

Research Article

Males' Greater Tolerance of Same-Sex Peers

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ABSTRACT—Three studies were conducted to examine the often-cited conclusion that human females are more sociable than males. Using perceptions of roommates, roommate changes at three collegiate institutions, and an experimental manipulation of friendship beliefs, the studies demonstrated unequivocally that males exhibit a higher threshold of tolerance for genetically unrelated same-sex individuals than females do. Tolerance was defined as acceptance of the stresses and strains within relationships. Results are discussed in terms of potential underlying mechanisms and ultimate explanations.

More than 40 years ago, Bakan (1966) transformed understanding of sex differences in social behavior by concluding that human females are more communal or sociable than males, who are more agentic or task oriented. Subsequent, often-cited characterizations of females versus males provide nuanced modifications of this fundamental theme. Prominent characterizations indicate that females, relative to males, are interpersonal, rather than individualistic (Block, 1973); are connected, rather than separate (Chodorow, 1978; Gilligan, 1982); are interdependent, rather than autonomous (Johnston, 1988); are invested in connection, rather than status (Tannen, 1990); focus on maintaining intimacy, rather than distance (Winstead & Griffin, 2001); and, under stressful conditions, are more prone to “tend-and-befriend,” rather than to “fight-or-flight” (Taylor et al., 2000). This large literature rests on consistent findings, across diverse cultures, that from early childhood throughout adulthood, females engage in more verbal exchange of intimate information than males do (Buhrmester & Prager, 1995; Verkuyten & Masson, 1996; Winstead & Griffin, 2001).

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This characterization of sex differences in social interaction has been ubiquitously accepted across the social sciences, despite a number of inconsistent findings. Three pieces of evidence in particular challenge this position. First, numerous studies of genetically unrelated same-sex peers from childhood through adulthood have documented that, across diverse cultures, males form larger, more inclusive, and more interconnected networks than females (Markovits, Benenson, & Dolenszky, 2001; Savin-Williams, 1980; Vigil, 2007). Second, across ages and cultures, additional studies have demonstrated that same-sex friendships of males endure longer than those of females (Benenson & Alavi, 2004; Benenson & Christakos, 2003; Kon & Losenkov, 1978; Vigil, 2007). Third, studies outside psychology, including ethnographic, political, military, and business studies, have provided strong cross-cultural evidence of greater cooperation among unrelated males than among unrelated females (Alexander, 1987; Tiger, 1969; Wrangham, 1999). A more complete perspective of human nature requires that these literatures be included.

Contrary to the widespread conclusion that females are the more sociable sex, these additional bodies of evidence suggest that human males' threshold for tolerance of same-sex peers is higher than that of females. Tolerance is defined simply as acceptance of the inevitable stresses and strains of relationships. Because degree of tolerance among genetically unrelated individuals strongly influences access to critical physical and social resources and degree of cooperation across animal species, detailed analysis of sex differences in tolerance provides an important window into each sex's social behavior (Kappeler, 2000; Sterck, Watts, & van Schaik, 1997) and, more generally, into the relative tolerance of species (Hare, Melis, Woods, Hastings, & Wrangham, 2007).

Chimpanzees, *Pan troglodytes*, illustrate the complexity of sex differences in sociability. Male chimpanzees exhibit consistently higher levels of physical aggression than females in their greater levels of competition for status and mates (Muller,

2002), and might therefore be regarded as less sociable. However, males also engage in many more cooperative activities, including joint bids for status, hunting, meat sharing, border patrols, and lethal raids on neighboring communities—activities in which females rarely engage (Watts & Mitani, 2001, 2002; Wilson & Wrangham, 2003; Wrangham, 1999). Given that many of these activities include competition with other males, success frequently rests on establishment of cooperative alliances and coalitions. Females do form coalitions with each other (against both other females and adolescent males) in agonistic contexts, but compared with male coalitions, female coalitions are rare and restricted to a few partners (Kahlenberg, Emery Thompson, & Wrangham, 2008). The greater frequency of male coalitionary behavior and the greater readiness of males to cooperate indiscriminately with other males in their community suggest that these sex differences reflect greater tolerance among males than females.

The studies we report here were designed to compare adult human males' and females' levels of tolerance of same-sex peers. Study 1 examined undergraduate students' perceptions of their roommates, and Study 2 extended that work by investigating the stability of roommate decisions. Study 3 then experimentally tested thresholds of tolerance. On the basis of past results, we expected that human males would exhibit higher levels of tolerance than human females.

STUDY 1

Method

Participants consisted of 30 male and 30 female students from a college in the northeastern United States. All students were between 18 and 22 years old ($M = 19.23$ years for males and 19.37 years for females), and within each class, similar numbers of males and females participated (15 and 12 freshmen, 8 and 8 sophomores, 5 and 4 juniors, and 2 and 6 seniors, respectively).

For the first part of the study, we used the campus's on-line system to recruit 15 males and 15 females who lived with one roommate and were experiencing a conflict with that roommate (conflictual condition). We included only students with one roommate so that the conflict focused on one individual. Students were recruited in late November so that they had been living with their roommate for at least 2.5 months. For the second part of the study, we recruited 15 males and 15 females who lived with one roommate and were planning to live with that roommate for the remainder of the academic year (generic condition); we recruited these students in early February at the student center.

Each student individually completed a questionnaire about his or her roommate. The first question asked, "To what extent are you satisfied with your roommate?" The rating scale ranged from 1, *completely unsatisfied*, to 5, *completely satisfied*. The remainder of the questionnaire, developed in collaboration with directors of residence life, focused on four factors that arise as

major sources of friction between roommates: style of social interaction (e.g., "exhibits unpleasant verbal behavior—such as yelling or saying mean things"), interests (e.g., "differs from me in activity preferences—likes to do different things"), values (e.g., "differs from me in financial behavior—such as different ways of spending money"), and hygiene (e.g., "has unpleasant personal habits—such as being too messy or neat"). Thirty-five potentially bothersome characteristics of roommates (representing the four factors) were listed, and students were asked to answer the following question for each characteristic: "When you consider your roommate, to what extent does this aspect of your roommate currently bother you?" The response scale ranged from 1, *does not bother me at all*, to 5, *bothers me a lot*.

Results

Students who rated their satisfaction as 4 or 5 were defined as satisfied with their roommates. We used chi-square analyses to compare the numbers of male and female students satisfied with their roommates. In both conditions (i.e., regardless of whether or not students were selected because they were experiencing a conflict with their roommate), approximately twice as many males as females rated themselves as being satisfied with their roommates, and 100% of the males in the generic condition rated themselves as satisfied with their roommates (see Table 1). The sex difference in roommate satisfaction was significant in both the conflictual condition, $\chi^2(1, N = 30) = 4.82, p < .03$, and the generic condition, $\chi^2(1, N = 30) = 8.97, p < .003$.

Next, we conducted analyses of variance (ANOVAs) on the ratings of bothersome aspects of roommates. Each of the four sources of friction was analyzed in a separate analysis, with condition (conflictual vs. generic) and sex as the independent variables. The Condition \times Sex interaction was not significant for any of the factors (see Table 2). As expected, students' ratings of their roommates were significantly more negative in the conflictual than in the generic condition; this was true for all factors except interests. Critically, in both the conflictual and the generic conditions, males rated their roommates less bothersome than females, and this difference was significant for three of the four factors and marginally significant for the fourth. Overall, regardless of whether students were experiencing

TABLE 1
Number of Males and Females Satisfied With Their Current Roommate in Each Condition of Study 1

Condition	Females			Males		
	No. satisfied	No. dissatisfied	% satisfied	No. satisfied	No. dissatisfied	% satisfied
Conflictual	5	10	33	11	4	73
Generic	6	7	46	12	0	100

Note. Two females and 3 males in the generic condition did not respond to this question.

TABLE 2

Mean Ratings of Four Potential Sources of Dissatisfaction With the Current Roommate in Study 1

Factor	Mean rating				Effect of condition, $F(1, 56)$	Effect of sex, $F(1, 56)$	Sex \times Condition interaction, $F(1, 56)$
	Females		Males				
	Conflictual condition	Generic condition	Conflictual condition	Generic condition			
Social interaction	2.51 (0.86)	1.84 (0.71)	1.83 (0.64)	1.14 (0.15)	16.78, $p < .001$	17.00, $p < .001$	0.00, n.s.
Interests	1.83 (0.69)	1.70 (0.80)	1.41 (0.50)	1.37 (0.56)	0.28, n.s.	5.07, $p < .03$	0.07, n.s.
Values	2.15 (0.67)	1.74 (0.84)	1.80 (0.72)	1.15 (0.24)	9.70, $p = .003$	7.63, $p = .008$	0.47, n.s.
Hygiene	1.83 (0.69)	1.70 (0.80)	1.41 (0.50)	1.37 (0.56)	11.74, $p = .001$	2.94, $p < .10$	0.79, n.s.

Note. Standard deviations are given in parentheses.

conflict with their roommates, males rated their roommates as being more satisfactory and less bothersome than females did.

We then checked whether these results were due primarily to 1st-year students, who (unlike upper-level students) were assigned roommates and did not have the opportunity to choose them. For each factor, we conducted an ANOVA with condition, sex, and year (1st year vs. other years) as the independent variables. None of the main effects of year and no interactions with year approached significance, all F s < 1 . Furthermore, across conditions and factors, there were no consistent effects of year on the magnitude of the sex difference. Specifically, in five of eight comparisons (2 conditions \times 4 factors), the magnitude of the sex difference was greater in upper-level students, compared with 1st-year students.

In our next study, we sought to determine whether these perceptions translate into actions. Therefore, we contacted three collegiate institutions to determine whether roommate switches occurred more frequently among females than males.

STUDY 2

Method

Residence-life directors at a small college, medium-sized university, and large university in the northeastern United States were contacted over the summer and asked to participate in a

year-long study of roommate changes. We asked the directors to tabulate the number of undergraduate students who switched rooms over the course of the upcoming academic year. Students were permitted to switch rooms only once in a year and were allowed to state a preference for a new roommate, though this preference was not always accommodated. We restricted the final analysis to double rooms only, because the vast majority of undergraduates who reside on campus live with only one roommate, and also because when a change occurs in a double room, one roommate moves away, and one remains. In larger rooms, by contrast, the exodus of different roommates is not independent, so overestimates of the number of individuals who are unhappy are probable.

Results

We used chi-square analyses to compare the numbers of males and females in double rooms who switched roommates over the course of the year (see Table 3). At all three categories of institutions, significantly fewer males than females switched rooms—small college: $\chi^2(1, N = 641) = 4.33, p < .04$; medium-sized university: $\chi^2(1, N = 770) = 3.75, p < .052$; large university: $\chi^2(1, N = 3,616) = 20.82, p < .001$. For the sake of comparison, we performed the same analyses for triple rooms, though the numbers likely overestimate dissatisfaction (see

TABLE 3

Percentage of Double Rooms With Occupancy Changes in Study 2

Number of double rooms and changes in these rooms	Size of institution (number of students)					
	Small college ($n = 1,700$)		Medium-sized university ($n = 4,000$)		Large university ($n = 16,000$)	
	Females	Males	Females	Males	Females	Males
No. doubles	405	136	477	293	1,951	1,665
No. doubles with occupancy change	33	4	34	11	196	98
% doubles with occupancy change	8.1	2.9	7.1	3.8	10.0	5.9

TABLE 4
Percentage of Individuals Who Moved Out of Triple Rooms in Study 2

Number of triple rooms and changes in these rooms	Size of institution (number of students)					
	Small college (<i>n</i> = 1,700)		Medium-sized university (<i>n</i> = 4,000)		Large university (<i>n</i> = 16,000)	
	Females	Males	Females	Males	Females	Males
No. triples	27	10	75	67	237	248
No. individuals who changed rooms	4	2	20	3	44	24
% individuals who changed rooms	14.8	20.0	26.7	4.5	18.6	9.7

Table 4). Although the sex difference was not significant at the small college, $\chi^2(1, N = 37) = 0.14$, n.s., a significant sex difference was obtained at the medium-sized university, $\chi^2(1, N = 142) = 12.84$, $p < .001$, and at the large university, $\chi^2(1, N = 485) = 7.94$, $p < .005$.

STUDY 3

Finally, to determine whether these results generalized beyond roommate decisions, we designed an experiment using the belief-revision paradigm (Elio & Pelletier, 1997; Markovits & Schmeltzer, 2007) to compare sex differences in levels of tolerance. In the belief-revision paradigm, subjects are provided with reliable and consistent information supporting one position, and then presented with a single piece of discrepant information. We examined how strongly one piece of discrepant and negative information influences perceptions of a positively regarded friend.

Method

A total of 111 French Canadian postgraduate students from Montréal, Canada (57 females, 54 males; average age = 27 years 1 month), were recruited in a university library. In a between-subjects design, males and females were separately randomly assigned to one of two conditions, such that half the males and half the females were in each condition.

In each condition, students read a story about a same-sex individual, the protagonist, who had a good friend (the target) who was consistently reliable. The protagonist then received one piece of information contradicting this belief. In one condition, the person who relayed the discrepant information about the target was the best friend of the protagonist. In the other condition, the person who relayed the discrepant information was described as the best friend of the target. We included this manipulation to determine whether the informant's friendship with the protagonist versus the target would influence the informant's credibility.

As an example, we quote from the version of the story in which the protagonist was female and the protagonist's best friend was the informant (translated from the original French):

Jeanne is a woman of your age. She has a very good friend, Danielle, whom she has known for several years. Jeanne has always found Danielle to be a reliable friend. In the past, whenever Jeanne needed help, Danielle was always ready to help her out, even when this was difficult for her. For example, when Jeanne moved, Danielle was the one to come and help her, and when Jeanne needed someone to support her loan application, Danielle was her guarantor. Danielle also has two other good friends, Micheline and Nicole. From what Jeanne has heard from them, Micheline and Nicole also consider Danielle to be a completely reliable friend.

Yesterday at noon, Jeanne and Danielle were together in a restaurant. Jeanne suddenly realized that she had forgotten to hand in an important paper for one of her classes. The professor had announced that he would be in his office on that day only for a brief time, at 5 o'clock, so that students who were late could have one last chance to hand in their papers. But Jeanne had a very important meeting, and she asked Danielle to hand in the paper for her.

After reading this passage, participants were asked to indicate whether or not it was true that Danielle was a reliable friend to Jeanne. Then they were asked how certain they were that she was a reliable friend, on a scale ranging from 0% to 100% in increments of 10%.

Next, participants read the following paragraph:

Later that evening, Jeanne meets her best friend, who was in the same class. Her friend informs her that at 5 o'clock, she had seen Danielle in a café talking to a group of girls and boys. She also mentions that she saw Jeanne's paper on the table at the café.

Participants then were asked what the probability was that the target was a reliable friend to the protagonist, on a scale ranging from 0% to 100% in increments of 10%.

Results

We first eliminated all participants who did not initially respond positively that the target was a reliable friend to the protagonist (this eliminated 9 participants, distributed evenly across conditions and genders). For brevity, we refer to the initial degree of certainty about the friendship as the *initial friendship belief* and the final judged probability that the target was a reliable friend as the *final friendship belief*. We calculated the mean levels of the initial friendship belief and the final friendship belief (see Table 5).

We first looked at whether the initial friendship belief varied across genders and conditions. We performed an ANOVA with initial friendship belief as the dependent variable and sex and informant condition (friend of protagonist, friend of target) as the independent variables. No significant effects were found. Then, we performed an ANOVA with final friendship belief as the dependent variable and sex and informant condition as the independent variables. This analysis produced a significant effect of sex, $F(1, 101) = 5.49, p < .025$. Across both conditions, mean level of final friendship belief was higher among males ($M = 64.1\%$) than among females ($M = 53.8\%$). Whether the informant was a friend of the protagonist or the target had no effect.

To explicitly account for initial friendship belief, we generated difference scores by subtracting final friendship belief from initial friendship belief. In the ANOVA on the difference scores, the effect of sex remained significant, $F(1, 101) = 4.52, p < .04$. Males' difference scores ($M = 16.5\%$) were significantly smaller than those of females ($M = 25.3\%$).

Our hypothesis implies that this effect should hold even when initial beliefs are very strong. We examined this by selecting the females and males with initial friendship beliefs greater than or equal to 90%. We then analyzed how many of these individuals had final friendship beliefs lower than 50%. Of the 19 females with initial friendship beliefs greater than or equal to 90%, 5 (26.3%) had a final friendship belief lower than 50%. Of the 23 males with initial friendship beliefs greater than or equal to 90%, none had a final friendship belief lower than 50%, a significant difference, $\chi^2(1, N = 42) = 8.76, p < .01$. When the

analysis was repeated with the females and males whose initial friendship belief was greater than or equal to 80% and whose final friendship belief was lower than 50%, similar results were obtained. Of the 33 females with initial friendship beliefs greater than or equal to 80%, 8 (24.2%) had a final friendship belief lower than 50%. Of the 34 males with initial friendship beliefs greater than or equal to 80%, none had a final friendship belief lower than 50%, a significant difference, $\chi^2(1, N = 67) = 12.45, p < .001$.

GENERAL DISCUSSION

Researchers investigating sex differences in social behavior between genetically unrelated individuals typically conclude that females are more socially oriented than males are. The current results challenge the simplicity of that conclusion. Males were more likely than females to be satisfied with their roommates and were less bothered by their roommates' style of social interaction, types of interests, values, and hygiene, regardless of whether or not the roommates were selected for study because they were experiencing conflicts. Furthermore, males were less likely than females to switch roommates over the course of a year at three collegiate institutions. Finally, violation of a friendship norm produced a smaller negative effect on friendship belief in males than in females. To our knowledge, these are the first studies that demonstrate that males, compared with females, display higher levels of tolerance for genetically unrelated same-sex individuals. Further, the validity of this conclusion is buttressed by convergent results from three disparate measures: perceptions of significant individuals, actual behavior, and experimental evidence.

In studies of genetically related individuals, researchers have shown that, universally, human females invest more than males in family members, especially young children (Chodorow, 1978; Gilligan, 1982; Konner, 2005). These findings are consistent with Trivers's (1972) theory that in virtually all mammalian species, females invest more in offspring. Extrapolating from investment in offspring to relations with genetically unrelated individuals, however, may prove erroneous. Sex segregation of genetically unrelated individuals begins in early childhood (Lafreniere, Strayer, & Gauthier, 1984) and continues in the universal sexual division of labor (Marlowe, 2007). Therefore, sex differences in investment in genetically unrelated same-sex individuals merit investigation in their own right.

Prior research on sex differences in relationships with unrelated same-sex individuals produced the conclusion that females are more sociable and males more individualistic and task oriented. However, although genetically unrelated males may focus more on tasks and activities than on verbal intimacy, task orientation and social tolerance are not mutually exclusive. Successful completion of tasks frequently demands cooperative interaction. A higher threshold of tolerance permits more individuals to be accommodated for lengthier periods of time before

TABLE 5

Mean Level of Initial Friendship Belief and Final Friendship Belief in Study 3

Informant condition and participants' gender	<i>n</i>	Initial friendship belief	Final friendship belief
Friend of protagonist			
Female participants	26	75.9	51.1
Male participants	24	79.2	62.4
Friend of target			
Female participants	27	82.3	56.5
Male participants	25	82.1	65.8

Note. Friendship beliefs were rated on scales from 0% to 100%.

tolerance levels are exceeded by divergence of individual interests. Our studies therefore provide evidence that, compared with females, males should be able to cooperate with more individuals for lengthier periods of time. This conclusion is consistent with cross-cultural findings that, compared with females, males interact in larger groups across a variety of institutions and form more enduring relationships with unrelated same-sex individuals.

In contrast, females appear to hold higher standards for same-sex relationships than males do, perhaps because of their greater desire for intimacy. Whereas such high standards likely produce high investment in a relationship, they may simultaneously limit the number and durability of relationships. Sex differences in tolerance, therefore, may be based on differential functions that same-sex relationships serve for females and males.

Ultimate explanatory mechanisms for this sex difference merit consideration. Evolutionary theory suggests that females must be more wary of conflict than males are because their reproductive success is more tied to their continued physical health (Campbell, 1999). Although females and their children generally encounter more danger in their interactions with males than in their interactions with other females (Daly & Wilson, 1988), females compete over high-quality mates (Campbell, 2004) and can harm one another's children (Borgerhoff Mulder, 1992). Thus, a low threshold for perceiving potential conflicts of interest may serve as an early warning signal of more serious, future conflict.

Also, because of their relatively greater investment in child care, females may invest more than males in kin and less than males in genetically unrelated individuals, with the exception of spouses (Benenson, Saelen, Markovits, & McCabe, 2008). For an unrelated individual to provide benefits equal to those of kin requires that the individual attain a high standard. Consistent with this position, research indicates that in childhood and adolescence, compared with males, females demand more loyalty and other benefits from their same-sex friends that resemble those that kin typically provide (Douvan & Adelson, 1966; Whitesell & Harter, 1996).

Given females' greater role in child care, investment in unrelated same-sex individuals may be less costly for males. This would explain other fields' consistent findings that, universally, unrelated males participate in community institutions to a far greater extent than unrelated females do. This also is consistent with findings that males form larger, more interconnected, and longer-lasting same-sex relationships.

Moreover, both sexes may benefit when males invest more than females in unrelated same-sex individuals. In societies that create institutions to compete with comparable institutions in other societies, numerical and physical strength and high energy level of the competing individuals likely enhance success of the entire community (Alexander, 1987; Tiger, 1969; Wrangham, 1999). The most successful military, financial, or political organizations, for example, will consist predominantly of large

numbers of physically powerful and highly energetic males. Unless females forgo child rearing, are highly energetic, or live in a society in which these institutions demand less commitment because they are not critical to the success of the society, the cost-benefit ratio of contributing to these institutions will be too high for females.

The definition of tolerance, however, demands further specification. In these studies, we used three measures to infer tolerance, which we defined as acceptance of the stresses and strains within relationships. More definitive evidence for sex differences in tolerance will require uncovering the proximal mechanisms that underlie our findings. At the most primitive level, females may have lower thresholds than males for sensing negative visual, auditory, or olfactory information in unrelated same-sex individuals. Alternatively, there may be sex differences in thresholds for recognition of negative social signals, which would be consistent with females' generally greater wariness toward conflict. At the most complex level, unrelated same-sex individuals may serve differing functions for females versus males, and degree of investment in same-sex individuals may vary depending on the short- and long-term needs of the individual at differing points in the life span. Females and males may not differ in their thresholds for perceiving negative physical or conflictual information emitted by same-sex individuals. Instead, females simply may weight negative information more heavily than males do, because negative information disrupts the establishment of intimacy, which serves a more important function in same-sex relationships for females than for males.

A limitation of the current research is that Study 2 may be open to alternative interpretations. For example, females may switch roommates more frequently than males not because of conflict or inability to accommodate, but instead because, compared with males, they care more about additional same-sex relationships or meet more same-sex individuals. From this perspective, switching to live with a preferred individual could demonstrate greater investment in or opportunity to form same-sex relationships. However, this interpretation is not reconciled easily with results from Studies 1 and 3, in which, compared with males, females perceived their roommates more negatively and were more sensitive to a single infraction of a hypothetical friend. Nor does this interpretation fit with research demonstrating males' larger same-sex networks and more enduring ties. Nonetheless, research on the causes of roommate switches will further understanding of sex differences in relationships with same-sex individuals.

In addition, Study 3 is limited because we relied on an experimental manipulation involving hypothetical friends. Examination of naturally occurring responses to transgressions by actual friends would enhance understanding of the precise nature of the physical or social stimuli that produce negative reactions. Future research must define and measure tolerance by analyzing the underlying proximal mechanisms so as to distinguish among alternate explanations of sex differences in tolerance.

The current research suggests that males have a higher threshold of tolerance for genetically unrelated same-sex individuals than females do. Future analyses of the proximal mechanisms and ultimate explanations for this sex difference are necessary to refine the definition of tolerance so that researchers may better understand sex differences in relationships with genetically unrelated individuals.

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