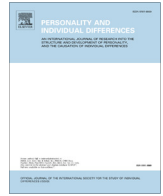




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## Elevated childhood separation anxiety: An early developmental expression of heightened concern for kin in homosexual men? <sup>☆</sup>



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### ABSTRACT

This study presents data bearing on an evolutionary developmental model of male homosexuality. This model hypothesizes that a predisposition toward elevated kin-directed altruism among homosexual males is expressed in childhood as elevated concern for close attachment figures (e.g., parents) and proximally influenced by the concomitant behavioral expression of femininity. We examined whether homosexual males recalled such elevated concern for parents during childhood and considered its association with recalled childhood gender behavior. Heterosexual and homosexual males and females ( $N = 524$ ) provided measures of recalled childhood gender behavior, concern about parental wellbeing, and other potential sources of separation anxiety. Heterosexual males experienced significantly less anxiety about parental wellbeing than all other groups. Recalled separation anxiety was positively correlated with childhood femininity for heterosexual females and homosexual males. The heterosexual sex and male sexual orientation differences in concern about parental wellbeing were accounted for by childhood feminine behavior. These findings are consistent with the proposed evolutionary developmental model. We discuss possible proximate influences that facilitate the development of this putative evolved predisposition toward elevated kin-directed altruism among homosexual males as well as limitations and future directions.

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### 1. Introduction

Male homosexuality is partially influenced by genes (Alanko et al., 2010), but also reduces reproduction (Schwartz, Kim, Kolundzija, Rieger, & Sanders, 2010). The kin selection hypothesis (Wilson, 1975) posits that these genes nevertheless persist because homosexual males behave altruistically toward close genetic relatives, thereby increasing kin's reproduction and passing on these genes indirectly. Consistent with this hypothesis, Samoan *fa'afafine* (i.e., same-sex attracted transgendered males) report greater altruistic tendencies toward kin compared to Samoan men and women; however, Western and Japanese gay men do not report elevated kin-directed altruism (reviewed in Vasey & VanderLaan, 2014).

To shed light on these cross-cultural discrepancies, VanderLaan, Gothreau, Bartlett, and Vasey (2011a) proposed an evolutionary developmental model informed by cross-cultural research on childhood separation anxiety (i.e., distress associated with separa-

tion from attachment figures). Elevated attachment to kin is important for motivating kin-directed altruism (reviewed in VanderLaan et al., 2011a). Despite discrepancies in kin-directed altruism between transgendered Samoan *fa'afafine* and relatively more masculine Western and Japanese males who identify as gay men, same-sex attracted males who recall being more female-typical as children appear to experience elevated attachment to kin during childhood. Samoan *fa'afafine* recalled elevated separation anxiety compared to men and women (Vasey, VanderLaan, Gothreau, & Bartlett, 2011) while Canadian homosexual men recalled more separation anxiety than heterosexual men (VanderLaan, Gothreau, Bartlett, & Vasey, 2011b). Similarly, in a clinical sample of boys, more extreme cross-sex behavior and identity was associated with elevated traits of separation anxiety (Zucker, Bradley, & Lowry Sullivan, 1996).

Based on this information, VanderLaan et al. (2011a) hypothesized that, across cultures, feminine boys who exhibit same-sex attraction as adults experience elevated childhood separation anxiety as an early developmental expression of elevated kin-directed altruism. In a Canadian sample of heterosexual and homosexual men and women, the current study tested two predictions derived from this hypothesis to provide an initial assessment of whether

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VanderLaan et al.'s model is tenable. The first prediction was that if elevated separation anxiety is an early developmental expression of elevated kin-directed altruism, then same-sex attracted males should be especially prone to worrying about the wellbeing of close relatives during childhood given their heavy reliance on kin for genetic fitness. In contrast, other potential sources of separation anxiety (e.g., going to school) would be less likely to produce a male sexual orientation difference because they are not as directly relevant to kin's wellbeing and, thus, indirect fitness. The second prediction was that positive associations between recalled feminine childhood behavior and recalled separation anxiety should mediate and account for group differences in recalled separation anxiety.

## 2. Material and methods

### 2.1. Participant recruitment

An online survey was advertised to Canadian men and women 18 years of age and older via 757 Canadian university distribution lists and community organizations, and through Facebook. The advertisement stated the survey was about family relationships and mental health. Participants ( $N = 676$ ) provided informed consent prior to participating.

### 2.2. Measures

Questionnaire items regarding biographic information, sexual orientation, childhood gendered behavior, and recalled childhood separation anxiety were included. Biographic information included age, socioeconomic status during childhood, annual income, level of education completed, religious affiliation, religiosity, ethnicity, and region of residence.

A Kinsey scale assessed sexual orientation. Participants described their sexual feelings over the last year (ranging from 0—"Sexual feelings toward the opposite sex only" to 6—"Sexual feelings toward the same sex only," as well as the option of "No sexual feelings"). Ratings of 0 or 1 were classified as heterosexual; ratings of 5 or 6 were classified as homosexual. Data from 18 men and 127 women who rated 2–4 were removed and considered in a separate, exploratory study because there were no clear predictions regarding bisexual individuals. Seven women who reported no sexual feelings were also removed. The final sample included 524 participants. Of the 121 men who rated as 0 or 1, 100 (82.6%) rated as 0, and of the 148 men who rated as 5 or 6, 113 (76.4%) rated as 6. Of the 170 women who rated as 0 or 1, 106 (62.4%) rated as 0, and of the 85 women who rated as 5 or 6, 49 (57.6%) rated as 6.

The Childhood Gender Identity Scale (CGIS), a previously validated measure (Johnson et al., 2004), measured male- and female-Typical behavior prior to 12 years of age. The CGIS consists of a Female-Typical Behavior Subscale (e.g., "Play with girls' toys and girls' games") and a Male-Typical Behavior Subscale (e.g., "Play with boys' toys and boys' games"). The response scale ranged from 1—"Never" to 5—"Always/All the Time." Mean scores for the items were calculated for each subscale.

Separation anxiety was assessed through a measure based on Separation Anxiety Disorder (SAD) criteria listed in the Diagnostic and Statistical Manual-IV-TR (DSM-IV-TR) (American Psychiatric Association., 2000). Scales based on these diagnostic criteria provide good discrimination of separation anxiety severity (Cooper-Vince, Emmert-Aronson, Pincus, & Comer, 2013) and show high internal consistency and test-retest reliability (Essau, Anastasiou-Hadjicharalambous, & Muñoz, 2013). The Separation Anxiety Scale (SAS) used in previous research (VanderLaan et al., 2011b) employed eight items related to SAD criteria. This measure was ex-

panded to include more items related to anxiety resulting from concern for parents (Appendix A) and is named the SAS-revised, containing two subscales: the Worry Subscale (i.e., worry about the wellbeing of parents), and the Separation Subscale (i.e., other sources of separation anxiety).

Standardized inter-item reliabilities (*alphas*) for these subscales are presented in Table 2.

### 2.3. Covariates

Descriptive statistics for biographic variables are presented in Table 1. One way analyses of variance (ANOVAs) showed that groups differed significantly for age,  $F(3, 523) = 8.31, p < .001$ , education,  $F(3, 523) = 4.83, p = .003$ , religiosity,  $F(3, 523) = 6.29, p < .001$ , annual income,  $F(3, 523) = 7.22, p < .001$ , region,  $\chi^2(9) = 25.07, p = .003$ , and method of recruitment,  $\chi^2(6) = 39.38, p < .001$ . These items were, therefore, included as covariates in all subsequent inferential analyses.

### 2.4. Statistical analysis

Between-group comparisons were performed using analysis of covariance (ANCOVA). To limit Type I Error, post-hoc direct group comparisons were performed using Fisher's protected test, which entails performing direct between group comparisons using Fisher's Least Significant Difference (LSD) when the omnibus ANCOVA reveals a significant effect of group. Post-hoc within-group comparisons of subscale scores were performed using paired *t*-tests. These statistical procedures are appropriate when evaluating *a priori* predictions (Saville, 1990), as is the case here.

## 3. Results

### 3.1. Separation anxiety

A two-way mixed model (Group x Subscale) ANCOVA revealed a significant interaction,  $F(3, 514) = 2.95, p = .032$ . Within groups, scores were higher on the Worry than on the Separation Subscale (heterosexual males,  $t(120) = 9.23, p < .001$ ; heterosexual females,  $t(169) = 12.70, p < .001$ ; homosexual males,  $t(147) = 12.77, p < .001$ ; homosexual females,  $t(84) = 9.14, p < .001$ ). A one-way ANCOVA testing the effect of group for the Separation Subscale was not significant,  $F(3, 514) = .92, p = .429$ . For the Worry Subscale, a statistically significant effect of group was found using a one-way ANCOVA,  $F(3, 514) = 4.25, p = .006$ . Fisher's LSD showed that heterosexual males scored significantly lower on the Worry Subscale than all other groups (Table 3).

### 3.2. Childhood gender behavior

A two-way mixed model (Group x Subscale) ANCOVA revealed a significant interaction,  $F(3, 514) = 227.48, p < .001$ . Within groups, heterosexual males scored significantly higher on the Male-Typical Behavior Subscale,  $t(120) = -35.88, p < .001$ ; homosexual males scored significantly higher on the Male-Typical Behavior Subscale,  $t(147) = -12.78, p < .001$ ; heterosexual females scored significantly higher on the Female-Typical Behavior Subscale,  $t(169) = 15.37, p < .001$ . A one-way ANCOVA testing the effect of group for the Female-Typical Behavior Subscale was significant,  $F(3, 514) = 253.75, p < .001$ . Fisher's LSD showed that heterosexual males scored significantly lower than all other groups. Heterosexual females scored significantly higher than homosexual individuals. Homosexual females scored significantly higher than homosexual males. A one-way ANCOVA testing the effect of group for the Male-Typical Behavior Subscale was significant,  $F(3, 514) = 128.61, p < .001$ . Het-

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