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ORIGINAL PAPER

Avuncular Tendencies and the Evolution of Male Androphilia in Samoan *Fa'afafine*

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Abstract The kin selection hypothesis for male androphilia holds that genes for male androphilia can be maintained in a population if the fitness costs of not reproducing directly are offset by enhancing indirect fitness. Kin share some proportion of genes identical by virtue of descent. Theoretically speaking, androphilic males can increase their fitness indirectly by allocating altruistic behavior toward kin, which, in turn, allows kin to increase their reproductive success. Research conducted in Independent Samoa has shown that androphilic males (known locally as *fa'afafine*) report significantly higher avuncular tendencies relative to gynephilic men. Here, we replicate this sexual orientation difference, using a larger, independent sample, suggesting that the documented sexual orientation difference in avuncular tendencies in Independent Samoa is genuine. We also extend previous research by showing that *fa'afafine* exhibit significantly higher avuncular tendencies even when compared to a more closely matched control group that also lacks direct parental care responsibilities (i.e., gynephilic men with no children). Although the greater avuncular tendencies of *fa'afafine* relative to gynephilic men are consistent with the predictions of the kin selection hypothesis for male androphilia, further research is needed before deeming male androphilia an adaptation for promoting elevated avuncularity. Likewise, more research is needed before deeming elevated avuncularity in *fa'afafine* an evolved adaptation for promoting indirect fitness. We discuss these findings in the context of alternative evolutionary explanations for male androphilia (i.e., an evolved by-product of an adaptation).

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Introduction

A large body of research indicates that there is a biological basis for male androphilia[1] (Mustanski, Chivers, & Bailey, 2002), and familial studies point to a genetic component (e.g., Bailey, Dunne, & Martin, 2000; Kendler, Thornton, Gilman, & Kessler, 2000). At the same time, research demonstrates that androphilic males reproduce at about one-fifth to one-tenth the rate of gynephilic males (Bell & Weinberg, 1978; Hamer & Copeland, 1994; Saghir & Robins, 1973; Yankelovich Partners, 1994). 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. Despite this prediction, archaeologic evidence suggests that male same-sex sexual behavior existed during human prehistory (e.g., Nash, 2001; Yates, 1993). Moreover, male androphilia seems to occur at similar (albeit, low) frequencies across different cultural and environmental landscapes (Whitam, 1983). This situation 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. 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

[1] *Androphilia* refers to sexual attraction to adult males, whereas *gynephilia* refers to sexual attraction to adult females. The usage and meaning of homosexual and heterosexual vary cross-culturally, rendering them poor constructs for the type of cross-cultural research presented here.

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 reproducing directly are offset by enhancing indirect fitness. From the perspective of kin selection theory, indirect fitness is a measure of an individual's impact on the fitness of its kin (who share some identical genes by virtue of descent), weighted by the degree of relatedness. Theoretically speaking, androphilic males can increase their indirect fitness by directing altruistic behavior toward kin, which, in principle, allows kin to increase their reproductive success. In particular, androphilic men should allocate altruistic behavior towards close kin, because they share more genes in common with such individuals.

In formulating this theory, Wilson (1975) stated that "Freed from the special obligations of parental duties, they [androphilic males] could have operated with special efficiency in assisting close relatives" (p. 555). Similarly, Ruse (1982) commented that "…the effect is that in being homosexual, offspring become altruistic towards close relatives in order thereby to increase their own overall inclusive fitness" (p. 20). Given that what is at issue here is a theory that can account for the origin of same-sex sexual attraction, it seems reasonable to interpret these statements as indicating that same-sex sexual attraction, itself, is a prerequisite for the expression of elevated kin-direct altruism, *not* childlessness. If so, then male androphiles should exhibit elevated kin-directed altruism, whereas male gynephiles (childless or otherwise) should not. Such a pattern would be consistent with the notion that male androphilia is a specially designed adaptation for promoting kin-directed altruism.

Bobrow and Bailey (2001) found that androphilic men in the United States did not differ significantly from gynephilic men in terms of their avuncular tendencies. In addition, they found that androphilic men were more estranged than gynephilic men from their respective kin, which runs contrary to the predictions of the kin selection hypothesis for male androphilia. In a similar study conducted in England, Rahman and Hull (2005) also found no evidence that androphilic men were more inclined towards avuncularity compared to their gynephilic counterparts.

Vasey, Pocock, and VanderLaan (2007) compared the altruistic tendencies of androphilic and gynephilic males in the non-Western Polynesian island nation of Independent Samoa using similar methods to those employed by previous researchers working in the US and England (Bobrow & Bailey, 2001; Rahman & Hull, 2005). In Independent Samoa, androphilic males are referred to as *fa'afafine,* which means "in the manner of a woman." Most *fa'afafine* tend to be effeminate, but they range from extremely feminine to unremarkably masculine, although instances of the latter are rare (Bartlett & Vasey, 2006; Besnier, 2000; Schmidt, 2003; Vasey & Bartlett, 2007). Despite this heterogeneity in gender role presentation, *fa'afafine* are, with very few exceptions, exclusively androphilic, but they do not engage in sexual activity with each other. Instead, *fa'afafine* are attracted to, and engage in sexual interactions with, masculine males who self-identify as "straight men" (Bartlett & Vasey, 2006; Danielsson, Danielsson, & Pierson, 1978).

In a Samoan cultural context, "straight men" are those who self-identify as men and are masculine with respect to 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 informed us that most straight men in Samoa have engaged in sexual interactions with *fa'afafine* at least once in their lives (see also Croall & Wunderman, 1999).

In contrast to research conducted in Western settings, Vasey et al. (2007) found that *fa'afafine* reported significantly higher avuncular tendencies relative to straight men in Independent Samoa. These findings are consistent with the basic prediction of the kin selection hypothesis for male androphilia, and raise the possibility that androphilic *fa'afafine* may act as "helper-in-the-nest," caring for nieces and nephews and, by extension, increasing their indirect fitness.

Although their findings were consistent with the basic prediction of the kin selection hypothesis for male androphilia, Vasey et al. (2007) were careful to stress that their results did not provide strong evidence in support of the conclusion that either male androphilia or elevated avuncular tendencies in *fa'afafine* represent specially designed adaptations resulting from past selection over evolutionary time. Rather, they suggested that increased avuncular tendencies by *fa'afafine* might simply reflect a generalized adaptive tendency on the part of all biological males to invest in kin, regardless of their sexual orientations. Some males, such as the *fa'afafine*, may, however, be able to exhibit elevated levels of avuncularity because they have no direct parental care responsibilities. In the Vasey et al. (2007) study, none of the *fa'afafine* participants had children ($n = 38$). In contrast, 58% of the gynephilic men ($n = 43$) who participated in that study had at least one child (range = 0–4). Unfortunately, Vasey et al.'s (2007) samples of gynephilic men with, and without, children were too small to perform the necessary analyses to properly test this hypothesis.

In this article, our goal was to ascertain whether the sexual orientation difference in avuncular tendencies originally reported in Vasey et al. (2007) could be replicated using a larger, independent sample. In addition, we extended previous research by comparing avuncular tendencies in *fa'afafine* with two distinct control groups, namely, gynephilic men with and without children. In conducting these latter comparisons, our aim was to test whether *fa'afafine*'s elevated

avuncular tendencies, if present, could be explained in terms of their lack of direct parental care responsibilities. If so, then avuncular tendencies in *fa'afafine* should not differ significantly from those of gynephilic men without children, but both of these groups should differ significantly for this measure from gynephilic men with children.

Method

Participants

All participants were recruited through a network sampling procedure on the two larger and more populated islands of Independent Samoa: 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), then obtaining referrals from them to additional participants who, in turn, provide further referrals, and so on. The rate of participation for all groups was greater than 90%.

To replicate the study by Vasey et al. (2007), new data were collected from 56 self-identified *fa'afafine* and 95 self-identified straight men that had not been interviewed previously. These data were collected during two field trips (September–October 2006, April–June 2007). Sexual orientation was assessed using Kinsey ratings of sexual feelings over the previous year (Kinsey, Pomeroy, & Martin, 1948). All 56 of these *fa'afafine* described their sexual feelings as exclusively androphilic (Kinsey rating = 6). Of the 95 straight men for whom Kinsey ratings were obtained, 82 (86.3%) described their sexual feelings as exclusively gynephilic (Kinsey rating = 0). Seven (7.4%) reported most sexual feelings toward females, but occasional fantasies about males (Kinsey rating = 1), and six (6.3%) reported most sexual feelings toward females, but some definite sexual feelings about males (Kinsey rating = 2).

In order to obtain sufficiently large sample sizes to compare *fa'afafine*, gynephilic men with no children, and gynephilic men with at least one child, we combined the data from the 56 *fa'afafine* and 95 gynephilic men in the replication sample with data from the sample of 38 *fa'afafine* and 43 gynephilic men interviewed in Vasey et al. (2007). Of the additional 38 *fa'afafine* interviewed in Vasey et al., 37 (97.4%) described their sexual feelings as exclusively androphilic (Kinsey rating = 6), and one (2.6%) reported most sexual feelings toward males, but some definite feelings toward females (Kinsey rating = 4). Of the additional 43 gynephilic men interviewed in Vasey et al., 35 (81.4%) described their sexual feelings as exclusively gynephilic, five (11.6%) reported most sexual feelings toward females, but occasional fantasies about males (Kinsey rating = 1), and three (7%) reported most sexual feelings toward females, but some definite sexual feelings about males (Kinsey rating = 2). After combining these two samples, there were 94 *fa'afafine*, 66 gynephilic men with no children, and 72 gynephilic men with at least one child.

Procedure and Measures

All participants were interviewed using standardized questionnaires. A Samoan-speaking research assistant was present for those interviews for which participants indicated that they preferred to do the interview in Samoan or for 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; Rahman & Hull, 2005; Vasey et al., 2007). The questionnaire included questions about the following basic biographic information: age, sex, sexual orientation identity (i.e., *fa'afafine* or "straight" man), highest level of education received (i.e., post-secondary, high school, junior high school, and primary school or less), and annual income. Data on the participants' annual incomes were converted to American dollars (USD). 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 (Kinsey et al., 1948), that the category "males" included straight men and/or *fa'afafine*, whereas the category "females" included women.

Participants were also asked to complete the Avuncular Tendencies Subscale. This subscale is a measurement instrument containing nine items and has been used to quantify willingness to allocate resources to nieces and nephews in previous studies (Bobrow & Bailey, 2001; Rahman & Hull, 2005; Vasey et al., 2007). The nine items of the Avuncular Tendencies Subscale are as follows: babysitting for an evening, babysitting on a regular basis, taking care of the children for a week while their parents are away, buying toys for the children, tutoring one of the children in a subject you know well, helping to expose the children to art and music, contributing money for daycare, contributing money for the children's medical expenses, and contributing money for the children's education. For each item, participants were asked to rate whether they would be willing to exhibit the behavior towards nieces and nephews that were the children of a sibling with whom they were emotionally close and who lived nearby. Responses to these items were based on a 7-point Likert-type scale that ranged from 1 = "Strongly Disagree" to 7 = "Strongly Agree." Participants' avuncular

tendencies scores were calculated as the mean rating given to the nine items.

In keeping with our previous study (Vasey et al., 2007), ordinal data were analyzed using a general linear model (GLM) for an ordinal multi-way frequency analysis (see Vokey, 2003).

Results

Replication Study

Table 1 summarizes results of the replication portion of the present study. Internal consistency reliabilities, standardized item *alpha* (α), were computed for both *fa'afafine* and gynephilic men on the Avuncular Tendencies Subscale. Reliabilities were high on this subscale for both groups (*fa'afafine*: $\alpha = .85$; gynephilic men: $\alpha = .88$). Two-tailed independent *t*-tests revealed that *fa'afafine* and gynephilic men did not differ in terms of age or annual income. A GLM showed that *fa'afafine* and gynephilic men did not differ in terms of the highest level of education they received ($G_1^2 = .001$, *ns*). *Fa'afafine* exhibited greater avuncular tendencies than gynephilic men. A Cohen's *d* indicated a moderate effect size difference between *fa'afafine* and gynephilic men for avuncular tendencies ($d = .57$).

Comparison of *Fa'afafine*, Gynephilic Men with No Children, and Gynephilic Men with at Least One Child

Table 2 summarizes results of the comparisons of *fa'afafine*, gynephilic men with no children, and gynephilic men with at least one child. Internal consistency reliabilities, standardized item *alpha* (α), were computed for *fa'afafine*, gynephilic men without children, and gynephilic men with at least one child (range = 1–12) on the Avuncular Tendencies Subscale. Reliabilities were high for all three groups on this subscale (*fa'afafine*: $\alpha = .84$; gynephilic men with no children: $\alpha = .83$; gynephilic men with at least one child: $\alpha = .91$).

An analysis of variance (ANOVA) indicated a main effect of group for age of participant. Post-hoc Fisher's Least Significant Difference (LSD) revealed that *fa'afafine* were significantly older than gynephilic men with no children ($p < .001$), but significantly younger than gynephilic men with at least one child ($p < .001$). Gynephilic men with at least one child were significantly older than gynephilic men with no children ($p < .001$). An ANOVA indicated a main effect of group for annual income. Post-hoc Fisher's LSD revealed that *fa'afafine* had significantly higher annual incomes than gynephilic men with no children ($p < .001$), but did not differ in this regard from gynephilic men with at least one child. Gynephilic men with at least one child had significantly higher annual incomes than gynephilic men with no children ($p = .002$). A GLM showed that *fa'afafine* and gynephilic men did not differ in terms of the highest level of education they received ($G_2^2 = 1.53$, *ns*).

An analysis of covariance (ANCOVA) was performed with Avuncular Tendencies as the dependent variable, group as the fixed factor, and with age and annual income as covariates. This analysis revealed a main effect of group. Post-hoc Fisher's LSD revealed that *fa'afafine* had significantly higher avuncular tendencies scores relative to gynephilic men without children ($p = .001$; Cohen's $d = .65$) and gynephilic men with at least one child ($p = .001$; Cohen's $d = .56$). The two groups of gynephilic men did not differ significantly from each other (Cohen's $d = .01$).

Comparative data on individual Avuncular Tendencies Subscale items for *fa'afafine*, gynephilic men with no children, and gynephilic men with at least one child are presented in Table 3.

A two-tailed Pearson's *r* correlation indicated no significant relationship between avuncular tendencies and number of children parented among gynephilic men ($n = 138$, $r = .02$, $p = .81$).

Partial correlations between avuncular tendencies and age, controlling for income, were calculated for each participant group. There was no significant relationship between these variables for *fa'afafine* ($r = .07, df = 91, p = .52$), gynephilic men without children ($r = .20$, $df = 63$, $p = .12$),

Table 1 Replication sample: results summary

	Fa'afafine ($n = 56$)		Gynephilic men ($n = 95$)		Two-tailed *t*-test		
	M	*SD*	*M*	*SD*	*t*[a]	*df*	*p*
Age (in years)	27.95	5.96	27.82	8.66	<1[b]	145.31	*ns*
Income (USD)	6099.11	9496.57	3661.42	3712.77	1.84[c]	65.05	.07
Avuncular tendencies	6.27	1.04	5.62	1.30	3.49[d]	135.66	.001

[a] Between group equality of variances not assumed

[b] Levene's test for equality of variances, $F = 5.85$, $p = .017$

[c] Levene's test for equality of variances, $F = 4.08$, $p = .045$

[d] Levene's test for equality of variances, $F = 5.49$, $p = .02$

Table 2 Combined sample: results summary

	Fa'afafine ($n = 94$)		Gynephilic men with no children ($n = 66$)		Gynephilic men with at least one child ($n = 72$)		Analysis of variance[a]		
	M	*SD*	*M*	*SD*	*M*	*SD*	*F*	df_{within}	*p*
Age (in years)[c,d,e]	29.48	7.31	21.88	4.22	33.39	7.48	53.33	229	<.001
Income (USD)[c,e]	5956.36	7980.22	2400.50	3517.59	5636.10	5096.89	7.42	229	.001
Avuncular tendencies[b,c,d]	6.20	.92	5.56	1.06	5.55	1.37	9.18	227	<.001

[a] Between-groups $df = 2$ for all analyses

[b] Groups were compared using ANCOVA with age and income included in the model as covariates

[c] Statistically significant difference ($p < .05$) between *fa'afafine* and gynephilic men with no children

[d] Statistically significant difference ($p < .05$) between *fa'afafine* and gynephilic men with at least one child

[e] Statistically significant difference ($p < .05$) between gynephilic men with no children and gynephilic men with at least one child

Table 3 Individual Avuncular Tendencies Subscale items for *fa'afafine*, gynephilic men with no children, and gynephilic men with at least one child, controlling for age and income: results summary

Act	*Fa'afafine* ($n = 94$)		Gynephilic men with no children ($n = 66$)		Gynephilic men with at least one child ($n = 72$)		$F_{2, 227}$	*p*
	M	*SD*	*M*	*SD*	*M*	*SD*		
Babysitting for an evening[a]	6.36	1.35	5.53	1.89	5.84	1.89	4.10	.018
Babysitting on a regular basis[a,b]	5.51	2.01	4.55	2.19	4.90	2.12	3.64	.028
Taking care of the children for a week while their parents are away[a,b]	5.71	1.89	4.77	2.22	4.81	2.30	4.96	.008
Buying toys for the children[a,b]	6.26	1.44	5.36	1.76	5.67	1.67	6.09	.003
Tutoring one of the children in a subject you know well[b]	6.64	0.79	6.36	1.10	6.00	1.70	4.57	.011
Helping to expose the children to art and music[b,c]	6.47	1.16	6.26	1.13	5.45	1.93	8.40	<.001
Contributing money for daycare	5.73	1.80	5.18	1.75	5.17	1.79	2.60	*ns*
Contributing money for the children's medical expenses[a]	6.49	1.17	6.08	1.29	6.10	1.44	2.75	*ns*
Contributing money for the children's education[a,b]	6.67	0.87	5.95	1.41	5.97	1.54	8.54	<.001

[a] Statistically significant difference ($p < .05$) between *fa'afafine* and gynephilic men with no children

[b] Statistically significant difference ($p < .05$) between *fa'afafine* and gynephilic men with at least one child

[c] Statistically significant difference ($p < .05$) between gynephilic men with no children and gynephilic men with at least one child

or gynephilic men with at least one child ($r = -.20, df = 69, p = .10$).

Also, partial correlations between avuncular tendencies and income, controlling for age, were calculated for each participant group. There was also no significant relationship between these variables for *fa'afafine* ($r = -.06, df = 91, p = .57$), gynephilic men without children ($r = .16, df = 63, p = .22$), or gynephilic men with at least one child ($r = .04, df = 69, p = .73$).

Discussion

In contrast to research conducted in Western countries (Bobrow & Bailey, 2001; Rahman & Hull, 2005), Vasey et al. (2007) showed that androphilic males (*fa'afafine*) reported significantly greater avuncular tendencies than gynephilic males ("straight men") in the Polynesian island nation of Independent Samoa. In this study, we replicated this sexual orientation difference in avuncular tendencies using a larger, independent sample. This replication suggests that the documented sexual orientation difference in avuncular tendencies in Independent Samoa is genuine and not the result of sampling bias. This finding is consistent with the kin selection hypothesis prediction that androphilic males should direct more altruism toward kin than gynephilic males.

A number of potentially interrelated proximate factors might account for why the avuncular tendency results obtained for androphilic males (*fa'afafine*) in this study and Vasey et al. (2007) differed from those conducted in Western countries (Bobrow & Bailey, 2001; Rahman & Hull, 2005), despite the fact that all employed very similar methodologies. To begin with, Independent Samoa is a relatively tiny nation consisting of four populated islands, which are closely

situated (2,934 km^2 total; Lal & Fortune, 2000). Owing to its small size, *fa'afafine* may be more geographically connected to their kin compared to androphilic men in Western cultures.

Second, the family unit, or *aiga* (extended family), is of great importance to Samoans (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). Due to the "sociocentric" manner in which Samoans organize familial relationships and patterns of residency (Mageo, 1998; Tiffany, 1975), *fa'afafine* may be more socially connected to their kin compared to androphilic men living in Western cultures, which are generally recognized as being more "egocentric" (Mageo, 1998) or individualistic (Hofstede, 1980).

Third, most *fa'afafine* enjoy a high level of acceptance within their families and within Samoan society in general (e.g., Bartlett & Vasey, 2006; Croall & Wunderman, 1999; Danielsson et al., 1978; Mageo, 1996; Vasey & Bartlett, 2007). It would be an over-statement to say that *fa'afafine* never experience *any* discrimination (Schmidt, 2003; Vasey & Bartlett, 2007). Nevertheless, the level of societal acceptance they enjoy, the manner in which they are integrated into the quotidian fabric of Samoan life, and their highly public presence stand in stark contrast to their Western counterparts for whom widespread discrimination is the norm (e.g., Cochran, Stewart, Ginzler, & Cauce, 2002; Namaste, 2000). Indeed, it was not uncommon to hear family members comment on how fortunate they were to have a *fa'afafine* in the family. As one woman stated:

> Sometimes we joke with the mothers of *fa'afafine* and we say "You're so lucky to have a *fa'afafine* son," because they do everything in the house and they do everything for the *fa'alavelave*.[2] Say for a wedding he'll [the *fa'afafine*] be the one cleaning and decorating the church even if he is working another job and he'll contribute money too. He'll do the gowns and the cake.

Another woman we spoke to recounted with sadness the story of her *fa'afafine* cousin who married a woman after being pressured by his church to do so.

> Samoan woman: His sisters felt they lost him. His mother *refused* to believe it when he said he had a girlfriend. The mother told him to stop. It took months for her to accept it. We loved him dearly and we were all very sad he turned into a boy. He doesn't act like a girl now and we can't sleep in the same bed with him. We don't know how to act with him now.
> Interviewer: Why did he turn into a boy?
> Samoan woman: He joined a different church and became "born again" and his church wanted him to be "straight." The church says they are this big evil, but how ironic is that? They help the community *so* much. They do fundraising all the time.
> Interviewer: Does he still have sex with men?
> Samoan woman (smiling): Well, up until the day of the wedding, they [the bride and groom] never kissed, so what do you think?

The preceding dialog illustrates how gaining a man as a relative at the expense of a *fa'afafine* is perceived by some Samoans as a net loss, not a net gain. Given this high level of social acceptance, estrangement of androphilic males from their families may be less likely in a Samoan cultural context (Besnier, 1994; Croall & Wunderman, 1999; Danielsson et al., 1978; Vasey & Bartlett, 2007) when compared to many Western settings, in which hostile attitudes towards androphilic males are more common (Fone, 2000).

Fourth, in Independent Samoa, almost all *fa'afafine* exhibit *transgendered male androphilia,*[3] not *egalitarian male androphilia.*[4] Archeological evidence suggestive of transgendered male androphilia has been documented (Knüsel & Ripley, 2000) and it is known to occur in a wide variety of cultural regions (e.g., North America: Williams, 1992; Central America: Chiñas, 1995; South America: Kulick, 1998; Africa: Brooks & Bocahut, 1998; Middle East: Wikan, 1977; India: Nanda, 1998; South-east Asia: Coleman, Colgan, & Gooren, 1992; Graham, 2004; Johnson, 1997; Koon, 2002; Polynesia: Besnier, 1994). In contrast, egalitarian male androphilia appears, with very few exceptions, to be a historically recent phenomenon that is quite rare outside of Western settings (e.g., Greenberg, 1988; Murray, 2000). For reasons that remain unclear, transgendered male androphiles are often described by the gender-normative members of their societies as being superior to men and women in terms of various labor practices, often combining the best that both sexes have to offer (Herdt, 1994; Williams, 1992). For example, one woman stated: "A *fa'afafine* is more responsible than a son or a daughter. They contribute more to the family. *Everyone* knows that." Thus, it is possible that the greater avuncular tendencies of *fa'afafine* are somehow tied

[2] The word *fa'alavelave* can be translated in several ways, but is commonly used to imply "trouble." A *fa'alavelave* is a traditional event (i.e., a wedding, a funeral, the opening of a new church) that involves very costly economic contributions (i.e., money, food, livestock) or time-consuming ceremonial activities by the families involved (e.g., decorating a church, sewing special clothing).

[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.

[4] *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 they treat each other as equals.

to their status as transgendered male androphiles, whereas this relationship is lacking in the West among egalitarian male androphiles who tend to be more gender normative, relatively speaking.

Alternatively, it is possible that femininity, not transgendered status, per se, is the important proximate factor influencing elevated avuncularity among the *fa'afafine*. Numerous researchers have reported that Samoan women are more involved in childcare activity compared to men (Freeman, 1983; Holmes, 1987; Nardi, 1983; Ochs, 1982; Ritchie & Ritchie, 1983). This raises the possibility that Samoan *fa'afafine,* who behave "in the manner of a woman," might follow culturally-specific feminine gender roles with respect to the care of nieces and nephews. If so, then *fa'afafine's* avuncular tendency scores should be relatively similar to the materteral tendency scores of a feminine class of individuals who also lack direct parental care responsibilities, namely, women without children. At the same time, both of these groups should differ for these measures from more masculine individuals (i.e., gynephilic men with and without children). Future research will be needed to assess this possibility.

In this study, we examined whether *fa'afafine*'s elevated avuncular tendencies were simply owing to the fact that, unlike some gynephilic men, they have no children and, thus, no direct parental care responsibilities. To test this possibility, we compared the avuncular tendencies of *fa'afafine* with gynephilic men whose familial circumstances afforded them similar opportunities to invest in kin (i.e., gynephilic men without children). If direct childcare constrains avuncular tendencies, then *fa'afafine* and gynephilic men without children should not differ in this regard. However, *fa'afafine* had significantly higher avuncular tendencies even when compared to gynephilic men without children. Gynephilic men with, and without, children did not differ significantly from each other for this measure. As such, it seems unlikely that a lack of direct parental care responsibilities can account for the elevated avuncular tendencies of *fa'afafine*.

Given our finding that *fa'afafine* exhibited greater avuncular tendencies relative to gynephilic men, both with and without children, we assessed whether a certain level of parental responsibilities constrained avuncular tendencies. We did so by testing whether number of children correlated negatively with avuncular tendencies scores among gynephilic men. However, there was no such correlation, which again suggested that parental care responsibilities did not affect willingness to allocate altruism to nieces and nephews.

Taken together, these results were consistent with predictions derived from the kin selection hypothesis that male androphiles should exhibit higher altruistic tendencies towards kin compared to male gynephiles, including those without children. Although our results were consistent with these conclusions, we stress our findings do not provide sufficient evidence to make strong conclusions regarding whether the *fa'afafine's* androphilia reflects an adaptation for promoting kin-directed altruism, and thereby offsetting the fitness costs associated with male androphilia. To ascertain whether this is indeed the case, more research will be needed to determine whether *fa'afafine's* androphilia is characterized by special design features that are indicative of adaptations (see Williams, 1966). Some researchers have argued cogently that male androphilia does *not* appear to be specially designed to facilitate elevated kin-direct altruism. As LeVay (1993) states, "To put it crudely, why do gay men waste so much time cruising each other, time that according to this theory would be better spent baby-sitting their nephews and nieces?" (p. 129). Given this apparent contradiction, some theorists have argued that kin selection theory has little explanatory power in terms of the origin of male androphila, but rather is better suited to explaining the existence of asexual individuals or those that actively choose to be celibate (Dickemann, 1995). Although all these groups could be characterized as "non-reproductive" morphs, asexuals and celibates do not invest time or energy in mating effort, whereas male androphiles often do (Saghir & Robins, 1973). As such, asexuals and celibates have more time and energy to invest in kin relative to male androphiles. In line with this reasoning, asexuals or celibates should exhibit elevated kin-directed altruism compared to male androphiles. Future research will be needed to ascertain whether this is indeed the case.

We also stress that our findings do *not* provide sufficient evidence to make strong conclusions regarding whether the *fa'afafine's* elevated avuncular tendencies reflect an adaptation to increase the fitness of kin, and thereby offset the fitness costs associated with male androphilia. To ascertain whether this is indeed the case, more research will be needed to determine whether *fa'afafine's* elevated avuncular tendencies are characterized by special design features that are indicative of adaptations (see Williams, 1966). Some authors have expressed doubt that kin-directed altruism as expressed by androphlic males in real world situations could ever be sufficient to offset the costs associated with not reproducing directly (e.g., Bailey, 2003). Individuals share more genes with their sons and daughters than with nieces and nephews. On average, humans share 50% of their genes with offspring and 25% of their genes with nieces and nephews in populations that mate randomly and are previously outbred (Haldane, 1955; Hamilton, 1963). As such, if an increased tendency towards avuncularity is the sole factor contributing to the evolution and maintenance of male androphilia, then *fa'afafine's* avuncularity would have to be sufficient to compensate for the fitness costs associated with not reproducing directly. Theoretically speaking, for every offspring that an androphilic male failed to produce directly, he would need to compensate for this by facilitating the production of, on average, two additional nieces and/or nephews that would

not otherwise have existed (Haldane, 1955; Hamilton, 1963). From this perspective, it would seem that *fa'afafine* would have to be "super" uncles, dispensing a much greater quantity of avuncular behavior so that their inclusive fitness would be on par with that of gynephilic men (Bailey, 2003). The difference in mean avuncular tendencies observed between *fa'afafine* and gynephilic men was significant, but the effect size was not large. This raises the question of whether moderate increases in avuncular tendencies, as exhibited by *fa'afafine*, are sufficient to make up for the costs associated with not reproducing directly. Future research will be needed to address this question.

Alternatively, quality of avuncular tendencies may be more important than quantity, such that certain kinds of avuncular altruism may result in relatively large fitness gains for both the recipient and the donor. If so, then the significant, but moderate effect size differences in mean avuncular tendencies observed between *fa'afafine* and gynephilic men becomes less of an issue when attempting to account for this pattern within an adaptationist framework. Research from another Pacific island locale, Ifaluk atoll in Yap, Federated States of Micronesia, suggests that moderate increases in particular types of kin directed altruism (e.g., food sharing) by non-reproductive kin (i.e., first and second born pre-reproductive daughters) can have significant fitness effects for reproductively active kin (i.e., mothers; Turke, 1988). In order to evaluate whether the quality of avuncularity is more evolutionarily important than the quantity, it will be necessary to undertake appraisals of the fitness-related benefits accrued by kin as a result of particular types of avuncular altruism that are actually expressed by their androphilic male relatives.

In conclusion, although our results were consistent with some of the basic predictions of the kin selection hypothesis for male androphilia, it is possible that androphilia in *fa'afafine* does not represent an evolved adaptation for increasing kin directed altruism. Likewise, it is equally possible that elevated avuncular tendencies do not represent an evolved adaptation for offsetting the reproductive cost of male androphilia. Despite all this, the *fa'afafine's* elevated avuncular tendencies may, nevertheless, contribute to the fitness of genetic factors underlying male androphilia. Camperio Ciani, Corna, and Capiluppi (2004) reported that the female maternal relatives (i.e., mothers, grandmothers, aunts) of androphilic men exhibit greater fecundity compared to the female maternal relatives of gynephilic men in an Italian sample (see also Camperio Ciani, Cermelli, & Zanzotto, 2008; Iemmola & Camperio Ciani, 2008). Other studies have reported elevated fecundity for the mothers (King et al., 2005; Rahman et al., 2008), maternal grandmothers (McKnight & Malcolm, 2000) and maternal aunts (Bailey et al., 1999; Rahman et al., 2008; Turner, 1995) of androphilic males relative to their gynephilic counterparts. Vasey and VanderLaan (2007a, 2007b) reported that the mothers of *fa'afafine* were significantly more fecund than those of gynephilic men. These findings raise the possibility that reproductive costs associated with genes for male androphilia may be offset by the reproductive benefits that occur if the same genetic factors result in increased reproductive success among female kin. From this perspective, male androphilia, could be conceptualized as a by-product of an adaptation[5] (sensu Buss, Haselton, Shackelford, Bleske, & Wakefield, 1998; Gould & Vrba, 1982) for increased female fecundity. In such a situation, increased avuncularity among male androphiles could potentially facilitate reproduction by female kin and thereby have positive effects (sensu Williams, 1966) on the genetic factors for both increased fecundity in females and, by extension, its conjectured by-product, male androphilia. Williams (1966) invoked the term "effect" to designate the fortuitous operation of a useful character not built by selection for its current role (for further discussion, see Gould & Vrba, 1982). Clearly, more research will be needed to test these various evolutionary perspectives on the origins and maintenance of male androphilia.

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[5] By-products of adaptations are characteristics that evolve in association with particular adaptations because they happen to be coupled with those adaptations (Buss et al., 1998). Although they may have some beneficial effect on fitness, they did not evolve to solve adaptive problems, and thus, do not have an evolved fitness-enhancing function and are not products of natural selection.

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