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Human female sexual behaviour across sexual orientations : evolution, personality, and fluidity

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HUMAN FEMALE SEXUAL BEHAVIOUR ACROSS SEXUAL ORIENTATIONS:
EVOLUTION, PERSONALITY, AND FLUIDITY

By Sarah Radtke

Bachelor of Arts Honours in Psychology, York University, Toronto, Ontario, June 2006

A thesis

Presented to Ryerson University

in partial fulfillment of the requirements for the degree of

Master of Arts

In the program of

Psychology

Toronto, Ontario Canada, 2009

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Abstract

Human Female Sexual Behaviour across Sexual Orientation: Evolution, Personality and Fluidity

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Master of Arts in the Program of Psychology, 2010

Psychology, Ryerson University

Women's sexual behaviour across sexual orientations was evaluated in this thesis. Evolutionary theory has shown that women and men pursue different reproductive strategies and predicts that strategic interference results when women and men are trying to acquire mates. This study compared women who varied in sexual orientation to assess differences between lesbian, bisexual and heterosexual female scores in sociosexuality. Masculine and feminine personality traits were additionally assessed by the Bem Sex Role Inventory. Sexual fluidity was assessed via interviews. Results indicated that lesbians and heterosexual women had similar scores in sociosexuality, suggesting little effect of strategic interference on lesbian sociosexuality. Extreme Kinsey scale scores were compared (i.e. completely heterosexual and completely lesbian), lesbians reported being more restricted in sociosexuality than heterosexual women. Bisexual women were statistically significantly more unrestricted compared to lesbian and heterosexual women. Lesbians had the highest self ratings of femininity when compared to heterosexual and bisexual women.

Acknowledgements

I would like to thank Dr. Wade Pickren, my supervisor and mentor. I thank you for taking me on as a graduate student who studies evolutionary psychology, I will never forget that. I thank you for always listening to my ideas and giving me constructive feedback, I could not ask for a more gifted mentor and supervisor. I look forward to working with you on my PhD, and growing together as academics and as friends.

I would like to thank my thesis committee members Dr. Maria Gurevich and Dr. Frank Russo. Thank you for your time and patience, and for all the constructive feedback that you have given me that has made this a stronger thesis.

To the participants who agreed to fill out my surveys, I thank all of you for contributing to this piece of work, without you none of this is possible. A special thanks to the four participants who agreed to be interviewed and recorded, thank you for your candid answers.

I would like to thank the Ryerson faculty especially Tara Stallberg and Dr. Martin Antony. Both of you have been extremely helpful when I needed questions answered, and have always been very supportive of me and my work.

To the other psychological science students, I thank all of you for your support through these two years. I look forward to working with those of you who are embarking on the PhD journey at Ryerson.

Finally, to my mother and father, who have supported and encouraged me to seek a higher education, I thank and love you.

Dedication

I dedicate this work to my partner, Michele Quinlan. Without her, I would not have had the courage to embark on this graduate school journey. I thank and love you.

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Human Female Sexual Behaviour across Sexual Orientations: Evolution, Personality and Fluidity

Introduction

Over the last seventy years, research on women's sexuality from a scientific perspective has started to emerge. Research on female sexuality, in general, has been sparse compared to research on male sexuality. Models of sexuality development have assumed that both develop in a similar manner. Some would argue that this is the default male bias, which assumes that women develop in the same way as men. An example of a default male bias in sexuality is the past assumption that women follow the same developmental path as men regarding same-sex behaviour. Studies are beginning to materialize that highlight developmental differences between female and male same-sex behaviour and functioning. Researchers such as Hrdy, Gowaty, and Diamond are developing models of female sexuality that do not assume analogous development to men.

Objectives of research

The objective of this research is to make a contribution to the data on female sexuality and to add to the growing body of work on female mating strategies, and perhaps clarify some of the discrepancies that exist in previous work on female sexuality. In examining the mating habits of lesbians, bisexual, and heterosexual women, this research hopes to highlight any similarities or differences among these groups. Further, the notion of female fluidity needs to be studied in more detail as indicated by preliminary interviews conducted for this thesis. Many factors account for the mating strategies observed in human females. Evolutionary explanations require thinking about humans as any other animal where adaptations have been selected for survival of

the organism. To gain a better understanding of human behaviour, evolutionary explanations can be considered.

In the last several decades, discrepancies have emerged in studies of female sexual behaviour, including mating preferences (Gangestad & Simpson, 2000). Several variables will be investigated to analyze their impact on female mating behaviour, including: sexual orientation, personality, and ethnicity. In sum, this study seeks to reveal some general trends in female sexuality across sexual orientations and add to the growing field of study on human female sexuality against the backdrop of evolutionary theory.

Evolutionary psychology views the human brain as any other organ, shaped by natural and sexual selection (Buss, 2004). Evolutionary psychology is one field that tries to explain female sexual behaviour and reasons why certain behaviours take place. The human female has often been overlooked in research regarding sexual behaviour from an evolutionary perspective and in general (Barash & Lipton, 2001; Gowaty, 2001, 2003; Hrdy, 1981). This may be due to a male bias in evolutionary psychology research. Natural and sexual selection are forces that act upon *both* sexes, although previous male scientists have not acknowledged this (Barash & Lipton, 2001; Hrdy, 1981). Sexual selection, in particular, selects for adaptations that are reproductively viable for women and men according to the unique reproductive challenges they faced (e.g., Buss, 1994); the resulting differences in strategies can cause strife between the two sexes (Haselton et al, 2005; Hrdy, 1981). A review when *Homo sapiens* first appeared in the fossil record, natural selection, and parental investment theory will now be discussed.

Evolutionary Explanations of Human Sexuality

The evolutionary section will focus on human female mating preferences that were first selected hundreds of thousands of years ago by our hominid ancestors. To gain a perspective of

how evolutionary psychology theory makes its predictions, a review of mammals and their reproductive history will briefly be discussed.

Mammals began to appear on earth roughly 200 million years ago (Beard, 2004; Buss, 2004; Dawkins, 2004; Stringer & Andrews, 2005). Placental mammals started to emerge 114 million years ago. In placental mammals, instead of the female laying eggs, the fetus gestates inside the mother and is attached to the placenta where nutrients are delivered to the offspring (Buss, 2003; Dawkins, 2004). Approximately 85 million years ago primates began to appear in the fossil record; these early primates were small, about the size of modern squirrels (Beard, 2004; Buss, 2004; Dawkins, 2004; Stringer & Andrews, 2005).

Approximately 200,000 years ago, modern *Homo sapiens* appeared in the fossil record (Beard, 2004; Dawkins, 2004; Stringer & Andrews, 2005). For most of hominid existence, life was on the open savannas and in forests, roaming the land. Human ancestors lived in small groups, living day to day to survive. Evolutionary psychology suggests that our brain is adapted to this kind of living (Buss, 2004; Dawkins, 2004; Jacobs, 2003; Miller & Kanawawa, 2007; Stringer & Andrews, 2005). Evolutionary psychology predicts that there are relics of human ancestral adaptations that can be observed today in "modern" human beings. One of the areas where ancestral relics can be observed is in human mating preferences.

It is thought that one of the origins of potential differences in human mating strategies may lie in the differential investment in reproduction. For example, female sex cells are quite large compared to male sex cells in all mammals. Female sex cells contain abundant amounts of nutrients while the smaller male sex cells are agile. Men continuously produce sperm throughout their lives, roughly 3 million per day, while women are born with a limited supply of ova (Ellison-Rogers, 2001). Evolutionary psychologists suggest that this initial difference will lead

human females to invest more time and energy in the reproductive process. That is, they will have more parental investment; this has been documented in many mammalian species including chimpanzees (*Pan troglodytes*), lions (*Panthera leo*), African bush elephants (*Loxodonta africana*) and American black bears (*Ursus americanus*) (Burley & Foster, 2006; Buss, 1989; Clutton-Brock & Vincent, 1991; Dawkins, 1989; Schmitt, 2003; Trivers, 1972). When pregnant, a human female must carry the baby nine months, breast feed the offspring for several years, and decrease mating opportunities during the gestation period and after the offspring is born (Buss, 1989; 2004; Schmitt, 2003; Thornhill & Gangestad, 2008). The greater parental investment of the female makes them a valuable resource in terms of time devoted to offspring (Dawkins, 1989; 2004; Trivers, 1972). Human males therefore compete for the valuable human female; this competition between men is demonstrated in the sexual dimorphism of the human species where men are generally larger in muscle mass and body structure compared to women (Buss, 1989; Clutton-Brock & Vincent, 1991; Dawkins, 1989; Thornhill & Gangestad, 2008; Trivers, 1972). Males in species that compete heavily for access to females develop large amounts of muscle mass and sometimes bodily structures such as horns in caribou to fight other males (Clutton-Brock & Vincent, 1991). This takes place in order to compete with rival males for female access. In species where males invest more heavily in offspring such as the mormon cricket (*Anabrus simplex*) and many sea horses (*Hippocampus sp.*), females compete for access to males and are larger than the males (Buss, 2004). However, in most mammalian species, the males compete for access to females. The more males compete with each other for access to females, the more pronounced sexual dimorphism will be in a given species (Dawkins, 1989). Females in many mammalian species will choose males who are successful at defeating other males for access to them.

Ancestors of human females today risked a high cost to their own reproductive success with an unwanted pregnancy. The cost of a pregnancy by an indiscriminate mate choice is a heavy cost for women since their reproductive time is finite: there is a window of opportunity to bear children with a limited amount of ova before the female experiences menopause (Buss, 2004; Trivers, 1972). Natural selection therefore favoured women who were more selective than other women in choosing a mate (Buss, 2004; Buss & Schmitt, 1993; Pillsworth et al, 2004; Schmitt, 2003; Thornhill & Gangestad, 2008; Trivers, 1972). Men can theoretically sire offspring until they die, and do not have a limited time where they can reproduce. Thus, women are predicted to be less inclined than men to engage in casual sexual encounters according to evolutionary psychology (Buss & Schmitt, 1993). Women are more inclined to seek out longer term commitments from men, and to be more selective than men in who they decide to mate with. This is due to the heavy parental investment women contribute to offspring (Trivers, 1972). Women who engage in casual sex frequently risk mating with someone with whom they may not want to have a child. Women will then have to allocate their parental investment to an offspring with a mate that may not have been suitable. However, what was adaptive in an evolutionarily adaptive environment may not be adaptive in today's environment.

Studies conducted from an evolutionary psychology viewpoint have provided support for these predictions. For example, Pillsworth et al (2004) found that women felt most attracted and sexually responsive if they believed that commitment was very strong in a relationship. Ellis and Symons (1990) and Buss and Schmitt (1993) both analyzed sexual fantasy and the desire for more sexual variety in men and women. Men more than women, reported sexual fantasies regarding numerous sexual partners and sexual variety; while women reported fewer fantasies regarding sexual variation and did not report as many fantasies that involved numerous sexual

partners (Buss & Schmitt, 1993; Ellis & Symons, 1990). The pattern of women engaging in and desiring casual sex less than men has been found across many cultures in the world (Buss & Schmitt, 1993; Gangestad & Simpson, 1990; Schmitt, 2003; 2005). Human males generally desire more casual sex, seek out more casual sex, and are persistent in pursuing casual sex more than human females (Buss, 2004). Although women do engage in casual mating, they do not do so as frequently as men, they are not as persistent in seeking out casual sexual encounters, and generally desire fewer sexual partners in comparison to human males (Buss, 2004). Although this is compelling evidence, it should be noted that most of these studies were based on self reports. Most studies on sexual behaviour use self-report measures, and this poses a problem since women in many cultures may not report casual sexual behaviour due to negative responses from the dominant culture. In sum, women could be underreporting casual sexual behaviour. The current thesis also uses self-report studies and this should be noted when interpreting results.

Evolutionary psychology theory postulates that when human females engage in casual mating as the dominant mating strategy, it is more condition dependent (Burley & Foster, 2006; Buss & Schmitt, 1993; Gangestad & Simpson, 2000; Schmitt, 2003). Although human females do generally engage in less casual mating behaviour than human males, there are women who do use casual mating as their dominant mating strategy (Gangestad & Simpson, 2000). However, their evolutionary reasons for doing so are different than for men. It is sometimes beneficial for women's reproductive success to engage in short term mating, especially if the current mate is a reproductive failure (Fisher, 1992; Greiling & Buss; Haselton et al; 2005; Schmitt, 2003; Thornhill & Gangestad, 2008). Evolutionary psychologists have offered speculations about why and when women engage in short term mating including mate assessment, increasing commitment of a long term mate, better genes, protection, and mate expulsion (Greiling & Buss,

2000; Schmitt, 2003; Buss & Schmitt, 1993). Most of these reasons for female short term mating have garnered some support (Greiling & Buss, 2000). There are many other primates where mating with many males is a female dominant mating strategy, including our closest relatives the bonobos, as is discussed later (Hrdy, 1981; De Waal, 1997, 2005). In sum, evolutionary theory suggests that women will engage in less short term mating compared to men. The theoretical framework for this thesis is based on evolutionary psychology. However, there are other theories that are important in explaining female mating behaviour and three are reviewed in the next section.

Approaches Other than Evolutionary Psychology to Explain Mating Strategies

An evolutionary explanation of mating behaviour is only one theory among many that tries to explain differences in men and women regarding mating behaviour that is observed among humans. This proposal will provide an overview of three relevant theories that contribute to explanations of female mating behaviour.

Feminism and Evolutionary Psychology

Feminist approaches to evolutionary psychology have challenged the discipline in some of its male biased views of adaptations in male and female mating strategies. Feminist perspectives have highlighted the fact that many scholars in the field of evolutionary psychology have ignored female mating strategies and have ignored studies that dispute or counteract popular accepted notions such as parental investment theory (Trivers, 1972). The following section will discuss some feminist theory and evolutionary psychology.

One alternative to parental investment theory is William Sutherland's (1985) "handling times". Handling time is the time it takes to copulate in addition to the time between the end of copulation with one partner and time of the start of receptivity to mating again, which may include parental care and attaining nutritional resources to reproduce again (Gowaty, 2003). Sex associated handling times can also explain the non-random mating of human females who are normally thought of as "coy". Gowaty (2003) thinks that it is surprising that more attempts to experimentally illustrate sex roles in typical species did not follow after the Sutherland (1985) publication. She attributes this to the male dominated biases of evolutionary psychology, and in the firm belief that parental investment theory cannot be challenged (Gowaty, 2003).

Following the Sutherland (1985) publication, two feminist evolutionary psychologists, Stephen P. Hubbell and Leslie K. Johnson, followed up on the handling times idea that

Sutherland described. Hubbell and Johnson used mathematical models to explore when random environmental variation would select or favour against choosiness or indiscriminate mating (Gowaty, 2003). The model that Hubbell and Johnson described illustrated that selection favours choosy strategies when the survival rate is high in the given environment. When survival rates are low, then indiscriminate selection is favoured. The model proposes that natural selection would favour a flexible mating pattern, that is, that selection should operate so that individuals respond in a flexible manner due to real time environments, to be either more choosy or indiscriminate (Gowaty, 2001; 2003).

This idea is not new in mainstream evolutionary psychology literature where condition dependent strategies of mating and strategic pluralism (Gangestad & Simpson, 2000) account for part of what is observed in our species with regards to mating. The environment a person resides in will always affect how selected adaptations of a species will be expressed (Gangestad & Simpson, 2000). Though evolutionary psychology does not ignore environmental circumstances, the role of genes is often portrayed as being more important. Gowaty (2003) advocates an environmental-gene interaction. Evolutionary psychology also advocates a gene environment interaction as no organism is unaffected by the environment it resides in (Gangestad & Simpson, 2000). Gowaty (2003) argues that there have been no empirical tests of the Hubbell and Johnson model; she notes that the paper was not cited very often, even though it received a lot of attention when published (Gowaty, 2003). Gowaty has argued that its low citation rate may be due to the male bias that favours parental investment theory. Gowaty goes on to suggest that the Hubbell and Johnson model (1987) needs to be tested and taken into consideration as an alternative to parental investment before accepting that parental investment theory (Trivers, 1972) can alone account for selection of sex roles observed in human mating interactions (Gowaty, 2003).

Gowaty (2003) discusses alternative theories to explain observed sex roles. She contends that the often observed "coy" nature of women is due to men's manipulation of the women's reproductive decisions. Fruit flies have been intensely studied in their mating strategies, it has been speculated that male fruit flies manipulate the female fruit fly and her mating strategies so that she becomes more selective and thereby, the male fruit fly has more confidence in the paternity of the offspring (Gowaty, 2003). The claim that men want chaste young women (Buss, 1989; Buss, 1993, 2004) can be viewed as men trying to manipulate a female's reproductive strategy instead of meaning that men prefer younger, chaste women (Gowaty, 2001). Gowaty (2001) argues that many mating decisions depend on the circumstances of women in a given society. If a woman is in a society with abundant resources and well organized female rights, then a female will make different mating decisions compared to a female who resides in a restrictive, resource-competitive society (Gowaty, 2001; 2003). If women have autonomous control of their own resources then they will mate more frequently with men who they are sexually attracted too instead of men who have abundant resources (Eagly & Wood, 1999; Fausto-Sterling, 1985; Gowaty, 2001). Women who are not in control of their own resources will be more likely to seek men who have resources, instead of those who may be more physically attractive to them since this is the women's only way of gaining access to essential resources (Eagly & Wood, 1999; Gowaty, 2001).

Hrdy (1997) also suggests that the "coy" innate nature of human females is misunderstood. The development of patriarchal systems in many human societies and the uncertainty men may have in paternity in offspring could have pushed the human female to be sexually modest because of the human males' reproductive strategy of avoiding paternity uncertainty (Hrdy, 1997). Sexual modesty in women may be a recent evolved adaptation or a

learned behaviour in women to avoid consequences of a male dominated system (Hrdy, 1997). Supposed female universals for the desire of wealthy men may also be due to male monopolization of resources in many societies, whereby a female would then try and mate with a wealthy male to obtain resources for her and her offspring (Hrdy, 1997).

Observations of female primate relatives by Hrdy (1981) showed that female chimpanzees and female langur monkeys (*Presbytis entellus*) actively pursue mating with various males, sometimes copulating with over eight males in one hour. The observation of chimpanzees, one of humans' closest relatives demonstrates females who are not "coy" but actively soliciting sex (Hrdy, 1981). Chimpanzees have a similar gestation period and a long infant dependence period similar to humans (Hrdy, 1981). Hrdy (1981) argued that female chimpanzees mate with many males to confuse paternity, thereby reducing infanticide of her offspring. Observations such as these are ignored by mainstream evolutionary psychology according to Gowaty (2003). Observations inconsistent with intuitive claims are not being researched extensively since they do not support the normative mating expectation of passive women and eager men. Both Gowaty (2003) and Hrdy (1981) challenge mainstream evolutionary psychology that has been dominated by male scientists since its origin. Feminist approaches can contribute to the modification of the theory and can view findings from a different perspective. As more feminist scientists enter the field, more ideas will be challenged, some aspects of the field may be modified, some may not, but science always needs to be challenged so it does not operate on assumptions of a given truth that may be accepted, even though not fully correct.

Social structure theory as an origin theory of sex differences

Social structure theory postulates that men and women occupy different social roles and that they therefore become different psychologically to adjust to these roles in a given culture or society (Eagly & Wood, 1999). Social structural theory places an emphasis on the social environment, but acknowledges the "genetically mediated sex differences" (Eagly & Wood, 1999 p. 409). The males' greater physical strength and female childbearing and lactation are important because they interact with a given culture's beliefs on what is appropriate for men and women; this subsequently leads to different roles for men and women in social organization (Eagly & Wood, 1999). These different sex roles also influence the division of labour prescribed to men and women in a given society (Eagly & Wood, 1999). Social structural theory views sex differentiated inclinations as influenced by the adjustment of the person to the sexual division of labour of that period of time (Eagly & Wood, 1999). The theory views physical differences between men and women as a vital influence that contributes to gender role assignment (Eagly & Wood, 1999).

The major crux of the social structural theory is based on the typical features of the roles of men and women. The first principle is that greater power and status is assigned to male typical or dominant roles (Eagly & Wood, 1999; Eagly & Steffen, 1984). Men's adjustment to roles with greater power and status produces more dominant and aggressive behaviour while women's adjustment to roles with less power and status produces more subordinate behaviour (Eagly & Wood, 1999; Eagly & Steffen, 1984). Eagly and Wood (1999) explain that dominant behaviour (mostly observed in men) is "controlling, assertive, relatively directive and autocratic, and may involve sexual control" (p.412); while subordinate behaviour (observed mostly in women in North American society) is "compliant to social influence, less overtly aggressive, more

cooperative and conciliatory and may involve a lack of sexual autonomy" (p. 412). Therefore, the general observed behaviours in men and women stem from their adjustment to conform to these gender norms of society.

The second major principle of the theory flows from the different balance of activities that are related to the typical roles of males and females in a particular society. Women and men try to fit in to these assigned roles by seeking skills and resources related to successful roles, and by adjusting to the role requirements as dictated by society (Eagly & Wood, 1999). For the most part, assignment of child rearing to women influences nurturing behaviour that further encourages a female to be nurturing not only to children, but other individuals as well (Eagly & Wood, 1999). Gender roles materialize for the work set out for a given gender. The traits that are essential to execute sex typical work become stereotypic of men and women (Eagly & Wood, 1999).

Social structural theory tries to explain the psychology of mating behaviour in women and men. Mate selection highlights an individual's effort to select a mate in a society that is constrained and governed by assigned gender roles. These roles, which are ascribed according to gender, dictate expectations that go along with the gender (Eagly & Wood, 1999). In a system where men are viewed as the provider and women as domestic, women seek men who are successful in wage earning and acquiring resources, while men look for women who are going to be strong in a domestic role (Eagly & Wood, 1999). Social structural theory suggests that sex differences in preferred age of a mate can be understood by society's idea of an ideal fit for the male and female because of the sexual division of labour and marital roles. The older male and younger female fit in the culturally expected pattern of males are the ones who go and make money and the female is the homemaker and does most of the child rearing (Eagly & Wood,

1999). Women who are younger than their potential marriage partners tend to have lower wage jobs, weaker social status and less education than women who are the same age as a marriage partner; therefore if the younger, inexperienced female marries an older experienced male, the power differentiation in favour of the male is easier to implement (Eagly & Wood, 1999). The differences seen in men and women according to this theory are largely based on the sexual division of labour and the physical dominance of men.

Social cognitive theory of gender development and differentiation

"Human evolution provides bodily structures and biological potentiality, not behavioural dictates" (Bussey & Bandura, 1999, p. 684).

Social Cognitive Theory (SCT) acknowledges that some gender differences are biological, but most of the stereotypical elements and roles linked to gender develop more from cultural dictates than from biological predispositions (Bussey & Bandura, 1999). This theory focuses on the sociocultural explanations of gender role development, and how men and women act accordingly (Bussey & Bandura, 1999). Gender conceptions and role behaviour is the product of a large number of social influences, including the family and the societal systems a person encounters in everyday life. Social cognitive theory proposes a layered social transmission rather than one that solely operates in the family unit (Bussey & Bandura, 1999). The theory proposes that gender role development and functioning take place throughout life rather than solely in the childhood years (Bussey & Bandura, 1999).

Social Cognitive Theory lists some distinctive attributes thought to be exclusive to the human animal and that have a substantial impact on male and female behaviour (Bandura, 1986; Bussey & Bandura, 1999). Humans have an amazing ability to create and recognize symbols, and this is a powerful source for understanding the environment and for regulating

environmental conditions that affect most areas of life (Bussey & Bandura, 1999). Another unique ability according to the theory, is the advanced capacity for observational learning, where people can learn through modelling, and they can learn information rapidly (Bussey & Bandura, 1999). Gender roles for men and women are learned through these processes.

In Social Cognitive Theory, gender development is espoused by three modes of influence that are subsequently processed cognitively (Bussey & Bandura, 1999). The first mode is modeling. A vast amount of gender appropriate information is learned through modeling. Modeling takes place in the immediate environment of the family and peers, and through people in social, educational, and occupational environments (Bussey & Bandura, 1999). The media provides modelling of gender dictates to the massive audience exposed it reaches (Bussey & Bandura, 1999). The second mode of influence is through experience in the culture a person resides in. Gender linked behaviour is sanctioned in most societies; a person learns what is and is not acceptable. A person learns this through viewing other people who go against gender norms, and the consequences that befall them (Bussey & Bandura, 1999). The third mode is direct teaching. A person is informed directly pertaining to what is appropriate and inappropriate gender conduct in a given society (Bussey & Bandura, 1999). These three modes operate together to develop appropriate gender roles and behaviour. Mating behaviour is directly influenced by these three modes of transmission, and though evolutionary explanations are mentioned briefly, they are not responsible for the differences that are observed in men and women in society, according to the social roles theory. The theory states that these behaviours and roles are learned. Gender behaviour is affected by these aforementioned influences. The individual learns what is appropriate for a given gender and abides by these rules. An individual who clashes with the normative gender roles is often ridiculed; this is observed by others and

serves as a warning. In sum, modeling is a powerful learning tool, and can impact people without being aware of it.

There is agreement in the feminist evolutionary paradigm and Eagly & Woods (1999) argument. Eagly & Wood (1999) and Gowaty (2003) and Hrdy (1981) have facets in their theories that are compatible. Both espouse that men may be trying to control female sexuality; both theories describe different ways this is completed. There is a parallel in both theories in that both mention physical strength of men and how this difference contributes to the way mating behaviour is carried out in western society. Both Gowaty (2003) and Hrdy (1981) question assumptions made by the mostly male dominated evolutionary psychology field that they are a part of. Eagly & Wood (1999) also question roles that are assumed to be natural for women and that these roles were made to be labelled natural by male scientists. Both the feminist evolutionary psychology field and the social structure theory question male power dynamics and how that has shaped Western society and also Western academia. Both theories question the dominant thinking of each field and continue to challenge assumptions that are naturally supposed.

There are overlapping areas of agreement between social cognitive theory and evolutionary psychology regarding mating. Both of these theories espouse that the environment plays a crucial in the development of mating strategies. An interaction between biological mechanisms (excluding the brain) and environmental conditions produces the different mating strategies observed in human males and females. The largest difference is that social cognitive theory does not believe that genetic adaptations help to shape behaviour in humans. Social cognitive theory believes that the human brain is too complex and malleable to be affected by

genes in mating behaviour. The theory proposes that humans are a special kind of animal that is exempt from what we are born with, that humans can overcome genetic heritage.

Evolutionary psychology does not view the human being as more special than other animals, it asserts that the human is an animal and subjected to forces of natural and sexual selection, as is every other living organism on the planet. It is therefore helpful to investigate mating in human beings' closest living relatives, the great apes. A review of sexual behaviour of chimpanzees and bonobos will be outlined next.

Comparative Analysis of the Great Apes and their Mating Strategies

One way to study evolutionary mechanisms in humans is to examine behaviour in closely related species. Humans' closest living relatives are chimpanzees and bonobos. Both of these apes behave in distinct ways, especially in the mating realm. A brief review of chimpanzee mating behaviour will be discussed, but the emphasis will be on the less studied bonobo and its sexual behaviour as their mating behaviour is more similar to human mating behaviour.

Humans are included in the three families of great apes in the super family Hominoidea. All the great apes except for humans have restricted regions in Southeast Asia or Africa. The five great apes: chimpanzees (*Pan troglodytes*), bonobos (*Pan paniscus*), orangutans (*Pongo pygmaeus*), gorillas (*Gorilla gorilla*) and humans (*Homo sapiens*), share common behaviours in mating and sexual behaviour. All great ape infants have an extended juvenile period. Females are usually the predominant caregivers of offspring, although male help is observed intermittently (De Waal & Lanting, 1997; Goodall, 1971; Savage-Rumbaugh & Wilkerson, 1978). Bonobos (*Pan paniscus*) and chimpanzees (*Pan troglodytes*) share 98% of DNA with humans. Humans, bonobos and chimpanzees are more related to each other than the chimpanzee and gorilla. The split between the last common ancestor of humans, bonobos, and chimpanzees occurred roughly 6 million years ago. Divergence of the bonobo and chimpanzee occurred approximately 2 million years ago. The selection pressures for each species were distinct. Chimpanzees had to adapt to a more open and dry habitat, and they scattered throughout central Africa. Bonobos never came out from the protection of the humid rainforest which they are speculated to have inhabited for the past 2 million years (De Waal & Lanting, 1997). *Homo sapiens* dispersed throughout Africa, subsequently branching out all around the world. This resulted in different behavioural repertoires for each ape.

Chimpanzees Pan troglodytes

Chimpanzees form strong male-male alliances with each other to engage in hunting parties and launch attacks on neighbouring chimpanzee colonies (Gagneux et al, 1999). Female chimpanzees live in multi-male groups where females solicit mating from the males in the group she resides in (Gagneux et al, 1999). If she goes outside this group, she risks losing resources accrued to her by the males in her group, and possible violent retaliation including infanticide from the males in her group (Gagneux et al, 1999; Hrdy, 1981). Killing the infant allows the male chimpanzee to have quick access to the female for mating as the female will go into oestrous soon after her offspring is killed (Hrdy, 1981; Gagneux et al, 1999). Female chimpanzees can often be seen with young infants on the perimeter of their territory, possibly to try and avoid aggressive male behaviours (Hrdy, 1981).

Male chimpanzees sharing food with females is thought of as a parental investment strategy because he may be sharing with offspring (Hrdy, 1981; Savage Rumbaugh & Wilkerson, 1978). Some of the sharing of food is repaid with sex by the female chimps; male chimpanzees are particularly generous with sharing food when a chimp female is sexually receptive, and especially if she is presenting herself for copulation (Hrdy, 1981; Savage Rumbaugh & Wilkerson, 1978). Male chimpanzees are very excitable and offer loud and violent displays to ensure dominance. Female chimpanzees are usually observed to want to mate with a dominant male in her group; by doing so she will better ensure protection of her offspring, and protection of herself.

Occurrences of female-female sexual behaviour have been detected in chimps. In a study of captive chimpanzees, females were observed to rub their genitals together (genito-genital rubbing or GG rubbing) with each other (Anestis, 2003). The behaviour occurred mostly for

social bonding. Sex in chimpanzee society is predominantly used for reproductive purposes and is comprised of dominance and aggression (De Waal, 1997, 2007; Goodall, 1971). *Homo sapiens* other closest living relative, the bonobo is quite distinct in behaviour from the common chimpanzee.

Bonobos Pan Paniscus

Male bonobos are only slightly larger than female bonobos. Males retain their sharp canine teeth that could potentially severely injure another individual. The males could possibly dominate females by brute force, but this is not observed (De Waal, 1997; Parish, 1996). Female bonobos are able to dominate in bonobo society as a result of the alliances they form with each other (De Waal, 2005; Parish, 1996; Savage-Rumbaugh & Wilkerson, 1978). Bonobo society as a whole is very sexual in that bonobos engage in sexual behaviour for more than reproductive purposes (De Waal, 2005; De Waal & Lanting, 1997; Kano, 1980; Rowe, 1996; Savage-Rumbaugh & Wilkerson, 1978). Bonobos display a pattern of slow reproduction rates, and high sexual activity (De Waal & Lanting, 1997). This is the same behaviour pattern found in *Homo sapiens*, where birthrates are low (at the most, one offspring per year) but high levels of sexual activity that take place throughout the female cycle (De Waal & Lanting, 1997).

In most animal species, sex is mainly used for reproduction; this is its main goal and purpose. However, sex in some species is also used for pair bonding (Wilson, 1978). Sex is used for pleasure as bonobos have been observed masturbating using their hands and feet, or tools (De Waal, 2005). Sexual behaviour is used for appeasement, reconciliation, pleasure and reproduction. If an aggressive situation between two bonobos is imminent, bonobos will employ sexual behaviour to deflate any tension (Hohmann & Fruth, 2000; Kano, 1980). Sexual activity to decrease tension takes place between all members of bonobo society. Aggression is kept at a

minimum through sexual responses between all members, male and female and old and young (De Waal, 1995; DeWaal & Lanting, 1997; Hohmann & Fruth, 2000; Kano, 1980;). Bonobos have been observed in the wild and in captivity to be angry with one another, and then engage in a quick sex act, the aggressive tension is consequently reduced (De Waal, 2005).

Female bonding is the most extreme difference between chimpanzees and bonobos (De Waal & Lanting, 1997). This point is exemplified by the fact that bonobo females migrate out of the group into new groups, and prefer the company of other females who are not related to them (De Waal & Lanting, 1997; Parish, 1994, 1996). One of the key elements in bonobo females is forming strong alliances with one another through engaging in sexual acts together (De Waal, 2005; De Waal & Lanting, 1997; Hohmann & Fruth, 2000; Kano, 1980; Parish, 1996; Savage-Rumbaugh & Wilkerson, 1978). Female bonobos perform genito-genital rubbing (GG rubbing) with each other. This behaviour has been observed by all researchers studying bonobos in the wild and in captivity (De Waal, 2005). The females' genitals swell significantly, the swelling of the vulva are located more between the legs than the chimpanzee and human hence the bonobos clitoris is very prominent, erectile, and frontally oriented (Savage-Rumbaugh & Wilkerson, 1978). The size of the bonobo clitoris and its position allows GG rubbing (and dorsal ventral mating with males) to be a very enjoyable act and often follows through to orgasmic climax (De Waal & Lanting, 1997; Hohmann & Fruth, 2000; Savage-Rumbaugh & Wilkerson, 1978). Once the female joins another group, she will engage in GG rubbing with the dominant female of the faction that she is infiltrating. This behaviour eases the process of the new bonobo female entering the new group (De Waal, 2005; Savage-Rumbaugh & Wilkerson, 1978). GG rubbing between the new female and other members of the clan serves as a bonding process that helps in forming sturdy alliances among the females in the group (De Waal, 1997; Kano, 1980; Savage-

Rumbaugh & Wilkerson, 1978;). These female ties are difficult to fracture. The rate of GG rubbing observed in wild bonobos is quite high, rates that have been reported are 2.7 per hour (Idani, 1991) and 0.33 per hour (Furuichi, 1989). Female bonobos engage in frequent same sex behaviour but they are not exclusively homosexual (De Waal, 2005; Savage Rumbaugh & Wilkerson, 1978).

Mating takes place throughout the female bonobos cycle beyond her peak oestrus swelling (Dahl, 1986). Often male bonobos do not know who his offspring are (Hrdy, 1981; De Waal & Lanting, 1997 & Soltis, 2002). Infanticide has never been observed in wild or captive bonobos (De Waal, 2005). It is therefore adaptive for the female bonobos to engage in multiple male mating to confuse paternity of their offspring thus avoiding infanticide (Hrdy, 1981; Parish, 1996 & Soltis, 2002).

Humans and bonobos share much common mating behaviour. Face to face copulations between bonobos is accompanied by eye gazes of each partner where bonobo pairs are observed to gaze in each other's eyes for the entire copulatory period (De Waal & Lanting, 1997; Savage Rumbaugh & Wilkerson, 1978). Eye gazing is a behaviour observed in humans that indicates strong emotional bonds. Sex between bonobos has been monitored to be enjoyable where many bonobo females achieve orgasm (De Waal, 2005; Savage-Rumbaugh & Wilkerson, 1978). Vocalizations and gestures happen before and during mating in bonobos but are not observed to occur in chimpanzees (De Waal, 2005; Savage-Rumbaugh & Wilkerson, 1978).

Homosexual pair bonds, masturbation and strong emotional ties between unrelated females are behaviours that occur in bonobos and human beings. Bonobos in general have many female and male sexual partners. Female bonobos sometimes prefer female to male sexual partners (Bagemihl, 1999; De Waal & Lanting, 1997). Bonobo females sometimes ignore

solicitations by males in favour of a sexual encounter with another female (Bagemihl, 1999). The variability of bonobo female sexual behaviour and rates of bisexuality in the species makes the bonobo a similar animal in some aspects of sexual behaviour to compare with human females. Bonobos may prefer female company in sexual or emotional bonds, but they always mate with males as well, ensuring reproductive success. Bonobo females possess a bisexual nature. More comparative work is needed between bonobos and human females. Human female genital arousal has been shown to take place when viewing male/male stimuli and female/female stimuli (Chivers et al, 2004). There may be some links in the mating strategies of bonobo and human females. Further research is needed to try and answer these questions.

Review of Past Research

Strategic Interference

As a result of men and women pursuing different mating strategies, conflict may arise. Conflict regarding short term mating is especially apparent between women and men (Buss, 1989; Haselton et al, 2005; Schmitt, 2005). Strategic interference is when a person utilizes a strategy to obtain a desired goal, but something blocks it, which is often the case when women and men employ their sexual strategy in pursuing a mate (Buss, 2004; Buss & Schmitt, 1993; Haselton et al 2005). For example, if a woman uses a strategy of delaying sexual intercourse until a commitment is assured from a male, and the male is using a strategy of seeking a casual sexual encounter, the woman will then experience interference with her strategy (Buss, 2004; Haselton et al, 2005). A great deal of disparity between men and women in terms of mating goes back to evolved differences in sexual strategies. Evolutionary psychology asserts that women will generally delay sex for longer periods of time upon meeting someone and will be more selective in short term and long term mating, whereas men will be more persistent in seeking casual sexual intercourse, will be more open to it, and will be more inclined to seek it out (Buss & Schmitt, 1993; Gangestad & Simpson, 2000; Haselton et al, 2005). Women and men often cannot obtain what they want regarding their sexual requirements, therefore strategic interference occurs. Conflict between women and men may then take place (Buss, 2004; Haselton et al, 2005).

A pervasive method of assessing strategic interference is to measure emotional responses to situations that promote distress. Haselton et al (2005) conducted a study to analyze emotions associated with strategic interference. Their sample was university undergraduates who had to complete a survey where they rated events associated with strategic interference. Haselton et al

(2005) predicted that women would be more upset than men by situations that described resource deception, exaggerated status, existing romantic partners, and post-copulatory deception.

Haselton et al (2005) supported their predictions. Women were more upset than men by situations associated with strategic interference. As a result of women and men having different mating strategies, they may deceive the other sex to get what they want.

Haselton et al (2005) used samples that were under the age of thirty. This may have impacted the results. Often undergraduate psychology students participate in studies to receive credit for their course. This may lead to biased results based on a young sample of eighteen or nineteen years of age. Haselton et al (2005) used two samples to assess emotional upset associated with strategic interference. In the second sample of heterosexual men and women, they were also given surveys that described situations that had a high likelihood of making participants emotionally upset. Haselton et al (2005) found that women more than men were more upset by situations associated with deception of commitment level in a relationship.

Keenan et al (1997) conducted a survey assessing deception strategies, examining both deception by the sexes and the concomitant responses. Keenan and colleagues (1997) found that women were more likely to assume that they were being deceived by men. The authors argued that women have more to lose when they make a bad mating choice, resulting in women being more cautious when interpreting intentions of a male who wants to develop a dating relationship (Keenan et al, 1997). Women indicated that they were assessing how serious the potential mate is regarding a long term relationship versus if the potential mate is interested only in a casual sex encounter (Keenan et al, 1997).

Another way to analyze strategic interference is to measure sexual behaviour. This can be done by analyzing mating behaviour of heterosexual men and women, since men and women

often have competing reproductive goals. However, when using gay and lesbian samples, the absence of strategic interference can be analyzed as well. Instead of searching for emotions in heterosexual individuals associated with strategic interference, one can study male/male and female/female sexual behaviour to examine the resulting impact of no opposite sex involvement. This is what the current thesis set out to do. There have not been many studies that assess strategic interference through investigating the gay and lesbian population.

Schmitt (2005) conducted a cross cultural study to assess if women were more likely to engage in less casual sex than men. Schmitt (2005) used the Sociosexual Orientation Inventory on samples of individuals from Africa to Australia. Schmitt (2005) found that cross culturally women had a overall more restrictive Sociosexual Orientation scores and more restrictive attitudes than men, indicating less casual mating. However, as was noted earlier, women sometimes use a casual mating strategy as their dominant mating strategy. For example, harsh environments where mortality rates are high were associated with more unrestricted SOI scores indicating a tendency toward casual mating (Schmitt, 2005). Environments that had lower mortality rates were associated with lower SOI scores in women indicating less casual mating (Schmitt, 2005).). By using the Sociosexual Orientation Inventory which has been well established in evolutionary psychology literature and samples of different sexual orientations, patterns may emerge according to sexual orientation regarding casual sex behaviour.

Discrepancies in studies on women; Lesbian, heterosexual and bisexual women and masculine and feminine personality traits

Studies on lesbians have produced results that are contradictory. These studies will be reviewed below.

Nearly thirty years ago, Donald Symons (1979) conducted an analysis of sexual behaviour in homosexual men and women. Symons (1979) surmised that if there was no opposite sex involvement, the mating strategies of each sex would be exemplified, and thus, would highlight evolutionary mating strategies. Lesbian sexuality studies that Symons (1979) discussed demonstrated that lesbians did not have as many casual sex partners as heterosexual women or men. The lesbians that Symons (1979) considered were all from the United States. These studies were conducted in the 1970's and the results of the research may be partially due to the social norms of the era.

Previous research also found that lesbians and heterosexual women placed little value on youth when rating physical attractiveness compared to men who placed immense value on youth when judging attractiveness (Deaux & Hanna, 1984; Jankowiak et al, 1992; Symons, 1979). In a study comparing personal ads of heterosexual men and women and homosexual men and women, lesbians mentioned their physical attractiveness less often than all other groups (Deaux & Hanna, 1984). Lesbians also requested photos of potential partners least often compared to all other groups examined (Deaux & Hanna, 1984). Lesbians mentioned specific physical characteristics (e.g. weight, eye colour, body build) less frequently than all other groups (Deaux & Hanna, 1984; Symons, 1979). In summarizing the information above, these early studies indicated that at the time, lesbians placed less emphasis on physical appearance and youth, and engaged in less casual sex compared to heterosexual women and men. There was no data for bisexual women.

More recent studies of lesbians and mating preferences have found contrasting results. Several studies have illustrated that compared to heterosexual women, lesbians show a more masculine mating pattern and attest to acting more like men (Buunk & Dijkstra, 2001; James,

2005; Singh et al, 1999). Jankowiak et al (1992) found that lesbians rate younger women as more attractive compared to the heterosexual female group who rated older potential male partners as more attractive. Kenrick and colleagues (1995) also found that lesbians, when compared with heterosexual women, placed a greater premium on youth. When compared with heterosexual women, lesbians were less interested in a potential partner's status (Kenrick et al, 1995) and were more inclined to pursue visual sexual stimuli than the heterosexual female group (Bailey et al, 1994). Lesbians had more "masculine" characteristics and as a result were more like men in their mating psychology and behaviour (Bailey et al, 1994; Singh et al, 1999). These results indicate that there are conflicting findings regarding mating strategies and sexual behaviour in both lesbian and heterosexual women.

Many researchers have found that lesbians are more sex atypical in personality traits than heterosexual women (Bailey et al, 1994; Lippa, 2005; Rieger et al, 2008; VanderLaan & Vasey, 2008). There is some evidence that gender nonconformity in childhood could be an indication of attraction to the same sex; there is also some suggestion that gender non conformity in personality traits are observed in adulthood among lesbians (Pillard & Bailey, 1998; Rieger et al, 2008).

There is some evidence that lesbians who consider themselves more masculine or "butch" have mating strategies and psychologies that are more similar to heterosexual men than heterosexual women and other lesbians (Levitt & Hiestand, 2005; Singh et al, 1999). Self described "Butch" or lesbians that are more comfortable with masculine gender codes, style and identities are able to recall childhood atypical gender behaviour more clearly and more often than non-butch lesbians (Bogaert, 1998; Singh et al, 1999). These women have more self described male personality traits (Bogaert, 1998; Singh et al, 1999). Hormonal analysis of self described

butch lesbians has shown that they have higher testosterone levels in their saliva compared to other lesbians who do not call themselves butch and heterosexual women (Brown et al, 2002; Singh et al, 1999). Butch lesbians also tended to have a higher waist to hip ratio than other lesbians, indicating higher testosterone levels. Further, butch lesbians preferred other women who had a *low* waist to hip ratio (an indicator of fertility of women); heterosexual men and butch lesbians both found women with low waist to hip ratios more sexually attractive (Bogaert, 1998; Muscarella et al, 2004; Singh et al, 1999). Numerous research studies have found that lesbians are more sex atypical in personality traits than heterosexual women (Bailey et al, 1994; Lippa, 2005; 2008; Rieger et al, 2008; VanderLaan & Vasey, 2008).

Among lesbian women there are sub-categories between butch and femme (Rosario et al, 2009; Singh et al 1999). Singh and colleagues (2004) assessed butch and femme lesbians in a study that recruited participants through friends and acquaintances. Questionnaires were given to 100 lesbian women and 58 heterosexual women. Women were asked to rate themselves on a butch/femme scale. Singh et al (1999) found that butch lesbians had higher waist to hip ratio's (indicating higher testosterone levels) and reported more gender non conformity in both childhood and adulthood. However, self described femme lesbians also reported some gender non conformity in childhood. Brown et al, (2002) analyzed levels of testosterone in lesbians and heterosexual women. Salivatory samples of self described "butch" or masculine women have found that testosterone levels are higher in butch lesbians compared to lesbians who were not butch (Brown et al, 2002; Pearcey et al, 1996).

Singh et al (1999) used the words "butch" and "femme" in their surveys. The current thesis did not want to use a measure that included these words. Women may respond negatively

or positively to "butch" or "femme" and this may result in inaccurate reporting. Furthermore, using terms such as butch or femme may prime the participants to answer in a certain way.

Female sexual responding is different than male sexual responding

Research on female sexual responding to images of different genders engaging in sexual acts has produced some fascinating results: Women respond in a more flexible manner than men. Physiological studies of genital arousal and subjective arousal in heterosexual and lesbian women have been conducted. These studies have added to the growing body of work on female sexuality and how female same sex behaviour operates differently than male same sex behaviour. However, studies on genital arousal studies are not without limitation. For example, genital arousal studies are restricted in the sample due to the personalities of those who volunteer to be in the studies. Chivers et al (2004) noted that many of the male and female participants who volunteered for such studies masturbated more frequently, were more open to sexually new experiences, and had many sexual partners. Another difficulty is that having instruments used to measure genital arousal may impact the genital responding of the individual. Perhaps a vaginal monitor attached to the vagina may produce lubrication thus, indicating arousal. Another issue is whether individuals can control their arousal states. More studies are needed regarding the drawbacks regarding genital arousal studies. However, in spite of the limitations, fascinating patterns of sexual responding in men and women, across differing sexual orientations, have been observed.

Genital responses are arousal patterns measured in the genitals when watching explicit films and subjective arousal is self reported arousal while watching explicit films. Women's genital responses are measured with vaginal photoplethysmography where vaginal pulse amplitude is assessed. A higher rate of vaginal pulse amplitude reflects sexual arousal and this is

specific to sexual response (Chivers et al, 2007). Previous research has indicated that female sexuality is more flexible compared to men, in that women respond to various depictions of sexual stimuli whereas men do not (Baumeister, 2000; Diamond, 2008; Hamer & Copeland, 1994; Kinsey, 1952). If a heterosexual male reports that he is mostly aroused by women, he will respond most highly to women in sexual acts (Baumeister, 2000; Chivers et al, 2004; Hamer & Copeland, 1994; Kinsey, 1952). Women are thought to be *less* category specific in that if they report being attracted mostly to men or women, however, they respond genitally to both categories, hence they are usually considered less category specific than men (Baumeister, 2000; Chivers et al, 2004; Hamer & Copeland, 1994).

Chivers et al (2004) conducted a study on genital arousal where subjective arousal was also measured. Heterosexual men and women and gay and lesbian participants for the study were recruited by alternative newspapers and in university community centers. Participants were given the Kinsey scale (Kinsey et al, 1952) to determine sexual orientation. Only individuals indicating a stronger homosexual or heterosexual tendency were selected to participate.

The Chivers (2004) study was conducted with participants in a private room with their genitals attached to an apparatus to assess arousal patterns. Participants were then shown several two minute clips of sexually explicit material, accompanied by sound. The depictions shown varied by gender (male or female) and sexual acts. All participants saw female-female oral sex; female vaginal penetration with a strap-on dildo; male-female cunnilingus; male-male penile-anal penetration and male-male fellatio. A neutral stimulus was used to create a baseline measure. As all the participants watched the films, they were asked to subjectively rate the films as very arousing or not very arousing by moving a lever with their hand.

Results showed that the link between self reported sexual preference and genital sexual arousal patterns was weaker for women than for men (Chivers et al, 2004). Chivers and colleagues (2004) suggest that women have a non specific pattern of sexual arousal that is quite different from men. Chivers et al (2004) found that women were less category specific in genital arousal whereas men were highly category specific. Male participants, whether gay or heterosexual, had subjective arousal patterns that matched genital arousal patterns. Women, whether lesbian or heterosexual had genital arousal patterns that were similar to all sexual stimuli shown, whereas the subjective arousal patterns matched what gender they preferred.

Chivers et al (2007) conducted a study to once again assess heterosexual men and women, and gay and lesbian sexual responses. Participants were recruited from local gay newspapers and student websites at a university. Chivers et al (2007) examined sexual activities in erotic films and gender of actors in the films. As in Chivers et al (2004) genital monitors were attached to men and women to measure genital arousal and subjective arousal to sexual stimuli was also measured. The sexual activities shown in this study were slightly different than Chivers et al (2004). Chivers et al (2007) wanted to measure intensity of sexual activity and responses to the intensity. The sexual stimuli viewed in Chivers et al (2007) included nude male exercise, male masturbation, male-male intercourse, female exercise, female masturbation and female – female intercourse. Patterns of responding were similar except one finding that showed that lesbian women responded more genitally to female-female sexual activity. This was a significant finding that demonstrated that some lesbians may be more category specific than heterosexual women and other lesbians.

Lesbians who have a more stable lesbian identity have a more category specific vaginal arousal pattern compared to other women (Chivers, 2004). Further, lesbians with higher

masculine ratings of themselves had a more category specific responding to female stimuli. Singh and colleagues (1999) found that lesbians with masculine traits act more in line with a male mating repertoire (more category specific), however further research is still needed. Moreover, heterosexual women, as indicated by genital arousal levels, were responding with arousal to depictions of female/female sexual activity. Why would this happen? Questions abound about why female sexual responding in general is more flexible. There are some explanations that suggest flexible sexual responding is adaptive for women (Chivers et al, 2007).

Fluidity

Research has shown that female sexual responding is more variable or fluid than male sexual responding (Baumeister, 2000; Chivers et al, 2004, 2007; Hamer & Copeland, 1994). Research on female sexual variability or "fluidity" is being pioneered by Lisa Diamond. Diamond (2008) interviewed 80 women over a ten year period to examine fluidity in female sexuality. Many of the women did indeed demonstrate a variable pattern of sexuality, shifting from women to men and men to women, whether they identified as lesbian or bisexual (Diamond, 2008). Many women did not label their sexuality. Diamond (2008) found that the women in her study gave different reasons for becoming involved with the same sex or other sex. Diamond (2008) alludes to possible evolutionary reasons for fluidity but does not discuss the issue in great detail. Diamond (2008) does acknowledge that most women do prefer men, but in her studies she found that many women at some point in their life did experience some kind of same sex attraction, which was either sexual or emotional.

According to Diamond (2008), fluidity is different from bisexuality, based on her interviews with the women in her studies. However, the distinction between bisexuality and fluidity according to Diamond is difficult to define. Diamond (2008) goes on to say that human

women are "readied" for same sex experience, but does not go further to explain why this may be so (p. 132). To assert that human women are "readied" to engage in same sex activity begs for some explanation. Evolutionary psychologists would ask why this would be adaptive for the human female. Is fluidity an attribute in the human species that does not have anything to do with evolutionary adaptations? Conversely, is there some adaptive function for female sexuality to be fluid? What is clear in the Diamond (2008) studies is that the women who experience same sex attractions experience different trajectories. Many women do not actively go out and choose to pursue other women, they just happen to find women in their lives they find attractive; many of the women go further to report having always felt a sense of sexual attraction to other women (Diamond, 2008). Other women have become attracted to the same sex when they are older or if they are in an environment with many other women (Diamond, 2008). Further research is needed to examine the different trajectories that female sexuality follows. Although there is not likely to be a clear answer, perhaps different reasons may contribute to explain why this occurs. As a result of the burgeoning research on female fluidity, there is a qualitative component of this thesis where fluid defined women were interviewed and recorded. They were all asked the same questions.

Diamond's findings on sexual fluidity are intriguing. While the questions she raises in her work cannot be fully addressed in this thesis, her results indicate that much more research is needed to better understand female sexuality. There needs to be some studies on self proclaimed bisexual women and to see what is produced in genital and subjective responding. Perhaps future research can investigate responding of bisexual women genitally and subjectively. Further, women could be broken down by number on the Kinsey scale where subgroups of lesbians and heterosexuals can be investigated. The omission of bisexual women is a disadvantage in Chivers

et al, (2004; 2007). Although Chivers and colleagues (2007) did say that bisexuals were not included in order to focus on what is being studied (either heterosexual or homosexual individuals), it would be of interest to assess how bisexual women respond genitally or subjectively to various depictions of sexual stimuli. Differences or similarities in responding of heterosexual, bisexual and lesbian women would be an interesting direction to take genital arousal studies. Although the current thesis is not measuring genital or subjective arousal, it did include bisexuals in the analysis. Bisexual women were included in all analyses of this thesis. Ignoring a group would miss out on potentially important data, especially with research on female fluidity starting to flourish.

Hypothesis

With no strategic interference operating in lesbians the prediction is that lesbians will have *lower* scores on the Sociosexual Orientation Inventory (SOI) than heterosexual women. Lower scores on the SOI indicate a mating strategy that does not involve a lot of casual sex encounters, and a low desire for sexual variety. Lower scores also indicate an attitude toward casual sex that is negative. Higher scores on the SOI indicate a mating strategy that includes casual sex encounters and a desire for a variety of sexual partners. Higher SOI scores also indicate that attitudes toward casual sex are positive.

Bisexuals were also analyzed, however no direct hypothesis on results were generated. Another factor that was analyzed was masculine and feminine personality traits. There was no hypothesis generated for personality traits and how personality traits impact scores on the SOI. No hypotheses were generated for bisexual females and the SOI. The reason for this is the literature is mixed on the results of studies regarding sexual orientation and personality traits. Further, studies on bisexual sexual behaviour are not as pervasive as studies on lesbian and

heterosexual women, but when conducted they also result in contradictory results. Therefore bisexual behaviour and personality traits of all sexual orientations were exploratory in nature in this thesis.

Participants

Participants were recruited from Toronto and the Greater Toronto Area (GTA). To obtain people for the study flyers were posted in various locations that described the research. Ads were also posted on social network sites such as craigslist and facebook. Through networking on the internet site "Facebook" many people were recruited. Participants also filled out the questionnaires at bars that have a large lesbian clientele and bars that have a mostly heterosexual clientele. Several colleagues, friends and acquaintances, had social gatherings where all the women who were told of the study and wanted to participate would assemble and fill out a survey. Participants were also recruited from the Ryerson and University of Toronto campuses. See Table 1.

Table 1

Breakdown of where participants recruited

Sexual Orientation	Facebook	Craigslist	Bars	Friends/ Acquaintances	University Campuses	Total
Heterosexual	38	0	19	15	32	104
Lesbian	17	0	26	28	33	104
Bisexual	12	5	11	7	17	52

Participants in the study were all over 18 years of age and all were born female. The breakdown of sexual orientation is $n = 104$ heterosexual; $n = 104$ lesbian and $n = 52$ bisexuals. The mean age for the heterosexual group is ($M = 27.30$, $SD = 5.6$) the lowest age was 19 years old and the highest was 45 years old. The mean age for lesbians was ($M = 27.25$, $SD = 5.99$) the lowest age was 19 and the highest age was 47. The mean age of bisexuals was ($M = 27.25$, $SD = 6.58$) the lowest age was 19 and the highest was 48. All groups had statistically similar age means. The current thesis used samples that were gathered from places other than university

campuses. Many studies that were reviewed in this paper used university age participants. An attempt was made to gather women from many areas including bars, social events, and internet sites. This increased the average participant age compared to studies that only used university samples. Participants had to fill out three surveys. No person took longer than 30 minutes to complete all three surveys.

The majority of participants self labelled as white. Different ethno cultural groups were compared, see Table 2.

Table 2

Number of participants in each ethnicity group

Ethnicity	Number of Participants $n = 260$
White/Canadian/Caucasian	$n = 193$
European (not from Canada)	$n = 28$
Asian	$n = 21$
Black	$n = 7$
Other*	$n = 11$

*Other includes Native, Native American/Canadian, South American and Mexican

An effort was made to try and recruit different ethnicities. However, the sample ended up consisting of mostly white or European women. There were also some women who identified as "two spirited" and suggested that the category be added to identifying measures on the survey. Different cultures identify sexuality in various ways. This thesis, like many other studies regarding sexuality, is based on a mostly white, Canadian, sample.

Even though the sample of different ethnicities is small compared to the white Canadian sample, ethnicity will be analyzed to see if there are any group differences on Sociosexual Orientation scores and Bem Sex Role Inventory measures.

Sociosexual Orientation Inventory (SOI)

To evaluate the absence or presence of strategic interference among lesbian, bisexual and heterosexual females, the Sociosexual Orientation Inventory (SOI) was utilized (Simpson, 1994). The SOI is a scale that was developed by Jeffry Simpson and Steve Gangestad (1991) in order to measure reported casual sex partners, desire for a variety of mates, fantasies about individuals other than a current partner, and attitudes toward casual sex. The SOI consists of an attitude component to measure attitudes towards casual sex encounters. The SOI is designed to measure individual differences in the willingness of people to engage in casual uncommitted relationships and sexual intercourse (Simpson, 1994). The survey contains seven items. Questions 1-3 require the participant to write down the numerical answer, for example, how many people have you had sex on only one occasion? Another question is how many sexual partners have you had over the past year? Questions 4-9 are answered on a Likert scale. Questions 5-7 consists of the attitude component and are also answered on a Likert scale from 1 to 9. An example of an attitude question on the SOI is "Sex without love is OK", those who circle closer to nine have more unrestricted attitudes toward casual sex while those who circle closer to one have more restrictive attitudes toward casual sex. Those who score high on the SOI are said to have an "unrestricted" sociosexual orientation (Simpson, 1994). They testify to a larger number of sexual partners in the past year, they estimate having more sexual partners in the next five years and they have engaged in more "one night stands" than restricted individuals (Simpson, 1994). Unrestricted individuals hold a belief that sex without love is acceptable and they often fantasize about being with someone (other than their current partner) when in a relationship (Simpson, 1994). The people who score lower on the SOI are said to have a more "restricted" sociosexual orientation meaning they report fewer sexual partners in the last year, they anticipate having

fewer sexual partners in the coming five years, they are less likely to have had many one night stands and they fantasize less about having sex with someone other than a current partner when in a relationship (Simpson, 1994). The higher the score, the more unrestricted the person is. The lower the score the more restricted the individual is. The SOI has been found to be a reliable and valid measure cross culturally (Schmitt, 2005).

Both convergent and discriminant validity has been shown for the SOI (Simpson & Bailey, 1991; Simpson, 1994). In terms of convergent validity, it was found that unrestricted individuals: a) engage in sex earlier in romantic relationships; b) are more prone to engage in sex with more than one person at a time; c) are involved in sexual relationships with less commitment, investment, love and weaker emotional ties (Simpson & Bailey, 1991; Simpson, 1994). Unrestricted individuals also seek out partners who are more attractive and who have higher social status; they place less emphasis on kindness, loyalty, and stability (Simpson & Bailey, 1991; Simpson, 1994). It was found that restricted individuals seek out partners who are kind, loyal, and place less emphasis on social status (Simpson & Bailey, 1991; Simpson, 1994). According to Simpson (1994) men tend to score higher than women on the SOI. The college sample used for the SOI had scores that ranged from 10-250. The average score for men and women of the college sample were not given. Scores can have a large range from 10 (a very restricted SOI score) to over a thousand, indicating a highly unrestricted SOI. As a result of mean scores for men and women not being provided, it is difficult to interpret what the normal scores are for men and women. Simpson (1994) provides the information that men score higher on average, and women score lower on average. A limitation is that it is difficult to compare other studies that generate mean scores of the SOI without normative mean scores being provided in the instrument.

Restrictive individuals compared to unrestricted individuals do not show evidence of a lower sex drive (thus variation underlying the SOI is not tainted by individual differences in the desire for sex). The more restricted individuals do not score higher on scales that measure sexuality based constructs that should not correlate with the SOI like sexual satisfaction, guilt, and sexual anxiety (Simpson & Bailey, 1991; Simpson, 1994). In large samples, the SOI is internally consistent, and the test-retest reliability in a span of two months is high $r=.94$ (Simpson, 1994). There is some evidence that parceling out the attitude and behaviour scores on the SOI leads to a more accurate description of the participants (Webster & Bryan, 2007).

The attitude score on the SOI is usually much lower compared to the behaviour score. As a result of the behaviour score usually being much higher than the attitude SOI scores (due to the nature of calculating the SOI), the differences in attitude toward casual sex can become lost in the total SOI score. Separating the attitude score from the total SOI scores ensures that if there are differences in attitude scores, those differences will be detected (Webster & Bryan, 2007).

Through measuring the attitude component separately, the participants who score low on attitude and high on behaviour or those who score high on attitude and low on behaviour can be exemplified (Webster & Bryan, 2007). This thesis separated and analyzed total SOI scores and attitude only SOI scores. There is no difference in the results if behaviour only (without attitude) and total SOI scores (behaviour and attitude combined) are used in the analysis.

At the bottom of the SOI participants were asked to fill in information. Participants were asked to circle which category that best described them including heterosexual, homosexual and bisexual. This was asked to corroborate the Kinsey scale scores. Participants were asked to write their age and ethnicity. They were also asked to circle the following if any applied to them:

married, committed relationship, single, monogamous, non monogamous. Participants could circle more than one answer.

The Bem Sex Role Inventory (BSRI)

For the purpose of measuring feminine and masculine personality traits in women the Bem Sex Role Inventory (BSRI) was used. The BSRI was developed to measure masculinity and femininity on a continuum, allowing the measure of individuals who are high in both feminine and masculine characteristics, low in both, or high or low in masculine or feminine personality qualities (Bem, 1981). The BSRI allows the measure of psychological androgyny to be studied. The BSRI comes in two versions, long and short. This thesis uses the long version of the BSRI. The BSRI contains sixty personality characteristics, twenty are stereotypically feminine such as "gentle" and twenty are stereotypically masculine such as "assertive" (Bem, 1981). Twenty items that do not relate to gender characteristics such as "truthful" are also included (Bem, 1981). When the BSRI is given to a participant they are asked to indicate how well each personality characteristic describes them. The participant answers on a seven point scale which ranges from one (never or almost never true) to seven (always or almost always true). Distinguishing factors of the BSRI are that it treats masculine and feminine as two independent points rather than two points on a single dimension (Bem, 1981). This allows a person to indicate whether he or she is high on masculine and feminine dimensions which is labelled androgynous, low on both dimensions, which is labelled undifferentiated, or high on one dimension and low on the other, either masculine or feminine (Bem, 1981). Participants could fall into one of the four categories of the Bem Sex Role Inventory.

The BSRI is based on personality conceptions that are highly desirable in North American culture (Bem, 1981). Someone who is very aware of the cultural norms of sex

appropriate behaviour uses these standards to evaluate their own sex typed behaviour (Bem, 1981). Items on the BSRI were deemed masculine or feminine based on the cultural definitions of sex typed social desirability and not on the basis of differential endorsement by men or women (Bem, 1981). A personality characteristic was judged to be masculine or feminine if it was deemed more desirable in North American society for a male or female to have that characteristic (Bem, 1981). This element also allowed this research to investigate if women who have same sex attractions and who label themselves lesbian are more inclined to go against feminine norms according to the BSRI or also be inclined to label the self as the dominant culture sees fit for female and male regardless of sexual orientation.

The BSRI yields several scores including standardized *t* scores and male and female raw scores (Bem, 1981). To score the items, all the respective masculine and feminine scores are added together and divided by twenty. Subjects are then classified according to a median split into four groups which are: feminine, masculine, androgynous and undifferentiated (Bem, 1981). Bem (1981) recommends using the given median splits if measuring one sex only, as was done in this research. These median splits were based on the normative sample of Stanford students that Bem used in analyzing the instrument. The median split used for the femininity raw score was 4.90 and for the masculinity raw score was 4.95. The scores are based on the 1978 normative sample of Stanford University students. The cultural climate may have changed since then in regards to what is deemed "masculine" or "feminine" and if it is a positive or negative trait for a male or female to have. This should be noted when interpreting the data. Dividing participants at the median on both the feminine and masculine scales allows a fourfold classification to be established (Bem, 1981). There are those individuals who will score very

close to the median split cut off points; these cases are inevitable and should be taken into consideration when investigating/interpreting the data.

The psychometric analyses of the BSRI have been conducted on two samples at Stanford University; both consisted of undergraduate students in introductory psychology courses (Bem, 1981). The first sample filled out the BSRI in 1973 and consisted of 279 females and 444 males (Bem, 1981). The second samples filled out the BSRI in 1978, 340 were females and 476 were males. As far as internal consistency, all three scores of femininity, masculinity and femininity-masculinity were highly reliable (Bem, 1981). In the first sample of University students, the coefficient alpha (only female scores are discussed) was .75 for femininity, .87 for masculinity and the F - M differences were .78. In the second sample the coefficient alpha for females was .78 for femininity, .86 for masculinity and .89 for the F-M difference (Bem, 1981). The relationship between femininity and masculinity are both logically and empirically independent (Bem, 1981). All three scores were highly reliable on test retest reliability measures were $r = .82$ for femininity, $r = .94$ for masculinity and $r = .88$ for F- M (Bem, 1981). As far as social desirability, the BSRI indicates the scores are not measuring a general tendency to describe the self in a socially desirable way (Bem, 1981).

The BSRI is an older measure, however, there is evidence that the BSRI is still a valid measure to use. Holt & Ellis (1999) found that the entire masculine and most of the feminine personality traits were rated as desirable for men or women. Two of the female personality traits (childlike and loyal) were not rated as desirable for a female to possess (Holt & Ellis, 1999). Harris (1994) found that the majority of items on the BSRI are a valid indicator of American definitions of masculinity and femininity. The BSRI does yield different results when used to measure masculinity and femininity in some non western cultures (Harris, 1994). Though the

BSRI is shown to be reliable and valid in contemporary North American society, both the original Bem and studies that continue to measure how valid it still is are based on undergraduate samples, this must be kept in mind when using the instrument and when interpreting results. Although the BSRI has many stereotypical masculine and feminine characteristics, the actual words "feminine" and "masculine" do not appear on the survey. As a result, the women may not know that masculinity and femininity are being analyzed and may answer in a more honest manner. Lesbians, bisexual and heterosexual females on the BSRI were compared to their respective Sociosexual Orientation Score SOI (Simpson, 1991) scores to assess if there is a relationship between BSRI and SOI scores.

The Kinsey Scale of Sexual Orientation

To measure sexual orientation, the Kinsey Scale of Sexual Orientation (Kinsey et al, 1948) was used. It is an older model but it serves the purpose of this study. This was the first item that participants filled out. The Kinsey Scale is a seven point scale, with 0 and 6 as the extreme points, and 3 as the midpoint in classification. On opposite sides of the midpoint the following relations hold:

- 0 is the opposite of 6
- 1 is the opposite of 5
- 2 is the opposite of 4 (p.641)

Definitions of the ratings: Participants were asked to circle which best describes them

0=entirely heterosexual

1=largely heterosexual, but with incidental homosexual history

2=largely heterosexual, but with a distinct homosexual history

3=equally heterosexual and homosexual

4=largely homosexual with a distinct heterosexual history

5=largely homosexual with incidental heterosexual history

6=entirely homosexual

The histories of the participants in the Kinsey (1952) study indicate that the many people are on a continuum in terms of sexuality rather than being dichotomous. There are many individuals who are either extremely heterosexual and those that are extremely homosexual, but there are many people who are somewhere in the middle (Kinsey et al, 1948). The rating of the person takes into account overt and psychological experiences and reactions, in most cases these two aspects are parallel to each other (Kinsey et al, 1948). The position of individuals on this scale is always based upon the relation of the heterosexual to the homosexual in the person's thoughts and experience, rather than upon the actual amount of only overt experience or only expressed thoughts (Kinsey et al, 1948).

The scale in this study was used to locate individuals who are more on the heterosexual side, and those individuals who are more on the lesbian oriented side or someone in between at the particular time of the participants' life when filling out the survey. Females who are lesbian, heterosexual and bisexual will be compared. Besides circling the Kinsey scale, participants had to corroborate their sexual orientation on the SOI page of the questionnaires. If a participant for example circled "2" on the Kinsey scale and circled "heterosexual" as what they best identify with, than they would be analyzed as heterosexual. If a person circled "2" on the Kinsey scale and then circled bisexual on the SOI best identify page then they would be analyzed as bisexual. The same reason follows for those who circled 4 and then best identified as bisexual or lesbian. Whatever the person circled on the best identify with section, that is how they would be analyzed as either heterosexual, bisexual or lesbian. One participant did not think these were enough options and wrote "you did not give us enough choices because you did not put down the

word lesbian". Perhaps the best identity section could have been more clearly worded and include the term lesbian or gay instead of homosexual. The word "homosexual" was used because that is what the Kinsey scale uses when labelling same sex activity. There was also a participant who self identified as asexual, they were removed from analysis. If the Kinsey scores and the best identify section were not circled, the surveys could not be used in the investigation. The Kinsey scale was used also to see how many women would score at either extreme of zero and six, and to assess how many would score in between.

Procedure

The survey was four pages. All participants had to sign a consent form (See Appendix A and B). Participants were also told about the interview section before they filled out any part of the survey. Participants were told to contact the researcher if interested in conducting an interview on fluidity. The participants who were interviewed received a \$20 gift certificate to a grocery store of their choosing. Three interviews took place in the investigators lab and one interview took place in a coffee shop, all were recorded. No compensation was given to participants who only filled out the surveys.

Ethical issues

All participants were treated in accordance with the REB of Ryerson University and ethical standards of the American Psychological Association. Participants could choose to discontinue the survey at any time. All participants had to fill out a consent form stating the purpose of the research and assuring all individuals of strict confidentiality. No names were used to link participants to the consent forms. Data from the study are going to be kept in a locked cabinet in the researcher's office for five years and then will be destroyed. Participants were

informed that some items on the instruments used may cause some emotional upset, however there was no threat of extreme harm to those who completed surveys.

The three independent variables of sexual orientation, Bem classification, and ethnicity group were tested against four dependent variables. The four dependent variables are SOI scores; attitude SOI scores; BSRI feminine raw scores and BSRI masculine raw scores. Using the BSRI raw scores yield a more accurate measure of masculine and feminine than the overall T scores. The SOI behaviour scores are not separated and analyzed as it is similar to the total SOI score. Parcelling out the attitude scores shows if there are attitudinal differences.

Analysis

Six independent measures ANOVA were performed in total. Four 3 (sexual orientation) x 4 (Bem Class) x 5 (ethnicity) were performed on the following dependent variables: SOI score; SOI attitude score; feminine raw score and masculine raw scores. Another two independent measures ANOVA were performed to examine participants who had extreme Kinsey scores. A 2 (extreme Kinsey score) x 4 (Bem class) x 5 (ethnicity) independent measures ANOVA was performed on the dependent variables SOI scores and feminine raw scores.

An alpha level of .05 was used for all statistical tests. The post hoc test gabriel in SPSS was chosen because sample sizes were slightly different (there were 52 bisexuals compared to 104 heterosexual and 104 lesbians) and this test has greater power compared to Hochberg's GT2 (Field, 2005). Overall, the post hoc tests including Bonferroni and REGWQ yielded similar significant rates on the data. No planned comparisons were generated. The .05 alpha rate was chosen as it is standard and results did not differ greatly if alpha .01 was used.

The data set had several dependent variables therefore a MANOVA could have been utilized to analyze the data in SPSS. The MANOVA was not chosen for this analysis. There are strengths associated with using a MANOVA. Information gained when using the test includes finding relationships between dependent variables. A MANOVA can have greater power in detecting an effect because it can distinguish if groups differ along a mixture of variables. When using several ANOVA's, detection of groups along only a single variable can be identified. Using a MANOVA also decreases the chance of making a type I error.

It is not adequate to put all dependent variables together and analyze them unless there is sufficient theoretical or empirical reasons for doing so (Huberty & Morris, 1989). The MANOVA is an omnibus test where all the dependent variables are placed in a grab bag type of

situation. A MANOVA is used if the outcomes expected of the groups are predicted to be similar. For example if lesbians are predicted to be high in masculinity they will also be predicted to be high in SOI scores and femininity. Predictions that the variables will all be similar were not expected for the variables being measured. The thesis used several ANOVA's because different outcomes are predicted for the variables. For example, if lesbians have low SOI scores, they are not predicted to have low BSRI masculine and feminine scores. If a MANOVA had been used, there may have been an omission of relevant information

For the current thesis, sufficient empirical or theoretical evidence was not garnered for relationships between the dependent variables. If the analysis is exploratory in nature, using several ANOVA tests is often performed instead of a MANOVA (Huberty & Morris, 1989). As a result of the discrepancies in the literature on the topics of the thesis and because the thesis is exploratory, several independent measures ANOVA tests were performed instead of a MANOVA. The rate of type I errors does increase by doing this and this fact should be kept in mind when interpreting results.

Sociosexual Orientation Inventory (SOI)

The means and standard deviations for SOI behaviour and attitude scores of lesbians, bisexuals, and heterosexuals, are presented in Table 3.

Table 3

Means, Standard Deviations, and Range of SOI scores

Sexual Orientation	SOI <i>M (SD)</i>	SOI attitude <i>M (SD)</i>	Range Minimum	Range Maximum
Lesbian	86.06 (6.33)	32.0 (1.43)	16.00	467.00
Heterosexual	77.65 (5.32)	32.02 (9.68)	24.00	427.00
Bisexual	119.38 (9.69)	36.34 (1.33)	16.00	682.00

The normal range according to Simpson (1994) in college samples is 10-250. However, Simpson (1994) does not distinguish if the range is for males or females; rather, the range is for both men and women combined. Simpson only notes that men tend to have higher SOI scores compared to women, but does not provide data to show this. The range for all sexual orientations in the present sample are higher both in the minimum and maximum scores compared to the sample in Simpson (1994). Participants in the current thesis were not only recruited from universities, this may be one reason that the range is higher for this sample.

For sexual orientation there was a significant main effect on SOI scores, see Table 4.

Table 4

Analysis of Variance for SOI scores

Source	<i>df</i>	<i>F</i>	η^2	<i>p</i>
Sexual Orientation	2	4.849*	.043	.009
Bem Class	3	2.237	.030	.085
Ethnicity	4	0.730	.013	.572
Sexual Orientation x Bem Class	6	1.230	.033	.292
Sex Orientation x Ethnicity	8	.631	.023	.752
Bem Class x Ethnicity	11	.831	.041	.609
Sexual Orientation x Bem Class x Ethnicity	10	1.322	.058	.220
Error	215	(4307.63)		

Note. Values enclosed in parentheses represent mean square errors.

* $p < .05$.

Gabriel's post hoc test was utilized to find where the difference in sexual orientation was located. Lesbians and bisexuals differed on SOI scores, such that bisexual women had higher SOI scores than lesbian women $p = .008$. Heterosexual women and bisexual women had significant results where bisexual women scored higher on the SOI compared to heterosexual women ($p = .001$). Bisexual women had higher SOI scores than both heterosexual and lesbian women. Heterosexual and lesbian women did not differ significantly on SOI scores ($p = .732$)

This finding is of interest in that even if there is no strategic interference lesbian women do not have statistically significant lower SOI scores than heterosexual women. See Figure 1.

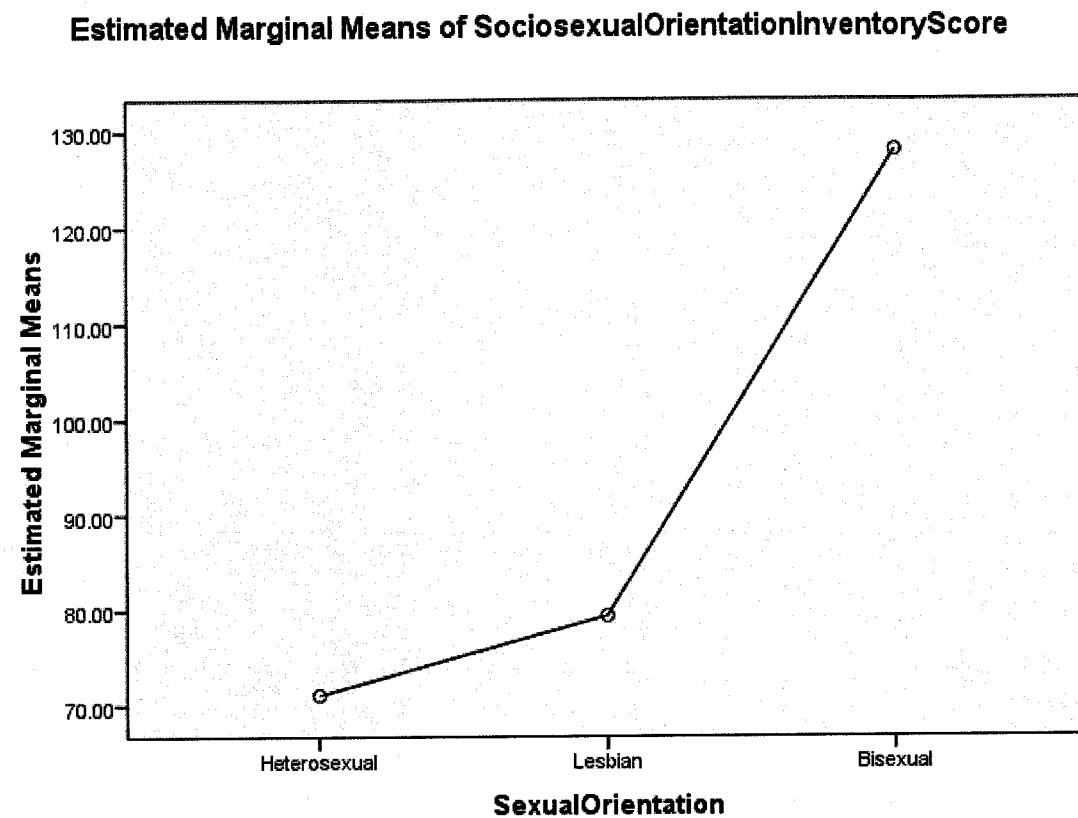


Fig. 1. Mean SOI scores of heterosexual, lesbian, and bisexual women

Attitude SOI

The SOI can be separated such that only the attitude component is measured. Individuals could possess a restrictive or unrestrictive attitude toward casual mating. Individuals could display high total SOI scores and low attitude scores and vice versa. Separating out the attitude components allows only attitude to be analyzed. If the attitude component is not separated out from the total SOI score, the attitude score will get lost in the total SOI score which measures the combined score of behaviour and attitude components (Webster & Bryan, 2007). To see if this

sample of females displayed this pattern, attitude SOI scores were analyzed. There was not a significant main effect for sexual orientation on attitude SOI scores. There was a significant interaction of sexual orientation and ethnicity on attitude SOI scores, see Table 5.

Table 5

Analysis of Variance for Attitude SOI Scores

Source	<i>df</i>	<i>F</i>	η^2	<i>p</i>
Sexual orientation	2	1.632	.015	.198
Bem Class	3	1.796	.024	.149
Ethnicity	4	1.870	.034	.117
Sexual orientation x Bem class	6	0.976	.027	.443
Sexual orientation x ethnicity	8	2.594*	.088	.010
Bem class x ethnicity	11	1.414	.067	.168
Sexual orientation x Bem class x ethnicity	10	0.793	.036	.635
Error	215	(157.667)		

Note. Values enclosed in parentheses represent mean square errors.

* $p < .05$.

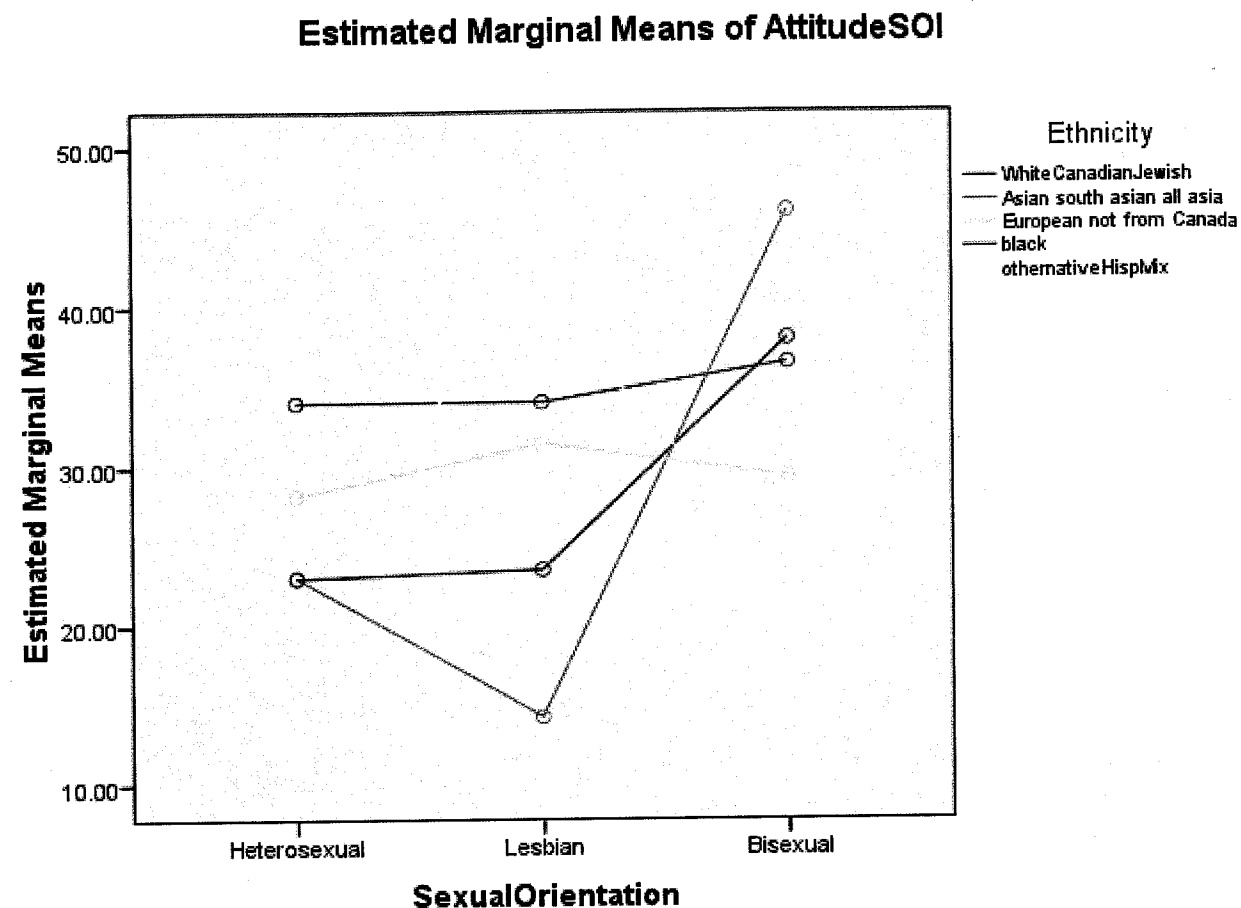


Fig. 2. Interaction of heterosexual, lesbian and bisexual women and ethnicity on Attitude SOI scores

Lesbians who were of an Asian background had the most restrictive overall attitude SOI scores while bisexual Asian women had the highest overall attitude SOI scores. Heterosexual black and Asian women had similar attitude SOI scores; White/Canadian women had similar attitude SOI scores regardless of sexual orientation. The *other* category heterosexuals and bisexuals had similar attitudes scores while the other lesbians had the highest scores. European (not from Canada) had similar scores across sexual orientations. Black heterosexual and lesbians had similar scores while black bisexuals had the higher scores than black heterosexual and lesbians. *Other includes Native, Native American/Canadian, South American and Mexican

Bem Sex Role Inventory

The breakdown for the BSRI categories is high feminine/low masculine $n = 69$; high masculine/low feminine $n = 60$; the androgynous category of high masculine/ high feminine $n = 89$ and undifferentiated label of low masculine/ low feminine $n = 42$. Most women were in the high masculine/high feminine group, which is androgynous.

Feminine Raw Scores on the BSRI

For raw scores of feminine personality characteristics on the BSRI there was a significant main effect of sexual orientation on feminine raw scores See Table 6. There was also a significant interaction of sexual orientation and ethnicity on feminine personality scores see Table 6 and Figure 3.

Table 6
Analysis of Variance for Feminine Raw Scores

Source	df	F	η^2	p
Sexual orientation	2	4.840*	.043	.009
Ethnicity	4	1.458	.026	.216
Sexual orientation x ethnicity	8	2.076*	.072	.039
Error	215	(.182)		

Note. Category of Bem class not shown as it was used to compute feminine raw score. Values enclosed in parentheses represent mean square errors.

* $p < .05$.

The post hoc tests show that for sexual orientation lesbians had significantly higher feminine raw scores than heterosexual women $p < .0001$. There were no significant differences between lesbians and bisexuals on feminine raw scores $p = .292$ and no significant differences between heterosexual women and bisexuals $p = .146$ on feminine raw scores.

Estimated Marginal Means of FeminineRawScores

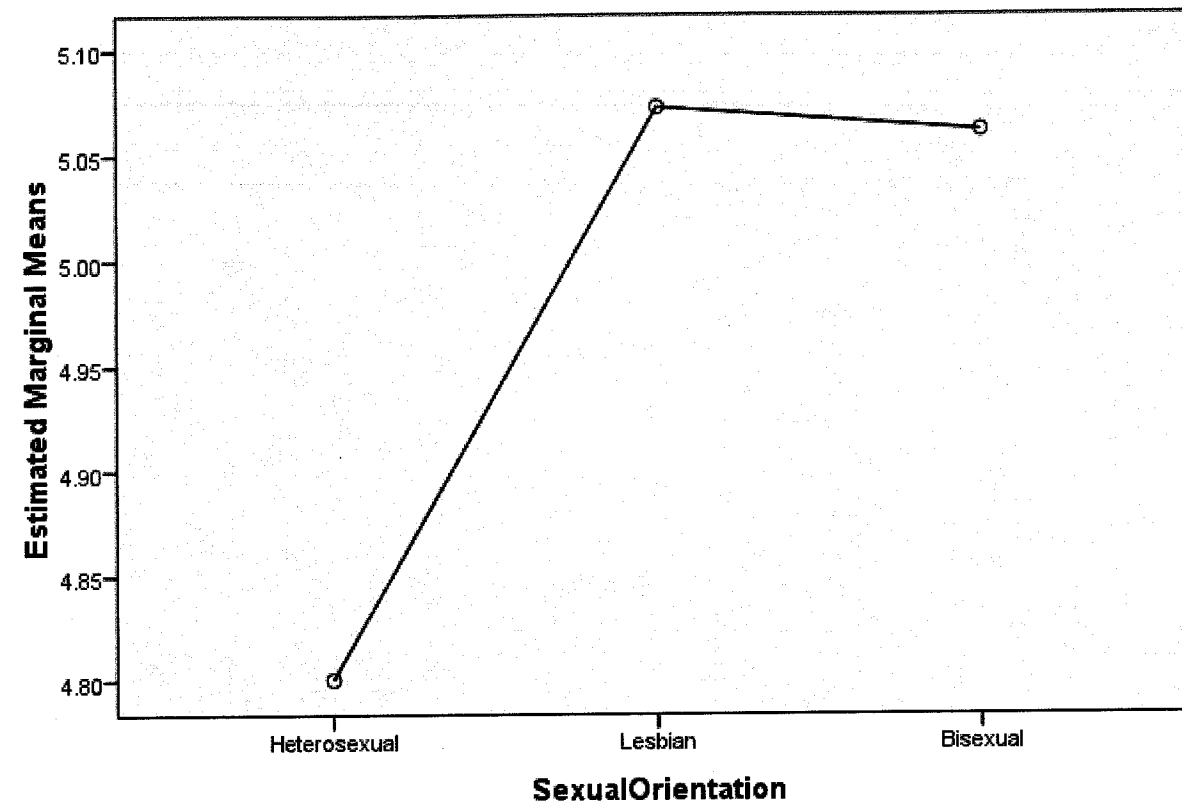


Fig. 3. Means of feminine raw scores of heterosexual, lesbian, and bisexual women

Black heterosexuals had the highest feminine raw scores in the ethnicity category, lesbian and bisexual black females had similar scores. "Other" bisexual and heterosexual feminine raw scores were similar while lesbian raw feminine scores were higher. Asian heterosexual and lesbian feminine scores were similar while bisexual feminine scores were the highest among Asians and overall among all ethnicities. European (not from Canada) heterosexual women had the lowest feminine scores while lesbians and bisexual scores were similar. White/Canadian feminine scores were similar across all sexual orientations see Figure 4.

Estimated Marginal Means of FeminineRawScores

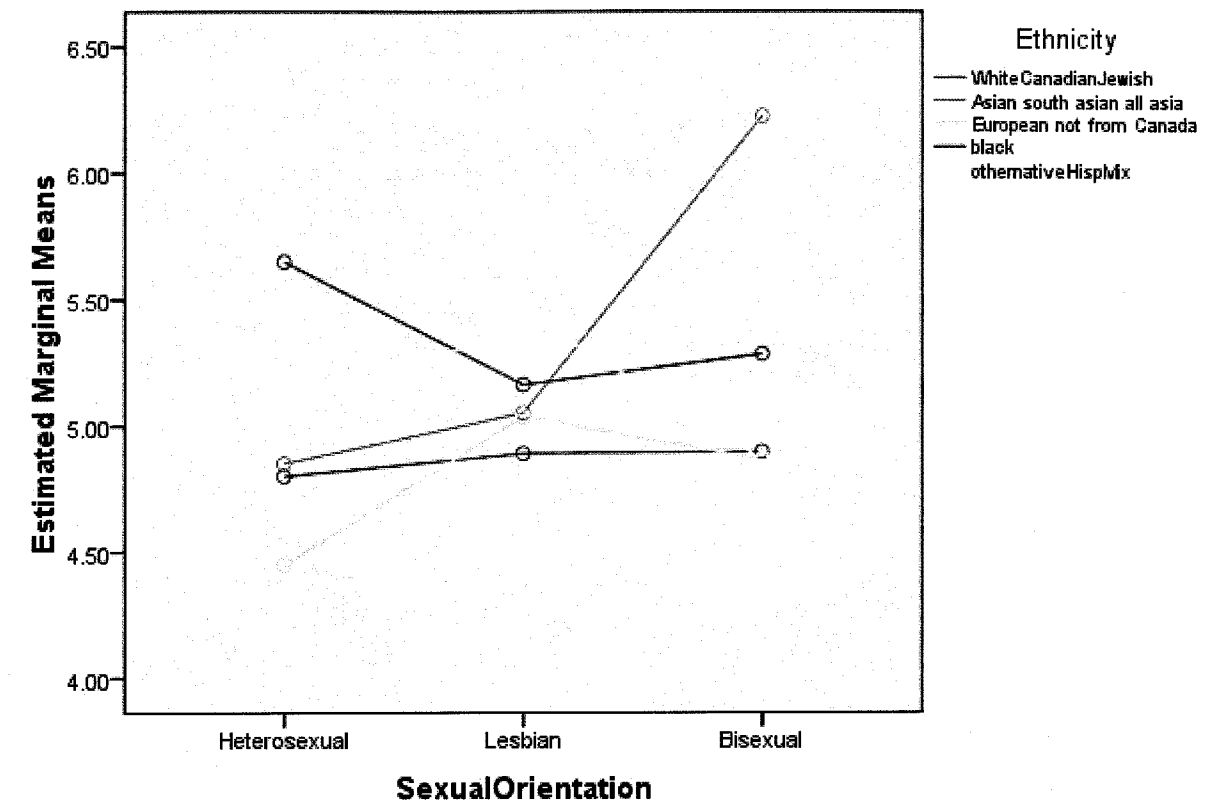


Fig. 4. Interaction of heterosexual, lesbian and bisexual orientation and ethnicity on feminine raw scores

Masculine Raw Scores on the BSRI

There was no significant main effect of sexual orientation or ethnicity on masculine raw scores. A significant interaction was detected on sexual orientation and ethnicity. See Table 7 and Figure 5.

Table 7

Analysis of Variance for Masculine Raw Scores

Source	df	F	η^2	p
Sexual orientation	2	.500	.005	.608
Ethnicity	4	.860	.016	.489
Sexual orientation x ethnicity	8	2.902*	.097	.004
Error	215	(.261)		

Note. Category of Bem class not shown as it was used to compute feminine raw score. Values enclosed in parentheses represent mean square errors.

* $p < .05$.

Estimated Marginal Means of Masculine Raw Scores

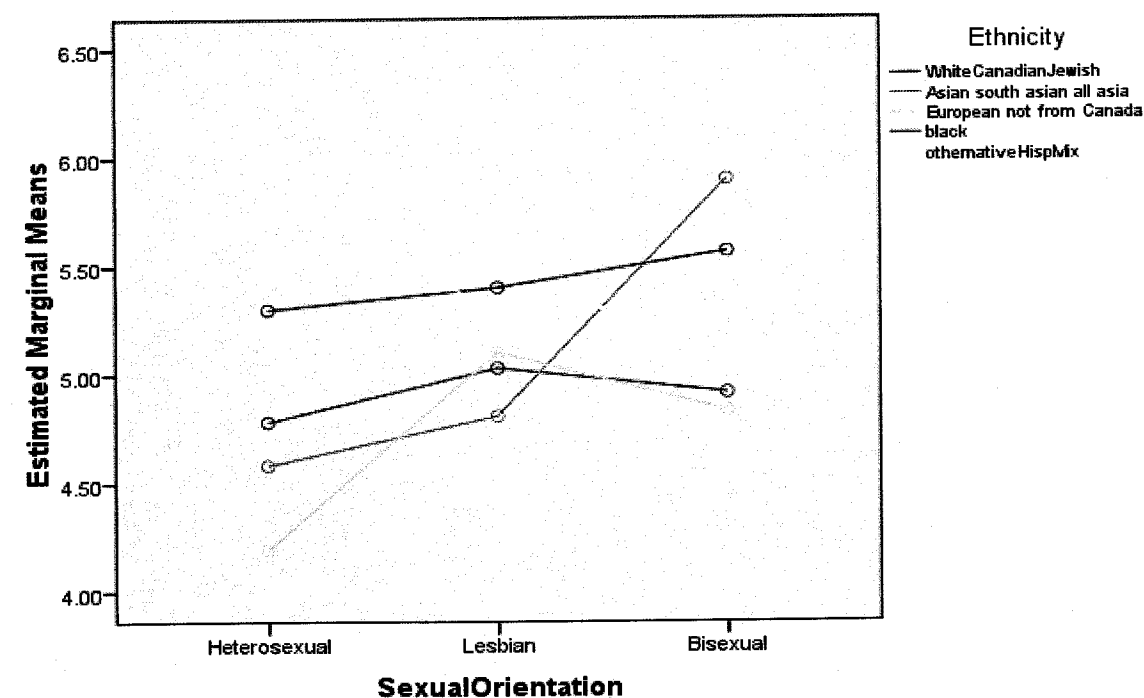


Fig. 5. Interaction of heterosexual, lesbian, and bisexual orientation and ethnicity on masculine raw scores

"Other" heterosexual women had the highest masculine scores compared to the lesbian and bisexual other; the "other" heterosexual women had the highest masculine scores overall. Black women had similar scores across all sexual orientations. White/Canadian women also had fairly similar scores across sexual orientations. Heterosexual Asians had similar scores to lesbian Asians, while bisexual Asians had much higher masculine scores. European (not from Canada) heterosexual women had the lowest masculine scores overall while lesbian and bisexual scores among Europeans were similar.

Extreme Kinsey Scale Scores

An additional analysis was performed to evaluate the women who were at the extremes of the Kinsey scale (discussed in more detail below), heterosexuals who scored "0" $n = 69$ and lesbians who scored "6" $n = 45$. No significant differences were found $F(1, 7) = 1.126$ $p = .291$. There was no statistical significance. However SOI scores of extreme lesbians were lower than the extreme heterosexual women. The extreme lesbians had lower SOI scores compared to the overall lesbian SOI scores. The extreme heterosexual women had higher SOI scores than the overall heterosexual SOI scores. See Figure 6.

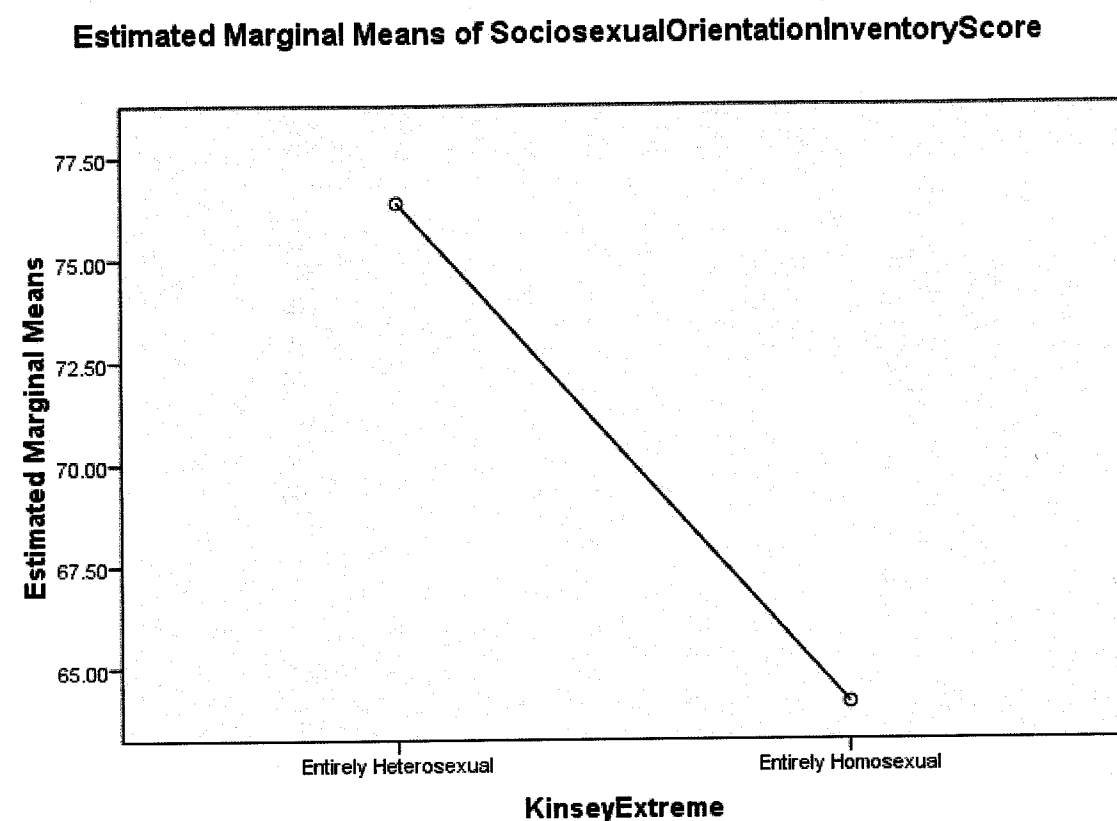


Fig. 6. Mean SOI scores of entirely heterosexual "0" and entirely homosexual "6" female

Lesbians may have more 5 and 6 scores because of cultural norms of heterosexuality and therefore perhaps entirely lesbian women did engage in sexual or some intimate behaviour with men, therefore circled 5 which is incidental history with men. A response bias may have also occurred for the heterosexual women. Heterosexual women may have not wanted to reveal that they had some intimate contact with women and therefore circled "0".

There was a significant difference on feminine raw scores between heterosexuals who scored "0" on the Kinsey scale and lesbians who scored "6" on the Kinsey scale. Those lesbians had higher feminine personality traits than heterosexual women $F(1, 114) = 9.33 p = .003$. Heterosexuals ($M = 4.83, SD = .70$) lesbians ($M = 5.23, SD = .62$). Lesbians who scored six on

the Kinsey Scale were found to have more feminine personality characteristics than heterosexual women who scored zero on the Kinsey Scale.

Sexual Orientation the SOI and Strategic Interference

Lesbian participants were hypothesized to have lower SOI scores compared to heterosexual female participants because lesbians have less sexual contact with men. Lesbians did not have statistically significant lower scores on the SOI overall compared to heterosexual women. When there was no strategic interference operating, lesbian and heterosexual women had similar behaviour and attitude components on the SOI. Lesbian and heterosexual women had conservative scores on the SOI. If lesbians do not have lower SOI scores, as predicted by strategic interference theory, then perhaps analyzing the lack of strategic interference in lesbians is not a viable way to assess the theory. The difficulty in studying lack of strategic interference in lesbians may be that female sexuality is inherently different compared to male sexuality.

Evolutionary psychology theory holds that women generally, will be less inclined to engage in short term mating behaviour compared to men. Both lesbian and heterosexual groups were somewhat conservative in their SOI scores. Both lesbians and heterosexual women do not pursue casual mating as their dominant mating strategy as demonstrated by the current thesis' SOI scores. The similarity between lesbian and heterosexual women may point to the fact that women (whether lesbian or heterosexual) do not desire casual sex as much as men. This supports the predictions of evolutionary psychology that women will be less inclined to engage in casual sex because it generally does not enhance their reproductive fitness, while men will be more inclined to engage in casual sex because it potentially enhances their reproductive success (Buss & Schmitt, 1993; Haselton et al, 2005; Schmitt, 2001; 2005).

As in other studies on female sexuality, many of the women in this sample did not circle "6" (entirely homosexual) or "0" (entirely heterosexual) on the Kinsey scale. As was mentioned in

the results section, 40 lesbians circled "5" on the Kinsey scale indicating incidental heterosexual history and nineteen lesbians circled "4" on the Kinsey scale indicating a distinct heterosexual history. Fifty-nine lesbians had male contact in the past, and those lesbians who scored "6" may also have had male contact, as there could be under reporting of past involvement with men.

An ANOVA was performed to evaluate the women who were at the extreme ends of the Kinsey scale, heterosexuals who scored "0" and lesbians who scored "6" (see figure 6). Although the results were not statistically significant, they indicated that lesbians who were "6" on the Kinsey scale had lower SOI scores compared with heterosexual women who were "0" on the Kinsey scale. This may indicate that the less women are involved sexually with men, the lower their SOI scores will be, indicating less casual mating. When comparing the extreme female cases, lesbians who were six also had lower attitude scores on the SOI than heterosexual women who scored zero although the results were not statistically significant. A general trend seems to be emerging that the less women are involved with men, the lower the SOI scores and a more extreme female mating strategy emerges, one with a lower number of casual sex partners, low desire for a variety of partners and an attitude that is restrictive toward casual sex. More studies are needed to verify if this is the case.

Although the hypothesis of the study regarding strategic interference was not supported, there were other interesting findings that will now be discussed.

Bisexuals and fluidity

Often female sexuality has been assumed to develop in the same way as male sexuality. Research on men indicates that their sexuality is generally a stable adult trait; female same sex behaviour has been regarded to operate in the same manner, although research on female sexuality indicates that their sexual orientation may not be a stable adult trait (Diamond, 2008;

Pillard & Bailey, 1998). Women seem to be showing less stability in adult sexual orientation compared to men (Reiger et al, 2005). A bisexual orientation has been shown to be more common in women than men (Chivers et al, 2007; Diamond, 2008; Johnson, 2004). A study demonstrated that men who were identified as bisexual did eventually adopt a gay orientation (Stokes et al, 1997). Another indication that men are more extreme in their sexual orientation are findings from genital arousal studies. Genital arousal studies demonstrate that men are more inflexible in their attraction targets, becoming aroused by either men or women, but not both (Reiger et al, 2005). Women are more likely to indicate genital arousal to both men and women more often than men (Baumeister, 2000; Chivers, 2004, 2007; Diamond, 2008). Caution is needed when interpreting results of genital studies, since social norms may impact results and certain individuals may be more willing to be studied in this manner than others which may bias the results.

Diamond (2008) has done extensive research following women over a ten year time period. Diamond (2008) found that many women shifted relationships with men and women over the course of the study. Numerous women whether self labelled lesbian, bisexual, or heterosexual did not fit into neat categories. Rosario et al (2009) found that many lesbians who identify as femme lesbians are also bisexual. In another study, Thompson & Morgan (2008) found that many women identify as mostly straight, these women are different from bisexual women, but they acknowledge that they are not fully heterosexual. Fitting into distinct categories may be a problem when assessing female sexuality, regardless of theoretical framework, evolutionary or otherwise. Further studies are needed that address how women label themselves and how this may affect studies on female sexuality.

Given the results of bisexual women, performing qualitative analysis could potentially help to understand fluidity in women. As a result of women having a tendency to be fluid and not fit into categories that are easily defined, interviews were conducted with a small sample ($n=4$) of women who self described as sexually fluid; an informal qualitative analysis was performed (See Appendix C)

Bisexuals and the SOI

Although there was no hypothesis made regarding bisexuals and the SOI, some interesting results were found. Bisexual women compared to heterosexual and lesbian women had statistically significant higher SOI scores overall than lesbian and heterosexual women, thus indicating a more unrestrictive mating strategy. As a result, strategic interference is complicated to measure in bisexuals because sexual behaviour may be occurring with both women and men, and this study did not ask participants to indicate if past sexual partners were either male or female. Mercer et al (2007) found that women who have sexual relationships with both men and women have a significantly higher number of male partners than heterosexual women who have sex with men exclusively. Mercer et al (2007) found that bisexual women have more casual sex than heterosexual and lesbian women. The present study found a similar pattern where bisexuals have significantly higher SOI scores indicating a higher number of sex partners and a positive attitude toward casual sex. More studies are needed on why bisexuals have higher SOI scores compared to heterosexual and lesbian women.

Research on actual bisexual female sexual behaviour is scarce, and more research is needed in this area. However, research of attitudes toward bisexual individuals has been done. There is a pervasive attitude or belief found in heterosexual men and women in North American society that women who are bisexual are more promiscuous than lesbian and heterosexual

women (Herek, 2002; Spalding, 1997). All four women who were interviewed for this thesis were aware of stereotypes regarding bisexual women (See Appendix C).

The Bem classification and SOI scores were not statistically significant. However, bisexual female participants in each Bem classification had the highest SOI scores. Bisexuals who were undifferentiated (low masculine/low feminine) had the highest overall SOI scores among the Bem classification groups, followed by high masculine/low feminine, androgynous and the lowest scores of bisexuals on the SOI high feminine and low masculine. The low feminine/high masculine Bem classification yielded the lowest SOI scores for heterosexual and lesbian women, although the results were not statistically significant. High masculinity personality traits leads to higher SOI scores and feminine personality traits leads to lower SOI scores. An interesting category is undifferentiated, which is low masculine and low feminine, which among bisexuals scored the highest on the SOI overall. Two factors seem to operating in this sample that lead to high SOI scores, they are bisexuality and masculine personality traits on the BSRI.

Attitude SOI

Bisexual female participants had the most unrestricted attitude score on the SOI compared to lesbian and heterosexual participants, although the results were not statistically significant. Heterosexual women and lesbians had similar attitude scores with lesbians scoring only slightly higher. There was no significant effect of the Bem classification groups on the attitude component of the SOI. However, bisexual female participants in all Bem classification groups had the highest SOI attitude scores indicating a more unrestrictive attitude toward casual sex. Lesbians and heterosexual women in each Bem classification were similar to each other.

Ethnicity and SOI Attitude

There was a significant interaction of ethnicity and sexual orientation on SOI attitude scores. Lesbian participants who were Asian had the lowest overall SOI attitude scores, while Asians participants who were bisexual had the highest overall SOI attitude scores. Heterosexual Asians participants had higher scores than the lesbian Asians on attitude SOI. There is a great leap from lesbian Asians to bisexual Asians in attitude towards casual sex. This finding is surprising, why do bisexual and not lesbian Asians have much higher unrestricted attitudes toward casual sex? Analysis of Asian bisexual and lesbian women could be conducted in a future research study to investigate this finding. The "other" groups displayed an interesting pattern. Heterosexuals and bisexual women had equal attitude SOI scores while "other" lesbian group had the highest SOI attitude scores among the "other" category. More studies are needed that analyze what role culture plays in determining attitudes about casual sex and sex in general. Culture is often a strong force regarding sexual behaviour in women.

Feminine Raw Scores

An interesting finding in this sample is that lesbian participants had statistically significant higher feminine personality traits on the BSRI compared to heterosexual female participants. In an additional analysis of lesbians who scored "6" and heterosexual women who scored "0", the extreme scoring lesbian participants had statistically significantly higher feminine personality traits than the extreme scoring heterosexual female participants. Thus the more extreme lesbian scores the higher the female personality characteristics were. These results do not support numerous research studies regarding lesbians and personality traits. The present thesis did not find a great personality divide among lesbian women who were more masculine and others more feminine. This thesis found that lesbians compared to heterosexual women have

the highest feminine personality traits. This indicates that the sample of lesbians used in the study have many self ascribed feminine personality traits, more than heterosexual and bisexual women. Bisexual women also have high feminine personality compared to heterosexual women.

Research has found that lesbians have more masculine personality traits compared to heterosexual women (Lippa, 2008; VanderLaan & Vasey, 2008). This thesis did not support numerous research findings that lesbians had more masculine personality traits compared to heterosexual women. Many studies on lesbians have shown that they rate their personality traits as more masculine, and they ascribe to more masculine behaviour (Bailey et al, 1994; Lippa, 2005; Pillard & Bailey, 1998; Rieger et al, 2008; VanderLaan & Vasey, 2008). The finding of lesbians having high feminine personality traits compared to heterosexual women is novel and more research is needed regarding personality traits that are masculine and feminine and how it relates to sexual orientation and sexual behaviour.

One explanation of lesbians scoring the highest on feminine personality traits is that lesbians may be more willing to admit to possessing female characteristics. Many items on the BSRI list masculine traits that are valued in Western society such as "independence" or "self reliance," while female traits such as "gullible" and "eager to soothe hurt feelings" are not as celebrated and often thought of as more undesirable than many masculine traits (Auster & Ohm, 2000). Perhaps because of the lesbians' attraction to women, these traits are not viewed as negative, but are viewed as positive and attractive in themselves and other women.

Heterosexual women may subscribe to the societal definitions of many of the "male" personality traits on the BSRI. Traits such as "independent", "athletic" and "analytical" are valued in Western tradition in both women and men (Auster & Ohm, 2000). Auster & Ohm (2000) found that many of the masculine traits as labelled in the BSRI were found to be desirable

by many women in their sample compared to the original sample used by Bem in 1978. Lesbians who subscribe to a high number of feminine personality traits are going against cultural norms of American and Canadian society, a culture that has more respect and admiration for "masculine" personality traits than female personality traits (Auster & Ohm, 2000).

There have been cultural shifts since the BSRI was first constructed. Although it is still a valid instrument to use, there should be some caution in interpretation, and this should be kept in mind when analyzing the results of the study. This study has added to the discrepancies on lesbian female sexuality and personality traits, this is an indication that more research is needed in this area. Another factor that could have contributed to the high feminine BSRI is that lesbians were trying not to be stereotyped as being more masculine and deliberately answered that they felt that these feminine characteristics pertained to them. Caution is always advised in interpretation of self report in questionnaires.

The cultural climate of Canada and the United States may play a role in how lesbian participants scored on the BSRI. The different cultures to which lesbians belong impact how lesbians rate their personality traits. There was a significant interaction of sexual orientation and ethnicity on feminine BSRI scores. Among the different ethnicities, Asian bisexual women had the highest feminine scores. Black heterosexual women had the second highest feminine scores. Lesbian "other" had the third highest feminine scores. More studies are needed that explore the role of culture and feminine personality traits.

Masculine Raw Scores

There was no significant effects of sexual orientation on masculine raw scores. However, among the sexual orientations, bisexual women had the highest masculine raw scores overall followed by lesbians and heterosexual women. Lippa (2008) found that bisexual women are

intermediate (between heterosexual and lesbian women) on self rated masculine and personality traits. Cautious interpretation of the finding should be taken as Lippa (2008) and VanderLaan & Vasey (2008) used different personality measures than the present study.

A significant interaction of ethnicity and sexual orientation was found. The "other" heterosexual women had the highest masculine raw scores overall, Asian bisexuals had the second highest masculine raw scores, followed by black lesbians. For masculine personality traits, sexual orientation and culture had an impact. As was discussed earlier, American and Canadian cultures hold masculine personality traits in high regard and this may impact the responses of the participants (Auster & Ohm, 2000).

Masculine personality traits have been associated with women who have a higher than average number of sexual partners, compared with women with low masculine personality traits. Although the results were not statistically significant, participants who had higher masculine raw scores had higher SOI scores than those participants who had low masculine raw scores. Mikach and Bailey (1999) found that women (they did not specify sexual orientation) who self described themselves as masculine had more sexual partners than women who did not describe themselves as masculine. Masculine women also had unrestricted SOI scores compared to feminine women (Mikach & Bailey, 1999). Women with higher SOI scores also had a 2D:4D finger pattern that confirms higher androgen exposure in the womb (Clark, 2004). Bisexual women in this thesis had the highest masculine personality traits (although not statistically significant) and the highest SOI scores and this is consistent with Mikach & Bailey (1999) and Clark (2004) in that women with higher masculine personality traits score higher than women with low masculine personality traits on the SOI. Clark (2004) found that having self described masculine personality traits led to higher SOI scores among heterosexual women. Bisexual women had the highest SOI scores

overall in this sample, and also the highest masculine raw scores. This may indicate that masculine personality traits is related to higher SOI scores.

Explanations other than Evolutionary Psychology

Eagly and Wood (1999) note how culture is a factor in determining attitudes and behaviour regarding sexuality. Support for Eagly and Wood (1999) is garnered in this thesis in that different environments or culture leads to differing attitudes toward sex. Culture seems to mediate attitudes toward casual sex and this supports Eagly & Woods social roles theory. For example, ethnicity of the individuals impacted attitudes toward casual sex. For example, Asian individual attitude scores are drastically different depending on sexual orientation. Asian bisexual women in this sample have unrestricted attitude scores while lesbian Asians have restricted scores. Eagly & Wood (1999) suggest that differences such as this are mediated by culture and what is appropriate for a person and the role that they fit into.

Both Eagly & Wood (1999) and Bussey & Bandura (1999) emphasize the environment in conjecturing how a person will act. Scoring on the BSRI may have been impacted by the culture that the sample came from. Bussey & Bandura (1999) note that roles that are ascribed to individuals in a given society take place beginning in childhood. As an individual grows in a culture they observe what traits or behaviours are rewarded and consequences associated when violating a normal trait (Bussey & Bandura, 1999). The high feminine personality trait found among lesbian women in this sample may have been a result of conforming to cultural norms. Lesbians are not the majority group in society, perhaps to fit in more with what is observed around them, the lesbians in this sample ascribed themselves with feminine traits since that is what they think is the norm, and what they observe in everyday encounters (Bussey & Bandura, 1999). Masculine lesbians are often ridiculed as they visually go against societal norms of

feminine. This may also have impacted the responses of lesbian women where they may have been trying to fit into a role that is often observed in the culture (Bussey & Bandura, 1999).

Lesbian and heterosexual women had similar SOI scores. The casual sex rates of either group were relatively restrictive. Generally, women who engage in frequent casual sex are often ridiculed and labelled negatively (Buss, 2004). As a result of negative labels associated with women who engage in casual sex, both heterosexual and lesbian women may have under reported the frequency of casual sex encounters experienced. Eagly & Wood (1999) note how males will try and control reproductive behaviours in women. One way of doing so is to label so called promiscuous females negatively (Eagly & Wood, 1999). As men may want females to be more conservative in their sexual behaviour so they can monopolize reproductive behaviours for their own benefit (Eagly & Wood, 1999). Both Eagly & Wood (1999) and Bussey & Bandura (1999) indicate that culture and social norms play a large role in how a person behaves in a given society. These two theories can help elucidate the findings of this thesis that evolutionary principles may have not been able to do alone.

Conclusion

Limitations

In this thesis, strategic interference was not the most adequate model to study lesbians compared to heterosexual women. This is because women score on a continuum on the Kinsey Scale. As a result, analyzing the impact of no men involved sexually with lesbians is difficult to measure. To try and resolve this, when recruiting participants, it could be explicitly stated that the study wanted lesbians who have only been with women and never been with a man sexually. Finding lesbians who have never had sex with men may prove to be difficult as many gay and lesbian individuals do have sex with the other sex because of pressure from the dominant culture that is (assumed to be) mostly heterosexual (Johnson, 2004). Lesbians, more than gay men have been found to engage in more opposite sex involvement as a result of numerous lesbians coming out at a later stage in life (Johnson, 2004). If lesbians have more other sex involvement, this is an impediment to using lesbian samples in studying strategic interference.

The fact that strategic interference may not be a suitable measure to analyze mating differences between lesbian and heterosexual women attests to the differences in female sexuality compared to male sexuality. While collecting data and reviewing relevant research regarding female sexuality, it became apparent that much more data regarding behaviour is needed. New models of sexuality development need to be constructed for female sexuality. What is apparent is that female sexuality is a topic that scientists have overlooked in the past, but now are starting to pay attention to. Conducting research on female sexuality is not simple. Various issues arise such as definitions of lesbian or bisexual. Other issues are categories of sexuality or labelling of sexual orientation. There seems to be a number of categories and sub categories that

women ascribe to. Future research could develop more suitable models of how to analyze female sexuality, whether from an evolutionary perspective or other theoretical perspective.

Women in this thesis sample were somewhat variable in their Kinsey scale scoring. Many women did not score "0" (entirely heterosexual) or "6" (entirely gay). This supports other research that found similar results such as Baumeister, (2004), Chivers (2004; 2007), Diamond (2000; 2008), and Johnson (2004). One oversight that took place in this thesis is that the primary researcher could have asked participants the gender (male or female) of past sexual partners. If this had been conducted, strategic interference could have been analyzed more thoroughly. A comparison could have been performed on lesbians who had higher numbers of sex partners who were male, and lesbians who had lower numbers of sex partners who were male. This would have made the thesis more comprehensive in what it was trying to investigate regarding evolutionary explanations of casual sex rates in women and strategic interference. Future research studies that compare lesbian and heterosexual women on casual mating (using the SOI or another instrument) may want to parcel out if the lesbians had one night stands with men, or with women.

Future Directions

This thesis set out to try and simplify studies on women and sexual orientation, personality traits and fluidity. However, results of the current study indicated that this work added to the discrepancies that exist on studies of women and sexuality. This indicates that more research is needed in all aspects that were explored in this thesis. Findings such as bisexual women having higher SOI scores than both heterosexual and lesbian women needs further investigation. The finding that lesbians had the highest self reported feminine raw scores also needs more verification. There is plenty of research that can be conducted in the future.

One of the problems with this study is that it did not specify lesbians who were only with women during their entire lifetime. Research is needed comparing the SOI scores of lesbians who have never been with men in an intimate or sexual manner to women who have only been with men (no women) in an intimate and sexual manner. To analyze strategic interference in women, very specific details of sexual orientation (more specific than the Kinsey Scale) need to be added to any questionnaire.

Several factors increased total SOI scores in women. One factor is if a female is bisexual. Another factor is masculine personality traits. As noted earlier there is a prevalent belief that bisexual women are engaging in frequent casual sexual behaviour. Several studies (including this one) have shown that bisexual women, compared to lesbian and heterosexual women, do have more sexual partners. However, many more studies are needed to assess if this is generally the pattern found in bisexual women. The highest SOI scorers all had high masculine personality raw scores. Both of these aspects need to be examined further.

Although there was no interaction of sexual orientation and Bem classification, other studies may find interactions. This thesis had a lower sample of bisexual women compared to lesbian and heterosexual women. Larger samples of bisexual women are needed to assess mating behaviour. Further studies are needed that ask which gender are the bisexual women having sex with most frequently. Is it other bisexual women? Men? Lesbians? Heterosexual women? A breakdown of bisexual sexual behaviour could help determine who they are predominantly mating with.

Further research on lesbians and personality traits need to be conducted. Comparing lesbians from different ethnicities may indicate how cultural background is influencing personality traits and sexual behaviour. An item analysis could be conducted on the future work

that uses the BSRI to establish which personality traits are being selected most frequently. Studies that continue to use the BSRI to investigate women may want to consider an item analysis to hone in on which feminine and masculine personality traits are being strongly supported by lesbian, bisexual, and heterosexual women. Further research on culture and sexual orientation are essential. It would be interesting to assess how various cultures define what a masculine or feminine personality trait is. Cross cultural studies can also show how differing social mores can impact a person's sexual behaviour. Certain cultures are more easily accessed, but some cultures are very closed in discussing sexual behaviour. Religious upbringing, which often is tied in with culture, can also be evaluated in future studies on female sexual behaviour.

Research on female sexuality needs to be conducted in a way that acknowledges the variability that can take place in women across all sexual orientations. Further research is needed on sub categories of sexual orientation. For example, there are women who proclaim that they are mostly straight but not fully bisexual. In what conditions will a mostly straight female have intimate contact with another woman? There needs to be more studies on lesbian identity. Butch and femme labels have been around for a long time in Canadian and American culture, are these labels still relevant today? Feminine and masculine characteristics also need further research in how they relate to sexual orientation. Why do "masculine" women have more sexual partners? Another question to be considered is what does "masculine" and "feminine" mean? This thesis did not explore definitions of masculine and feminine and why they exist, but studies need to be conducted that analyze why these certain traits are ascribed to men and women in Western cultures. As a result of lesbians having the most feminine personality traits, future studies could perform an item analysis to indicate what traits that lesbians were ascribing the most compared to heterosexual and bisexual women. Interviews with women across sexual orientation are

needed to understand the lived experience of individuals rather than solely relying on numerical data to speculate about sexuality.

Evolutionary explanations on the ultimate function of female same sex sexuality are a direction the field can go in instead of the many by-product explanations for same sex behaviour. By-product explanations mean that a certain behaviour exists because other behaviours that are associated with the by product increase survival. New research investigating survival and reproductive benefits of ancestral women who may have engaged in same sex behaviour can be explored. Comparative analysis of *Pan paniscus* field studies are needed to help generate hypothesis of why human female same sex behaviour takes place. There have been many field studies on chimpanzees in the wild, but fewer on bonobos. Time may be running out on field studies of bonobos since environmental degradation is leading them to extinction. This is a sad factor for the species and for humans who may have a lot to learn about human sexuality from our closest living relative. Evolutionary explanations have been conjectured regarding male same sex activity, but there has been an omission in female same sex activity from an adaptive perspective. Further work is needed on female sexuality from evolutionary, cultural and personality perspectives.

Appendix A

Ryerson University Consent Agreement (Questionnaire section of research of study)

Human Female Sexual Behaviour across Sexual Orientation: Evolution, Personality and Fluidity

You are being asked to participate in a research study. Before you give your consent to be a volunteer, it is important that you read the following information and ask as many questions as necessary to be sure you understand what you will be asked to do.

Investigators:

Sarah Radtke

M.A. Candidate Department of Psychology
Ryerson University

Wade E. Pickren, Ph.D.

Department of Psychology
Ryerson University

Purpose of the study: The study will be on human female mating strategies from an evolutionary point of view. Several aspects of female mating will be explored including lesbianism, bisexuality, casual sex, fluidity, comparative studies, femininity and masculinity in females. The purpose of the study is to investigate female sexuality which has often been overlooked in past sex research. Several interviews will be conducted on females who identify as "fluid" in their sexuality. This study hopes to analyze the different paths of sexual orientation in the human female compared to the human male. The study would like to recruit at least 100 heterosexual females, 100 lesbian females, and 50 bisexual or "fluid" females. Only females 18 years of age or older can participate in the study.

Description of the Study: If you decide to participate in the research study, you will be asked to do the following: Sit in a relatively private space either a private lab at Ryerson University or a relatively private setting where the participant in the study is comfortable. The principle researcher will give you three questionnaires to fill out. The questionnaires will take approximately 20-30 minutes to fill out. The researcher will be present if the participant has any questions, but the researcher will not be close enough to see what the participant is writing.

What is Experimental in this Study: The study will be comparing answers on the three questionnaires that the participant fills out and comparing whether there is a statistical difference between answers given by the heterosexual females, the lesbian females and the bisexual or "fluid" females.

Risks or Discomforts: Occasionally people feel uncomfortable when answering questions that ask about sexuality and identifying as more masculine or feminine, and this may cause some psychological discomfort to the participant. The psychological discomfort experienced is believed to be minimal, and no more harmful than what a person sees on television, or reads in magazines or newspapers. However, if any aspect of this study makes you uncomfortable, you may choose not to answer certain questions, or to withdraw from the study temporarily or permanently at any time.

Benefits of the Study: Benefits to the participants are participants will get to contribute in their own way to science and to the study of female sexuality which has been overlooked in the past. Benefits include a greater understanding of lesbian and bisexual females, and the growing study of how their sexuality does not always follow the same path as heterosexual and gay male sexuality. In comparing females who identify as more lesbian and who are more heterosexual, an analysis from an evolutionary point of view (analyzing the effect of no males in the lesbian population) may show that differences in female and male mating strategies exist. Understanding these differences can help in relationship building and understanding of romantic partners, whether long term or short term. Interviewing a few females on sexual fluidity can enrich the understanding of the sexual spectrum, where women can talk about how they feel, and how their sexuality has unfolded over the lifespan. This research hopes to contribute to a more accurate understanding of human female sexuality. Contribution from participants will allow this knowledge to grow. I cannot guarantee, however, that you will receive any benefits from participating in this study.

Confidentiality: Your responses in this research will be confidential because you will not put your name on any legally identifying number or information as part of the answers to the questions. The questions and answers will be identified by number only. You will be asked to sign only this consent form (if you decide to participate), and it will be filed separately from the copy of your answers. The data from this study will be held in a locked lab room for a five year period, to which only the primary researcher and supervisor will have access. After this period, that data will be destroyed.

Incentives to Participate: The participant will not be paid to participate in this study.

Voluntary Nature of Participation: Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with Ryerson University. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty or loss of benefits to which you are allowed. At any particular point in the study, you may refuse to answer any particular question or stop participation altogether.

Questions about the study: If you have any questions about the research now, please ask. If you have questions later about the research, you may contact:
Sarah Radtke sradtke@psych.ryerson.ca 416-902-4935
Dr. Wade Pickren, 416-979-5000, ex. 2632 wpickren@psych.ryerson.ca

If you have any questions regarding your rights as a human subject and participant in this study, you may contact the Ryerson University Research Ethics Board for information:

Research Ethics Board
c/o Office of the Vice President, Research and Innovation
Ryerson University
350 Victoria Street
Toronto, ON M5B 2K3
416-979-5042

Human Female Sexual Behaviour across Sexual Orientation: Evolution, Personality and Fluidity

Agreement:

Your signature below indicates that you have read the information in this agreement and have had a chance to ask any questions you have about the study. Your signature also indicates that you agree to be in the study and have been told you can change your mind and withdraw your consent to participate at any time. You have been given a copy of this agreement.

You have been told that by signing this consent agreement you are not giving up any of your legal rights.

Name of Participant (please print)

Signature of Participant_____

Date_____

Signature of Investigator_____

Date_____

Appendix B

Ryerson University

Consent Agreement (Interview)

Human Female Sexual Behaviour across Sexual Orientation: Evolution, Personality and Fluidity

You are being asked to participate in a research study. Before you give your consent to be a volunteer, it is important that you read the following information and ask as many questions as necessary to be sure you understand what you will be asked to do.

Investigators:

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Purpose of the Study: The study will be on human female mating strategies from an evolutionary point of view. Several aspects of female mating will be explored including lesbianism, bisexuality, casual sex, fluidity, comparative studies, feminism and masculinity in females. The purpose of the study is to investigate female sexuality which has often been overlooked in past sex research. Several interviews will be conducted on females who identify as "fluid" in their sexuality. This study hopes to analyze the different paths of sexual orientation in the human female compared to the human male. The study would like to recruit at least 100 heterosexual females, 100 lesbian females, and 50 bisexual or "fluid" females. Only females 18 years of age or older can participate in the study. This study also would like to interview 5 to 10 females who identify as "fluid" to further understand female sexuality. Females who are over 18 years of age and identify as "fluid" may participate in this study.

Description of the Study: If you decide to participate in this research, you will be asked to do the following: Sit in a private lab space with the primary researcher who will ask you questions pertaining to fluidity and bisexuality. With your permission, the researcher will audiotape your answers. The study will take place at Ryerson University at 105 Bond Street, in the researchers lab, or in another room that is private. The study will take approximately 60 minutes to complete.

What is Experimental in this Study: None of the procedures used in this portion of the study are experimental in nature. The only experimental aspect of this study is the gathering of information for the purpose of analysis. The procedure of asking you to tell about yourself in the form of a narrative or story is a common practice in everyday life and is also very common in what is called narrative research. This portion of the study is considered qualitative research, in that it does not use numbers or statistics to understand you

Risks or Discomforts: Occasionally people feel uncomfortable when answering questions that ask about sexuality and fluidity or identifying as more masculine or feminine, and this may cause some psychological discomfort to the participant. The psychological discomfort experienced is

believed to be minimal, and no more harmful than what a person sees on television, or reads in magazines or newspapers. However, if any aspect of this study makes you uncomfortable, you may choose not to answer certain questions, or to withdraw from the study temporarily or permanently at any time.

Benefits of the Study: We anticipate that you will benefit from this portion of the study by sharing your story about your experiences with your fluid sexuality. We also anticipate others will benefit from this research that you are participating in, in that it will give females a chance to discuss their sexuality, and to understand female sexuality better. This research hopes to contribute to a more accurate understanding of human female sexuality. Contribution from participants will allow this knowledge to grow. I cannot guarantee, however, that you will receive any benefits from participating in this study.

Confidentiality: Your responses in this research will be confidential because you will not put your name on any legally identifying number or information as part of the answers to the questions. The questions and answers will be identified by number only. You will be asked to sign only this consent form (if you decide to participate), and it will be filed separately from the copy (transcript) of your answers. The data from this study will be held in a locked lab room for a five year period, to which only the primary researcher and secondary investigator will have access. After this period, that data will be destroyed.

Incentives to Participate: participant will not be paid to participate in this study.

Voluntary Nature of Participation: Participation in this study is voluntary. Your choice of whether or not to participate will not influence your future relations with Ryerson University. If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty or loss of benefits to which you are allowed. At any particular point in the study, you may refuse to answer any particular question or stop participation altogether.

Questions about the study: If you have any questions about the research now, please ask. If you have questions later about the research, you may contact:

Sarah Radtke sradtke@psych.ryerson.ca 416-902-4935

Dr. Wade Pickren, 416-979-5000, ex. 2632 wpickren@psych.ryerson.ca

If you have any questions regarding your rights as a human subject and participant in this study, you may contact the Ryerson University Research Ethics Board for information:

Research Ethics Board
c/o Office of the Vice President, Research and Innovation
Ryerson University
350 Victoria Street
Toronto, ON M5B 2K3
416-979-5042

Human Female Sexual Behaviour across Sexual Orientation: Evolution, Personality and Fluidity

Interview portion of the study

Agreement:

Your signature below indicates that you have read the information in this agreement and have had a chance to ask any questions you have about the study. Your signature also indicates that you agree to be in the study and have been told you can change your mind and withdraw your consent to participate at any time. You have been given a copy of this agreement.

You have been told that by signing this consent agreement you are not giving up any of your legal rights.

Name of Participant (please print)

Signature of Participant_____

Date_____

Signature of Investigator_____

Date_____

Appendix C

Interview n = 4

Four women contacted me to be interviewed regarding female fluidity and sexuality. All four of the women were white. Each of the women labelled their sexual identity differently. All women were asked the same questions (see Appendix D).

Overview of Interview Participants

"M" who is 31 liked to use the label "queer". "M" did identify herself as fluid or bisexual, however she did not like to label herself. She mostly has bisexual men and women in her peer group since they understand her better than heterosexual men and women. She is currently involved with a bisexual male, they are in a polyamorous relationship. Her male partner is currently in a sexual relationship with another woman, while "M" is not, if the opportunity arose, she would do so. "M" explained that polyamory is not casual sex with strangers, it is like having more than one relationship, and sex is not casual. "M" and her partner are the primary relationship and they must agree on the person that they potentially become involved with.

"H" is 28 (youngest of all four) and she has never been sexually involved with another female. She does not like to label herself, but if she is pressed, she will label herself as bisexual. She has some trouble saying that she is bisexual because she has never had sex with another woman. She is currently in a long term relationship with a heterosexual male. The male she is involved with is insecure regarding "H"'s bisexuality.

"L" is 31. She does not like to label herself but she does label herself "lesbian" because many of her peers and family think of her as lesbian. However, she says that she is bisexual/fluid and enjoys sex with men. She does not like to disclose her bisexuality to lesbians, in that she has

had adverse reactions from the lesbian community. "L" has had sexual relationships with "many, many men" especially in her late teenage years and early twenties.

"M2" is 30 years old. She does not like labels. She now calls herself "lesbian" and she is married to her female partner. They have been together nine years. She says that 10% of her sexual attraction is toward men and the other 90% toward women. She has had an extensive sexual past with men, however, she says that she was using the men for sexual purposes, and that those encounters did not mean much. M has had extra marital contact with a gay male (along with her partner) after that encounter she had declared that at this point in her life, she is mostly lesbian.

Although no formal analysis was conducted on the interviews, some general patterns and anomalies will be discussed. All of the participants' families and friends knew of their sexual orientation. The word fluidity was not discussed with parents and sometimes friends. It is easier for all the women to use words like bisexual or lesbian instead of fluid. "M" does not prefer to disclose her bisexuality to people because she is also polyamorous and she is afraid that stereotypes of bisexuals as promiscuous will be perpetuated by her disclosure.

General findings

All of the women note a difference in attraction to women compared to men. Three of the four women say that women are more emotional and more "touchy feely" and "cuddly". Three of the women commented that it is much easier to pursue one night stands with men. If they tried to pursue casual mating with women, it was more difficult to get to the sex part. If pursuing women, more effort had to be made to get them to a sexual encounter. Even after a casual encounter, women wanted to continue contact, while the men were okay with just having a sexual encounter.

All women discussed having a crush on a teacher either in middle school or high school. They usually wanted to be around this teacher and receive attention from the teacher (both positive and negative). Two of the women were not aware as to why they wanted to be around these female teachers, while the other two knew that they were experiencing a same sex attraction. Three of the women did not reveal their same sex attractions to anybody in high school, while "M2" did disclose her bisexuality to her best friend who responded with acceptance and with "as long as you know that I'm not gay".

"L" and "M2" who identify as lesbian presently, both had a substantial sexual history with men, more so than the two women who identify as bisexual. They both dated and had sex with many men in high school. Both felt that the best way to get satisfaction sexually at the time was with men. Both were aware of their same sex attraction but could not act on it at that point. They also spoke of "behaving the way men would" in that they would have a sexual encounter that was casual and the men would want a relationship; they surmised that this what women usually go through.

Three of the four women have had difficulty with lesbians accepting their bisexuality. "M" only dates other bisexual women as a result of negative reactions from lesbian women, she notes that dating bisexual women "is easier". "L" and "M2" have had negative experiences when dating lesbians. Both were often questioned about their "true" sexual orientation, or they were mocked in that they were called "fence sitters" or "straight". The reasons that the two participants think this happens is insecurity that they will leave them for a man. Both of these relationships did not last.

Women are "harder to read" according to "M" who stated "dating women is great, it is getting to the point of dating that is the difficult part". "M" often feels frustrated in that she

cannot tell if another woman is interested in her. "M" commented that she is more secure in a relationship with a male on an emotional level; this differed compared to the other participants who found emotions easier with female companions. "M2" did comment on the notion that many women think being in lesbian relationship is easier. "M2" commented that at times, it is more difficult because women are more emotional. She went on to say that if you want to be left alone and not talk, the female partner will continually ask what the problem is, if this was male partner, "M2" claimed that this would not happen and they would "back off".

Gaining a perspective from what these women are experiencing adds an extremely important dimension to the work, one that is more concrete in explanations, not just numbers that are either significant or not. The real lived experience will help to understand what these women feel and go through as a result of having an identity that does not fit into a neat category of heterosexual or lesbian.

Appendix D

Interview Questions

How do you label yourself (if you do label yourself)? Why? How old are you?

1. When did you first think about or experience same sex attraction? How did you feel when you were aware of it? Can you tell me? E.g. Denial, Fear, anger, etc...

2. Do family or friends know you are attracted to both sexes? If they know what do your family and friends think about this? Has anything changed in your relationships?

3. Have you ever been intimate with the same sex and/or dated someone of the same sex? (Do not need to answer if uncomfortable). Have you ever engage in same sex behaviour for male arousal (e.g. on a dance floor) or with a male involved? To entice a male?

4. Can you tell me the difference (if you feel there are any differences) when dating or being intimate with a male or a female. Can you describe this?

5. Have you ever dated a male (who is straight/bi) who has known about your bisexuality (fluidity)? Can you describe this? Also, if you have dated a female (who was/is lesbian) who has known about your bisexuality, can you describe this?

6. Can you tell me if there if you are more emotionally attracted to men/women or both and why?

Can you tell me if you are more sexually attracted to men or women or both? And why?

7. When you are interested in a male or a female (dating or intimate contact), how does your approach differ (if it does)?

Do these relationships evolve differently when dating a male or female? How?

8. It has often been stated in research on fluidity that some people "fall in love with the person, not the gender"? Would you say this applies to you and expand on this if you can?

9. There is some resentment in the gay community regarding bisexuals or fluid individuals, have you felt any negativity (or positivity) from the gay community or gay/lesbian individuals regarding your bisexuality (fluidity)? If you have experienced negativity or positivity, can you tell me about that?

10. Any thoughts on how sexual orientation develops? (E.g. social construction, biology, both, choice, etc...).

11. Anyone in your family (related biologically) that you know of that are gay/lesbian/bisexual/fluid?

12. Can you describe your peers? Are many of them bisexual/gay/straight, and are they accepting, can you tell about that?

Do not have to answer

13. When masturbating, do you mostly think about men or women or both? Does this coincide with your real life pattern, do you think about the gender that you mostly are romantically involved with?

14. Do you ever watch pornography? If yes, ask following

If watching sexually explicit material (pornography) do you imagine yourself in the different characters, for example do you ever put yourself in the place of the male making love to the women etc...why do you think that is?

15. Is there anything that you would like to discuss regarding bisexuality/fluidity? The floor is yours!

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