

FACTORS INFLUENCING PARENTAL INVESTMENT:
DOES PARENTAL FINANCIAL ALLOCATION VARY AS A FUNCTION OF
PERCEIVED CHILD SEXUAL ORIENTATION?

A THESIS

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ABSTRACT

An evolutionary perspective on parental investment suggests that natural selection might have favored mechanisms by which parents can evaluate the likelihood of a given offspring's chances of successful reproduction. Adopting such a perspective, an online survey-based monetary allocation task was employed to test the hypothesis that parental investment was positively related to likelihood of offspring heterosexuality, such that vignettes describing heterosexual offspring would receive more money than vignettes describing homosexual offspring. Results did not support this hypothesis, as investment in offspring was unrelated to perceived offspring sexual orientation. However, exploratory analyses revealed that increasingly negative attitudes towards lesbians and gays predicted decreased investment in offspring. Such findings could serve to embolden civil rights activists in their struggle for increased LGBT social rights. Future research in this area would benefit from correlational research examining real familial relationships and investment patterns, rather than experimentally simulated relationships, to increase the external validity of findings and to reduce social desirability bias.

INTRODUCTION

While individuals may vary investments across different aspects of living (e.g., work compared to family), they also face investment decisions confined to single aspects of living, such as intrafamilial relationships (e.g., husband-wife compared to father-child). Of particular interest to many researchers in the fields of evolutionary biology and psychology has been investment in children. Such investment has been termed “parental investment” (PI), and has been defined as any investment by a parent to an offspring that increases the offspring’s chances of survival and reproductive success, at the expense of the parent’s ability to invest elsewhere, including in other offspring (Trivers, 1972). However, parental time and energy comes in limited supply, and investment in one offspring frequently detracts from the ability to invest in other offspring (Hertwig, Davis, & Sullo way, 2002). As a result, parents must not only make decisions on how much to invest in family affairs and children, but how much to invest between children as well. The question of how many resources to allocate to offspring then becomes “how then, should parents distribute their limited resources *among* their offspring?” (emphasis added, Hertwig et al., 2002, p. 729). Simply stated, what factors influence the degree of parental investment?

Perspectives on Parental Investment

Social Psychology: Identity Theory

While social psychologists have not necessarily addressed differential investment between offspring, they have addressed factors that might influence parental investment across offspring. In general, identity theorists suggest that the “self,” or how an individual defines himself or herself, consists of varying identities and roles, such as father-child, or

husband-wife (Fox & Bruce, 2001). External feedback from others is also believed to be critical in shaping how an individual behaves in a particular role (Stryker, in Fox & Bruce, 2001). With specific regards to investment decisions in children, Fox and Bruce (2001) demonstrated that father-role salience, satisfaction in the role, and reflected appraisals of father-role performance were positively correlated with paternal investment. Importantly, these findings remained even after controlling for socio-demographic variables such as father age, race, education, income, and history of father-child co-residence. However, identity theory encounters two key limitations in its ability to fully explain observed patterns in parental investment. First, identity theorists mainly address male (paternal) investment, but fail to address maternal investment. Second, identity theory fails to explain how or why parents, including mothers, might consistently and predictably invest differentially between offspring – a well-documented phenomenon known as “parental favoritism” (Buss, 2012).

Economics: The Equity Heuristic

Unlike identity theory, economic theories have attempted to account for parental favoritism. One perspective assumes that parents will invest in offspring based on that offspring’s potential to accrue wealth into adulthood (Becker & Tomes, 1976). Parents should therefore seek to maximize their “parental payoff,” or the overall quality of the child, via parental favoritism. If some children demonstrate higher quality potential, parents should bias investment in favor of those children. However, this perspective has received substantial criticism for its psychological implausibility (Elster, 1997). Specifically, parents would have to perform complex calculations of the likelihood of future events, in addition to converting every offspring action into a common currency

(Hertwig et al., 2002). Such difficulties have prevented this type of analysis from being applied to psychological studies of parental investment.

A separate model, called the “equity heuristic,” proposes that parental favoritism occurs even if parents deliberately divide their resources equally between all of their children. Specifically, Hertwig et al. (2002) have identified three sources of “resource handicaps” that occurred as a function of family size and birth order. Taking a family size of three or more, the “middleborn resource handicap” occurred because the middle child(ren) never had an opportunity to be the only child in the household, and was therefore always splitting parental investment among other siblings (Lindert, 1977). “Earlierborn” and “laterborn” resource handicaps occurred if the nature and/or presence of resources had differing effects during infancy (for the earlier-born) or adolescence (for the later-born). Indeed, as family size increased, Taubman and Behrman (1986) found that earlier-borns relied more heavily on non-parental resources such as loans and scholarships to fund college expenses, since parents were still dividing resources between offspring by the time the first-born attended college. Therefore, later-borns might have a parent-provided economic resource advantage when paying for college when compared to their earlier-born siblings (Steelman & Powell, 1989). Conversely, earlier-borns have frequently been documented to receive greater health-related medical investments (such as vaccinations) than later-borns, due to the undivided care they received as infants (for a summary of studies documenting health-related later-born handicaps, see Hertwig et al., 2002). Thus, as a function of both family size and birth order, investment inequality can arise even when parents attempt to split resources equally among children.

Evolutionary Psychology: Parental Investment Theory (PIT)

While social psychological and economic models have proven valuable in identifying factors associated with parental investment, neither accounts for the apparent reality that males and females do not invest equally in children. Indeed, in upwards of 95% to 97% of mammalian species, males provide minimal direct investment in offspring (Clutton-Brock, 1989, 1991). Cross-cultural data have documented similar phenomena in humans, although human males contribute significantly more paternal investment than the males of our nearest primate relatives, the chimpanzee and bonobo (Geary, 2000). A comprehensive evolutionary approach to parental investment must therefore offer a compelling explanation for both parental favoritism, and maternally biased investment patterns. Given its ability to account for (1) mammalian female-biased parental investment and (2) parental favoritism, an evolutionary perspective on parental investment will be adopted for the remainder of this paper.

Rooted in evolutionary biology, parental investment theory (PIT) seeks to explain extant patterns of parental investment and favoritism across species, as well as maternally-biased investment strategies (Trivers, 1972). Specifically, the sex that invests more in offspring is hypothesized to be (1) choosier when it comes to mating, and (2), less competitive for sexual access to the low-investing sex (Trivers, 1972; Buss, 2012; for counterarguments, see Alexander & Fisher, 2003; Finkel & Eastwick, 2009). Relative to males' sperm, females' eggs are large and costly. Whereas female mammals produce a comparatively small and finite number of mature ova (Zuckerman, 1951; for evidence of postnatal oogenesis, see White, Woods, Takai, Yasushi, Ishihara, Seki, & Tilly, 2012), males produce millions of mature sperm within just a single ejaculate (for recently

documented declines in human sperm concentration, see Rolland, Le Moal, Wagner, Roye`re, & De Mouzon, 2013). In humans, women are also taxed with an approximately 9-month gestation period, whereas minimal male investment is only the time necessary to copulate. Even after conception and childbirth, paternal uncertainty – the probability that another male had fertilized the female’s egg – has the effect of reducing paternal investment because directing resources towards another male’s offspring is reproductively costly (Alcock, 2009; Buss, 2012). This is particularly true in species with internal fertilization, which increases paternal uncertainty (Geary, 2000). Relative to females, males also forgo an increasingly significant number of copulation opportunities in order to provide parental care – a phenomenon called the “mating opportunity cost” (Buss, 2012). Thus, greater initial female investment, coupled with paternity uncertainty and skewed mating opportunity costs against males, may help account for why females, in most mammalian species including humans, provide the majority of parental care.

In accounting for the phenomenon of parental favoritism, an evolutionary approach assumes that natural selection could have favored mechanisms that allow both male and female parents to evaluate the reproductive value of offspring. As stated by evolutionary psychologist David Buss (2012):

...offspring are the vehicles fashioned by selection by which parental genes get transported into future generations. However, not all offspring reproduce. Some are better at survival or have more promising mating prospects and so are better bets for fully transporting the parent’s genes. Some offspring are more likely to benefit from parental care. As a general rule, selection will favor adaptations for *parental care* – the preferential

allocation of investment to one or more offspring at the expense of other forms of allocating investment – that can have the effect of increasing the fitness of the parent. It follows that mechanisms of parental care will favor some offspring over others – a condition called *parental favoritism*. Stated differently, selection will favor the evolution of mechanisms in parents that favor offspring who are likely to provide a higher reproductive return on the investment (Daly & Wilson, 1995). (p 208)

Consequently, parental care should be sensitive to the ability of the offspring to convert parental care into fitness (Alexander, 1979). The question of parental investment in children then becomes “will a given unit of my investment make a difference to the survival and reproduction of my children?” (Buss, 2012, p. 209). If yes, what characteristics make it more or less likely for a child to benefit from parental investment?

Offspring ability to benefit from parental investment. Psychologists Daly and Wilson (1988, 1995) have identified two major factors that enable children to use parental care: (1) the age of the child, and (2) whether or not the child was born with an abnormality. All else being equal, congenitally disabled children have lower reproductive potential than healthy children, and young children have lower reproductive value than older children (Buss, 2012). As a result, documented differences in parental care based on child health and child youth would be consistent with the hypothesis that parental investment varies as a function of child congenital health and child age. What evidence is there that suggests parents invest less in congenitally ill children and young children?

Child congenital health and disabilities. The predominant line of evidence suggesting that parental investment may be a function of child health comes from

decades of data documenting an increased risk of abuse and maltreatment among children with disabilities (for detailed reviews, see Westcott & Jones, 1999; Westcott, 1991; Vig & Kaminer, 2002; Staker & McArthur, 2012). In conjunction with this accumulating literature, recent efforts have focused on increasing awareness of the risk of maltreatment among this subpopulation (Hibbard & Desch, 2007). According to the United States Department of Health and Human Services, the 2010 Federal Child Abuse Prevention and Treatment Act (CAPTA) defines child abuse/neglect as "Any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation" (Child Welfare Information Gateway, 2011). Among children with physical congenital abnormalities (e.g., spina bifida, fibrocystic disease, cleft palate, Down syndrome), anywhere from 7.5% to 60% of children are maltreated, compared to an estimated base rate of 1.5% in the general population (Daly & Wilson, 1981).

Elevated abuse rates were also reported for children with varying disability types that are easily detected at an early age, such as behavioral, speech/language, mental retardation, health, learning, visual, autism (Sullivan & Knutson, 2000a; Spencer, Devereux, Wallace, Sundrum, Shenoy, Bacchus, & Logan, 2005), and hearing (Sullivan & Knutson, 1998). Among children with these varying disabilities, disabled children were found to be approximately 3.4 times more likely to be maltreated than nondisabled peers (Sullivan & Knutson, 2000a). Children and youth with disabilities were also found to be at an increased risk of becoming runaways, particularly with the presence of physical and sexual abuse (Sullivan & Knutson, 2000b). Such information continually suggests a negative correlation between poor child health and parental investment;

parental investment (both physical and emotional) seems to decrease for children with disabilities. It is important to remember that these data deal strictly with physical and developmental disabilities that are believed to honestly reflect decreased ability to convert parental care into fitness (Buss, 2012), instead of relatively superficial injuries and ailments such as the cold, cuts, or bruises.

An additional line of evidence documenting decreased parental investment in disabled children comes from studies of maternal affection. In the United States, twin studies have demonstrated that healthy twins may receive more positive maternal attention (kissing, holding, soothing, talking to, playing with, and gazing) than the less healthy twin (Mann, 1992). This is particularly startling, given that the pervasiveness and dominance of maternal human care over paternal care (Geary, 2000) often renders maternal love as “unconditional.” A similar study on women diagnosed with depression (presumed to have limited “emotional” energy to invest in children) found that premature babies born significantly before completing a 9-month gestational period received significantly less maternal care than non-premature babies. Conversely, women without depression (more “emotional” resources) invested most in premature babies (Beaulieu & Bugental, 2008). Since premature babies are at greater risk of life-threatening health problems than non-premature babies (Saigal & Doyle, 2008), it was presumed that prematurity can suggest a decreased ability to convert parental care into fitness. Overall, these data support the “healthy baby hypothesis,” which suggests that maternal care is dependent on how well the offspring can convert that care into fitness. Finally, the “healthy baby hypothesis” is not mutually exclusive of other alternative explanations that may account for variations in maternal care (Mann, 1992). While these studies on

maltreatment/abuse and decreased maternal care among congenitally ill and disabled children are largely correlational, they nevertheless support the hypothesis that parental care is sensitive to child health.

Child age. Evidence suggesting that age of the child (youth) influences the degree of parental investment in children stems largely from ethnographic studies and a review of the Human Relations Area Files (HRAF) (Daly & Wilson, 1988). For example, ethnographies of the Ayoreo of Bolivia and Paraguay (Bugos & McCarthy, in Daly & Wilson, 1988), and the !Kung of Africa's Kalahari Desert (Howell, in Daly & Wilson, 1988), indicated that infanticide was common when nursing the newborn adversely affected the mother's ability to effectively wean its older sibling. For the !Kung San women, such infanticide rates have been documented to be at least 6 in every 500 live births (Howell, in Daly & Wilson, 1988). Women in the Ayoreo culture have also been documented to commit infanticides due to lack of perceived parental support, the birth of twins, or childhood deformities (Bugos & McCarthy, in Daly & Wilson, 1988) – the last of which is also consistent with previously discussed literature documenting decreased parental investment in children with disabilities.

A review of various world societies described in the HRAF also revealed that infanticide was documented in 39 of 60 societies (Daly & Wilson, 1988). Reasons provided in these descriptions are consistent with the hypothesis that infants and young children have less reproductive potential than their older siblings. For example, women of the Arunta Australian aborigines were documented to commit infanticide if the family was too large and the mother could not afford to nurse another infant (Spencer & Gillen, in Daly & Wilson, 1988). In 56 of 112 studied societies, infanticides were also

documented for reasons pertaining to unfavorable circumstances including the birth of twins, a short birth interval, and lack of maternal resources (Daly & Wilson, 1988). Twenty-one societies had also documented infanticides due to child deformities, which again indicates that parental care may be sensitive to child health as well as child age. Finally, Canadian samples reviewed by Daly and Wilson (1988) revealed that infants were at the greatest risk of being the subjects of homicide, especially at the hands of a stepparent. Infants between the ages of 0 and 2 were over six times more likely to be killed than children ages 3-5. With each progressive year, the rates of child homicide steadily decreased until they are negligible by age 17. Increased self-defense abilities as a child ages failed to account for these data, as nonrelatives (stepparents) were more likely to kill teenagers over members of any other age category (Buss, 2012).

These cross-cultural data on infanticides from ethnographies and meta-analyses of the HRAF cumulatively suggest that infanticide may not simply be an occurrence randomly scattered across societies for unrelated reasons. Instead, documented infanticides seem to be linked to circumstances where the mother and/or family incurs a net cost for providing infant care. In these instances, the consistent choice to kill the youngest child, coupled with the explanations provided by mothers for having committed infanticide, are consistent with the hypothesis that older children have more reproductive potential than their younger siblings.

Child Sexual Orientation

Interestingly, findings suggesting lower levels of parental investment in homosexual children have also been documented, but have yet to be interpreted from an evolutionary perspective. For instance, homosexuals frequently report poor emotional

relationships with either one or both parents. A study by Apperson and McAdoo (1968) found that male homosexuals, relative to their heterosexual peers, perceived their father as being more critical, impatient, and rejecting. Evans (1969) also found that male homosexuals were more likely to report: (1) being less favored over other siblings, (2) hatred towards the father, (3) less acceptance from the father, (4) less respect from the father, and (5) increased fear of physical harm from the father. These findings extend to female homosexuals as well, with both male and female homosexuals reporting further emotional distance and attachment to both parents than did their heterosexual counterparts (Thompson, Schwartz, McCandless, & Edwards, 1973). More recent studies have also supported the findings that homosexuals have poorer parental relationships (Landolt, Bartholomew, Saffrey, Oram, & Perlman, 2004; Seutter & Rovers, 2004), suggesting that increased societal acceptance of homosexuality in recent decades may have not impacted the emotional nature of these relationships. Finally, researchers have consistently documented that homosexuals also experience higher rates of childhood parental physical and emotional *abuse* (Corliss, Cochran, & Mays, 2002; Friedman, Marshal, Guadamuz, Wei, Wong, Saewyc, & Stall, 2011; Roberts, Rosario, Corliss, Koenen, & Austin, 2012; Harry, 1989; Wilson & Widom, 2010). Such findings on physical abuse bear striking similarities to the previously discussed abuse rates in children born with congenital abnormalities.

In addition to increased rates of physical and emotional abuse, homosexuals were also subject to higher rates of attempted and actual suicide (Bagley & Tremblay, 1997, 2000; Savin-Williams, 2001; Wichstrom & Hegna, 2003). Could these rates of suicide have been predicted by difficulty dealing with negative social stigma? While this

explanation may be likely, one interesting study found that elevated rates of suicide were best predicted by parental identifiability of their child as homosexual (D'Augelli, Grossman, Salter, Vasey, Starks, & Sinclair, 2005). In other words, these suicide attempts were best predicted by whether or not the parents were aware of their child's sexuality. Upon finding out that their child was homosexual (frequently via a "coming out" process, by which the child willingly reveals his or her sexuality), parents exhibited increased distress and increased levels of coercion on the child to abandon homosexuality and pursue heterosexual relationships instead (Wisniewski, Robinson, & Deluty, 2010). This phenomenon was particularly strong for biological mothers, and for biological fathers who were still actively contributing resources to the child's development.

These two findings are consistent with Trivers' (1974) parent-offspring conflict theory, which states that parents and children frequently fight and vie over the distribution of resources due to differences in genetic interest. Thus, observed rates of actual and attempted suicide in homosexuals may be indicative of underlying decreased parental investment and increased parent-offspring conflict. Children may therefore be sensitive to the reproductive burden they place on their parents, supporting the controversial hypothesis that suicide is an adaptation that serves to remove individuals who provide a net cost to familial reproductive success. Indeed, an identical and similarly shocking hypothesis has been used to explain elevated suicide levels in the elderly (de Catanzaro, 1991, 1995). On the other hand, suicides among homosexual youth may be strategies to extract extra investment from their parents, that parents are otherwise unwilling to give homosexual offspring. The logic would be as follows: (1) parents detect homosexuality in an offspring, (2) the parents subsequently decrease investment in that

offspring, (3) the child detects this change in parental investment, and (4) the child engages in attempted suicide in an effort to increase parental support against the reproductive interests of the parent, as predicted by the theory of parent-offspring conflict. This is an identical argument hypothesized by Andrews (2006), in an attempt to explain elevated adolescent rates of suicide in general.

Detecting Sexual Orientation

At this time, it is important to address a fundamental distinction between congenital health, youth, and sexual orientation. Unlike poor congenital health (e.g., spina bifida, fibrocystic disease, cleft palate, Down syndrome) and child youth, sexual orientation is much less ostensible; there are relatively few cues that can accurately be used to identify an individual's sexuality (Nicholas, 2004). If parental investment is partly contingent on child sexual orientation in a similar manner as it is to congenital health and child youth, it follows that parents may also be sensitive to cues of potential homosexuality; in other words, sexual orientation is detectable. Consequently, an evolutionary approach predicts that detecting and discerning an individual's sexual orientation would have yielded adaptive benefits to mating and courtship, contributing to an overall ability to detect homosexuality (Gross, Green, Storck, & Vanyur, 1980; Herek, 1991). If this is true, which factors influence perception of sexual orientation?

Research suggests that a variety of visual and informational cues may contribute to the ability to assess sexual orientation. First, behavior that deviated from perceived gender norms was often associated with a non-heterosexual sexual orientation (Duran, Renfro, Waller, & Trafimow, 2007; Wong, McCearry, Carpenter, Engle, & Korchynsky, 1999; Deaux & Lewis, 1984). For men, such behaviors included ballet dancing,

hairstyling, interior design, clothes shopping, an interest in fashion, and divulging emotions, even if these cues may have sometimes lead individuals to incorrectly label a man as homosexual (Bosson, Prewitt-Freilino, & Taylor, 2005). Men who walked with relatively exaggerated hip and shoulder movements were also likely to be perceived as homosexual (Johnson, Gill, Reichman, & Tassinari, 2007). For women, behaviors that have been identified to deviate from gender norms included watching football, hunting, or participating in a construction project, engineering project, or strength-training workout (Bosson et al., 2005). Similar gender-role specific information has successfully been included in vignettes to elicit feelings of homophobia, indicating that vignette-based methodology can be used to characterize someone as likely homosexual (Schope & Eliason, 2004). Compared to women's gender role violations, men's gender role violations seemed to elicit stronger assumptions of homosexuality (Kite & Deaux, 1987; Martin, 1990; McCreary, 1994). Finally, it is important to note that the phenomenon of associating gender non-conformity with homosexuality does not seem to simply be a misconception influenced by cultural mores. Instead, research suggested that gender non-conformity, especially in the childhood years, was significantly and positively associated with increased chances of later adult homosexuality (Bailey & Zucker, 1995; Hamer & Copeland, 1994; for a review, see Bem, 1996).

Second, facial masculinity/femininity was associated with accurately predicting the sexual orientation of individuals (Dunkle & Francis, 1990; Hughes & Bremme, 2011). Specifically, feminized male faces and masculinized female faces were more likely to be perceived as homosexual (Freeman, Johnson, Ambady, & Rule, 2010). Such information stemmed from face shape and texture (Freeman et al., 2010), such as

eyebrow thickness, basal nose width, mouth width (Burton, Bruce, & Dench, 1993 in Hughes & Bremme, 2011), cheekbone size, jaw and chin lines, and brow ridge size (Enlow, 1982, 1990 in Hughes & Bremme, 2011). Additional facial cues stemming from the eyes, facial symmetry, and hairline also increased the probability of correctly identifying homosexual individuals (Rule, Ambady, Adams, & Macrae, 2008). Male homosexuality could also be accurately judged in as quickly as 50 milliseconds, simply by examining a face picture (Rule & Ambady, 2008). Finally, body shape (Johnson et al., 2007), personality type (Nieto, 1996), and even body odor (Lubke, Hoenen, & Pause, 2012) may also be used to ascertain sexual orientation.

Such studies on the ability to detect homosexuality in both men and women suggest that a variety of behavioral, facial, and structural cues can be used to increase the chances of correctly identifying an individual as homosexual (for a review, see Hughes & Bremme, 2011). Therefore, homosexuality is a trait that seems to be partly detectable even without being explicitly divulged by the individual in question. For this reason, it is suspected that parents should not need explicit information on the sexuality of their child to experience biases in parental investment. On the contrary, it is plausible and consistent with the described evidence that information, such as gender conformity/non-conformity, could be enough to arouse a parent's suspicions of his or her child's sexuality.

Current Study

An evolutionary perspective has proven useful in identifying two factors, congenital abnormalities and youth, that contribute to parental investment in humans (Daly & Wilson, 1981, 1988). Support for this conclusion stems primarily from two types of information: (1) high abuse and neglect rates in children with abnormalities, and (2)

high rates of cross-cultural intrafamilial infanticide and child homicide, particularly when families face a paucity of resources. Interestingly, research has identified similarly high rates of physical and emotional abuse and neglect of homosexual children, including elevated rates of actual and attempted suicide, although such information has yet to be interpreted from an evolutionary perspective.

Therefore, the purpose of the current study is to expand upon previous work suggesting that parental investment is sensitive to age and child congenital health by investigating if parental investment is similarly contingent on the likelihood of offspring homosexuality. It has been reliably demonstrated that homosexuals produce less offspring than their heterosexual counterparts (Bell & Weinberg, 1978; Moran, 1972), although some argue over the size of this effect (Strout, 2012). Thus, the reproductive “threat” of a homosexual child is directly pertinent to Alexander’s (1979) argument that parental care should be sensitive to the child’s “ability to convert a given unit of parental care into fitness” (Buss, 2012, p. 219), just as it might be for child congenital health and youth. Therefore, it is not unreasonable to suspect that natural selection might have favored the evolution of mechanisms in parents that bias distribution of resources (both financial and emotional) away from offspring consistently demonstrating elevated homosexual tendencies.

To address this research question, adults 18 years and older were asked to make investments in a monetary allocation task for either themselves or a hypothetical offspring (named either Mark or Ashley) whose sexual orientations were manipulated using brief vignettes (for examples of studies that use financial allocation as a measure of parental investment, see Anderson, Kaplan, & Lancaster, 1999; Smith, Kish, & Crawford,

1987). Specifically, information on same-sex or opposite-sex relationship status was included to explicitly manipulate sexual orientation, and information on gender conformity, such as behaviors, interests, and hobbies, was included to implicitly manipulate sexual orientation. The purpose of manipulating the explicitness of the sexual orientations was to discern whether gender-non-congruent behavior alone was sufficient to affect perception of sexual orientation, and subsequent investments in the money-allocation task. Manipulating both sexual orientation and gender conformity permitted the creation of eight total vignettes that varied as a function of sexual orientation explicitness and sex- four of which described Mark (male), and four of which described Ashley (female).

In the implicitly heterosexual condition, both Mark and Ashley were described as engaging in gender-congruent behaviors (see Appendices C and D). In the explicitly heterosexual condition, additional information was added that they were in opposite-sex relationships. In the implicitly homosexual condition, both Mark and Ashley were described as engaging in gender non-congruent behaviors, while in the explicitly homosexual condition, information was added that they were in same-sex relationships (see Appendices C and D).

Hypotheses

Based on an evolutionary perspective of parental investment, the following relationships were hypothesized:

1. 'Investment Offspring' and 'Perceived Offspring Heterosexuality' are positively correlated.
2. An interaction between 'Vignette Explicitness' and 'Vignette Orientation'

- a. Planned comparisons: Explicit homosexual < implicit homosexual < implicit heterosexual < explicit heterosexual
 - b. Main effect of 'Vignette Orientation' such that Homosexual < Heterosexual (contained in the planned comparisons above).
3. A simple main effect of 'Offspring Sex', such that female homosexuals receive more investment than male homosexuals.

This hypothesis was based on the finding that males, when compared to females, were more likely to be perceived as homosexual upon violating gender norms (Kite & Deaux, 1987; Martin, 1990, and McCreary, 1994, in Bosson et al., 2005).

4. A main effect of 'Participant Sex', such that females invest more than males.

METHOD

Participants

Participants were recruited using five different techniques: (1) an online snowballing technique via email where potential participants were not only asked to take the survey, but also to forward it to additional friends, (2) a campus-wide recruitment email for SUNY New Paltz undergraduates that contained the study link, (3) targeted recruiting of Psychology undergraduates at SUNY New Paltz via the department SONA system, where participants were awarded one research credit-hour for their participation, (4) online Craigslist ads posted in the “volunteers” section under various U.S. cities, and (5) in-person recruiting at George Mason University, where potential participants were given a hard copy of the study information containing the link to the online survey. Of the total 281 participants who began the survey, 14 were excluded from analysis for failing to complete the survey. An additional 45 were excluded from analysis for failing to comply with monetary guidelines during the money allocation task (see Appendix E). Finally, one participant who identified as “bigendered” was removed from analysis.

Remaining participants included in analyses were 221 adults (88 men and 134 women) ranging in age from 18 to 71 years ($M = 34.22$ years, $SD = 15.17$ years). Participants completed the survey separately and anonymously, and were randomly assigned to one of the eight experimental conditions. For a complete record of participant demographic information, see Table 1.

Apparatus and Materials

The research survey was created using SurveyMonkey® software, and was administered using the online SurveyMonkey.com website.

Participant Consent

The first page of the survey contained information debriefing the participant on confidentiality procedures, the voluntary nature of the survey completion, the expected time necessary for survey completion, and a statement of Internal Reviews Board (IRB) approval (see Appendix A).

General Instructions

The purpose of the general instructions (see Appendix B) was to provide the background information necessary for participants to complete the subsequent money-allocation task. Participants were presented with a hypothetical example asking them to imagine having a 17-year-old son or daughter who was a high school senior considering to attend college in one year. For participants assigned to the “male” condition, the child’s name was Mark, and for participants assigned to the “female” condition, the child’s name was Ashley. These general instructions (see Appendix B) were the same for all participants, except for the name and apparent sex of the hypothetical child.

The instructions provided participants with the following information: (1) Mark/Ashley was considering attending a private college costing \$45,000 per year, or a public state college costing \$25,000 per year, (2) Mark/Ashley was ineligible for loans, and that he/she was considering working part-time to help pay for college expenses, (3) the participant had \$50,000 in expendable (imaginary) money for each of the next few years, and (4), no money had previously been saved for Mark/Ashley’s college expenses. The instructions then informed the participant that they would read a description of Mark/Ashley. To help ensure that participants read the description in its entirety, participants were told they would be asked questions regarding the description after they

were done reading. No mention of a monetary-allocation task was mentioned during these instructions (see Appendix B).

Vignette Creation

Vignettes describing Mark and Ashley contained the following information: (1) general health status, (2) academic performance, (3) extracurricular activities, and (4), hobbies and personal interests. Among these categories of information, three key aspects of these vignettes remained the same for all conditions: (1) to control for child health (Daly & Wilson, 1988), all vignettes explicitly mentioned that Mark/Ashley had no serious health problems, (2) to control for age (Daly & Wilson, 1988), the general instructions indicated that Mark/Ashley was 17 years old (see Appendix A), and (3) all vignettes indicated that Mark/Ashley had maintained a “respectable” GPA, and “competitive” SAT scores (since college investment may depend on the perceived intelligence of the child). Specific GPA and SAT scores were not included, as many adults may have been unfamiliar with the specific significance of raw GPA and SAT values.

In accordance with studies suggesting that gender non-conformity influenced beliefs about sexual orientation (Duran et al., 2007; Wong et al., 1999; Deaux & Lewis, 1984), gender conforming and non-conforming behaviors and interests (Bosson et al., 2005) were used to manipulate Mark/Ashley’s perceived sexual orientation. In vignettes where either Mark or Ashley needed to be perceived as homosexual, they were depicted as having gender non-conforming interests (see Appendix C for Mark, and Appendix D for Ashley). In vignettes where either Mark or Ashley needed to be perceived as heterosexual, they were depicted as having gender conforming interests (see Appendices

C and D). Additionally, in half the vignettes, Mark and Ashley's sexuality was made explicit, and the participant was told that they are in a relationship with either a person of the same sex, or the opposite sex. In vignettes where sexuality was implicit, no reference was made to relationship status. In total, this produced four vignettes each for Mark and Ashley (implicitly heterosexual, implicitly homosexual, explicitly heterosexual, explicitly homosexual; see Appendices C and D).

Monetary Allocation Task and Creation of the Dependent Variables

The purpose of the monetary allocation task (see Appendix E) was to create ten different dependent variables (items) that assessed the amount of money participants would allocate to each item. After reading the assigned vignette, participants were presented with a list of ten items and indicated the amount of money, out of \$50,000, they would allocate for each item. Of the ten items, five pertained to investments for Mark/Ashley, and five items pertained to personal investments that would not be received by Mark/Ashley (see Table 2). Presentation of the ten items was randomized as to avoid order effects. Two aggregate dependent variables titled "Total offspring" and "Total you" were then created by summing all of the items pertaining to Mark/Ashley, and by summing all of the items not pertaining to Mark/Ashley, respectively.

It is important to note that some of the items on the list (see Appendix E) were inherently more expensive than others (ex., the price of a car compared to the price of a computer). To help control for these cost effects, participants were provided with a range of dollar amounts they are allowed to allocate for each item (this would also prevent people from allocating, say, \$30,000 towards a new computer.) Additionally, the total maximum dollar amount available for both Mark/Ashley (\$71,000) equaled the

maximum dollar amount available for items for oneself (\$71,000), so the relative value of the total items was constant between potential recipients. (Note that per the methodology, participants could not allocate more than \$50,000). Finally, participants were instructed that not all items needed monetary investment, but that all \$50,000 must have nevertheless been allocated (participants were unable to proceed until they did so).

Manipulation Check

The purpose of the manipulation check (see Appendix F) was two-fold: (1) to measure the effectiveness of the vignettes at influencing perception of offspring sexual orientation, and (2), to create an independent variable titled ‘Perceived offspring heterosexuality’. Worded in reference to heterosexuals, the manipulation check asked “Given the description of Mark/Ashley, how likely do you think it is that Mark/Ashley is heterosexual (straight)?” Responses were recorded on a likert-scale (1 = Extremely Unlikely to 7 = Extremely Likely).

Klein Sexuality Grid

The Klein Sexuality Grid (Klein, 1993; see Appendix G) is a 7-item questionnaire that measures different aspects of human sexual orientation (e.g., sexual attraction, sexual behavior, and self identification, among others). The purpose of including this questionnaire was to create a covariate that measured the sexual orientations of the participants. Responses to the question “To whom are you sexually attracted” (1 = other sex only to 7 = same sex only) were used to create a covariate titled “Participant sexual orientation”, since this response was deemed least likely to be affected by sexual availability (e.g., sexual behavior) or societal influence (e.g., self identification), and therefore most representative of actual biological attraction. Since the distribution of

responses on the ‘Participant sexual orientation’ item were uneven (most participants scored either a 1 or 2), responses to this item were also categorized, creating a second covariate titled ‘Categorical participant sexual orientation’. Specifically, individuals who scored a 1 or 2 were labeled as “heterosexual”, those who scored a 3, 4, or 5 were labeled as “bisexual”, and those scoring a 6 or 7 were labeled as “homosexual” (see Table 1).

Attitudes Toward Lesbians and Gays Scale (ATLGS)

The ATLGS (Herek, 1988; see Appendix H) is a 20-item questionnaire that measures attitudes towards lesbians and gays. It is comprised of two smaller subscales of 10-items each, one of which measures attitudes towards lesbians (the ATL-S) and one that measures attitudes towards gays (the ATG-S). Each item is a statement that the participant responds to on a 9-point scale (1 = strongly disagree to 9 = strongly agree). Thus, participants’ scores could range from 9 to 90 on the ATL-S and ATL-G, and from 18 to 180 on the ATLGS. Higher scores indicated more hostile attitudes towards lesbians and gays. The purpose of including the ATLGS in this survey was to create a covariate titled ‘ATLGS’ that measured participant biases against homosexuals. All participants completed both the ATL-S and ATG-S, regardless of his or her experimental condition.

Demographic Information

In addition to basic demographic information (e.g., age, sex, ethnicity), participants were asked about their geographical location (Census region), income, education, marital status, parenthood status, religious affiliation, and religiosity (see Appendix I and Table 2). Given the exploratory nature of this study, these additional demographic variables were included as covariates that might influence parental

investment even though no hypotheses were proposed that directly referenced these variables.

Design

The experiment used a 2 (Vignette sex: male/female) x 2 (Vignette explicitness: implicit/explicit) x 2 (Vignette orientation: homosexual/heterosexual) between-subjects design. For a summary of the variables used in this experiment, see Table 2.

Procedure

Upon clicking the study link, participants were redirected to the study web page where they received an initial debriefing (see Appendix A) followed by general instructions (see Appendix B). After reading the instructions, SurveyMonkey randomly assigned each participant to one of the eight experimental conditions, and presented the participant with the appropriate vignette. Participants completed the monetary allocation task (see Appendix E), then answered the manipulation check (see Appendix F). Participants then completed the Klein Sexuality Grid (see Appendix G), followed by the ATL-S and then the ATL-G (see Appendix H). Lastly, participants completed the demographic questionnaire (see Appendix I). Upon completing the survey, participants were taken to a thank you page, where they were given the researcher's contact information if they had any further questions.

RESULTS

Manipulation Check

Responses to the manipulation check were compared as a function of condition type using a one-way ANOVA. Results indicated that the vignettes successfully manipulated perceived offspring sexual orientation, $F(7,213) = 38.72, p < .001, \eta^2 = 0.56$. Tukey's HSD was then performed to identify significant differences between individual means (see Table 3). All means were significantly different from each other at the $p < .05$ level or below with the following exceptions: (a) female explicit heterosexual ($M = 5.66, SD = 1.08$) and male explicit heterosexual ($M = 5.86, SD = 1.11$), and (b) female explicit homosexual ($M = 4.24, SD = 1.33$), female implicit homosexual ($M = 4.50, SD = 1.18$), male implicit heterosexual ($M = 4.71, SD = 1.06$), and female implicit heterosexual ($M = 4.71, SD = 1.01$). The comparison between male implicit heterosexual ($M = 4.71, SD = 1.06$) and female explicit heterosexual ($M = 5.66, SD = 1.08$) approached significance, $p = 0.062$ (see Table 3 for summary).

Dependent Variables

To test the internal consistency of the twelve items used to measure investment, Cronbach's α (alpha) was calculated within the six items pertaining to investment for offspring (including Total offspring), and within the six items pertaining investment for oneself (including Total self). For investment items for offspring, Cronbach's $\alpha = 0.53$. For investment items for oneself, Cronbach's $\alpha = 0.66$. Due to these low internal consistencies, further analysis of data was conducted using all twelve dependent variables, rather than just the two totals (Total offspring and Total self).

Hypothesis 1

Hypothesis 1 stated that parental investment in offspring would be positively related to perceived offspring heterosexuality. To test this hypothesis, a series of bivariate correlations were conducted between perceived offspring heterosexuality and all twelve dependent variables. Results indicated that investment in gifts for offspring was negatively correlated with perceived offspring heterosexuality, $r = -.184$, $p = .028$, such that as perceived heterosexuality increased, the amount of gift money given decreased. All other correlations were non-significant ($p > .05$; see Table 4). Next, a series of partial correlations were conducted between the same items, controlling for the effects of the measured demographic covariates. Results indicated that investment in gifts for offspring remained significantly correlated with perceived offspring heterosexuality, $r = -.083$, $p = .019$. All other correlations were non-significant ($p > .05$; see Table 4).

A Bonferroni correction was then applied to the twelve bivariate correlations and the twelve partial correlations to maintain an overall alpha level of .05. Results of the Bonferroni correction required lowering the critical p -value from $p = .05$ for each comparison to $p = .004$. Taking this consideration into account, the above correlations between investment in gifts for offspring and perceived offspring heterosexuality were not statistically significant, ($p = .028 > .004$, and $p = .019 > .004$), respectively. After applying this correction, all correlations were non-significant, and no evidence was provided that investment was positively correlated with perceived offspring heterosexuality. Therefore, hypothesis 1 was not supported.

Hypotheses 2, 3, and 4

Analyses testing hypotheses 2, 3, and 4 were subsumed under 3-way (Vignette Sex x Vignette Explicitness x Vignette Orientation) Factorial MANCOVA. Covariates used in this analysis included participant age, participant attitudes toward lesbians and gays (ATLG), and participant sexual orientation. Prior to running the MANCOVA, the data were analyzed for possible violations in MANCOVA's four main assumptions: (1) normality, (2) independence of observations, (3) homogeneity of variances, and (4), homogeneity of covariances.

To test the assumption of normality, normal Q-Q plots were examined for each dependent variable. All dependent variables were normally distributed except for "Miscellaneous Self", which exhibited a positive skew (see Figure 1.) Given the robustness of MANCOVA, this single violation was ignored and the assumption of normality was met. Additionally, the assumption of independence of observation was met via design methodology.

To test for homogeneity of variances (homoscedasticity), Levene's test of equality of error variances was calculated for all twelve dependent variables. Levene's test was violated for the following two items: (1) stock investments: $F(7,210) = 3.320, p = .002$, and (2) gifts: $F(7,210) = 2.365, p = .024$. Hartley's F_{\max} was then computed as a follow-up to check for homoscedasticity violations. With an $F_{\max \text{ critical}}(8,20) = 4.10$, neither stock investments ($F_{\max} = 3.89 < 4.10$) nor gifts ($F_{\max} = 3.38 < 4.10$) violated this second test. Therefore, the assumption of homoscedasticity was met.

While Box's M test was needed to test for violations of homogeneity of covariances, study design (which contained fewer than two nonsingular cell matrices)

prevented the test statistic from being calculated. However, Field (2009, p. 614) suggested that violations of this assumption are mostly problematic at or below the $p < .001$ level, and that Pillai's Trace should be consulted if such a violation was suspected. Since Pillai's Trace and Wilks' Lambda were in agreement for the duration of the MANCOVA, the assumption of homogeneity of covariances was met.

Hypothesis 2

Hypothesis 2 stated an interaction between vignette explicitness and vignette orientation, and was tested by examining this interaction in the MANCOVA output. Results were not significant, Wilks' $\Lambda = .900$, $F(9,199) = 0.231$, $p > .05$, $\eta^2 = .01$, power_{observed} = .125, and hypothesis 2 was not supported. Hypothesis 2a proposed specific planned comparisons between the following groups such that in terms of investment received, explicit homosexual vignettes < implicit homosexual vignettes < implicit heterosexual vignettes < explicit heterosexual vignettes. Planned comparison results were all non-significant ($p > .05$), and hypothesis 2a was not supported. Means and standard deviations are provided in Table 5. Finally, hypothesis 2b proposed a main effect of vignette orientation such that in terms of investment received, homosexual vignettes < heterosexual vignettes. Planned comparison results were all non-significant ($p > .05$), and hypothesis 2b was not supported. Means and standard deviations are provided in Table 6.

Hypothesis 3

Hypothesis 3 stated a simple main effect of offspring sex, such that female homosexual vignettes would receive more investment than male homosexual vignettes. Observed effect sizes across all twelve dependent variables ranged from $\eta^2 = .000$ to $\eta^2 = .028$. Observed power ranged from .058 to .419. Planned comparison results were all

non-significant ($p > .05$), and hypothesis 3 was not supported. Means and standard deviations are provided in Table 7.

Hypothesis 4

Hypothesis 4 stated a main effect of participant sex, such that female participants would invest more in offspring than male participants. Planned comparisons revealed four investment differences between men and women. Contrary to my hypothesis, men invested more in college expenses ($M = \$28,092$, $SD = \$1,163$, 95% CI = $\pm \$2,292$) than did women ($M = \$24,586$, $SD = \$919$, 95% CI = $\pm \$1,812$). Additionally, men invested more in offspring overall ($M = \$33,276$, $SD = \$1,097$, 95% CI = $\pm \$2,162$) than did women ($M = \$30,282$, $SD = \$867$, 95% CI = $\pm \$1,709$). Women kept more money for themselves to put into retirement savings ($M = \$10,775$, $SD = \$657$, 95% CI = $\pm \$1,638$) than did men ($M = \$8,493$, $SD = \$831$, 95% CI = $\pm \$1,295$), and women also kept more money for themselves overall ($M = \$19,718$, $SD = \$867$, $\pm 95\%$ CI = $\pm \$1,709$) than did men ($M = \$16,724$, $SD = \$1,097$, 95% CI = $\pm \$2,162$). Since these findings were contradictory to the original hypothesis, hypothesis 3 was not supported. Means and standard deviations are provided in Table 8.

Exploratory Analyses

Although not explicitly hypothesized as part of this experiment, a significant effect for participant age on investment was discovered via the primary MANCOVA analysis (Wilks' $\Lambda = .908$, $F(9,198) = 2.226$, $p = .022$, $\eta^2 = .092$, $\text{power}_{\text{observed}} = .888$.) Participant age significantly predicted two dependent variables: (1) investment toward a new computer for offspring, $F(1,207) = 7.102$, $p = .008$, $\eta^2 = .033$ and (2) gifts for offspring, $F(1,207) = 4.620$, $p = .033$, $\eta^2 = .022$. Specifically, for each SD increase in age,

investment for a new computer increased by .164 *SD*, $t(216) = 2.448$, $p = .015$. However, for each *SD* increase in age, investment for gifts decreased by .155 *SD*, $t(216) = -2.309$, $p = .022$.

Additionally, there was a significant interaction between vignette sex and vignette explicitness on investment regardless of sexual orientation, Wilks' $\Lambda = .908$, $F(9,198) = 2.239$, $p = .021$, $\eta^2 = .092$, $\text{power}_{\text{observed}} = .891$. Specifically, this interaction affected investment on two dependent variables: (1) investment toward a new car for offspring, $F(1, 207) = 7.390$, $p = .007$, $\eta^2 = .034$, and (2) stock investments for oneself, $F(1, 207) = 4.451$, $p = .036$, $\eta^2 = .021$. For investments toward a new car for offspring, there was a simple main effect of explicitness such that female vignettes with explicit sexual orientations received more money for a car ($M = \$2,154$, $SD = \$240$) than did female vignettes with implicit sexual orientations ($M = \$1,314$, $SD = \$213$), $t(163) = 2.03$, $p = .044$. There was no corresponding difference for male vignettes, although the observed pattern was in the opposite direction (see Table 9). For stock market investments for oneself, no simple main effects were observed (see Table 10).

Finally, a linear regression was performed to test if any covariates (see Table 2), including vignette condition, significantly predicted investment in 'Total Offspring'. While the overall ANOVA for the regression was not significant, $F(13,164) = 0.697$, $p = .764$, and $R^2_{\text{model}} = .052$, attitudes towards lesbians and gays (ATLG) significantly predicted investment in offspring under the equation $y_{\text{predicted}} = -\$67x + \$45,160$, where x = participant score on the ATLGs. For every one-point increase on the ATLGs, participants invested an average of \$67 less in offspring regardless of the experimental condition, $t(164) = -1.998$, $p = .047$, $R^2 = .030$.

DISCUSSION

Main Hypotheses

From an evolutionary perspective, the presence of differential parental investment (i.e., parental favoritism) is intriguing, as parental favoritism suggests that humans may be sensitive to the reproductive potential of their offspring. Understanding whether parental investment consistently unfolds according to evolutionary predictions is important to help us understand any evolutionary underpinnings that may or may not influence this phenomenon. Evidence which suggests that parents respond differently (or similarly) when making financial investment decisions toward offspring with homosexual orientations helps elucidate which aspects of parental investment are influenced by child sexual orientation, if any.

To test whether parental investment might be related to offspring sexual orientation, the vignettes used for this study had to successfully manipulate the orientation of the hypothetical offspring being described. Results indicated that the vignettes used successfully manipulated perceived offspring heterosexuality, as vignettes describing homosexual offspring were all rated as more homosexual than vignettes describing heterosexual offspring. Additionally, male homosexual vignettes were rated as more homosexual than female homosexual vignettes. These findings were consistent with past literature suggesting that gender non-conformity increases suspicions of homosexuality (Duran et al., 2007; Wong et al., 1999; Deaux & Lewis, 1984), that gender non-conforming behaviors and interests increase suspicions of homosexuality (Bosson et al., 2005), and that men are more likely than women to be perceived as homosexual upon violating gender norms (Kite & Deaux, 1987).

Successful vignette manipulation then permitted use of the manipulation check (see Appendix F) as an independent variable that could be correlated with each investment item within conditions. However, in a test of hypothesis 1, perceived offspring heterosexuality failed to predict investment even after all measured covariates were controlled for. This finding suggested that perceived offspring heterosexuality was not related to, or predictive of, parental investment. Similarly, none of the proposals in hypotheses 2, 3, or 4 regarding parental investment were supported by the results from the MANCOVA analysis. (Hypothesis 2 stated an interaction between vignette explicitness and vignette orientation, hypothesis 3 stated a simple main effect of offspring sex, and hypothesis 4 stated a main effect of participant sex.) Most importantly, offspring that were perceived to be homosexual did not consistently receive less investment than offspring perceived to be heterosexual. In fact, many vignettes describing homosexual offspring received more investment than vignettes describing heterosexual offspring (for the most direct example, see Table 5, comparison 4), although these examples were not statistically significant. In summary, while manipulations of explicitness and gender non-conformity were significant enough to impact perceived sexual orientation, these same manipulations failed to generate the expected outcomes of differential parental investment.

Four primary explanations were considered for these non-significant findings. First, participants may have been influenced by social desirability bias in their responses. Within the context of current policy decisions regarding homosexuality in U.S. society (e.g., the repeal of Don't Ask Don't Tell (DADT), California's Proposition 8, the Defense of Marriage Act (DOMA)), many respondents may have been self-conscious of appearing

homophobic or anti-gay. For example, investment items such as ‘New Car Offspring’ and ‘New Car Self’ may have increased the perception among participants that the study was examining investment in offspring compared to investment in oneself. This perception could have led to an artificial equaling of investment between offspring and oneself, or artificially inflated offspring-centered investments, particularly in conditions where either Mark or Ashley was described as being homosexual.

In addition to eliciting a social desirability bias, the study methodology could have been too artificial and unrealistic to produce the expected patterns in investment. For example, asking participants to imagine a hypothetical offspring with only a paragraph of information was unlikely to mimic the conditions of having actual living children. Having surplus income in excess of \$50,000 was also highly unrealistic, so participants may have been more liberal and generous during the resource allocations than otherwise. Another important factor was that participants were only asked to imagine having one offspring, not multiple offspring. Therefore, participants given homosexual vignettes may have invested more in them simply because they did not have the opportunity to invest in a second or third non-heterosexual vignette. While the presentation of multiple vignettes (one homosexual, one heterosexual) was briefly considered for the study methodology, it was abandoned due to concerns for making the manipulation excessively obvious to participants.

A third reason for the lack of significant results could have been due to relatively low statistical power. For example, power analysis for hypothesis 2 revealed observed power at .125, while the observed power for hypothesis 3 was never greater than .419. Both values were well below the typical level of .80 desired by most social scientists.

Additionally, the observed effect size for hypotheses 2 and 3 never exceeded $\eta^2 = .028$ (negligible/small effect). Taken together, these values for effect size and power made it extremely unlikely to find significant results regarding these hypotheses. Nevertheless, there is some reason to suspect that lack of statistical power did not dramatically alter the ultimate findings of the current study, as many of the mean investment scores were not in the predicted directions (e.g., see Tables 6 and 7). With increased power, there was no statistical rationale to believe that the means would have reversed direction and become significant. For this reason, lack of statistical power may likely be the least compelling explanation (of the three provided so far) for why significance was not observed.

Fourth, and perhaps most importantly, were the ramifications of this study's sample selection bias. Specifically, the obtained sample for this study was disproportionately white (90% of participants), single (52 % of participants), and non-heterosexual (20% of participants). These biases imposed a significant impediment on interpreting the data, namely, with regards to external population validity. The obtained study participants may have been less affected by the prospect of a homosexual offspring compared to the general population, especially when a fifth of the current study participants were either homosexual or bisexual themselves. Additionally, participants who volunteered to complete a survey regarding sexual orientation may have self-selected such that only those comfortable with the material ended up accessing and taking the survey. This bias could have prevented obtaining data from participants who would have otherwise demonstrated significant biases in their investment towards offspring of differing sexual orientations. As a result, the obtained sample (and consequently the study conclusions) may not have been representative of the general population.

Finally, the findings comparing investment patterns between male and female participants not only failed to support the hypothesis that women would invest more in offspring than would men, but contradicted it. From an evolutionary perspective, it is typically understood that women invest more in offspring than do men (Buss, 2012). However, findings from this study suggested that men allocated significantly more amounts of money to offspring than did women, and women saved more than did men for personal retirement. Since the external validity of these study findings is unknown, the ramifications of this finding on this particular evolutionary hypothesis are unclear. Nevertheless, these findings suggest that investment patterns in humans regarding male/female differences may not follow according to predictions generated by an evolutionary psychological approach. Future research efforts could benefit from examining under which circumstances, if any, gender-based investment patterns consistently unfold among humans.

Exploratory Analyses

During the MANCOVA analysis, a few significant findings appeared that were not the target of a hypothesis. Specifically, as participants' ages increased, they were likely to give more money to offspring for a computer, but less likely to give money for gifts. Female vignettes with explicit orientations were also found to receive more money for a car than were female vignettes with implicit orientations. Both findings were particularly unusual, as they lack a theoretical explanation. There was no obvious reason to suspect that parental investment in car money in particular would decrease only for female offspring, and only if those offspring had implicit sexual orientations. Regarding participant age, there seemed to be no reason why increased age would be associated with

giving more money for a computer, but less money for gifts. Consequently, these particular results may have likely been type I errors.

More importantly were the results of the performed regression. Unsurprisingly, these results suggested that as negative attitudes towards lesbians and gays increased, ‘Total offspring’ investment decreased. Additionally, examination the effect size of $R^2 = .030$ revealed a small effect. First, it is important to note what these results are *not* suggesting, namely, that parents or adults deliberately or consciously withheld more resources from offspring due to perceived offspring homosexuality or implications for reproductive success. Neither do these results imply homophobia. Rather, they simply suggest a small investment bias away from homosexual offspring as negative attitudes towards lesbians and gays intensifies in the sample currently studied.

Second, it is worth noting that negative attitudes towards any construct, not necessarily just gays and lesbians, may serve to decrease investment in that particular construct. Since this research only investigated ATLG and subsequent investment, it may be the case that substituting ‘homosexual’ and ‘heterosexual’ with some other dichotomy (e.g., Republican/Democrat, and then measuring political party affiliation) could also have produced similar trends in investment. In other words, a simple “if-then” decision rule (e.g., if your attitudes are increasingly negative about construct X, then invest less in construct X) may be more parsimonious in explaining the observed relationship between ATLG and investment, compared to an evolutionary psychological approach that assumes a tentative connection with offspring reproductive success. Therefore, it cannot necessarily be inferred that an evolutionary approach provides the best explanation for the effects of negative attitudes towards gays and lesbians on investment.

It is also possible that since ATLG was the only significant predictor of investment toward offspring, an evolutionary approach attempting to integrate aspects of reproductive success and other variables (such as participant gender, or offspring sex) may be unwarranted. Typically, ATLG varies greatly as a function of society, transitory cultural beliefs, and social movements, so the underlying cause for ATLG-based investment effects may largely be transient in nature and tangential to idea of cross-cultural evolutionarily informed parental investment patterns. Therefore, social and/or economic attempts to reduce discrimination towards lesbians and gays may be most effective with concerted efforts to target and change societal attitudes.

Implications

Arguably the defining civil rights issue of current U.S. culture, social rights for the LGBT community and homosexuality's role in society are at political and legal crossroads. As such, any empirical research that addresses homosexuality, and particularly research that addresses whether parents differentially invest in offspring based on sexual orientation, can impact political and public debate. Therefore, results from this study indicating that perceived offspring sexual orientation failed to predict investment patterns can be viewed as "good news" from the perspectives of both the LGBT community and society writ large. Results supporting the hypothesis that parental investment increases as a function of offspring heterosexuality could have been misinterpreted to mean that homophobia or discrimination against sexual minorities had an evolutionary and 'natural' basis. This interpretation could have run the risk of being used as an argument to justify discrimination toward sexual minorities, including bolstering support for (arguably) socially unacceptable, irresponsible, and intrusive religious-based initiatives such as

DOMA. Even if such results regarding differential parental investment were found, they certainly would not warrant these conclusions or interpretations.

This research also sheds light on what might not influence parent-offspring relationships, or at least how much parents allocate to offspring. Such information could be extremely useful to counselors dealing with LGBT youth who are under the impression that their parents are withholding resources from them due to their sexual orientation. For researchers, such information could lead to the formation of new non-evolutionary based hypotheses for parental investment in modern societies. Results from the exploratory regression also suggested that factors other than the covariates measured (including ATLG) in this experiment might be better at accounting for investment differences than the factors manipulated in this study, assuming such differences in investment actually exist. Examples include child temperament, personality, or intelligence.

Finally, and perhaps most critically, are the implications of the findings that ATLG significantly predicted investment in offspring. While significant advancements have been made over the past couple decades in terms of social rights for individuals identifying as LGBT, the current finding that negative attitudes towards lesbians and gays can decrease parental investment suggests there is still progress to be made in altering societal attitudes about the LGBT community. While there is nothing inherently 'wrong' or unacceptable about maintaining various private and personal beliefs about homosexuality, these feelings and personal biases can be damaging when they begin to affect others, particularly intrafamilial relations. For example, such attitudes may often be the source of undue emotional stress among gay youth attempting to reconcile their

sexualities with societal and/or parental expectations. Such emotional stress may be a significant factor in explaining why non-heterosexual youth are disproportionately and adversely affected by drug use and suicide attempts. The findings presented in this research are therefore critical to highlighting the damaging effects of negative ATLG, and could serve as an impetus for social activist groups to continue the social and legal struggle for LGBT rights.

Future Research

Future studies investigating contingencies of parental financial investment could benefit from engaging in correlational research that examines existing familial relationships and actual investment patterns, rather than attempting experimental research that comparatively lacks external validity. Such studies would be significantly more realistic for two reasons: (1) the scenarios being observed would not be artificial, and (2), participant bias could effectively be eliminated if the study focuses on actual past behavior and financial expenditures. Second, comparing family structures with one homosexual offspring and one heterosexual offspring of matched age and sex (ideally identical twins), would be ideal for isolating the effects of sexual orientation on received parental investment in humans.

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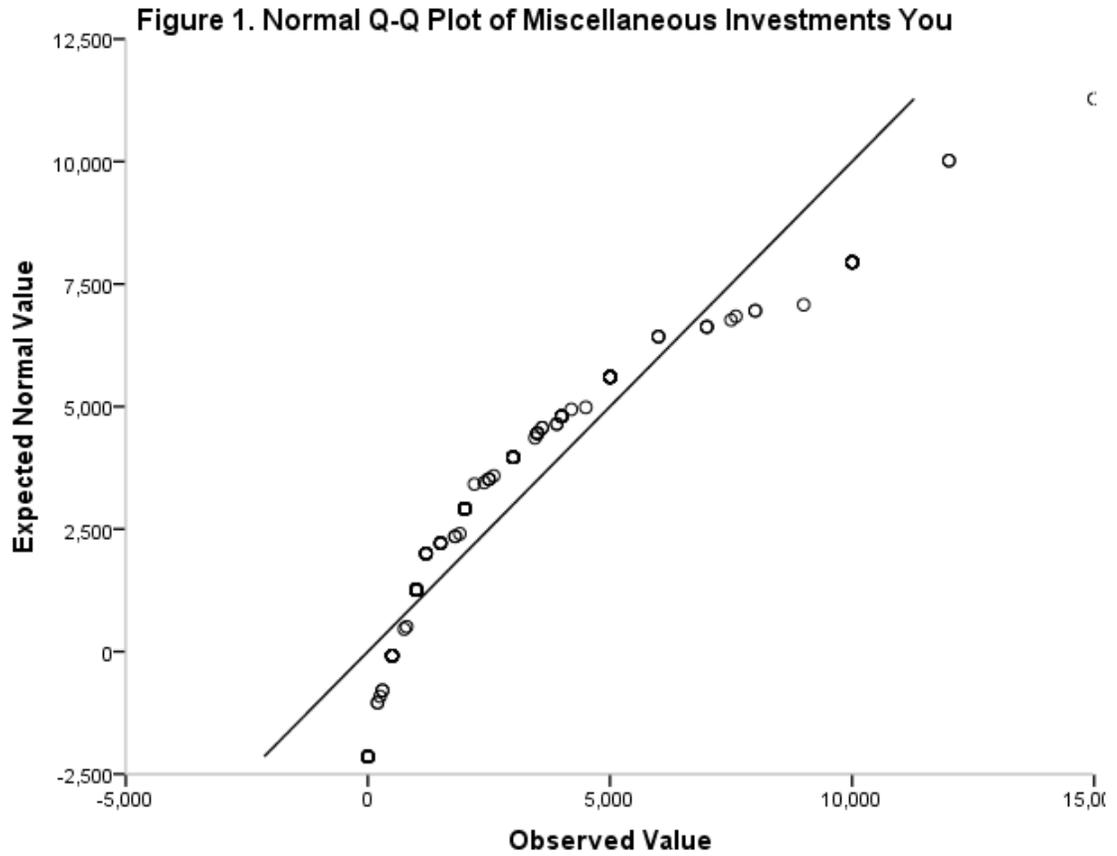
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FIGURES



**Note:* The S-shaped curve around the diagonal line suggests a non-normal distribution of the dependent variable.

TABLES

Table 1. Participant Demographic Information, by Study Condition

Variable (N)	Male/Mark (N = 99)				Female/Ashley (N = 122)			
	Homosexual (N = 50)		Heterosexual (N = 49)		Homosexual (N = 65)		Heterosexual (N = 57)	
	Implicit (26)	Explicit (24)	Implicit (21)	Explicit (28)	Implicit (40)	Explicit (25)	Implicit (28)	Explicit (29)
Gender								
Male	11	10	7	13	15	8	11	11
Female	15	14	14	15	25	17	16	18
Age								
<i>M</i>	34.50	37.82	31.00	34.71	34.78	35.88	33.22	31.79
<i>(SD)</i>	(17.25)	(16.03)	(14.67)	(13.85)	(15.33)	(16.20)	(13.16)	(15.67)
Ethnicity								
Caucasian	25	23	18	25	35	21	25	26
Asian	1	0	2	0	2	1	0	1
African American	0	0	1	0	1	0	0	0
Hispanic	0	0	0	2	2	2	2	0
Mixed	0	1	0	1	0	1	0	2
Other	0	0	0	0	0	0	1	0
Census Region								
Northeast	16	16	14	17	24	17	17	20
South	6	4	4	7	9	3	8	5
Midwest	1	0	0	1	2	1	0	1
West	2	3	1	1	2	2	1	1
Out of Country	1	1	1	1	3	1	1	1
Religious Affiliation								
Christian/Catholic	4	9	4	10	9	10	10	7
Christian/NonCatholic	5	5	6	2	10	4	3	5
Jewish	6	1	2	3	7	2	2	2
Atheist	2	0	0	4	3	0	1	2
Agnostic	2	0	3	2	2	2	0	0
None	4	5	4	1	1	3	7	3
Other	1	2	1	4	4	2	5	3
Education								
GED	4	3	4	2	5	4	3	6
Associates	6	9	5	8	11	7	6	10
Bachelors	10	7	4	11	10	7	10	9
Masters	6	4	6	7	10	6	7	3
PhD	0	1	1	0	3	0	1	0
Marital Status								
Single	16	10	12	12	22	11	15	17
Married	6	8	4	9	13	7	6	5
Divorced	1	3	1	3	4	3	3	4
Widowed	2	0	0	0	0	1	0	0
Cohabiting	0	3	3	3	1	2	0	3
Domestic Partnership	0	0	0	1	0	1	2	0

Table 1. Participant Demographic Information, by Study Condition continued

Variable (N)	Male (N = 99)				Female (N = 122)				
	Homosexual (N = 50)		Heterosexual (N = 49)		Homosexual (N = 65)		Heterosexual (N = 57)		
	Implicit (26)	Explicit (24)	Implicit (21)	Explicit (28)	Implicit (40)	Explicit (25)	Implicit (28)	Explicit (29)	
Parenthood Status									
Yes	10	12	5	6	14	9	8	8	
No	16	11	16	22	26	14	20	21	
Income (\$)									
Unemployed	4	0	3	3	7	6	2	9	
< 15,000	8	6	6	6	9	4	11	10	
15,001- 30,000	3	4	2	2	5	4	1	2	
30,001 – 45,000	0	2	0	6	4	1	2	2	
45,001 – 60,000	1	4	4	3	2	2	2	1	
60,001 – 75,000	1	1	0	2	3	3	2	1	
75,001 – 90,000	2	0	1	0	3	1	1	0	
90,001 – 105,000	2	2	0	1	1	0	1	1	
105,001- 120,000	1	4	0	2	0	0	1	2	
> 120,000	2	1	5	3	4	3	4	1	
Sexual Orientation									
Heterosexual	21	22	15	23	31	15	23	18	
Bisexual	2	1	2	3	6	6	1	4	
Homosexual	3	1	4	2	3	4	4	7	

Table 2. Summary of Variables Used in Analysis

	Independent Variables	Covariates	Dependent Variables	
			For Hypothetical Offspring	For Oneself
1.	Vignette Sex	Age	Tuition	Vacation
2.	Vignette Explicitness	Sex	Car Offspring	Car Self
3.	Vignette Orientation	Ethnicity	Computer	Retirement Savings
4.		Census Region	Gifts	Stock Investments
5.		Religious Affiliation	Misc. Offspring	Misc. Self
6.		Religiosity	Total Offspring	Total Self
7.		Marital Status		
8.		Education		
9.		Income		
10.		Parenthood Status		
11.		Sexual Orientation		
12.		ATLG		

Note: Covariates refer to characteristics of the participant. “Misc.” is an abbreviation for “miscellaneous”.

Table 3. Means for Perceived Offspring Heterosexuality Grouped by Statistical Significance

Condition Type	N	Subset for alpha = .05			
		1	2	3	4
Male Explicit Homosexual	24	1.67 (0.92)			
Male Implicit Homosexual	26		3.19 (1.02)		
Female Explicit Homosexual	25			4.24 (1.33)	
Female Implicit Homosexual	40			4.50 (1.78)	
Male Implicit Heterosexual	21			4.71 (1.06)	
Female Implicit Heterosexual	28			4.71 (1.01)	
Female Explicit Heterosexual	29				5.66 (1.08)
Male Explicit Heterosexual	28				5.86 (1.11)
Significance		1.000	1.000	0.763	0.998

Note: Means within a column were not significantly different from each other. Means between columns were significantly different from each other at or below $p < .05$. Standard deviations are shown in parentheses.

Table 4. Correlations Between Perceived Offspring Heterosexuality and Investment Items

Dependent Variable	Correlation Type	
	Bivariate	Partial
Investment For Offspring		
College Expenses	.032	.060
New Car	.079	.093
New Computer	-.081	-.016
Gifts	-.184*	-.183*
Miscellaneous	-.020	-.061
Total	.029	.051
Investment For Oneself		
Vacation	.006	.009
New Car	-.032	-.043
Retirement Savings	-.054	-.075
Stock Investments	.020	.020
Miscellaneous	.038	.023
Total	-.029	-.051

Note: * indicates significance at the $p < .05$ level. Calculated Bonferroni correction required significance at the $p < .004$ level. Partial correlations controlled for the following variables: participant sex, ethnicity, age, census region, religious affiliation, strength of religious affiliation, education, marital status, parenthood, income, sexual orientation, and attitudes towards lesbians and gays (ATLG).

Table 5. Mean Investments as a Function of Vignette Condition Across Vignette Sex (Hypothesis 2a)

Dependent Variable	Planned Comparison			
	1		2	
	Explicit Homosexual	Implicit Homosexual	Implicit Homosexual	Implicit Heterosexual
Investment for Offspring				
College Expenses	24,864 (1,565)	26,271 (1,319)	26,425 (1,258)	27,493 (1,478)
New Car Offspring	1,814 (256)	1,643 (216)	1,634 (213)	1,443 (250)
New Computer	770 (43)	753 (36)	756 (36)	665 (42)
Gifts	996 (144)	887 (121)	925 (112)	840 (131)
Miscellaneous Offspring	2,574 (276)	2,228 (233)	2,214 (231)	1,789 (272)
Total Offspring	31,018 (1,483)	31,783 (1,250)	31,953 (1,140)	32,229 (1,339)
Investment For Oneself				
Vacation	2,271 (282)	1,722 (237)	1,683 (190)	1,524 (224)
New Car Self	1,755 (288)	1,726 (243)	1,712 (235)	1,272 (276)
Retirement Savings	9,625 (1,102)	9,987 (928)	10,005 (913)	9,844 (1,072)
Stock Investments	2,093 (379)	1,908 (319)	1,860 (338)	2,420 (397)
Miscellaneous Self	3,238 (411)	2,873 (346)	2,787 (324)	2,711 (381)
Total Self	18,982 (1,483)	18,216 (1,250)	18,047 (1,140)	17,771 (1,339)

Note: All amounts are in \$. Covariates appearing in the model were evaluated at the following values: For comparison 1: ATLGS = 40.48, Participant Age = 35.55, Sexual Attraction = 2.10. For comparison 2: ATLGS = 36.55, Participant Age = 33.65, Sexual Attraction = 2.09. Differences in means were evaluated within each dependent variable. All differences between means were non-significant. Standard deviations are shown in parentheses.

Table 5. Mean Investments as a Function of Vignette Condition Across Vignette Sex continued

Dependent Variable	Planned Comparison			
	3		4	
	Implicit Heterosexual	Explicit Heterosexual	Explicit Homosexual	Explicit Heterosexual
Investment for Offspring				
College Expenses	27,717 (1,534)	24,943 (1,407)	25,036 (1,641)	24,812 (1,489)
New Car Offspring	1,454 (259)	1,791 (237)	1,785 (265)	1,837 (241)
New Computer	679 (52)	676 (47)	766 (53)	688 (48)
Gifts	861 (102)	796 (94)	988 (118)	778 (107)
Miscellaneous Offspring	1,855 (313)	2,267 (287)	2,545 (322)	2,362 (292)
Total Offspring	32,566 (1,420)	30,474 (1,302)	31,120 (1,598)	30,476 (1,450)
Investment For Oneself				
Vacation	1,462 (267)	2,166 (245)	2,302 (323)	2,134 (293)
New Car Self	1,305 (286)	1,701 (262)	1,805 (297)	1,703 (269)
Retirement Savings	9,652 (1,120)	10,028 (1,027)	9,523 (1,155)	9,930 (1,048)
Stock Investments	2,420 (451)	2,130 (414)	2,016 (424)	2,250 (384)
Miscellaneous Self	2,595 (446)	3,501 (409)	3,234 (476)	3,506 (432)
Total Self	17,434 (1,420)	19,526 (1,302)	18,880 (1,598)	19,524 (1,450)

Note: All amounts are in \$. Covariates appearing in the model were evaluated at the following values: For comparison 3: ATLGS = 36.09, Participant Age = 32.78, Sexual Attraction = 2.32. For comparison 2: ATLGS = 40.35, Participant Age = 34.84, Sexual Attraction = 2.34. Differences in means were evaluated within each dependent variable. All differences between means were non-significant. Standard deviations are shown in parentheses.

Table 6. Mean Investments for Vignette Condition Across Vignette Sex and Vignette Explicitness (Hypothesis 2b)

Dependent Variable	Vignette Condition	
	Homosexual	Heterosexual
Investment for Offspring		
College Expenses	25,823 (1,002)	26,063 (1,040)
New Car Offspring	1,687 (166)	1,666 (172)
New Computer	759 (31)	679 (32)
Gifts	948 (81)	809 (84)
Miscellaneous Offspring	2,351 (191)	2,101 (198)
Total Offspring	31,569 (943)	31,318 (978)
Investment For Oneself		
Vacation	1,943 (180)	1,852 (187)
New Car Self	1,741 (185)	1,517 (192)
Retirement Savings	9,822 (717)	9,872 (744)
Stock Investments	1,938 (266)	2,314 (276)
Miscellaneous Self	2,988 (277)	3,127 (288)
Total Self	18,431 (943)	18,682 (978)

Note: All amounts are in \$. Covariates appearing in the model were evaluated at the following values: ATLGS = 38.36, Participant Age = 34.22, Sexual Attraction = 2.21. Differences in means were evaluated within each dependent variable. All differences between means were non-significant. Standard deviations are shown in parentheses.

Table 7. Mean Investments for Vignette Condition Across Vignette Explicitness (Hypothesis 3)

Dependent Variable	Vignette Condition	
	Male Homosexual	Female Homosexual
Investment for Offspring		
College Expenses	24,423 (1,543)	26,618 (1,324)
New Car Offspring	1,664 (253)	1,751 (218)
New Computer	736 (43)	778 (37)
Gifts	1,122 (140)	793 (120)
Miscellaneous Offspring	2,670 (272)	2,152 (233)
Total Offspring	30,614 (1,464)	32,093 (1,257)
Investment For Oneself		
Vacation	2073 (281)	1860 (241)
New Car Self	1,990 (283)	1,552 (243)
Retirement Savings	10,403 (1,087)	9,419 (933)
Stock Investments	1,994 (375)	1,978 (322)
Miscellaneous Self	2,926 (407)	3,098 (349)
Total Self	19,386 (1,464)	17,907 (1,257)

Note: All amounts are in \$. Covariates appearing in the model were evaluated at the following values: ATLGS = 40.48, Participant Age = 35.55, Sexual Attraction = 2.10. Differences in means were evaluated within each dependent variable. All differences between means were non-significant. Standard deviations are shown in parentheses.

Table 8. Mean Investments as a Function of Participant Sex Across Vignette Condition (Hypothesis 4)

Dependent Variable	Participant Sex	
	Male	Female
Investment for Offspring		
College Expenses	28,092* (1,163)	24,586* (919)
New Car Offspring	1,407 (194)	1,838 (153)
New Computer	741 (37)	705 (29)
Gifts	778 (94)	938 (75)
Miscellaneous Offspring	2,257 (225)	2,215 (178)
Total Offspring	33,276* (1097)	30,282* (867)
Investment For Oneself		
Vacation	1,935 (212)	1,891 (167)
New Car Self	1,313 (216)	1,825 (171)
Retirement Savings	8,493* (831)	10,775* (657)
Stock Investments	2,115 (313)	2,107 (248)
Miscellaneous Self	2,868 (321)	3,121 (254)
Total Self	16,724* (1097)	19,718* (867)

Note: All amounts are in \$. * Means within a row were significantly different at $p < .05$. Covariates appearing in the model were evaluated at the following values: ATLGS = 38.41, Participant Age = 34.28, Sexual Attraction = 2.21. Differences in means were evaluated within each dependent variable. Standard deviations are shown in parentheses.

Table 9. Mean for New Car for Offspring Across Vignette Orientation

		Vignette Sex	
		Male	Female
Vignette Explicitness	Implicit	1,878 (254)	1,314* (213)
	Explicit	1,460 (247)	2,154* (240)

Note: All amounts are in \$. *Means were significantly different at $p < .05$. Covariates appearing in the model are evaluated at the following values: ATLGS = 38.36, Participant Age = 34.22, Sexual Attraction = 2.21. Standard deviations are shown in parentheses.

Table 10. Means for Stock Investment Across Vignette Orientation

		Vignette Sex	
		Male	Female
Vignette Explicitness	Implicit	1,751 (411)	2,389 (345)
	Explicit	2,630 (400)	1,629 (388)

Note: All amounts are in \$. Covariates appearing in the model were evaluated at the following values: ATLGS = 38.36, Participant Age = 34.22, Sexual Attraction = 2.21. All differences between means were non-significant. Standard deviations are shown in parentheses.

APPENDICES

Appendix A

Participant Consent:

Welcome! Thank you for volunteering to participate in our research study!

Your information is completely anonymous, and results of this survey are kept entirely confidential. None of the information in this survey can be used to target or identify specific respondents.

Participation in this survey is completely voluntary. If at any time you do not wish to continue, you may quit by closing the survey window.

Completion of this survey should take approximately 15 minutes.

This survey has been approved by the SUNY New Paltz Internal Reviews Board (IRB).

To continue with the survey, press 'next.'

Appendix B

General Instructions:

For Participants Assigned to the “Male” Condition:

Imagine that you have a 17-year-old son, Mark, who is currently a high school senior and is considering attending college in one year.

Mark has been accepted by a few colleges and is currently choosing between a private college in your state (with annual expenses, including tuition, costing \$45,000/year) and a local state college (with annual expenses, including tuition, costing \$25,000/year). For various reasons, you have not previously been able to amass any sum of money for Mark’s college expenses.

Based on your income, current taxes, and other expenses, you expect to have \$50,000 expendable at the end of each of the next few years. Your income is such that Mark is not eligible for loans. You are discussing the possibility of Mark working at least part-time to help pay for his/her expenses.

Please read the following description of Mark. You may re-read the description as you feel necessary, as you will subsequently be asked a series of questions about Mark.

After you are done, please press “next.”

For Participants Assigned to the “Female” Condition:

The script remained the same as above, except that the name “Mark” was replaced with the name “Ashley”.

Appendix C

Male Vignettes

Implicit Heterosexual

Mark has never had any serious health problems, and has maintained average health for his age. Throughout high-school, Mark has also maintained a respectable cumulative grade-point average (GPA), and has scored competitively on the scholastic aptitude test (SAT). For extracurricular activities, Mark plays on the high school football team. In an effort to maintain physical strength, Mark frequently works out and lifts weights at the local gym. Mark's additional interests include hunting, and he loves to participate in small-scale construction projects whenever possible, motivated by ideas he reads in popular engineering magazines.

Explicit Heterosexual

Mark has never had any serious health problems, and has maintained average health for his age. Throughout high-school, Mark has also maintained a respectable cumulative grade-point average (GPA), and has scored competitively on the scholastic aptitude test (SAT). For extracurricular activities, Mark plays on the high school football team, while his girlfriend participates in the cheerleading squad. In an effort to maintain physical strength, Mark lifts weights at the local gym while his girlfriend does cardio. Mark's additional interests include hunting, and he loves to participate in small-scale construction projects whenever possible, motivated by ideas he reads in popular engineering magazines.

Implicit Homosexual

Mark has never had any serious health problems, and has maintained average health for his age. Throughout high-school, Mark has also maintained a respectable cumulative grade-point average (GPA), and has scored competitively on the scholastic aptitude test (SAT). For extracurricular activities, Mark has taken ballet lessons throughout high school, and has avoided sports and other team-oriented physical activities. In search of the latest fashion trends, Mark frequents the mall at least once a month to update his wardrobe. Mark's additional interests include interior design, and he loves to cut his friends' hair in the newest hairstyles he's read in fashion magazines.

Explicit Homosexual

Mark has never had any serious health problems, and has maintained average health for his age. Throughout high-school, Mark has also maintained a respectable cumulative grade-point average (GPA), and has scored competitively on the scholastic aptitude test (SAT). For extracurricular activities, Mark has taken ballet lessons throughout high school with his boyfriend, and has avoided sports and other team-oriented physical activities. In search of the latest fashion trends, Mark and his boyfriend frequent the mall at least once a month to update their wardrobes. Mark's additional interests include interior design, and he loves to cut his friends' hair in the newest hairstyles he's read in fashion magazines.

Appendix D

Female Vignettes

Implicit Heterosexual

Ashley has never had any serious health problems, and has maintained average health for her age. Throughout high-school, Ashley has also maintained a respectable cumulative grade-point average (GPA), and has scored competitively on the scholastic aptitude test (SAT). For extracurricular activities, Ashley has taken ballet lessons throughout high school, and has avoided sports and other team-oriented physical activities. In search of the latest fashion trends, Ashley frequents the mall at least once a month to update her wardrobe. Ashley's additional interests include interior design, and she loves to cut her friends' hair in the newest hairstyles she's read in fashion magazines.

Explicit Heterosexual

Ashley has never had any serious health problems, and has maintained average health for her age. Throughout high-school, Ashley has also maintained a respectable cumulative grade-point average (GPA), and has scored competitively on the scholastic aptitude test (SAT). For extracurricular activities, Ashley has taken ballet lessons throughout high school while her boyfriend plays on the football team. In search of the latest fashion trends, Ashley brings her boyfriend to the mall at least once a month to update her wardrobe. Ashley's additional interests include interior design, and she loves to cut her friends' hair in the newest hairstyles she's read in fashion magazines.

Implicit Homosexual

Ashley has never had any serious health problems, and has maintained average health for her age. Throughout high-school, Ashley has also maintained a respectable cumulative grade-point average (GPA), and has scored competitively on the scholastic aptitude test (SAT). For extracurricular activities, Ashley plays on the high school softball team. In an effort to maintain physical strength, Ashley frequently works out and lifts weights at the local gym. Ashley's additional interests include hunting, and she loves to participate in small-scale construction projects whenever possible, motivated by ideas she reads in popular engineering magazines.

Explicit Homosexual

Ashley has never had any serious health problems, and has maintained average health for her age. Throughout high-school, Ashley has also maintained a respectable cumulative grade-point average (GPA), and has scored competitively on the scholastic aptitude test (SAT). For extracurricular activities, Ashley and her girlfriend both play on the high school softball team. In an effort to maintain physical strength, Ashley and her girlfriend lift weights at the local gym. Ashley's additional interests include hunting, and she loves to participate in small-scale construction projects whenever possible, motivated by ideas she reads in popular engineering magazines.

Appendix E

Monetary Allocation Task

Below, please indicate how much you would be willing to expend, per year, for the following activities/items. The “range permitted” column indicates the range of money you are permitted to spend for that item. In the “amount provided” column, please indicate the amount of money you would spend for that item. The total “amount provided” must sum to \$50,000.

Activity/Item	Range Permitted (\$ minimum - \$ maximum)	Amount Provided (in Dollars, \$)
1. Mark’s/Ashley’s college expenses (tuition, etc.)	(\$ 0 - \$45,000)	\$
2. Vacation for you	(\$ 0 - \$10,000)	\$
3. New car for you	(\$ 0 - \$5,000)	\$
4. New car for Mark/Ashley	(\$ 0 - \$5,000)	\$
5. New computer for Mark/Ashley	(\$ 0 - \$1,000)	\$
6. Other investments for you (e.g., entertainment, miscellaneous)	(\$ 0 - \$15,000)	\$
7. Other investments for Mark/Ashley (e.g., personal spending money, miscellaneous)	(\$ 0 - \$15,000)	\$
8. Retirement savings for you	(\$ 0 - \$31,000)	\$
9. Stock market investments for you	(\$ 0 - \$10,000)	\$
10. Gifts for Mark/Ashley (e.g., Birthday, Holidays)	(\$ 0 - \$5,000)	\$

Appendix F

Manipulation Check

1. How likely do you think it is that Mark/Ashley was heterosexual (straight)?

Very Unlikely			Unsure			Very Likely
1	2	3	4	5	6	7

Appendix G

Klein Sexuality Grid

- A) Sexual attraction: to whom are you sexually attracted?
- B) Sexual behavior: with whom have you actually had sex?
- C) Sexual fantasies: about whom are your sexual fantasies?
- D) Emotional preference: who do you feel more drawn to or close to emotionally?
- E) Social preference: which gender do you socialize with?
- F) Lifestyle preference: in which community do you like to spend your time? In which do you feel most comfortable?
- G) Self identification: how do you label or identify yourself?

Scoring:

- Responses are on a scale from 1 to 7 categorizing the individual's answers to the questions.
- For variables A through E, possible answers are:
 - 1 = other sex only
 - 2 = other sex mostly
 - 3 = other sex somewhat more
 - 4 = both sexes
 - 5 = same sex somewhat more
 - 6 = same sex mostly
 - 7 = same sex only
- For variables F and G, these range from:
 - 1 = heterosexual only, to 7 = homosexual only

Appendix H

Attitudes Toward Lesbians and Gay Men (ATLG) Scale

Attitudes Toward Lesbians Subscale (ATL-S)

1. Lesbians just can't fit into our society.
2. A woman's homosexuality should *not* be a cause for job discrimination in any situation.*
3. Female homosexuality is detrimental to society because it breaks down the natural division between the sexes.
4. State laws regulating private, consenting lesbian behavior should be loosened.*
5. Female homosexuality is a sin.
6. The growing number of lesbians indicates a decline in American morals.
7. Female homosexuality in itself is no problem, but what society makes of it can be a problem.*
8. Female homosexuality is a threat to many of our basic social institutions.
9. Female homosexuality is an inferior form of sexuality.
10. Lesbians are sick.

Attitudes Toward Gay Men Subscale (ATG-S)

1. Male homosexual couples should be allowed to adopt children the same as heterosexual couples.*
2. I think male homosexuals are disgusting.
3. Male homosexuals should *not* be allowed to teach school.
4. Male homosexuality is a perversion.
5. Just as in other species, male homosexuality is a natural expression of sexuality in human men.*
6. If a man has homosexual feelings, he should do everything he can to overcome them.
7. I would *not* be too upset if I learned that my son were a homosexual.*
8. Homosexual behavior between two men is just plain wrong.
9. The idea of male homosexual marriage seems ridiculous to me.
10. Male homosexuality is merely a different kind of lifestyle that should *not* be condemned.*

Note: All items are scored using a 9-point likert scale: (1 = strongly disagree to 9 = strongly agree). Reverse scoring is used for items with an asterisk, *.

Appendix I

Demographics Questionnaire

General Demographics:

1. What is your sex? Male____ Female____ Other (please specify)_____
2. What is your ethnicity? Caucasian____, African-American____, Asian____, Hispanic____, Pacific-Islander____, Other (please specify)_____
3. What is your age (in years)? _____
4. What state do you live in (if in USA) - if not in USA, what country? _____
5. What is your current religious affiliation, if any? Christian/Catholic____, Christian/Non-Catholic____, Jewish____, Muslim____, Other (please specify)____.
6. If applicable, to what degree do you associate yourself with the above religion?

Not strongly at all		Neutral		Very Strongly	N/A
1	2	3	4	5	x

7. What is your highest degree earned? GED____, Associates____, Bachelors____, Masters____, PhD____, Other (please specify)____.
8. What is your current marital status? Single ____, Married____, Divorced____, Widowed ____, Cohabiting____, Civil union____, Domestic partnership____, Other (please specify)____
9. Do you have any children? Yes____ No_____
 - a. If you have children, please indicate their age and sex, along with the primary caregiver for each child. (Free Response)_____

10. What is your estimated yearly income?

Currently unemployed___, < \$15,000___, \$15,001 - \$30,000___, \$30,001 -
\$45,000___, \$45,001 - \$60,000___, \$60,001 - \$75,000___, \$75,001 - \$90,000___,
\$90,001 - \$105,000___, \$105,001 - \$120,000___, >\$120,000___.