

Kin selection and male androphilia in Samoan *fa'afafine*[☆]

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Abstract

The Kin Selection Hypothesis for male androphilia posits that genes for male androphilia can be maintained in the population if the fitness costs of not reproducing directly are offset by enhancing inclusive fitness. In theory, androphilic males can increase their inclusive fitness by directing altruistic behavior toward kin, which, in turn, allows kin to increase their reproductive success. Previous research conducted in Western countries has failed to find any support for this hypothesis. The current study tests this basic prediction of the Kin Selection Hypothesis for male androphilia by comparing the altruistic tendencies of androphilic and gynephilic males in the Polynesian nation of Independent Samoa. In Independent Samoa, androphilic males are known locally as *fa'afafine*. Altruistic tendencies were assessed using a Kin Selection Questionnaire. Comparisons of the altruistic tendencies of *fa'afafine* and gynephilic men revealed that these two groups did not differ in terms of their overall generosity and allocation of financial resources toward kin, nor did they differ in terms of general neediness or financial resources obtained from kin. *Fa'afafine* did, however, report greater avuncular tendencies than gynephilic men. Although the greater avuncular tendencies of *fa'afafine* support the basic prediction of the Kin Selection Hypothesis for male androphilia, further research is needed before one can conclude that these elevated tendencies represent a specially designed adaptation for promoting the fitness of kin. We discuss a number of sociocultural factors that might promote the expression of avuncular tendencies by androphilic males in Independent Samoa. Our results underscore the importance of testing functional hypotheses in evolutionarily appropriate environments.

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1. Introduction

The persistence of male androphilia¹ over time, as witnessed in the historic (e.g., Crompton, 2003) and archaeological records (e.g., Yates, 1993), is perplexing when considered within the context of natural selection, a

process that favors the persistence of those traits enabling their bearers to achieve reproductive success. To begin with, androphilic men have much lower rates of reproduction than gynephilic men (Bell & Weinberg, 1978; Saghir & Robins, 1973; Yankelovich, 1994). Furthermore, evidence indicates that there is a biological basis for male androphilia (Mustanski, Chivers, & Bailey, 2002), and familial studies point to a genetic component (Bailey, Dunne, & Martin, 2000; Bailey & Pillard, 1991; Bailey & Pillard, 1995; Pillard & Weinrich, 1986; Whitam, Diamond, & Martin, 1993). In light of the apparent fitness benefits associated with male gynephilia, one would expect genes for male gynephilia to have long replaced those for male androphilia. As such, the maintenance of a trait that lowers direct reproduction requires explanation when viewed from a functional perspective.

The Kin Selection Hypothesis has been advanced as one possible explanatory framework to account for male androphilia (Ruse, 1982; Weinrich, 1987; Wilson, 1975). The hypothesis holds that genes for male androphilia can be maintained in the population if the fitness costs of not

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¹ *Androphilia* refers to sexual attraction to males, whereas *gynephilia* refers to sexual attraction to females. These terms are preferable to homosexual and heterosexual because they make no assumptions about the biological sex of the actor. Furthermore, the usage and meaning of homosexual and heterosexual vary cross-culturally, rendering them poor constructs for the type of cross-cultural research presented here (Bartlett & Vasey, 2006; Mageo, 1996; Nanda, 2000; Shore, 1981).

reproducing directly are offset by enhancing inclusive fitness. Androphilic males can increase their inclusive fitness by directing altruistic behavior toward kin, which, in turn, allows kin to increase their reproductive success. Although different versions of the Kin Selection Hypothesis exist (for a review, see McKnight, 1997), they all share the basic prediction that androphilic males should behave more altruistically than gynephilic males toward their respective kin.

In the past, anecdotal evidence has been used to support the Kin Selection Hypothesis (reviewed in Kirkpatrick, 2000). For example, in the Siwah of Libya, families obtained financial resources in the form of betrothal payments when their sons married into same-sex sexual relationships (Murray, 1997). However, the problem with this sort of anecdotal evidence is that it is unsystematic and fails to provide a strong test of the hypothesis' basic prediction. Moreover, one can always pick and choose anecdotal examples to support one's favored polemic.

Few empirical tests of the Kin Selection Hypothesis for male androphilia have been conducted. In one indirect test of the hypothesis, Salais and Fischer (1995) found that androphilic males were more empathic than gynephilic males. Because some studies have found a correlation between empathy and altruism (Eisenberg, 1986; Hoffman, 1981, 1982; Rosenhan, 1978), Salais and Fischer interpret their findings as circumstantial evidence in favor of the Kin Selection Hypothesis for male androphilia. However, as Bobrow and Bailey (2001) point out, increases in general altruism do not necessarily translate into elevated levels of altruism that are specifically directed toward kin. Whether such a relationship actually exists awaits empirical demonstration. Furthermore, sampling bias may account for the increased levels of empathy displayed by androphilic male participants in the Salais and Fischer study because the majority of these individuals were affiliated with a religious group, DignityUSA, which is involved in charity work and volunteer activity (Dignity USA, 2006).

To date, there have been only a few direct tests of the Kin Selection Hypothesis for male androphilia. Bobrow and Bailey (2001) found that androphilic males in the United States did not differ significantly from gynephilic males in terms of general familial affinity, generosity, neediness, avuncular tendencies, money received from kin, or money given to parents. However, they did find that androphilic males gave significantly less money to their older and younger siblings, as compared with gynephilic males. In a similar study conducted in England, Rahman and Hull (2005) also found no support for the basic prediction that androphilic males should confer greater altruistic benefits to kin. In addition, Bobrow and Bailey found that androphilic males were more estranged than gynephilic males from their respective kin, which runs contrary to the predictions of the Kin Selection Hypothesis for male androphilia. The findings of Bobrow and Bailey, coupled with those of Rahman and

Hull, indicate that male androphilia is not a specially designed adaptation for promoting increased altruism toward kin.

With these findings in mind, Bobrow and Bailey (2001) note that data from Western societies may be less valid when testing the Kin Selection Hypothesis for male androphilia compared with data from non-Western societies. Bobrow and Bailey reason that individuals in Western cultures may be less geographically and emotionally connected to their kin than their non-Western counterparts, thus mitigating the potential for androphilic males to exhibit greater altruism toward kin. This emotional and geographical disconnect may stem from the fact that Western cultures tend to be more individualistic (Hofstede, 1980). Moreover, the homophobic attitudes that characterize many Western cultures (Fone, 2000) may alienate androphilic males from their families and, similarly, lead them to exhibit fewer kin-directed altruistic acts than they would otherwise. Taken together, these considerations lead one to question the validity of testing the predictions of the Kin Selection Hypothesis for male androphilia in a Western cultural context.

The social environments provided by Western cultures may not be representative of the context in which male androphilia evolved. Hence, if an altruistic male androphilic phenotype indeed exists, such social environments may not be conducive to its development. Thus, despite the lack of empirical evidence in support of the Kin Selection Hypothesis for male androphilia, it is conceivable that the hypothesis is correct but that the adaptation is not expressed in the Euro-American societies in which it has been studied. This may be because the environmental factors that mediate the relationship between a gene for male androphilia and its functional behavioral expression are not present in the environments in which the Kin Selection Hypothesis has been previously tested. Consequently, in the absence of a social context that approximates the gene's environment of evolutionary adaptiveness, a functional behavioral expression of the gene is simply not manifested.

Some non-Western societies may furnish more appropriate social contexts in which to test the predictions of the Kin Selection Hypothesis for male androphilia. The small island nation of Independent Samoa may be one such society. In Independent Samoa, androphilic males are referred to as *fa'afafine*. Translated literally, *fa'afafine* means "in the manner of a woman." Although the term *fa'afafine* implies that the members of this category are uniformly very feminine, they are, in fact, a heterogeneous group in many ways (Bartlett & Vasey, 2006; Besnier, 2000; Schmidt, 2003). Most self-identify as *fa'afafine*, not as men. Some self-identify as women although they recognize, as do all Samoans, that they differ physically and socially from biological females. In appearance and mannerisms, although most would be considered effeminate, they range from strikingly feminine to unremarkably masculine. For example, a few *fa'afafine* adopt feminine modes of gender role

presentation to the point where they could easily “pass” as women in public. More commonly, they adopt only particular elements of feminine gender role presentation such as wearing high heels or moving in a feminine manner. Some engage in feminine modes of gender role presentation on a daily basis, whereas some do so only occasionally. Although *fa’afafine* means “in the manner of a woman,” a small proportion of *fa’afafine* make no attempt to appear feminine as adults. Nonetheless, members of this latter group self-identify and are identified publicly by others as *fa’afafine*. They socialize preferentially with other *fa’afafine*, and they may also prefer to engage in female-typical activities (i.e., jobs and hobbies), while avoiding certain male-typical activities. The more masculine *fa’afafine* are sometimes referred to as *fa’afafine-tama* (“boy *fa’afafine*”) within the *fa’afafine* community, but they do not appear to be treated any differently from their more feminine counterparts. Some *fa’afafine* take feminine names (e.g., Ginger), but there does not appear to be any clear relationship between gender role presentation and the gendered name one adopts. Some of the most feminine *fa’afafine* have the most masculine names (e.g., Frank).

Despite this heterogeneity in gender role presentation, *fa’afafine* are, with very few exceptions, exclusively androphilic. It is important to note, however, that in Independent Samoa, the category “gay,” is not one that androphilic males employ to construct their identities. In fact, the majority of *fa’afafine* are quite resolute in their assertion that Samoan “gays” do not exist (Bartlett & Vasey, 2006). Despite the fact that almost all *fa’afafine* are exclusively androphilic, they do not engage in sexual activity with each other. Instead, *fa’afafine* are invariably attracted to, and engage in sexual interactions with, males who self-identify as “straight men” (Bartlett & Vasey, 2006; Besnier, 1993; Danielsson, Danielsson, & Pierson, 1978).

In a Samoan cultural context, “straight men” are those who self-identify as men and are masculine in terms of their gender role presentation. Inclusion in this category is not contingent on exclusive sexual activity with women. Most self-identified straight men are gynephilic but may engage in sexual activity with *fa’afafine* or other straight men on a temporary basis, particularly if female sexual partners are unavailable. Our participants inform us that most straight men in Samoa have engaged in sexual interactions with *fa’afafine* at least once in their lives (also see Croall & Wunderman, 1999).

There are no social prohibitions against *fa’afafine* marrying women and having children, but examples of this are very rare (approximately two to three reported cases). In all of the instances of which we are aware, marriage occurred in response to familial pressure, not because the individual desired marriage or a female sexual partner. Once married, these individuals repudiate the identity label *fa’afafine* and their gender role enactment more or less mirrors that of straight men. Nonetheless, they are still considered to be *fa’afafine* by members of the *fa’afafine*

community who routinely describe them as “faking it.” Our informants tell us that such individuals still have sex with straight men, albeit, in a clandestine manner.

There is a widespread notion, in both the social sciences and popular literature, that Samoan parents decide that a male infant will be a *fa’afafine* when there is an insufficient number of girls in the family to carry out the traditionally female chores (for example, see Danielsson et al., 1978; Mageo, 1992; Schoeffel, 1979). None of the Samoans we interviewed suggested such an etiology. Despite the seriousness with which such claims are taken in Western academic circles, the *fa’afafine* we interviewed found such a suggestion quizzical. Instead, qualitative evidence suggests that *fa’afafine* are usually identified in childhood based on their tendency to behave in a gender-atypical manner (Bartlett & Vasey, 2006; Besnier, 1993; Mageo, 1992; Poasa, 1992). As such, parents do not choose to make certain male children into *fa’afafine*. Rather, they recognize that particular male children have an inclination for female-typical behavior, and they equate this inclination with a *fa’afafine* gender identity.

It is noteworthy that Samoans do not necessarily equate an early inclination for female-typical behavior in males with adult androphilia (Schmidt, 2003). This probably is due to the fact that inclusion in the category *fa’afafine* is typically contingent on feminine gender role expression rather than androphilic sexuality (Poasa, 1992; Schmidt, 2003; Shore, 1981). Although the vast majority of *fa’afafine* are androphilic in adulthood, Samoans seem to view this pattern of sexual attraction as an optional consequence of being a *fa’afafine* rather than as an essential condition for inclusion into this category (Besnier, 1993).

Several factors make Independent Samoa a more appropriate environmental context in which to test the predictions of the Kin Selection Hypothesis for male androphilia. First, Independent Samoa has been described as one of the least Westernized of all the Polynesian societies (Bennett et al., 2003). It is one of the few Polynesian nations in which the government operates autonomously from Western countries (Bennett et al., 2003; Lal & Fortune, 2000). Moreover, a population survey conducted by the Samoan Ministry of Finance in 2001 indicates that more than 97.5% of the population is composed of ethnic Samoans (Samoan Statistical Services Division of the Ministry of Finance, 2006). Second, Independent Samoa is a relatively tiny nation consisting of four populated islands that are closely situated: Apolima, Manono, Savai’i, and Upolu (2934 km² total; Bennett et al., 2003; Lal & Fortune, 2000). Owing to its small size, kin members within Independent Samoa are likely to be less geographically dispersed than in North America and Europe. Third, the family unit, or *aiga* (extended family), is of great importance in Samoa (Mageo, 1998; Schmidt, 2003). Samoan families are usually quite large and often live together or in closely situated dwellings. When a distance separates members of a family, emotional proximity is maintained via frequent visits (Mageo, 1998).

Fourth, in contrast to Western societies, androphilic males (i.e., *fa'afafine*) are publicly visible and socially accommodated in Independent Samoa (Bartlett & Vasey, 2006; Mageo, 1996). In this type of cultural context, estrangement of androphilic men from their families is less likely (Besnier, 1993; Croall & Wunderman, 1999). Fifth, Samoan society is characterized by cognatic patterns of residency following marriage (Tiffany, 1975). In contrast to unilineal descent systems (e.g., matrilineal residency), cognatic descent groups afford individuals the choice of where to reside following marriage. As such, in cognatic societies, married gynephilic males can live with their biological kin and need not be separate from them. This pattern of marriage residency helps control for the possible confound of “distance lived from kin” that might otherwise distinguish unmarried androphilic males and married gynephilic males in matrilineal societies.

In this study, we compare the altruistic tendencies of gynephilic men and *fa'afafine* in Independent Samoa to test the Kin Selection Hypothesis for male androphilia. We tested the hypothesis' basic prediction that *fa'afafine* should exhibit more altruistic tendencies than gynephilic men. Three measures of altruistic tendencies were investigated including overall generosity, avuncular tendencies, and allocation of monetary funds. In addition, we compare the extent to which gynephilic men and *fa'afafine* receive resources from their respective kin by examining general neediness and acquisition of monetary funds.

2. Methods

2.1. Participants

All participants were recruited through a network sampling procedure on the two larger and more populated islands of Upolu and Savai'i. A network sampling procedure involves contacting initial participants who display qualities of interest (i.e., status as *fa'afafine* or gynephilic men), from whom we obtain referrals for additional participants who, in turn, provide further referrals, and so on. The rate of participation for all groups was greater than 90%. Participants were 38 self-identified *fa'afafine* and 43 self-identified straight men.

Kinsey ratings (Kinsey, Pomeroy, & Martin, 1948) of sexual feelings over the previous year were obtained for all participants. To assess sexual feelings, we asked the participants, “Which of the following statements best describes your sexual feelings during the last year?” Participants were then asked to choose one of the following six statements: “Sexual feelings only toward females” (Kinsey rating=0), “Most sexual feelings toward females, but an occasional fantasy about males” (Kinsey rating=2), “Most sexual feelings toward females, but some definite sexual feeling toward males” (Kinsey rating=2), “Sexual feelings equally divided between males and females. No strong preference

for one or the other” (Kinsey rating=3), “Most sexual feelings toward males, but some definite sexual feelings toward females” (Kinsey rating=4), “Most sexual feelings toward males, but an occasional fantasy about females” (Kinsey rating=5), “Sexual feelings only toward males” (Kinsey rating=6). Samoans, both inside and outside the *fa'afafine* community, recognize that *fa'afafine* are biological males that are socially distinct from men and women. Nevertheless, for the sake of consistency, participants were told, prior to answering questions pertaining to the Kinsey scale, that the category “males” included straight men and/or *fa'afafine*, whereas the category “females” included women.

Of the 38 *fa'afafine* for whom Kinsey ratings were obtained, 37 (97.4%) described their sexual feelings as exclusively androphilic (Kinsey rating=6). One *fa'afafine* reported most sexual feelings toward males but some definite sexual feelings toward females (Kinsey rating=4). Of the 43 straight men for whom Kinsey ratings were obtained, 35 (81.4%) described their sexual feelings as exclusively gynephilic. Five (11.6%) reported most sexual feelings toward females but an occasional fantasy about males (Kinsey rating=1), and three (7%) reported most sexual feelings toward females but some definite sexual feelings toward males (Kinsey rating=2).

Data on the participants' average annual incomes were also collected, and all values were then converted to American dollars (USD).

All *p* values for the independent *t* tests presented here reflect two-tailed probabilities.

2.2. Procedure and measures

Data were collected during two field trips (August–September 2005 and December 2005–January 2006). Participants were interviewed using a standardized questionnaire to assess their relationship to and involvement with family members. A Samoan-speaking research assistant was present for those interviews for which the participant(s) indicated that they preferred to do the interview in Samoan or for those participants who were deemed by the researchers to be insufficiently fluent in English. Questions were read aloud in English by one of the researchers and in Samoan by a research assistant when necessary. The questionnaire used in this study was available in English and Samoan, after being translated and back-translated by two fluent Samoan–English speakers.

The questionnaire employed in this study was a modified version of a previously used Kin Selection Questionnaire (Bobrow & Bailey, 2001). This questionnaire was composed of two main sections. The first section of the Kin Selection Questionnaire contained 26 questions that formed the Family Relationship Scale. Responses were based on a 7-point Likert-type scale that ranged from 1=*strongly disagree* to 7=*strongly agree*. The Family Relationship Scale was composed of three subscales:

Table 1

Family Relationship Scales: group means and standard errors, *t* values for two-tailed independent *t* tests, degrees of freedom, *p* values, and effect sizes (*d*)

Scale	Items (<i>n</i>)	<i>Fa'afafine</i> (mean±S.E.)	Gynephilic men (mean±S.E.)	<i>t</i>	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
Avuncular tendencies	9	6.1±0.17	5.4±0.16	3.2	74.2	.002	.74
Generosity	11	6.2±0.16	5.9±0.15	1.75	79	.08	.39
Neediness	6	5.6±0.17	5.5±0.16	0.71	79	.48	.16

- Overall Generosity subscale (*n*=11 items), which measured participants' willingness to give resources to family members. Items in this subscale include the following: (a) I would undergo a serious operation if it could possibly help a family member; (b) my family relies on me in times of stress; (c) if I owned a company, I would hire my relatives preferentially over nonrelatives; (d) in general, my family would describe me as a generous person; (e) I would be willing to have my parents live with me if they became unable to live by themselves; (f) if one of my siblings needed money, I would help them; (g) if one of my siblings needed a place to live, I would let them live with me; (h) I would donate an organ if one of my siblings needed it; (i) I often give gifts to my siblings and their children; (j) I have often loaned money to my siblings; and (k) my siblings often ask me for advice.
- General Neediness subscale (*n*=6 items), which measured the extent to which participants received resources from family members. Items in this subscale include the following: (a) I rely on my family for support, (b) family members have helped me find work in the past, (c) my family has helped me financially when I needed assistance, (d) my family has given me emotional support during times of stress, (e) I have often borrowed money from my siblings, and (f) my siblings would let me live with them if I needed to.
- Avuncular Tendencies subscale (*n*=9 items), which measured the participants' willingness to give resources to nieces and nephews. Items in this subscale include the following: (a) babysitting for an evening, (b) babysitting on a regular basis, (c) taking care of the children for a week while their parents are away, (d) buying toys for the children, (e) tutoring one of the children in a subject you know well, (f) helping to expose the children to art and music, (g) contributing money for day care, (h) contributing money for the children's medical expenses, and (i) contributing money for the children's education.

The second section of the Kin Selection Questionnaire contained questions about specific family members (i.e., mother, father, oldest sibling, youngest sibling). In addition, open-ended questions were used so that participants could identify how much money they gave to, and received from, specific family members over the last year in the form of cash and/or gifts.

3. Results

3.1. Family Relationship Scales

Internal consistency reliabilities, standardized item alpha (α), were computed for both *fa'afafine* and gynephilic men on the three Family Relationship subscales. Reliabilities were moderate to high for *fa'afafine* on the Avuncular Tendencies ($\alpha=.83$), Overall Generosity ($\alpha=.72$), and General Neediness ($\alpha=.71$) subscales of this instrument. Similarly, reliabilities were moderate to high for gynephilic men on the Avuncular Tendencies ($\alpha=.88$), Overall Generosity ($\alpha=.71$), and General Neediness ($\alpha=.71$) subscales.

An independent *t* test revealed that there was no statistically significant age difference between *fa'afafine* (*n*=38, mean±S.E.=31.2±1.37) and gynephilic men [*n*=43, mean±S.E.=28.02±1.21, independent *t* test: $t(79)=1.74$, $p=.086$]. The variability in distance (in kilometers) lived from mothers differed significantly between the two participant groups (*fa'afafine*: *n*=38, mean±S.E.=2.1±1.2; gynephilic men: *n*=43, mean±S.E.=726.1±357.8; Levene's test for equality of variances, $F=13.96$, $p<.001$). Although the difference between participant groups in mean distance lived from mother appears large, it is important to note that the median and modal distances for both groups are 0 km. In other words, most participants lived in the same household as their mothers. Consequently, an independent *t* test was conducted in which equal variance was not assumed, and this indicated that *fa'afafine* and gynephilic men did not differ significantly in terms of distance lived from mother [$t(63)=-1.76$, $p=.052$]. Likewise, independent *t* tests indicated that *fa'afafine* and gynephilic men did not differ significantly in terms of distance lived from their father [*fa'afafine*: *n*=20, mean±S.E.=219.15±217.05; gynephilic men: *n*=29, mean±S.E.=513.48±422.16; $t(47)=-0.544$, $p=.589$], their older siblings [*fa'afafine*: *n*=38, mean±S.E.=2076.03±397.05; gynephilic men: *n*=41, mean±S.E.=1352.56±361.01; $t(77)=1.35$, $p=.18$], or their younger siblings [*fa'afafine*: *n*=37, mean±S.E.=476.97±177.06; gynephilic men: *n*=40, mean±S.E.=458.48±236.85; $t(75)=-0.062$, $p=.951$]. A general linear model for an ordinal multiway frequency analysis revealed that there was no significant difference with respect to the highest level of education achieved by the *fa'afafine* and gynephilic men who participated in the study [$G^2(74)=0.01$, $p=.92$]. An independent *t* test showed that *fa'afafine* and gynephilic men did not differ in terms of their annual incomes [*fa'afafine*: *n*=38, mean±S.E.=5145.48±683.78; gyne-

Table 2

Individual Avuncular Tendencies subscale items for *fa'afafine* and gynephilic men: group means and standard errors, degrees of freedom, *t* values for two-tailed independent *t* tests, and *p* values

Act	<i>Fa'afafine</i> (mean±S.E.)	Gynephilic men (mean±S.E.)	<i>df</i>	<i>t</i>	<i>p</i>
Babysitting for an evening	6.42±0.14	5.6±0.27	61.98	2.67	.01
Babysitting on a regular basis	5.16±0.31	4.23±0.32	79	2.06	.042
Taking care of the children for a week while their parents are away	5.71±0.27	4.86±0.36	74.85	1.89	.063
Buying toys for the children	6.18±0.19	5.6±0.2	79	2.11	.038
Tutoring one of the children in a subject you know well	6.55±0.11	6.26±0.21	64	1.27	.208
Helping to expose the children to art and music	6.45±0.14	5.4±0.25	64.55	3.58	.001
Contributing money for day care	5.42±0.3	4.88±0.25	79	1.39	.168
Contributing money for the children's medical expenses	6.39±0.18	6±0.19	79	1.47	.146
Contributing money for the children's education	6.66±0.09	5.72±0.24	52.78	3.69	.001

philic men: $n=43$, mean±S.E.=5032.49±958.1; $t(79)=0.094$, $p=.926$].

Two-tailed independent *t* tests were conducted to assess differences between *fa'afafine* and gynephilic men for each of the three Family Relationship subscales (Table 1). There were no significant differences between *fa'afafine* and gynephilic men on the Overall Generosity and General Neediness subscales. However, *fa'afafine* exhibited significantly more avuncular tendencies than gynephilic men ($p<.01$). A Cohen's *d* indicated a moderate-to-large effect size ($d=.74$). Comparative data for *fa'afafine* and gynephilic men on individual avuncular tendency subscale items are presented in Table 2.

3.2. Exchange of financial resources

Two-tailed independent *t* tests were conducted to determine whether *fa'afafine* and gynephilic men differed in the amounts of money they gave various types of kin, including their youngest sibling, oldest sibling, mother, and father. Results of these tests indicated that there were no significant differences between these two participant groups in terms of the amount of money they gave to each type of kin (Table 3). Independent *t* tests were also used to determine whether *fa'afafine* and gynephilic men differed in the amounts of money they obtained from each type of kin. The results indicated that there were also no significant differences between *fa'afafine* and gynephilic men in terms of the amount of money they obtained from each type of kin (Table 4).

4. Discussion

The current study examines the Kin Selection Hypothesis for male androphilia in the Polynesian nation of Independent Samoa. The altruistic tendencies of androphilic males (i.e., *fa'afafine*) in Independent Samoa did not differ from those of gynephilic men in terms of overall generosity or financial resources given to kin. Likewise, these two groups did not differ in terms of general neediness or financial resources received from kin. In contrast, *fa'afafine* did report significantly greater avuncular tendencies than gynephilic men. Similar research conducted in Western countries (Bobrow & Bailey, 2001; Rahman & Hull, 2005) has failed to find any differences in the altruistic tendencies of androphilic and gynephilic males. As such, this is the first empirical study to furnish any support for the Kin Selection Hypothesis' basic prediction that androphilic males should direct more altruistic behavior toward kin than gynephilic males. Indeed, the present study suggests that some altruistic acts by *fa'afafine* may serve to improve their nieces' and nephews' chances of attaining reproductive success by facilitating the development of attributes that are pertinent to obtaining mates and rearing offspring (e.g., education, exposure to culturally relevant social skills). It is also possible that siblings might be able to produce more offspring with reduced parental effort owing to the childcare support provided by their *fa'afafine* kin. The following comment made by a *fa'afafine* participant illustrates this point nicely: "My sister has a daughter and a newborn son now. Soon she will go back to work and I will be the mother."

Table 3

Financial resources given to kin: group means and standard errors, sample sizes, *t* values for two-tailed independent *t* tests, degrees of freedom, and *p* values

	<i>Fa'afafine</i>		Gynephilic men		<i>t</i>	<i>df</i>	<i>p</i>
	<i>n</i>	Mean±S.E.	<i>n</i>	Mean±S.E.			
Youngest sibling	36	432.35±127.51	35	773.18±274.12	−1.12	48.12	.27
Oldest sibling	36	394.71±164.99	41	650.53±201.37	−0.97	75	.34
Mother	32	934.72±207.69	35	1396.57±395.96	−1.01	65	.32
Father	26	759.9±186.54	33	948.91±302.61	−0.5	57	.62

Table 4

Financial resources obtained from kin: group means and standard errors, sample sizes, *t* values for two-tailed independent *t* tests, degrees of freedom, and *p* values

	<i>Fa'afafine</i>		Gynephilic men		<i>t</i>	<i>df</i>	<i>p</i>
	<i>n</i>	Mean±S.E.	<i>n</i>	Mean±S.E.			
Youngest sibling	36	153.69±54.12	35	327.90±134.01	−1.21	44.84	.23
Oldest sibling	37	413.93±145.23	40	630.44±282.13	−0.67	75	.51
Mother	32	627±214.63	36	128.51±578.61	−1.02	66	.31
Father	26	707.54±295.77	33	1070.15±614.37	−0.49	57	.63

Our finding that avuncular tendencies are expressed at elevated levels by androphilic males in Independent Samoa, relative to their gynephilic counterparts, underscores the importance of testing the Kin Selection Hypothesis in an appropriate sociocultural context. At least three factors pertaining to sociocultural environment might account for why the results obtained in this study differed from those conducted in Western countries (Bobrow & Bailey, 2001; Rahman & Hull, 2005), despite the fact that all three employed very similar methodologies. First, in Independent Samoa, *fa'afafine* may be more geographically connected to their kin owing to the small size of this island nation (see Section 1; Bennett et al., 2003; Lal & Fortune, 2000). Furthermore, the manner in which Samoans organize familial relationships and patterns of residency may facilitate geographic connectedness and interactions among androphilic males and their kin in this culture (see Section 1; Mageo, 1998; Tiffany, 1975). It seems likely that the geographic connectedness that characterizes kin networks in many non-Western cultures also characterized the small-to-medium-sized kin networks that are thought to have existed in the ancestral social environment in which male androphilia evolved (Aiello & Dunbar, 1993; Rodseth, Wrangham, Harrigan, & Smuts, 1991).

Second, *fa'afafine* are highly visible in public and integrated into the daily fabric of Samoan society. In this type of cultural context, estrangement of androphilic males from their families may be less likely (Besnier, 1993; Croall & Wunderman, 1999; Danielsson et al., 1978; Williams, 1992a, 1992b), when compared with many North American or European contexts, in which hostile attitudes toward androphilic men are more prevalent (Fone, 2000). Indeed, it was not uncommon for our *fa'afafine* participants to make statements such as “family comes first,” thereby accentuating the great degree of emotional connectedness between androphilic males and their families in this culture. If kin selection is, indeed, the mechanism whereby male androphilia evolved, it seems reasonable to presuppose that this process would have been contingent on a social context in which male androphiles were socially accepted. It is unclear, however, what the social and familial status of androphilic males was in the ancestral past. The cross-species data indicate that aggression specifically directed toward individuals that engage in same-sex sexual activity is rare or nonexistent in nonhuman primates (Vasey, 1995), although exceptions do exist (e.g., Vasey, 1998; Yamagiwa, 2006).

Similarly, the cross-cultural literature indicates that social and familial accommodation of androphilic males is not uncommon across non-Western cultural settings (Williams, 1992a, 1992b), although it would not be difficult to generate counterexamples (e.g., Willis, 2003). As such, more research needs to be done on the origin and evolution of prejudice against male androphiles to better understand the ancestral social context in which male androphilia evolved.

Third, it is important to recognize that the manner in which androphilia is expressed among adult males in Western culture (i.e., *egalitarian male androphilia*²) appears, with few exceptions, to be a historically recent phenomenon and quite rare in non-Western societies (e.g., Greenberg, 1988; Herdt, 1997; Murray, 2000). As such, egalitarian androphilia may not be representative of the form of male androphilia expressed in the ancestral social environment in which humans evolved. In Independent Samoa, *fa'afafine* do not exhibit egalitarian male androphilia; instead, almost all *fa'afafine* exhibit *transgendered male androphilia*,³ a pattern that is widespread cross-culturally (e.g., Besnier, 2000; Brieu, 2004; Brooks & Bocahut, 1998; Coleman, Colgan, & Gooren, 1992; Graham, 2004; Johnson, 1997; Koon, 2002; Kulick, 1998; Nanda, 1998, 1999; Prieur, 1998; Teunis, 1996; Totman, 2003; Wikan, 1977; Williams, 1992a, 1992b). The widespread nature of transgendered male androphilia across many human cultures suggests that it may represent the ancestral form that male androphilia took in the evolutionary past.

The results of this study raise the possibility that elevated avuncular tendencies on the part of *fa'afafine* are the adaptive products of special evolutionary design. We stress, however, that our findings do not provide strong evidence in support of this conclusion. It is possible that increased avuncular tendencies by *fa'afafine* are simply part of a generalized adaptive tendency on the part of all biological males to invest in kin, regardless of their sexual orientations. Some males may, however, be able to exhibit elevated levels

² *Egalitarian male androphilia* occurs between two males not markedly different in age, gender-related characteristics, or other traits. Within the relationship, partners do not adopt social roles and treat each other as equals.

³ *Transgendered male androphilia* occurs between a male who is markedly gender-atypical and another who is more or less gender-typical for his own sex.

of avuncular tendencies because they have no direct parental care responsibilities. In this regard, it is important to note that none of the *fa'afafine* we interviewed had children of their own. In contrast, 58% of the gynephilic men who participated in the study had at least one child (mean \pm S.E. = 1.2 ± 0.2 , range = 0–4). Consequently, *fa'afafine* may exhibit higher avuncular tendencies compared with most gynephilic men simply because they are not constrained by direct parental care responsibilities and live in a social environment in which they are emotionally and geographically connected with their kin.

A strong test of the special design hypothesis will need to examine whether *fa'afafine* exhibit higher avuncular tendencies relative to gynephilic men who do not have children and, as a result, have no direct parental care responsibilities. If such a comparison reveals that *fa'afafine* exhibit higher levels of avuncular tendencies than gynephilic men without children, then this would furnish support in favor of a special design argument. Unfortunately, our sample of gynephilic men without children was insufficient to conduct this test. Future research will focus on replicating the results for avuncular tendencies presented here, as well as obtaining a larger sample of gynephilic men to test the special design hypothesis. In addition, future research needs to ascertain whether increased avuncular tendencies, when expressed by androphilic men, are sufficient to offset the costs associated with failure to reproduce directly. To evaluate this possibility, it will be necessary to investigate how actual, kin-directed, avuncular altruism impacts the inclusive fitness of androphilic males. This will require a qualitative and quantitative appraisal of the fitness-related benefits accrued by kin as a result of the avuncular altruism actually expressed by their androphilic male relatives.

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References

- Aiello, L. C., & Dunbar, R. I. M. (1993). Neocortex size, group size and the evolution of language. *Current Anthropology*, *34*, 184–193.
- Bailey, J. M., Dunne, M. P., & Martin, N. G. (2000). Genetics and environmental influences on sexual orientation and its correlates in an Australian twin sample. *Journal of Personality and Social Psychology*, *78*, 524–536.
- Bailey, J. M., & Pillard, R. C. (1991). A genetic study of male sexual orientation. *Archives of General Psychiatry*, *48*, 1089–1096.
- Bailey, J. M., & Pillard, R. C. (1995). Genetics of human sexual orientation. *Annual Review of Sex Research*, *6*, 126–150.
- Bartlett, N. H., & Vasey, P. L. (2006). A retrospective study of childhood gender-atypical behavior in Samoan *fa'afafine*. *Archives of Sexual Behavior*, *35*.
- Bell, A. P., & Weinberg, M. S. (1978). *Homosexualities: A study of diversity among men and women*. New York: Simon and Shuster.
- Bennett, M., Chinula, T., Cole, G., Dillon, S., Farfor, S., Hubbard, C., Logan, L., Miller, K., Oakley, M., O'Byrne, D., Owen, W., Vincent, T., & Wheeler, T. (2003). South Pacific. Melbourne: Lonely Planet Publications.
- Besnier, N. (1993). Polynesian gender liminality through time and space. In G. Herdt (Ed.), *Third sex, third gender: Beyond sexual dimorphism in culture and history* (pp. 285–328). New York: Zone Books.
- Besnier, N. (2000). Transvestism (transgenderism). In B. V. Lal, & K. Fortune (Eds.), *Pacific Islands: An encyclopedia* (pp. 416–417). Honolulu: University of Hawaii Press.
- Bobrow, D., & Bailey, J. M. (2001). Is male homosexuality maintained via kin selection? *Evolution and Human Behavior*, *22*, 361–368.
- Brieu, S. (May, 2004). Dans la ville des travesties. *National Geographic (France)*, *2*–17.
- Brooks, P., & Bocahut L. (1998). *Woubi Cheri* [Motion Picture]. San Francisco: California Newsreel.
- Coleman, E., Colgan, P., & Gooren, L. (1992). Male cross-gender behavior in Myanmar (Burma): A description of the acault. *Archives of Sexual Behavior*, *21*, 313–321.
- Croall, H., & Wunderman, E. (1999). *Paradise bent: Gender diversity in Samoa* [Motion Picture]. New York: Filmmakers Library.
- Crompton, L. (2003). *Homosexuality and civilization*. Cambridge, MA: Belknap Press.
- Danielsson, B., Danielsson, T., & Pierson, R. (1978). Polynesia's third sex: The gay life starts in the kitchen. *Pacific Islands Monthly*, *49*, 10–13.
- DignityUSA. (2006). DignityUSA website. Retrieved April 25, 2006 from the World Wide Web: <http://www.dignityusa.org/links.html>.
- Eisenberg, N. (1986). *Altruistic emotion, cognition, and behavior*. Hillsdale, NJ: Lawrence.
- Fone, B. R. S. (2000). Homophobia: A history. New York: Picador.
- Graham, S. (2004). It's like one of those puzzles: Conceptualizing gender among bugis. *Journal of Gender Studies*, *13*, 107–116.
- Greenberg, D. F. (1988). *The construction of homosexuality*. Chicago: The University of Chicago Press.
- Herdt, G. (1997). *Same sex, different cultures*. Colorado: Westview Press.
- Hoffman, M. L. (1981). Is altruism part of human nature? *Journal of Personality and Social Psychology*, *40*, 121–137.
- Hoffman, M. L. (1982). Development of prosocial motivation: Empathy and guilt. In N. Eisenberg (Ed.), *The development of prosocial behavior* (pp. 281–313). New York: Academic Press.
- Hofstede, G. (1980). *Culture's consequences*. Beverly Hills, CA: Sage.
- Johnson, M. (1997). *Beauty and power: Transgendering and cultural transformation in the Southern Philippines*. New York: Berg.
- Kinsey, A. C., Pomeroy, W. B., & Martin, C. E. (1948). *Sexual behavior in the human male*. Philadelphia and London: Saunders.
- Kirkpatrick, R. C. (2000). The evolution of human homosexual behavior. *Current Anthropology*, *41*, 385–413.
- Koon, T. Y. (2002). *The Mak Nyahs: Malaysian male to female transsexuals*. Singapore: Eastern Universities Press.
- Kulick, D. (1998). *Travesti: Sex, gender and culture among Brazilian transgendered prostitutes*. Chicago: University of Chicago Press.
- Lal, B. V., & Fortune, K. (2000). *Pacific Islands: An encyclopedia*. Honolulu: University of Hawaii Press.
- Mageo, J. M. (1992). Male transvestism and cultural change in Samoa. *American Ethnologist*, *19*, 443–459.
- Mageo, J. M. (1996). Samoa, on the Wilde side: Male transvestism, Oscar Wilde, and liminality in making gender. *Ethos*, *24*, 588–627.
- Mageo, J. M. (1998). *Theorizing self in Samoa: Emotions, genders and sexualities*. Ann Arbor: University of Michigan Press.

- McKnight, J. (1997). *Straight science? Homosexuality, evolution and adaptation*. New York: Routledge.
- Murray, S. O. (1997). The will not to know: Islamic accommodation of male homosexuality. In S. O. Murray, & W. Roscoe (Eds.), *Islamic homosexualities: Culture, history, and literature* (pp. 14–54). New York: New York University Press.
- Murray, S. O. (2000). *Homosexualities*. Chicago: The University of Chicago Press.
- Mustanski, B. S., Chivers, M. L., & Bailey, J. M. (2002). A critical review of recent biological research on human sexual orientation. *Annual Review of Sex Research*, 13, 89–140.
- Nanda, S. (1998). *Neither man nor woman: The hijras of India*. Belmont, CA: Wadsworth.
- Nanda, S. (1999). *Gender diversity: Crosscultural variations*. Long Grove, IL: Waveland Press.
- Pillard, R. C., & Weinrich, J. (1986). Evidence of familial nature of male homosexuality. *Archives of General Psychiatry*, 43, 808–812.
- Poasa, K. (1992). The Samoan *fa'afafine*: One case study and a discussion of transsexualism. *Journal of Psychology and Human Sexuality*, 5, 39–51.
- Priour, A. (1998). *Mema's house, Mexico City: On transvestites, queens, and machos*. Chicago: University of Chicago Press.
- Rahman, Q., & Hull, M. S. (2005). An empirical test of the kin selection hypothesis for male homosexuality. *Archives of Sexual Behavior*, 34, 461–467.
- Rodseth, L., Wrangham, R. W., Harrigan, A. M., & Smuts, B. B. (1991). The human community as a primate society. *Current Anthropology*, 3, 221–254.
- Rosenhan, D. L. (1978). Toward resolving the altruism paradox: Affect, self-reinforcement, and cognition. In L. Wispe (Ed.), *Altruism, sympathy, and helping: Psychological and sociological perspectives* (pp. 101–113). New York: Academic Press.
- Ruse, M. (1982). Are there gay genes? Sociobiology and homosexuality. *Journal of Homosexuality*, 6, 5–34.
- Saghir, M. T., & Robins, E. (1973). *Male and female homosexuality: A comprehensive investigation*. Baltimore: Williams & Wilkins.
- Salais, D., & Fischer, R. B. (1995). Sexual preference and altruism. *Journal of Homosexuality*, 28, 185–196.
- Schmidt, J. (2003). Paradise lost? Social change and *fa'afafine* in Samoa. *Current Sociology*, 51, 417–432.
- Schoeffel, P. (1979). *Daughters of Sina: A study of gender, status and power in Western Samoa*. Unpublished doctoral dissertation. Australian National University.
- Samoan Statistical Services Division of the Ministry of Finance. (2006). 2001 Census of population. Retrieved April 25, 2006 from the World Wide Web: www.spc.org.nc/prism/Country/WS/stats/census_survey/census.htm.
- Shore, B. (1981). Sexuality and gender in Samoa: Conceptions and missed conceptions in sexual meaning. In S. B. Ortner & H. Whitehead (Eds.), *The cultural construction of gender and sexuality* (pp. 192–215). Cambridge: Cambridge University Press.
- Tiffany, S. W. (1975). The cognatic descent groups of contemporary Samoa. *Man*, 10, 430–447.
- Teunis, N. F. (1996). Homosexuality in Dakar: Is the bed the heart of a sexual subculture? *Journal of Gay, Lesbian, and Bisexual Identity*, 1, 153–170.
- Totman, R. (2003). *The third sex kathoey: Thailand's ladyboys*. London: Souvenir Press.
- Vasey, P. L. (1995). Homosexual behavior in primates: A review of evidence and theory. *International Journal of Primatology*, 16, 173–204.
- Vasey, P. L. (1998). Female choice and inter-sexual competition for female sexual partners in Japanese macaques. *Behaviour*, 135, 579–597.
- Weinrich, J. D. (1987). *Sexual landscapes: Why we are what we are, why we love whom we love*. NY: Scribner.
- Whitam, F. L., Diamond, M., & Martin, J. (1993). Homosexual orientation in twins: A report on 61 pairs and three triplet sets. *Archives of Sexual Behavior*, 22, 187–206.
- Wikan, U. (1977). Man becomes woman: Transsexualism in Oman as a key to gender roles. *Man*, 12, 304–319.
- Williams, W. (1992a). *The spirit and the flesh: Sexual diversity in American Indian culture*. Boston: Beacon.
- Williams, W. (1992b). Benefits for nonhomophobic societies: An anthropological perspective. In W. J. Blumenfeld (Ed.), *Homophobia: How we all pay the price* (pp. 258–274). Boston: Beacon.
- Willis, J. (2003). Heteronormativity and the deflection of male same-sex attraction among the Pitjantjatjara people of Australia's Western Desert. *Culture, Health & Sexuality*, 5, 137–152.
- Wilson, E. O. (1975). *Sociobiology: The new synthesis*. Cambridge, MA: Belknap Press.
- Yamagiwa, J. (2006). Playful encounters: The development of homosexual behaviour in male mountain gorillas. In V. Sommer, & P. L. Vasey (Eds.), *Homosexual behaviour in animals: An evolutionary perspective* (pp. 273–293). Cambridge: Cambridge University Press.
- Yankelovich Partners. (1994). *A Yankelovich MONITOR perspective on gays/lesbians*. Norwalk, CT: Yankelovich Partners.
- Yates, T. (1993). Frameworks for an archaeology of the body. In C. Tilley (Ed.), *Interpretive Archaeology* (pp. 31–72). Providence: Berg Publishers.