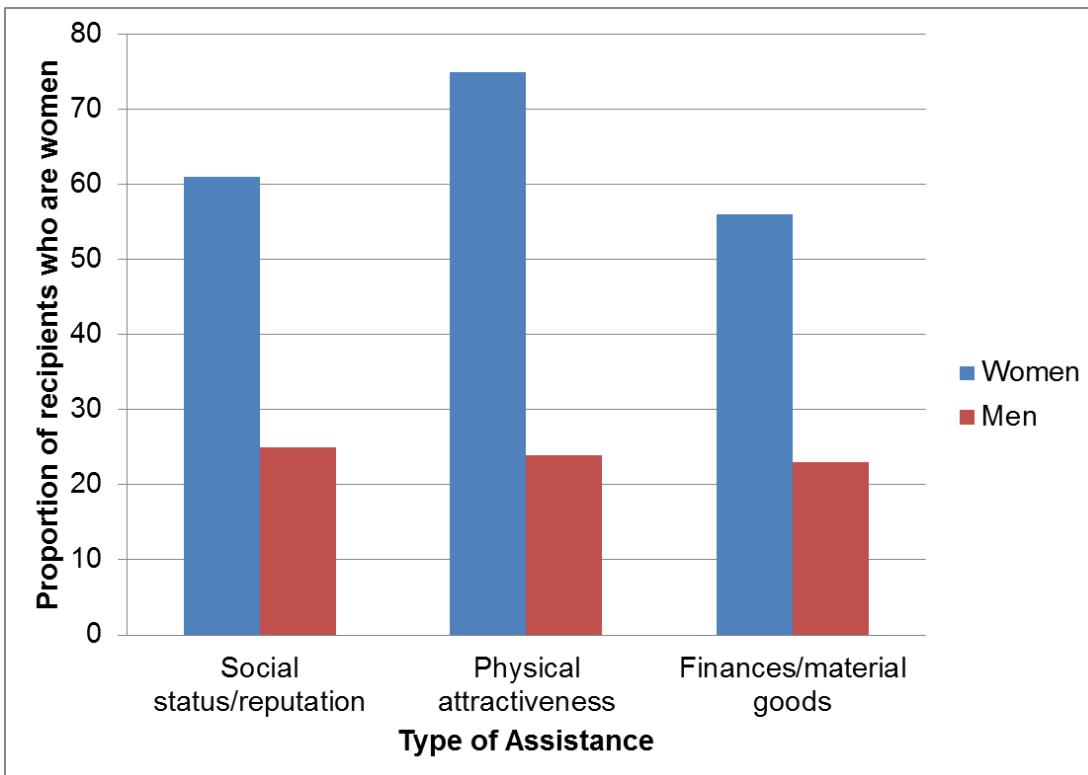


Figure 2: Proportion of aid recipients who are women by participant sex and type of assistance.

In their descriptions of their most recent assistance activities, participants were more likely to report helping friends than helping kin for each type of assistance: social status/reputation ($\chi^2(1) = 290.98, p < .001$); physical attractiveness ($\chi^2(1) = 283.64, p < .001$); and finances/material goods ($\chi^2(1) = 302.17, p < .001$). There were no significant effects of kinship status on the costs or benefits of helping for any domain of assistance.

DISCUSSION

This study investigated two central hypotheses, 1) people take sex-specific mate selection criteria into account when allocating costly assistance, and 2) that nepotistic tendencies will be stronger for each sex on the characteristics that each is differentially valued for in mate selection. We found some support for the first hypothesis; men were more likely than women to provide assistance enhancing social status and reputation. This tendency combined with a general tendency for both men and women to provide assistance to those of the same sex. The exception to the latter tendency was the lack of a sex preference in female provisioning of financial and material good assistance. This type of assistance showed the most divergence from the tendency to provide assistance to those of the same sex, where both men and women were more likely to provide assistance to males compared to the other domains. Approximately 75% of assistance benefiting physical attractiveness was given to the same sex by both men and women. This lack of sex difference is puzzling considering patterns of grooming behavior which could be considered to enhance physical attractiveness, although women will sometimes act as if they are helping their friends improve their appearance but with the motive to reduce their attractiveness in order to reduce competition for male partners (Fisher, 2004). Assistance benefiting social status/reputation exhibited a bias to assist males that was in-between the bias for financial and material good assistance and the lack of bias for physical attractiveness assistance.

The findings that participants were more likely to help individuals of the same-sex and did not demonstrate nepotism in altruistic assistance cannot easily be explained with evolutionary theory alone. As guided by Korchmaros and Kenny (2001), a better understanding of altruistic behavior may be obtained by integrating evolutionary and social psychology theories. From this framework, Korchmaros and Kenny found a substantial impact of emotional closeness on the likelihood of helping kin, suggesting additional factors are involved other than purely genetic relatedness. Kruger (2003) found that although individuals reported a greater predicted likelihood for helping kin than non-kin, they reported less feelings of oneness toward siblings and reported feeling of being more similar to friends than siblings. Ackerman, Kenrick, and Schaller (2007) found that although there was not a significant difference between helping kin and non-kin friends in women or men, women treat friends more like kin, reporting feelings of being closer and more similar to friends than kin. Sternberg (1986) found that women report stronger bonds to friends than to spouses, and stronger bonds to spouses than to kin. In contrast, men felt the strongest bonds to their spouses. Regarding the current study, a possible explanation for participants increased likelihood of helping others of the same-sex who are evolutionary competitors and helping non-kin over kin is that they feel

closer and more similar to those they are helping and, therefore, exhibit a greater likelihood of helping behavior.

An alternate explanation is found in the well-documented social psychological research on the impact of proximity in the development of friendships (Back, Schmukle, & Egloff, 2008; Latane, Liu, Nowak, Bonevento, & Zheng, 1995; Nahemow & Lawton, 1975). From this framework, we might predict that the individuals in our sample are more likely to help those who are in close proximity (e.g., non-kin friends) than they are to help kin who may not be in close proximity. Another explanation from social psychological research can be found in Zajonic's (1968) mere exposure effect which asserts that increases in exposure is related to increased liking. With this, we might assume that if individuals are exposed to non-kin friends more than they are exposed to kin, they may report greater liking and as a result, more likelihood to help. Modern college students on residential campuses are separated from their kin and surrounded by non-kin to a much higher degree than was typical during hominid evolution. Thus, non-kin will be the socially proximal individuals, rather than the close relatives that were socially proximate when kin selecting altruistic tendencies evolved.

Limitations

Nepotistic tendencies indicative of kin selection were not evident in our data. This may have been due to the use of a residential undergraduate sample. Utilizing this population limits the number of nepotistic opportunities because these participants often do not live within close proximity of their kin and may not have developed adequate resource holdings or social status to make a substantial contribution. Altruistic acts that enhanced the target's finances/material goods were both least common action reported and rated as the most costly, supporting this interpretation. We realize that our survey methodology is not able to determine whether there has been specific genetic selection for nepotistic tendencies consistent with sex-specific mate selection criteria, or if these tendencies are a response to learned mate selection criteria.

Future Research

Because the findings that men are more likely to help men and women more likely to help women and the lack of kin-selection in altruistic assistance are in contrast to what the evolutionary perspective would predict, future research is greatly needed in order to better understand these findings. This study should be replicated expanding the sample to include populations from wider demographics, including non-students. Additionally, future samples could investigate different ages to better understand if these trends are unique to an undergraduate student sample. Using a sample of older individuals that have regular contact with their kin may yield significant results in support of kin selection. Most ambitiously, those living in pre-technological societies closer to human ancestral conditions would provide the strongest test of the experimental hypothesis. These individuals would live in a variety of social structures, though the compositions of kin and non-kin would likely

be more representative of human evolutionary history than found in highly mobile technologically advanced societies.

Additionally, further investigation is needed examine the strong tendencies for men to help men and women to help women. Future research could analyze the proximity of the helping individual to members of the opposite sex. For example, students who live in same-sex settings may be more likely to help members of their same sex than individuals who live in mixed-sex settings because of social availability. Young adults may also socially self-segregate by sex, especially when planning efforts to court members of the other sex. Further investigation could also examine if the trend of same sex assistance could instead be explained by a tendency for individuals to ask members of the same sex for assistance rather than the trend of individuals to tend to help the same sex.

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