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The Roles of Exercise Habits, Gender Stereotype of Exercise, and Self-Esteem in Sexual Victimization

Nicole Rene Harder
Nova Southeastern University, nicole@dr-luk.com

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THE ROLES OF EXERCISE HABITS, GENDER STEREOTYPE OF EXERCISE,

AND SELF-ESTEEM IN SEXUAL VICTIMIZATION

by

Nicole R. Harder, M.A.

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This dissertation was submitted by Nicole R. Harder, M.A., under the direction of the dissertation committee listed below. It was submitted to the School of Psychology and approved in partial fulfillment of the requirements for the degree Doctor of Philosophy in Clinical Psychology at Nova Southeastern University.

Approved:

_____   _____
Date of Defense   Ana I. Fins, Ph.D., Chairperson

                                              _____
                                              Edward R. Simco, Ph.D.

                                              _____
                                              Jan Faust, Ph.D.

_____   _____
Date of Final Approval   Ana I. Fins, Ph.D., Chairperson

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TABLE OF CONTENTS

LIST OF TABLES

ABSTRACT

Anecdotal evidence suggests that women who exercise regularly increase not only their physical strength but also their mental strength, which has been conceptualized as self-confidence, assertiveness, and self-esteem. Empirical investigation into this area of research, however, is scarce. One study found that self-reported victimization rates of female athletes were significantly lower when compared with another study's female non-athlete sample. More recently, research found significant differences in levels of self-esteem and sexual victimization rates between female collegiate varsity athletes and the general female college population. The current study is a subsequent analysis of the data used in the aforementioned study.

Data were collected from an undergraduate population of females in a mid-sized western university. Subjects were drawn from four varsity athletic teams and from two general classes. Measures of sexual victimization, self-esteem, and exercise habits were administered.

The current study found that frequency of exercise, intensity of exercise, duration of exercise, and self-esteem, were not related to victimization at a statistically significant level. This was true for the sample as a whole, and when varsity athletes and non-varsity athletes were considered separately. Though it did not reach statistical significance, further analysis revealed that varsity athletes were three times less likely to report victimization than non-varsity athletes.

Gender stereotype of exercise was not able to predict victimization scores over and above frequency of exercise, intensity of exercise, duration of exercise, and self-

esteem, among non-varsity athletes. The variable of gender stereotype of exercise demonstrated that subjects who reported female-stereotyped exercises were three times more likely than those who participated in gender-neutral exercises, and eight times more likely than those who participated in male-stereotyped exercises, to endorse statements of sexual victimization. These results, however, were not statistically significant.

Though neither research hypothesis was supported, analyses indicated that further investigation into variables that buffer one against sexual victimization relative to self-esteem and choice of exercise habits is merited.

CHAPTER I: STATEMENT OF THE PROBLEM

For a woman, the time of life that carries the highest risk of being sexually assaulted, is while attending college. In a survey of 4,446 randomly selected women attending a 2-year or 4-year college or university, Fisher, Cullen, and Turner (2000) found that 5% of collegiate women per year, projected to 20 – 25% of all women over their collegiate career, are victims of rape. Similarly, the Bureau of Justice Statistics reported that the age group at highest risk for rape is 20 – 24 year old females (U.S. Department of Justice, 2004). Consistent with this finding, Gross, Winslett, Roberts, and Gohm (2006) found that, in a convenience sample of 935 female undergraduate students at a state university, 27% of college females reported unwanted sexual experiences, 19% of whom reported forced intercourse. Additionally, Breitenbecher (2006) reported that 54% of 416 undergraduate women surveyed on a university campus reported some form of sexual victimization and 88% of these victims were assaulted by someone they knew.

These statistics have not gone unnoticed by lawmakers, nor by college and university officials. The *Jeanne Clery Disclosure of Campus Security Policy and Campus Crime Statistics Act* (U.S. Department of Education, 2005) requires that schools disclose annual campus crime statistics including information pertaining to specific sexual offenses. This act was amended in 1992 and 1998, and now requires that schools develop crime prevention policies and provide assistance to victims of crimes. Though six out of ten colleges and universities have implemented educational safety and prevention programs, only 60% of those programs address sexual assault, and less than one-third of

those programs address acquaintance rape (Karjane, Fisher, & Cullen, 2005). These programs have been shown to increase empathy for victims and raise awareness of rape myths, as most recently demonstrated by Foubert and Newberry (2006), and Milhausen, McBride, and Jun (2006). What remains to be consistently accomplished however, is reduction of the incidence of sexual assault, as most recently suggested by Gidycz, Rich, Orchowski, King, and Miller (2006). As suggested by Karjane, Fisher, and Cullen (2005), the relative lack of success of these programs may be due to two factors, first that preventive efforts incorrectly convey that stranger, not acquaintance, rape poses the greater risk. The second factor is that the majority of collegiate women do not believe that they are at risk. Furthermore, when prevention strategies were taught on college campuses, it was found that women who had not been previously victimized did not believe they were at risk, and did not believe the prevention strategies were personally applicable (Breitenbecher & Gidycz, 1998; Norris, Nurius, & Graham 1999; Gidycz et al., 2001).

In regard to the first factor, that of stranger rape, it was found that college students most commonly experienced sexual assault under initially non-threatening circumstances such as while on a date, or attending a party or small gathering. In a report issued by the U.S. Department of Justice (Fisher et al., 2000), it was found that in nearly 90% of both attempted and completed rapes, the victim knew their assailant, who was usually a classmate, friend, acquaintance, or ex-boyfriend. Additionally, it was found that 60% of completed rapes took place in the victim's residence. The stereotypical rape scene of a stranger lurking in the bushes, a dark alley, or a deserted stairwell, while very real, is less

typical of the danger faced by female college students. Rather, this population is most threatened by those they know and by whom they may have possibly come to trust. Unfortunately, the vast majority of educational programs currently offered do not address this fact (Karjane, Fisher, & Cullen, 2005).

The fundamental question is this: what can be done to decrease the risk of sexual victimization faced by females on college campuses? Altering the content of educational programs to more accurately reflect the risk of acquaintance rape and date rape is certainly part of the solution. Perhaps it is also important to study who is most at risk, and then tailor prevention programs to capture the attention of those individuals and then provide strategies which address those specific risk factors.

With the goal of identifying those most at risk, a study was found which briefly addressed the difference in rates of interpersonal violence experienced by female athletes and female non-athletes. The research focused on male-athlete sexual perpetration rates, but the authors also stated that the self-reported sexual victimization rate for varsity female athletes was significantly lower in comparison to another study's reported victimization rate of female non-athletes (Jackson, 1990).   This difference in victimization merits further exploration.

Previous research (Harder, 2003) found significant differences in levels of self-esteem and sexual victimization between female collegiate varsity athletes and the general female college population. Differences were also found when non-varsity athletes were analyzed by type of exercise. Specifically, women who participated in exercises or sports requiring a high degree of force, sustained strength, and endurance,

what the literature generally refers to as male-stereotyped exercise, reported higher self-esteem and lower rates of victimization. Those who participated in lower-impact exercises, which required less sustained exertion, reported relatively lower self-esteem and higher rates of victimization. Those who reported that they did not exercise at all reported the lowest self-esteem and the highest rates of sexual victimization.

Anecdotal evidence suggests that women who exercise regularly increase not only their physical strength but also their mental strength, which can be conceptualized as self-confidence, assertiveness, and self-esteem. They are more able and more likely to fight off a physical threat, as well as assert themselves in other areas of their lives (Nelson, 1997). Exercise has also been anecdotally effective in recovery from trauma (Hayes, 1994) by being able to successfully manage the physiological and cognitive effects of the trauma, and prevent or minimize the effects of subsequent victimization (Nelson, 1997). Despite the fact that this assertion has been made as early as 1984 (Rogers, 1984), empirical investigation into this area of research is scarce.

The current study aims to further investigate the results of Harder's (2003) study in two ways. First, it will explore the relationships between nature of exercise (frequency, intensity, duration), and self-esteem, and report of sexual victimization in both varsity athletes and non-varsity athletes. Secondly, this study will examine the relationship between gender stereotype of exercise and sexual victimization in non-varsity athletes. Gender stereotype of exercise will be tested for its ability to significantly relate to sexual victimization over and above the effects of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem.

CHAPTER II: REVIEW OF THE LITERATURE

Sexual Assault and Victimization

Rates of Sexual Victimization

In a recent National Crime Victimization Survey, the Bureau of Justice Statistics Special Report (Baum & Klaus, 2005) stated that approximately 4% of college students reported rape or sexual assault. However, the accuracy of this figure is questionable as it is suspected that fewer than 5% of all college women who are sexually victimized actually report the incident to the police (Fisher, Cullen, & Turner, 2000). Another report by the Department of Justice (Sampson, 2003) posits that the projected figure of 350 rapes per 10,000 female students represents dramatic under-reporting as well. This assertion is widely supported in numerous studies that do not rely upon reports to law-enforcement officials. For example, in 2000, sexual victimization rates on college campuses were reported at a rate of 5% of collegiate women per year, projected to 20 – 25% of all women over their collegiate career (Fisher et al., 2000). Breitenbecher (2006) reported that 54% of 416 undergraduate women surveyed on a university campus reported some form of sexual victimization, and that 88% of these victims were assaulted by someone they knew. Gross, Winslett, Roberts, and Gohm (2006) found similar rates, citing that 27% of college females ($N = 935$) reported unwanted sexual experiences with 19% reporting forced intercourse.

In a more dated report, Koss, Gidycz, and Wisniewski (1987) stated that of 3,187 female college students from across the nation, 54% reported some type of unwanted

sexual activity, and 27% of the students endorsed rape statements. Koss et al. went on to report that only one quarter of those rape victims acknowledged the event as a rape and a mere 5% of such incidences were reported to the police, while 42% of rapes went completely unreported.

The 1998 Minnesota Student Survey by Ackard and Neumark-Sztainer (2002) surveyed 81,247 9th-grade and 12th-grade high school students throughout the state. Results indicated that 7% of 9th-grade and 12% of 12th-grade girls reported some type of date-related violence. Concurrently, 6% of 9th-grade and 6% of 12th-grade boys reported experiences of date violence or rape. While it is problematic to meaningfully extrapolate statistics from the high school population to college students, the authors assert that their results indicated that date-related violence starts early in an individual's dating experiences and exacerbates into early adulthood.

College students most commonly experience sexual assault under initially non-threatening circumstances such as a date, party, or small gathering. In a report issued by the U.S. Department of Justice (Fisher et al., 2000) which studied sexual victimization of college women ($N = 4,446$), it was found that 60% of completed rapes took place in the victim's residence. When combining both completed and attempted rapes, nearly 90% of the victims knew their assailant, who was usually a classmate, friend, acquaintance, or ex-boyfriend. The assailant was unknown to the victim in only 4% of completed rapes and 8% of attempted rapes, which means that the stereotypical rape scene of a stranger lurking in the bushes, a dark alley, or a deserted stairwell, while very real, is less typical

of the danger faced by female college students. Rather, this population is most threatened

by those they know and by whom they may have possibly come to trust.

Victim Characteristics

Demographics

In the interest of identifying those most at risk for sexual victimization,

characteristics of victims have been the focus of several studies. In a study of battered

women, Campbell and Soeken (1999) found no significant differences in age, education,

total family income, employment status, or history of child sexual abuse between women

who had been forced into sex by intimate partners and women who had not (N = 159,

Cohen's d = .80). Similarly, in a sample of 180 single women aged 25 – 30, who self-

identified as consuming at least three to four drinks per occasion, Testa and Derman

(1999) found that sexual coercion was not associated with ethnicity (d = .12).   In a

sample of 2,823 female undergraduate students, Brener, McMahon, Warren, and Douglas

(1999) analyzed their sample by comparing two groups: those who had experienced rape

and those who had not, and then compared percentages of each group that were White,

Black, Hispanic, or Other; no differences were found. Gross, Winslett, Roberts, and

Gohm (2006) however, found differences when comparing victimization rates between

White and African American college females (N = 903). More African American women

(36%) than White women (26%) reported unwanted sexual experiences, p = .057.

Additionally, when compared with White women, more African-American women

reported that their partner used emotional pressure (p < .002) or physical strength (p <

.015) to force sexual compliance. However, significantly more White students (44%)

than African-American students (3%) reported such incidences to have occurred while they were drinking ($p < .001$).

In regards to age, Fisher et al., (2000) reported that the time of life when a woman's risk for rape is highest is while attending college. The Bureau of Justice Statistics concurs with this, as they reported that the group at highest risk for rape is 20 – 24 year old females (U.S. Department of Justice, 2004).

Previous Victimization

In a study investigating past psychological maltreatment and its relationship to sexual assault, Aosved and Long (2005) surveyed 648 female undergraduate students. They found that previous psychological maltreatment was related to both coerced and forced sexual contact as a young adult ($d = .34$). Based on this, the researchers suggested that perpetrators may seek out potential targets who exhibit characteristics which indicate that they have been victimized in the past. The authors go on to assert that past psychological maltreatment may predispose someone to future victimization, as the victim may have learned to deal with maltreatment and abuse in the past by being submissive or passive in order to self-protect. Aosved and Long state that this self-protective tactic works to the advantage of a perpetrator who uses coercive methods, as the victim is likely to simply acquiesce.

Messman-Moore and Long (2000) addressed the link between childhood sexual abuse and victimization as an adult. In a sample ($N = 633$) of college women, they found that victims of childhood sexual abuse were more likely to be victims of sexual assault as adults than women who had not been victimized as children. Results indicated that adult

victims of childhood sexual abuse were more likely than their non-victimized counterparts to report that when they were victimized as an adult, the perpetrator had both misused their authority and employed sexual harassment ($d = .29$). This may suggest that due to victimization as a child, when it was likely that the victim was not able to refuse or had limited methods or abilities with which to defend themselves, the adult victims may similarly perceive themselves to be unable to effectively manage the threat of assault. Additionally, perpetrators may recognize this as suggested by Aosved and Long (2005) and seek out these individuals as targets.

A subsequent study, Messman-Moore and Brown (2004) explored various forms of childhood victimization as they related to risk for rape as an adult. It was found that, in a sample of 944 female undergraduate students, risk of rape was greater for victims of childhood sexual abuse ($OR = 1.9$) even when family environment was controlled for.

Using a sample of women living in a metropolitan area in the northeast ($N = 114$), Livingston, Buddie, Teste and VanZile-Tamsen (2004) explored the significance of Traditional Sexual Scripts in sexual victimization. Summarizing a qualitative analysis of interviews with women who had endorsed items on a measure of sexual assault, the authors stated that women may feel that they must appear willing to engage in sex in order to maintain and further the relationship, but must refuse higher levels of sexual intimacy in order to avoid being labeled as promiscuous. The script to which men are hypothesized to ascribe suggests that they must be persistent in their sexual advances because women engage in token resistance in an effort to not appear promiscuous. In short, these scripts suggest that men are expected to be persistent while women are

expected to capitulate in order to maintain or further the relationship. Consequently a woman's resistance is perceived as an act and not considered sincere, even when she does not wish to engage in sexual intercourse.

Victimization of Athletes

A study by Savage and Holcomb (1999) compared sexual risk-taking behaviors of high school female athletes ($N = 141$) with data from the Centers for Disease Control and Prevention's sample of 7,839 female adolescents. In a series of chi-square analyses, it was found that high-performance high school female athletes generally engaged in fewer sexual risk-taking behaviors, such as lower frequency of sexual activity before 14 years of age, fewer partners, lower frequency of sexual activity in general, and higher frequency of condom use, than their non-athlete cohorts (all $p < .05$). The authors suggested that the behavioral differences could be due to a heightened awareness of the potential consequences of risky sexual behavior, and how these behaviors may interfere with their athletic goals. If female athletes have a lower frequency of engaging in high-risk sexual behaviors, it stands to reason that their exposure to situations that would lead to date rape or acquaintance rape would be lower as well. Arguably, participating in athletic endeavors produces a buffering effect from interpersonal violence whereby female athletes simply have less time for and place lower importance on dating relationships.

Alternatively, female athletes face certain hazards due to their participation in sports. Brackenridge (2000) claims that a young female athlete lacking a strong male parental figure may see a male coach as a surrogate father, with whom she may become

emotionally close, infatuated, and with whom she may possibly fall in love. If these emotions are reciprocated, she may become easily exploited. Brackenridge further suggests that a pedophile may use sports to gain access to young boys or girls, or a sexual predator may take advantage of the powerful role of coach for such exploitation. Brackenridge asserts that either of these scenarios may be particularly realistic for community recreational clubs, which depend upon volunteers to run the programs, and do not have the luxury of conducting thorough background checks or implementing an interview process.

Preventive Educational Programs

The dynamics of sexual assault, specifically when the perpetrator is not a stranger to the victim, are fraught with ambiguous cues of danger, misinterpretation of communication, and social expectations. Educational programs on college campuses which have sought to clarify these areas of interpersonal dynamics, have had limited success in decreasing the rate of sexual victimization.

Gidycz, et al. (2001) examined this belief in the area of sexual victimization. Using an experimental method, 1,136 college students were given several measures on their attitudes toward victimization and their personal previous victimization or perpetration, and were then randomly assigned to either a treatment group or control group. The experimental group attended an hour-long sexual assault educational workshop, and the control group was given a handout on sexual assault. Nine weeks later, participants again completed the measures. Based on participants' responses, rates of victimization and perpetration remained constant over the nine weeks regardless of

experimental group (control, experimental, total) and history of victimization (rape, moderate sexual victimization, no victimization). Changes in attitudes were affected slightly, reflecting empathy toward victims, an increase in liberal attitudes toward women, and lower acceptance of rape myths. In an evaluation of Gidycz's et al. educational program, both men and women rated the content positively, but did not feel it was personally relevant, or that they were at risk to be victimized or to perpetrate. One change that could have been made would be to survey experimental group participants' attitudes immediately after the workshop. This would demonstrate any immediate positive effect of the presentation, which could have been reinforced throughout the nine weeks.

Hanson and Gidycz (1993) reported mixed results of a similar sexual assault prevention program. In their study, one group of college females attended an acquaintance rape prevention program aimed at reducing the incidence of sexual assault during a nine-week follow-up period. The control group did not attend the program, but was assessed at the same times as the experimental group. For purposes of statistical analysis, all participants were divided into three groups depending upon previous victimization: none, moderate, and severe. The intervention was effective in significantly lowering the incidence of sexual victimization over the subsequent nine weeks for women who were not previously victimized, but was not effective for women who had previously experienced moderate and severe victimization ($d = .44$). This suggests the need for a stronger intervention with this population.

Breitenbecher and Gidycz (1998) designed an intervention program specifically aimed at women with sexual assault histories and presented it to a population with moderate or no previous victimization, as well as severe previous victimization. No significant differences were found when comparing the treatment and control groups, despite considerable sample size ($N = 406$, $d = .15$). The authors believed that the more intense intervention alienated women who had not been previously victimized, possibly because they did not believe the information applied to them personally. These results are somewhat discouraging but not uncommon; Breitenbecher and Gidycz (1998) note that one-time interventions may not be effective in impacting long-term behavioral change.

A subsequent study by Breitenbecher and Scarce (1999) implemented a similar research design with similar measures. The follow-up assessment was given at seven months, a considerably longer time-frame than the previously cited studies of nine weeks and seven weeks. The program significantly increased women's knowledge of sexual assault ($d = .68$), but incidences of sexual assault did not decrease ($d= .23$).

Gidycz, Rich, Orchowski, King, and Miller (2006) used a 2 x 2 x 3 (group by victimization status at 3-month follow-up by time) experimental design to implement a sexual assault educational program with a self-defense component ($N = 500$). It was successful in detecting an increase in self-protective behaviors, such as paying attention to their dating partner's drug and/or alcohol intake, assertive communication, and attending to surroundings, over a six month period between the experimental and control group ($d = .37$). However, differences in occurrences of victimization did not reach

statistically significant levels. The authors attributed this lack of significance to low overall frequency of sexual victimization over a relatively short time-frame of six months.

Foubert and Marriott (1997) conducted a study of fraternity pledges who attended a workshop titled, "How to Help a Sexual Assault Survivor." Using Burt's Rape Myth Acceptance Scale (BRMAS) as a pre- and post-test, attendees' endorsement of rape myths significantly decreased after attending the workshop, ($d = 2.14$). At a one month follow-up, the attendees' scores significantly increased yet remained significantly lower than their pre-test scores ($d = 1.15$) . Surprisingly, the scores for pledges who did not attend the workshop also decreased significantly when compared with pre-test scores ($d = .75$), suggesting that the simple administration of the BRMAS raised consciousness. As implied by Breitenbecher and Scarce, a major shortcoming of the study is the lack of evidence of behavioral change. While endorsement of rape myths is positively correlated with rape behavior, and the reduction of rape myth endorsement was correlated with a reduction in the men's self-reported likelihood to assault or rape, the study did not assess long-term behavioral changes. The authors readily admitted that lasting attitudinal and behavioral changes are difficult to achieve through education alone, which is consistent with the outcomes that have been found with women and with prevention programs. Although not addressed by Foubert and Marriott, the pledges may have learned the socially acceptable responses, and supplied those in place of their actual attitudes and behaviors in response to demand characteristics. A strength of Foubert and Marriott's

study was their approach to this topic. Men were addressed as helpers to victims of sexual assault, rather than perpetrators of sexual assault.

Though not educational in nature, another study proposed a possible point of distinction between women who have been sexually assaulted, and those who have not. Research by Harder (2003) found that college women who participated in male-stereotyped athletic activities reported statistically significant higher levels of self-esteem when compared with women who participated in female-stereotyped exercises. Furthermore, self-esteem was the strongest predictor of lower levels of sexual victimization and rape, an a priori effect size of $d = .70$ was reported. Several variables may influence one's decision to exercise and their choice of athletic activity such as endorsement of gender role, reasons for exercising, and prior victimization. This research intended to assess for a possible protective factor created by increased self-esteem through engaging in particular athletic endeavors.

Roles in Sexual Assault

Morry and Winkler (2001) examined college men's and women's expectations of rape, acceptance of sexual assault across different situations, and endorsement of rape myths ($N= 154$). There was no difference between men's and women's acceptance of rape ($d = .11$) or expectation of situations in which rape would occur ($d = .27$). However, when individuals were separated between high and low rape myth acceptance, differences were found regarding in which situations rape was accepted ($d = .51$), and in which situations rape could be expected ($d = .35$). Based on the Feminist theory, the authors interpreted this as agreeing when the victim was to blame, but disagreeing as to when the

aggressor was exonerated. The authors suggested that these results pointed to the effectiveness of educational programs in changing attitudes, or less optimistically, providing men with socially acceptable responses. A possible explanation that was not explored is that the participants did not share the authors' underlying assumption that expectation of assault equated to blaming the victim. This basic misunderstanding could have been clarified by providing an operationalized definition of expectation, which in Morry and Winkler's study, conveyed victim blame. Without this information, the implications of the results are vague.

Conditions can be likely for a certain event to happen without it actually occurring, and if it in fact it does occur, it does not necessarily mean the victim holds the entirety of the blame. Norris, Nurius, and Graham (1999) demonstrated this point when they examined women's ability to perceive the risk of acquaintance rape, given various situational factors. Results indicated that in certain hypothetical situations, women perceived even an ambiguous threat as reason for being uncomfortable ($r = .27$, $p < .01$) or on-guard ($r = .22$, $p < .05$). Three of these risk factors were also included in Morry and Winkler's (2001) study: the man being intoxicated, the woman being intoxicated, and being alone with a man. In Morry and Winkler's study, these factors were among those that received the highest frequency of endorsement of expecting assault. Norris et al. identified these as risk factors, which participants rated as having varying degrees of potential danger, but asserted that these circumstances are not a sufficient condition for assault to occur. This operational difference demonstrates a gradation of risk not considered by Morry and Winkler.

Norris et al. (1999) also found that although women were able to discern between ambiguous and clear risk factors, the participants attributed them largely as risk factors for other women, but not for themselves, ($d = 1.27$). This concurs with Gidycz et al.'s (2001) and Breitenbecher and Gidycz's (1998) conclusions that women who have not been previously victimized, do not feel prevention strategies are personally applicable.

Summary

Statistics indicate that rape is most commonly committed by someone who is known to the victim (Fisher et al., 2000; Breitenbecher, 2006; Koss et al., 1987) which suggests an interpersonal component to sexual assault. Research also indicates that rape may include a communication element whereby there is a misattribution of the reasons for a woman's resistance (i.e., not wanting to appear promiscuous versus not wanting to have sex) (Livingston et al., 2004) and a subsequent violation of the woman's wishes.

Educational programs on have not been consistently successful in decreasing the occurrence of sexual victimization on college campuses. The reason for this is two-fold. First, the educational programs convey that the greatest danger for sexual assault is at the hands of a stranger, which has been suggested to be inaccurate (Fisher, Cullen, & Turner, 2000). Secondly, the audience intended to receive the message that sexual assault is often perpetrated by a friend or acquaintance, does not believe that it applies to them.

Victimization and Self-Esteem

Most commonly, research focuses on the psychological and behavioral characteristics of victims, specifically, how personality traits influence one's behavioral patterns.

Personality Traits

Testa and Dermen (1999) hypothesized that a constellation of personality traits characterizes women who experience sexual coercion. These personality traits supposedly make resistance to pressure difficult, especially when the pressure comes from intimate partners. Their hypothesis held true. It was reported that, when compared to women who had not been coerced (*n* = 64), women who had experienced coercion (*n* = 47) tended to have lower scores on measures of self-esteem and assertiveness (*d* = .56).

This concurs with results from Campbell and Soeken (1999) whose research found that, when compared with women who had experienced sexual assault, women who had not been sexually assaulted had a more positive image of their physical self, (*N* = 159, *p* = .046, *d* = .58).

Day (1994) cited a study that conceptualized women who most feared rape. Such women perceived a risk of victimization, believed that they were physically incompetent to rebuff an attack, and held a limited sense of attachment to the community (Riger, Gordon, & Le Bailly, 1978 in Day, 1994). It was not stated if any of these women had been assaulted, therefore it is unknown if these fears were related to actual victimization. However, the characteristics described in the study appear to have a common link of low self-esteem.

Ackard and Neumark-Sztainer (2002) found, in sample of 81,247 high school students, that date violence and rape were associated with higher rates of disordered eating behavior, suicidal thoughts, suicide attempts, and lower scores of emotional well-being and self-esteem. Specifically, it was found that when compared with non-abused

peers, girls and boys who reported experiencing both date violence and rape scored the lowest on measures of emotional well being and self-esteem (d = .27). This dually victimized group also had significantly lower scores than boys and girls who experienced either date violence or date rape only. This would indicate that as the frequency of this type of trauma increases, its toll on self-esteem and emotional well-being increases as well.

In an investigation of adult victims of childhood sexual abuse aged 18 to 56 (N = 103), Gold (1986) explored how one's attributional style in regard to childhood abuse was related to functioning in adulthood. Gold found that psychological distress and low self-esteem were present in victims whose attributional style was internal, stable, and global for bad events, (r = .82, p < .0001, d = 2.87), a style which was interpreted as self-blaming. The investigator suggested that the interplay between victimization and its effect on self-esteem was mediated by perceptions of the abuse.

Behavioral Characteristics

Similarly, Testa and Dermen (1999) suggested that low self-esteem was a marker of vulnerability, which preceded sexual coercion. In their analysis, it was found that, among other characteristics, women who tended to stay in sexually coercive relationships generally had lower self-esteem than those who did not (p < .05, d = .41), and also failed to effectively communicate their objections to unwanted sex (p < .05, d = .56). It was suggested that these women were perceived by sexually aggressive men as an appropriate target for unwanted sexual advances.

Sharpe and Taylor (1999) cited several earlier studies (Burke, Stets, & Pirog-Good, 1989; Kasian & Painter, 1992; Stets, 1991) which found that female victims of dating violence had significantly lower self-esteem compared to their non-abused counterparts. In their own study of college women ($n = 225$), the researchers found that low reports of self-esteem were related to both inflicting and receiving physical violence, while high self-esteem in college males ($n = 110$) was related to receiving physical violence ($p < .01$). Based on these results, the authors concluded that women have a greater emotional investment in romantic relationships than men, and when relationship problems arise, such as conflicts over physical involvement, they experience a greater decline in self-worth and self-esteem. Staying in the relationship may be a protective effort on the part of the woman, hoping to eventually resolve the conflict and regain self-esteem.

In a study investigating the roles of self-esteem and emotional distress in sexually active adolescent females ($N = 155$), Ethier et al. (2006) found that lower self-esteem was related to earlier initiation of sexual activity ($r = .18$) and having risky partners (i.e., those who do not use condoms) ($r = -.22$). Lower self-esteem significantly predicted unprotected sex risk six months later ($r = -.35$). It is not clear if low self-esteem preceded or was a result of the behaviors.

The same liability, low self-esteem, which resulted in risky sexual behavior in Ethier et al.'s study may hold implications for the current research. Assuming that the adolescent female does not want to have unprotected sex, but lacks the self-esteem to

effectively assert her wishes, this same female may not be able to successfully navigate a situation wherein she does not wish to have sex at all.

Summary

There are several studies which correlate low self-esteem with victimization and risky sexual practices (Testa & Dermen, 1999; Campbell & Soeken, 1999; Messman-Moore & Long, 2000; Ethier et al., 2006). This suggests that the more one is exposed to high-risk situations, the higher one's risk for victimization will be. Testa and Dermen (1999) suggest that low self-esteem is a marker of vulnerability, which precedes sexual coercion. However, several other studies (Aosved & Long, 2005; Messman-Moore & Long, 2000) suggest that prior victimization leads to future victimization, which exacerbates damage to self-esteem, resulting in a downward spiral of victimization. In an investigation of adult victims of childhood sexual abuse, Gold (1986) found that a self-blaming attributional style mediated victimization and low self-esteem. Taken together, the research demonstrates a strong relationship between self-esteem and victimization.

Self-Esteem and Exercise

Motivation for Exercise

For those who exercise, research investigating self-esteem and exercise holds a dual message, which may be explained in part, by the length of time one adheres to an exercise routine. Tiggemann and Williamson (2000) initially found exercise to be negatively associated with body satisfaction and self-esteem ($N = 252$). They found that young women who exercised more were increasingly dissatisfied with their body and scored lower on a measure of self-esteem ($r = -.25$, $p < .0001$). However, upon further

statistical analysis, the researchers found that the reason for exercise delineated two distinct groups with two different outcomes. Women who exercised for purposes of weight control or muscle tone had lower self-esteem, but women who exercised for health and fitness, had enhanced self-esteem scores ($d = .33$). This pattern possibly reflects an intrinsic motivation for exercise and lower emphasis on approximating popular media's image of beautiful, thin women. Similarly, women who were attempting to achieve the look of cover models were exercising for extrinsic reasons.

Strelan, Mehaffey, and Tiggemann (2003) replicated and expanded upon these findings in a sample of 104 women ages 16 to 25, who exercised daily. Those who had high scores on a scale of self-objectification were more likely to report that they exercised for reasons of weight control, body tone, and attractiveness ($R = .78$, $p < .01$). These women's high scores on self-objectification were negatively correlated with body satisfaction, body esteem, and self-esteem. Negative correlations were found between reports of self-objectification and exercising for health and fitness, ($r = -.73$, $p < .01$), and enjoyment and mood enhancement, ($r = -.56$, $p < .01$). These latter reasons for exercise were positively related with higher scores on body satisfaction, body esteem, self-esteem, health/fitness, and enjoyment/mood ($R = .62$, $p < .01$). As pointed out by the authors, longitudinal data would delineate the causal nature of this relationship. It may be that women who exercise for cosmetic reasons do so in an effort to overcome feelings of low self-esteem, body esteem, and body satisfaction. For this group, exercising may exacerbate these feelings if one becomes preoccupied with body image.

Maltby and Day (2001) attempted to account for this difference in motivation for exercise. In a sample of 227 undergraduate men and women, it was found that the reasons for exercise were different when comparing the length of time for which individuals had exercised. In a series of analyses, subjects who had been exercising for more than six months ($n = 125$), were compared to those who had been exercising for less than six months ($n = 102$). For the group who had been exercising for six months or less, reasons of extrinsic motivation were correlated with lower scores on a measure of self-esteem, social recognition, affiliation, competition, weight management, and appearance (all $p < .01$). They also scored higher on various measures, including social recognition, affiliation, competition, and appearance (all $p < .01$). The group that had been exercising for six months or more reported higher scores on measures of intrinsic motivation for exercise such as revitalization, enjoyment, and challenge. Based on self-determination theory, the authors posit that motivations for exercise change over time. Individuals may start exercising for extrinsic reasons, but as they continue to exercise, the motivation becomes internalized. This conclusion supports the explanation posited by Strelan, Mehaffey, and Tiggemann (2003) who stated that, as one continues with an exercise program, motivation for exercise changes. Alternatively, it could be that those who exercise for extrinsic reasons do not continue their regimen beyond six months.

Self-esteem Increased Through Exercise

The EXSEM Model

The relationship between exercise and self-esteem has been examined in specific athletic routines, exercise types, and acquisition of skill. Sonstroem, Harlow, Gemma,

and Osborne (1991) isolated specific capabilities in the physical fitness arena as agents that enhance global self-esteem in a sample of 145 adults, mean age of 54.2, gathered from a cardiac rehabilitation program, a community fitness program, and through telephone and personal contacts. Using structural models, the path between self-efficacy and physical competence was significant ($d = .38$), as was the path between physical competency and self-esteem ($d = .27$). The authors concluded that feelings of mastery of athletic skills were associated with enhanced perception of one's physical competence, which was in turn associated with self-esteem.

Later, Sonstroem, Harlow, and Josephs (1994) developed an Exercise and Self-Esteem Model (EXSEM) based on the theory that specific abilities generalize to overall self-concept. In a sample of 216 adult females who exercised on a regular basis, a confirmatory factor analysis supported the EXSEM model. The model demonstrated that perceived self-efficacy in specific athletic skills impacts sport competence, physical condition, body attractiveness, and strength. These factors accounted for 15%, 27%, 4% and 17%, respectively, of the variance in reported physical self worth, which accounted for 87% of the variance of self-esteem derived from exercise, ($d = 5.1$) which in turn accounted for 33% of the variance in scores of overall self-esteem ($d = 1.4$). Considering the multitude of sources of self-esteem, finding that one factor, exercise, accounts for nearly one-third of global self-esteem is noteworthy, and holds powerful implications.

Fox (2000) further illustrated these findings with an example. Learning a specific skill, such as scoring a goal in a soccer game, generalizes to the overall skill of shooting ability. This competency leads to the ability to play soccer, which in turn generates

overall sport competence, which results in increased physical self-worth, a sub-domain of global self-esteem. Fox concluded his meta-analysis of comparable studies by stating that competency in exercise, particularly aerobic exercise and weight training, positively impacts one's view of oneself. This suggests that there is a psychological process which runs parallel to that of physical competency, which implies that as physical abilities strengthen, so does one's perception of being able to master goals outside of the physical realm.

McAuley, et al. (2005) proposed an expanded EXSEM model whereby exercise, along with self-efficacy, directly impacts self-esteem, instead of being mediated by self-efficacy as in the original EXSEM model. Using McAuley et al.'s data of 174 previously sedentary older adults (M = 66.7 years), the original EXSEM model accounted for 51% of the variance in global self-esteem (d = 1.9), and the expanded EXSEM model accounted for 69% of the variance in global self-esteem (d = 2.9). The message of the research remains clear; exercise provides a positive impact on self-esteem.

Other Experimental Applications

Dishman et al., (2006) used a structural equation model, and found that self-concept mediated the relationship between physical activity/sports participation and self-esteem in a sample of 1,250 adolescent female high school students (p < .001). Furthermore, high scores on physical activity/sports participation were associated with lower scores of depressive symptoms (r = –.336). As in other studies, the researchers went on to suggest that by engaging in physical activity, one's self-concept changes, which in turn raises self-esteem.

In a study of 67 third through fifth graders, Walters and Martin (2000) sought to confirm the findings of exercise increasing self-esteem, and improving scores on measures of behavioral compliance. The researchers found no difference between pre- and post-measures of self-esteem (d = .08), nor in behavioral measures (d = .11) after a 13-week intervention of aerobic activity, 30 – 40 minutes in length, performed five times a week. These results are inconsistent with the literature on self-esteem in adolescents and adults. The authors suggest that their findings may be due to a ceiling effect, as the initial measures of self-esteem were generally high, leaving little room for improvement.

Research by Trujillo (1983) which preceded the EXSEM model, investigated the effect of weight training and a running regime on self-esteem. Using a quasi-experimental design, three groups of college students were studied: females enrolled in a weight training class, females enrolled in a running class, and a control group comprised of women who engaged in a variety of other physical activities such as racquetball, swimming, and ice dancing. Comparing pre- and post-test scores of self-esteem, the running, (d = .43), and weight training groups (d = .38) displayed statistically significant gains in self-esteem, while the control group exhibited a non-significant loss.

Summary

Exercise has been related to self-esteem, and while this relationship has yet to be clearly delineated, what research suggests is that the longer one exercises, the greater one's self-esteem becomes. Additionally, as one continues to adhere to an exercise regimen, reasons for exercise may change from extrinsic to intrinsic, and positively impact self-esteem.

Sex Roles

Sex roles have been an area of investigation in research addressing self-esteem, choice of exercise, and sexual victimization.

Sex Roles, Exercise, and Self-esteem

In an investigation of 134 adolescent girls' sex role development, sports participation, and self-esteem, Butcher (1989) found that girls with above-average sports participation scored significantly higher on masculine sex-role scales than below-average sport participants ($d = .63$). This was true throughout the study, which followed girls from 11 years of age to 15 years of age, suggesting that higher masculine orientations present in high school and collegiate female athletes are existent at least by age 11. The group with above-average sports participation had higher scores on masculine sex-role development across the five years ($p < .05$), which was significantly related to higher scores on self-esteem ($p < .05$). Conversely, feminine sex-role development was either negatively correlated or uncorrected with self-esteem scores, depending upon age. Using cross-lagged differentials, the data suggested that in grades six and seven, self-esteem influenced the development of masculine sex-roles, and in grades nine and ten, sports participation influenced development of masculine sex-roles. Using self-esteem as the basis for comparison, girls with high self-esteem had significantly higher masculine scale scores than girls with low self-esteem ($d = .66$), but no differences were found for feminine scale scores and ratings of self-esteem.

Adjectives such as assertiveness, forcefulness, risk-taking, and leadership are common to the Bem Sex Role Inventory (BSRI) masculinity scale, and suggest high self-

esteem. Using the BSRI, Butcher (1989) suggested that traditionally, sports have been sex-typed as masculine endeavors, and that therefore girls who endorse fewer masculine scale items, may be less likely to participate in sports, as they may believe such activities are not appropriate for their feminine orientation. Additionally, sports are highly achievement-oriented activities and require confidence in one's abilities. These characteristics of achievement and confidence are embodied in the masculine sex-role orientation.

In a similar study by Lau (1989) of 191 eleventh-grade Chinese students, individuals in masculine and androgynous groups scored significantly higher than the feminine and undifferentiated individuals on measures of general, academic, and appearance self-esteem, with similar results on a measure of social self-esteem ($d = .96$).

Not only has research demonstrated that female athletes are perceived as more masculine than their non-athlete counterparts, but the sports in which a woman participates can be judged as masculine or feminine (Koivula, 1995). Matteo (1986) investigated the categorization of gender-stereotyped sports by asking 80 college students to rate an extensive list of sports as masculine, feminine, or neutral. The list of sports judged to be male-stereotyped involved body contact, endurance, force, bursts of strength, and power. Female-stereotyped sports emphasized grace, beauty, and artfulness.

In a comparison of perceptions of masculinity and femininity, the characteristics of the ideal male athlete, ideal female athlete, ideal athlete (non-gender specific), ideal female person, ideal male person, and ideal person (non-gender specific) were studied.

The ideal male and the ideal male athlete were rated as significantly different in terms of masculinity, as were the ideal female and the ideal female athlete ($d = 1.38$) (Martin & Martin, 1995). This study indicated that the ideal female is not an athlete, solidifying the concept that female athletes may not fit a sexually aggressive male's profile of an ideal female, and thus that the aggressive male will not pursue a female athlete. This lowers a female athlete's attractiveness to such a male, as well as her likelihood of being viewed as a potential victim. This supposition depends on the condition that in order for the female athlete to avoid categorization as a potential rape target, the woman must look like, or be known as, a female athlete.

A subsequent study of perceived female-stereotyped and non-female-stereotyped sports (Matteo, 1988), found that individuals who subscribe to traditional sex roles, termed sex-typed individuals, were more likely to participate in a sex-stereotyped sport. In addition, the reasons that sex-typed individuals gave for their choice of sport were likely to be gender-related ($d = .61$), and to carry greater importance to sex-typed individuals than to non-sex-typed individuals ($d = .64$). Conversely, non-sex-typed individuals who participated in non-sex-stereotyped sports gave non-gender-related reasons for their choice of sport. As previously stated, sex-typed males' ideal female is also sex-typed, so that if an ideal female were to be involved in athletics, she would likely participate in a female-stereotyped sport. This buttresses the concept of athleticism providing a buffering effect for female athletes; they are not viewed as traditional females and therefore may be less likely to appeal to a sex-typed male.

Sex Roles and Victimization

Research by Boeringer (1999) assessed differences in rape-supportive attitudes between collegiate male athletes ($n = 52$), fraternity members ($n = 113$), and male controls ($n = 312$). Using a series of t tests, Boeringer reported that male athletes and men belonging to fraternities endorsed a higher percentage of rape-supportive statements than male controls, as well as a tendency to view females in traditional sex roles. Differences between these two groups' scores produced significant t values, which ranged from to 1.96 to 5.06 with p values of either $p < .05$ or $p < .001$. This research supports previous findings in which endorsement of traditional sex roles, and objectification of females, was shown to be a factor in supporting rape mentality (Anderson, Simpson-Taylor, & Herrmann, 2004; O'Toole & Schiffman, 1997; Benedict, 1997; Nelson, 1997). These roles may not be readily attributed to, nor accepted by, female athletes who are not consistent with the traditional female sex role, and instead espouse characteristics of physical strength, agility, and stamina.

In a longitudinal study of 197 college men over a one-year time frame, Abbey and McAuslan (2004) revealed differences between men who reported having never been sexually assaultive, men who had assaulted once prior to the study, men who assaulted once during the study, and men who had repeatedly assaulted. Using a MANOVA ($\eta^2 = .19$), with follow up Tukey analysis, it was found that men who had sexually assaulted more than once, held hostile gender-role beliefs ($p < .05$, $\eta^2 = .05$), had callous attitudes toward women ($p < .01$, $\eta^2 = .08$), endorsed verbal pressure as a viable method for

obtaining sexual consent ($p < .01$, $\eta^2 = .21$), frequently drank prior to consensual sex ($p < .01$, $\eta^2 = .11$), and had histories of adolescent delinquency, ($p < .01$, $\eta^2 = .08$).

Research by Lackie and de Man (1997) expounded upon these findings. Using a sample of 86 male undergraduate students, it was found that sexually aggressive male students, not just those who endorsed rape-supportive beliefs, tended to be physically aggressive ($r = .33$, $d = .69$), to be hyper-masculine ($r = .31$, $d = .65$), to hold traditional sex role beliefs ($r = .28$), to be more accepting of interpersonal violence ($r = .26$, $d = .58$), and to be members of fraternities ($r = .24$, $d = .49$), all $p < .05$. Furthermore, a regression analysis pinpointed sex role stereotyping along with physical aggression and fraternity membership as the most salient predictors of sexual aggression, accounting for 23% of the variance ($d = 1.06$).

Summary

Female athletes, regardless of the sport in which they participate, perceive themselves, and are perceived by others, as more masculine than their non-athlete counterparts. This perception conflicts with attributes of the traditional female gender role, and may make female athletes less appealing to sexually aggressive men (Novick, 1998; Matteo, 1986).

Risk factors for sexual victimization include low self-esteem, feminine and non-differentiated sex role orientation, and negative body image. Exercise and involvement in male-stereotyped exercises may potentially mediate these risk factors.

Conclusions

Statistics indicate that rape is most commonly committed by someone who is known to the victim (Fisher et al., 2000; Breitenbecher, 2006; Koss et al., 1987) which suggests an interpersonal component to sexual assault, rather than a scenario pitting physical dominance versus physical resistance. Research also indicates that rape may include a communication element whereby there is a misattribution of reasons for a woman's resistance (i.e., not wanting to appear promiscuous versus not wanting to have sex) (Livingston et al., 2004) and a subsequent violation of the woman's wishes.

Several studies correlate low self-esteem with victimization and risky sexual practices (Testa & Dermen, 1999; Campbell & Soeken, 1999; Messman-Moore & Long, 2000; Ethier et al., 2006). Research also suggests that prior victimization may lead to future victimization, which is correlated with lower scores on measures of self-esteem (Aosved & Long, 2005; Messman-Moore & Long, 2000).

Women who engage in exercise and athletics enjoy two benefits that may translate into lower sexual victimization rates. First, they have increased self-esteem (Novick, 1998), which buffers them from high-pressure tactics often used in date rape situations. Second, female athletes perceive themselves, and are perceived by others, as more masculine than their non-athlete counterparts, which makes them less appealing to sexually aggressive men (Novick, 1998; Matteo, 1986). This more masculine perception diminishes societal pressure against assertion, which allows women the mental and physical strength to fight off a potential perpetrator.

The literature indicates that low self-esteem is a risk factor for sexual victimization, while exercising increases self-esteem and has been associated with lower reports of victimization.

Hypotheses

Currently, there are two published studies that partially address the relationship between exercise and sexual victimization (Jackson, 1994; Gidycz, et al., 2006). Though both show promise for this avenue of research, neither isolates the impact of exercise alone, nor investigates possible aspects of exercise that may influence risk for sexual victimization.

Two hypotheses were addressed by the current research. First, it was predicted that self-esteem, and three factors associated with exercise, namely frequency, intensity, and duration, would relate differently to sexual victimization scores for varsity athletes and non-varsity athletes. Secondly, for the group of non-varsity athletes, it was predicted that gender-stereotype of exercise would significantly predict victimization scores over and above the variables of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem.

Hypothesis I: Varsity athletes and non-varsity athletes will differ in how the variables of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem relate to reports of sexual victimization.

Rationale: Varsity athletes engage in longer and more demanding periods of exercise than the general collegiate population, and the status of varsity athlete carries with it different social norms, experiences, protections, demands, and risks than those of

the general population.   Due to differences in exercise habits and social experiences, varsity athletes and non-varsity athletes will differ in how the set of independent variables relate to the dependent variable.

Hypothesis II: Among non-varsity athletes, gender-stereotype of exercise will significantly predict sexual victimization score over and above the effects of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem.

Rationale: Research suggests that one's gender-role is influential in choice of exercise or sport, and that gender-roles also enter into the dynamics of sexual assault.

CHAPTER III: METHOD

Archival data are being used in the research, therefore, this section reflects the methods that were initially used to gather the data.

Subjects

Attending college is one of the riskiest times of life for women in terms of sexual assault. Over the course of a 4 – 5 year college career, a woman has a 20 – 25% chance of being sexually victimized (Day, 1994; Fischer, et al., 2000). Therefore, the greatest concentration of female victims is on a college campus, which is where the present study was conducted.

The longer a female is on campus the greater the likelihood she will be victimized (Fisher et al., 2000). An ideal sample would be limited to students nearing the end of their college career because they would have been exposed to the risk factor of being a college student for the longest period of time. The results would then reflect the cumulative risk of victimization across the entire collegiate experience. Unfortunately, this proved to be impractical due to juniors and seniors representing less than half of the female varsity athlete population.

The sample was drawn from two sub-groups of the female population in a mid-sized western university. The first group, labeled "varsity athletes," were females participating in the university's varsity athletic programs. Type of sport was categorized as female-stereotyped or non-female-stereotyped. The assignment of non-female-stereotyped sports was based on the presence or absence of physical contact between

players and on the amount of strength, stamina and force needed to successfully participate, while female-stereotyped sports were those that emphasized grace, beauty, and artfulness. These categorizations were based on results of research by Matteo (1988). Four sports were considered: two were categorized as male-stereotyped, namely basketball and lacrosse, and two were categorized as female-stereotyped, gymnastics and figure-skating.

The second group of approximately equal size was drawn from two upper level classes at the university. Only those participants who reported that they exercised on a regular basis were considered for the current study.

Measures

Four measurements were implemented in this study: Sexual Experiences Survey (Koss & Oros, 1982), Self-esteem Rating Scale (Nugent & Thomas, 1993), Athleticism Profile, and Body Mass Index.

Sexual Experiences Survey

A modified version of the Sexual Experiences Survey (Koss & Oros, 1982), presented in Appendix A, was used to assess degree of sexual victimization. It is "a self-report instrument that is designed to reflect various degrees of sexual aggression and victimization, and is capable of identifying hidden rape victims and undetected offenders" (Koss & Gidycz, 1985, p. 422). A great strength of this measure is that individuals are not asked to conceptualize what constitutes rape or assault, as those words are not used in the survey (Breitenbecher & Scarce, 1999). Asking participants to make such judgments or evaluations may lower report rates as women are often hesitant to

label their own experiences as rape or assault. This would imply their own victimization and may require labeling someone they know as a rapist, both of which may provoke feelings of embarrassment and fear of being blamed (Fisher et al, 2000). Test-retest reliability and internal consistency reliability for the Sexual Experiences Scale have been proven to be stable. Research conducted by Koss and Gidycz (1985) reported internal consistency (Cronbach alpha) of .74 for women and .89 for men. The original instrument consisted of 10 yes/no questions measuring varying degrees of sexual victimization, with higher scores indicating more experiences of sexual victimization. A modified version of this measure was used, which tempered the description of the target behaviors and eliminated one item that contained more graphic language.

Self-esteem Rating Scale

The Self-esteem Rating Scale (Nugent & Thomas, 1993), found in Appendix B, measures problematic, positive, and non-problematic areas of self-esteem. Possible scores range from –180 to 180. Higher scores reflect higher self-esteem, and negative scores reflect problematic self-esteem. The measure is comprised of 40 statements to which the participant responds using a Likert-type scale ranging from 1 (*never true of me*) to 7 (*always true of me*). The internal consistency of the Self-esteem Rating Scale has been proven to be excellent with an alpha of .97 and a standard error of 5.67. It has also been judged to have "good construct validity, with significant correlations with the Index of Self-esteem and the Generalized Contentment Scale and generally low correlations with a variety of demographic variables" (Fischer & Corcoran, 2000, p. 690). Current research does not reflect the use of the Sexual Experiences Survey and the Self-

esteem Rating Scale in the same study, so it is not known if, or how well, they correlate with each other. The current study will investigate this relationship.

Athleticism Profile

After an extensive search including the *Mental Measurement Yearbook* (Mitchell, 2001), *Tests in Print* (Murphy, Impara, & Plake, 1999), and *Measures for Clinical Practice* (Fischer & Corcoran, 2000), a measure specifically assessing level of physical exercise was not found. A measure titled the "Athleticism Profile" was constructed and can be found in Appendix C.   The Athleticism Profile asks participants to report exercise type, frequency, intensity, and duration. The measure was based on *The Scottish Health Survey 1995 - Physical Activity* (1995) and *Physical Activity and Health: A Report of the Surgeon General* (U. S. Department of Health and Human Services, 1999, p. 20). Scores for the Athleticism Profile were reported by subjects reporting the intensity (light = l, moderate = 2, vigorous = 3), the frequency (days per week), and the duration (minutes) of the exercise. Regular activity was defined as at least moderate intensity, lasting 20 minutes or more, and occurring at least three times a week (U.S. Department of Health and Human Services, 1999).

This measure was presented in combination with the Body Mass Index, which asks for height and weight and results in a two-digit score (Calorie Control Council, 2002) that was subsequently calculated by the researcher during data analysis. The Body Mass Index is a non-psychological nutritional measurement. It is the ratio of weight to the square of height, multiplied by 703 (Epic4health, 2007). The suggested ratio is between 20 and 25. Scores below 19 and above 25 are considered outside of the

recommended Body Mass Index range. The difficulty presented by this measure is that athletes are sometimes above the recommended Body Mass Index due to their high amount of lean muscle tissue. This may result in an elevated Body Mass Index that does not properly reflect body type (Lifetime Fitness, 1997). However, the Body Mass Index is the easiest instrument to use without measuring body fat, taking physical measurements, or evaluating each individual's body type.

Additionally, subjects were asked to report the type of exercise in which they engaged the most. Research conducted by Klomsten, March, and Skaalvik (2005) classified exercise based on the degree of risk, violence, speed, strength, and endurance involved in the sport or exercise, which resulted in activities being categorized as feminine, neutral, or masculine. Because this research took place in Norway, and societal norms may be different in the United States, data from the National Sporting Goods Association (2007) was used to verify these classifications. Activities were categorized as "feminine" if more than 60% of the participants were reported to be female. Similarly, activities were categorized as "masculine" if more then 60% of the participants were male. Activities for which the percentage of participants did not reach 60% were categorized as "neutral."   A complete listing of reported exercises and their categorization is presented in Appendix D.

Validity and Reliability of Measures

The reliability of self-report data is problematic, particularly when it encompasses personal and sensitive information that is often stigmatized by society. Two measures used in this study are particularly susceptible to social stigma: reporting of sexual assault

and accurate measurements of height and weight. In addressing the former, the Sexual Experiences Survey deals with this issue by refraining from the use of the words "rape," "attack," or "assault," and is specifically designed to identify individuals who may not consider their experience(s) to be an assault. For many women, disclosing height and weight measurements may be anxiety provoking due to feelings of dissatisfaction with their appearance. Despite the confidentiality of the study, soliciting this information, as well as the incidence of sexual victimization may lead to false reporting. However, it is assumed that the accuracy or inaccuracy of self-reports will be similar for athletes and for non-athletes. Therefore, errors in self-reporting of information are not expected to produce bias in the results of this research.

Procedures

Approval to gather the data used in the current study was granted by the University of Denver's Institutional Review Board. Subsequent approval to conduct the data analysis for the present study was granted by Nova Southeastern University's Institutional Review Board.

In cooperation with coaches of women's sports teams, female athletes were asked to participate in the study. Permission was obtained by completion of a consent form by each athlete and coach. The survey was distributed either between practice segments or at the completion of practice. In an effort to provide an environment conducive to candor and comfort, the team coaches were asked to leave the room until the completion of the survey. Students were given an overview of the purpose of the research and the consent form was explained, emphasizing the voluntary and confidential nature of the study.

Upon completion, participants placed their signed consent form in a manila folder and the completed survey in a separate manila folder. Each person was given a copy of the consent form with a resource sheet on the reverse side listing contact information for counseling agencies in the areas that provide services to victims of sexual abuse as well as general mental health resources.

The non-varsity athlete sample was drawn from female students in an upper-level women's study class and a music appreciation class. The same procedures were followed as described above. Although the coaches and professors were politely asked to step outside of the testing room, one of the coaches and one of the professors seemed hesitant to do so and delayed their exit. It is not clear what, if any, effect this had on the students' candor.

Except for the Sexual Experiences Survey score, all other data were analyzed in the original form. Anytime abuse occurs, it is, at the least, an adverse and distressing experience, regardless of the degree of personal violation. However, in the current study, it was important to delineate between varying degrees of victimization, as a factor being addressed is one's ability to rebuff an assailant. To address this question, the Sexual Experiences Scale scores were weighted to reflect the degree of victimization reported by each subject. Items one, two, and three, which refer only to "sensual touching" were given a weight of one. Items four, five, and six, which refer to an attempt to have sexual intercourse, were given a weight of two. Items seven, eight, and nine, which refer to intercourse having taken place, meeting the legal definition of rape, were given a weight

of three. Following this formula, the lowest possible score remained at zero, but the highest possible score was 18.

Data Analysis

In order test the hypotheses using multiple regression analysis, the following procedures were proposed. First, variables were examined to determine if distributions met the assumptions of multiple regression analysis. Observations were examined for outliers as well as potentially influential points. Regression diagnostics were used to determine what, if any assumptions of the model were tenable. Assumptions tested included independence, linearity, homoscedasticity, and normality (Kleinbaum, Kupper, Muller, & Nizam, 1998).

Hypothesis I stated that the set of variables of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem, would be significantly related to sexual victimization score, but that the relationship would be different for varsity athletes than for non-varsity athletes.

This hypothesis was to be tested through multiple regression analysis. Athletic status would be entered into the regression equation as a binary variable. Three tests were to be utilized to assess for different relationships between the two groups. First, coincidence would be tested, which examines if the regression planes for varsity athletes and non-varsity athletes were significantly different from one another. If the regression planes were not coincident, a test of parallelism would be conducted. This test would determine if the beta weights of the dependent variables were significantly different between the two groups, and therefore contributed to the prediction of sexual

victimization scores in a different manner. Finally, a test of the intercepts was to be conducted, which would determine if the constants of each equation were equal.

A follow-up analysis was proposed to asses for the proportion of variance accounted for by the model. R^2 change for the model would be evaluated with and without athletic status as a predictor. Subsequent to this, a partial F test was proposed, which would determine if any of the specific independent variables significantly contributed to the prediction of sexual victimization score over and above the other variables in the model.

Hypothesis II stated that among non-athletes, gender stereotype of exercise would significantly predict sexual victimization score over and above the effects of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem.

Again, multiple regression analysis was proposed to address this hypothesis. Gender stereotype would be examined for its association with sexual victimization score, holding constant frequency of exercise, intensity of exercise, duration of exercise, and self-esteem.

CHAPTER IV: RESULTS

Descriptive Statistics

Means, standard deviations, maximum values, and minimum values of sexual victimization scores, self-esteem scores, frequency of exercise, intensity of exercise, and duration of exercise are presented in Table 1. Scores are presented for the total sample, and then separated into varsity athletes and non-varsity athletes.

Characteristics of each variable in the data set will be discussed. The outcome variable, sexual victimization score, was examined first. Most notably, there were 51 observations of zero, which indicated that just over 65% of all participants had no experience of sexual assault. When subjects were grouped by athletic status, it was found that 78% of varsity athletes reported no victimization, and 56% of non-varsity athletes reported no victimization. Non-varsity athletes also had a higher mean sexual victimization score than varsity athletes, and a greater standard deviation. When the sample as a whole was considered, skewness on the measure of sexual victimization was 2.283, which was greater than what is usually acceptable for normality. Kurtosis was 5.100, which is also greater than what is found in a normal distribution. Though these values were somewhat smaller when calculated separately for varsity athletes and for non-varsity athletes, they still indicated that sexual victimization scores were not normally distributed in this sample.

Table 1: Descriptive statistics for the total sample and by athlete status

Total sample (*N* = 78)	Mean	SD	Minimum	Maximum
Sexual victimization	1.154	2.157	0.00	10.00
Frequency of exercise	5.013	1.616	1.00	7.00
Intensity of exercise	2.545	.599	1.00	3.00
Duration of exercise	6.609	2.280	1.00	10.00
Self-esteem	61.808	33.060	-93.00	112.00

Varsity (*n* = 46)	Mean	SD	Minimum	Maximum
Sexual victimization	.913	1.787	0.00	8.00
Frequency of exercise	5.804	.980	3.00	7.00
Intensity of exercise	2.837	.366	2.00	3.00
Duration of exercise	7.957	1.549	4.00	10.00
Self-esteem	67.303	23.530	16.00	108.00

Non-varsity (*n* = 32)	Mean	SD	Minimum	Maximum
Sexual victimization	1.500	2.590	0.00	10.00
Frequency of exercise	3.875	1.680	1.00	7.00
Intensity of exercise	2.125	.622	1.00	3.00
Duration of exercise	4.672	1.693	1.00	9.00
Self-esteem	53.906	42.447	-93.00	112.00

Regarding self-esteem scores, the lowest five observations had a range of 102 points and the overall range was 205 points. Therefore, five observations accounted for almost half of the total range. Because of this considerable difference in scores, the five lowest values were verified. It was found that these scores were indeed correctly calculated and entered. Upon further examination of self-esteem scores, the range was considerably smaller for varsity athletes, 92, than for non-varsity athletes, 205. Varsity athletes also reported a higher mean and lower standard deviation in self-esteem scores than non-varsity athletes.

The variables of frequency of exercise, intensity of exercise, and duration of exercise tended to be weighted toward greater values. Varsity athletes tended to report higher scores on frequency and duration than non-varsity athletes, but intensity was approximately the same for both groups.

A correlational analysis was performed on the variables and there were several pairs of variables that demonstrated a significant level of correlation. For the sample as a whole, intensity of exercise was correlated with both frequency of exercise, $r = .624$, $p < .001$, and duration of exercise, $r = .603$, $p < .001$. Frequency of exercise was correlated with duration of exercise, $r = .574$, $p < .001$. Regarding the varsity athletes, frequency of exercise was significantly correlated with both duration of exercise, $r = .467$, $p = .001$, and intensity of exercise, $r = .331$, $p = .025$. For the non-varsity athletes, intensity of exercise was significantly correlated with frequency of exercise, $r = .401$, $p = .023$, and duration of exercise, $r = .431$, $p = .014$.

Regression Diagnostics

Prior to hypothesis testing, variables were examined to determine if distributions met the assumptions of multiple regression analysis. Several indices were employed to address these assumptions, they included studentized deleted residuals, leverages, and various graphical techniques.

The assumption of independence of observations was met, in that one individual's score did not influence another's score. Each subject reported their responses independently of all others.

To test for normality, the Kolmogorov-Smirnov test was used as the sample was greater than 50. Results suggested that the data were not normally distributed ($p < .001$). The studentized deleted residuals, which identify potential outliers, were examined. Skewness and kurtosis of the studentized deleted residuals were then evaluated. The skewness index was 1.803, which fell outside the conventionally accepted limits. This is likely due to the high number of subjects who reported no sexual victimization. The kurtosis value of 3.642 was also outside of normal limits.

Extreme values of studentized deleted residuals revealed that the five highest values all exceeded the customary cut-off of 2. This indicated that these observations were potential outliers. The studentized deleted residual stem-and-leaf plot had cause for concern as there were five values which fell more than two standard deviations from the mean, indicating that the data contained numerous points in the extreme range of possible values. This was consistent with the computed value of kurtosis, which indicated heavy tails in the distribution of residual values. A histogram of the studentized deleted

residuals indicated a disproportionate number of observations in the tails as well. Several transformations of the dependent variable were attempted, but none were successful in significantly decreasing the skewness of the distribution to an acceptable level.

To test for homogeneity of variance, a scatterplot was constructed which plotted the regression standardized predicted values against the jackknife residual values. When the assumption of homogeneity is tenable, no clear pattern of points is evident, and observations appear to be randomly distributed above and below the 0 line. However, in the scatterplot generated from the data, a random distribution was not observed. There appeared to be a funneling effect, with observations becoming increasingly disbursed as the predicted values increased. Due to this, the assumption of homogeneity of variance was not met.

The Variance Inflation Factor was used to assess for collinearity between variables. The VIF for each variable was less than 2.5 which was below the recommended threshold of five. Therefore, no collineartiy was detected.

To evaluate for potential points of influence, Cook's distance was used. A critical value of 1 was adopted and no subjects were identified as potential influential points. The only notable observation was subject number 42, with a Cook's distance of .959. In an additional screening, the F value of the leverage was calculated along with its associated p value. A Bonferroni adjustment was made to the adopted $\alpha = .05$. Subject number 42 was identified as an outlier.

Due to the violations of the assumptions of multiple regression including non-normality of the distribution of the dependent variable, values of skewness and kurtosis

outside of the acceptable ranges, the shape of the distributions, the failure of transformations to adequately address the large number of observations of zero on the dependent measure, and heterogeneity of variance, it was determined that multiple regression analysis was not an appropriate method for performing statistical analyses on these data. For two reasons, logistic regression was used instead. First, other than independence of observations, logistic regression does not require the tenability of assumptions of the model that are required by multiple regression. Secondly, logistic regression would still adequately address the objective of testing for a significant relationship between the dependent variable of sexual victimization, and the set of independent variables of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem in athletes as a whole, and for both varsity athletes and non-varsity athletes.

In order to use logistic regression, the dependent variable was coded as victim or non-victim. Subjects who did not endorse any items on the Sexual Experiences Survey were assigned to the non-victimized group. Subjects who reported a score of one or greater on the Sexual Experiences Survey were assigned to the victimized group. Separate analyses were conducted for varsity athletes and non-varsity athletes.

Hypothesis Testing

Hypothesis I

Hypothesis I stated that frequency of exercise, intensity of exercise, duration of exercise, and self-esteem, would be significantly related to reports of sexual victimization, and that the relationship would be different for varsity athletes than for

non-varsity athletes. To test this hypothesis, logistic regression was used and the alpha level was set at .05.

Results of logistic regression indicated that, for the overall sample, the hypothesized relationship between sexual victimization and the set of predictor variables was not significant, χ^2 (4, N = 78) = 3.847, p = .427. When varsity athletic status was entered into the equation, results did not reach statistical significance either, χ^2 (5, N = 78) = 6.119, p = .295. Because it was identified as an outlier, the analysis was conducted without subject 42, but results did not change, χ^2 (5, N = 78) = 5.198, p = .392. Varsity athletes and non-varsity athletes were then analyzed separately. The results were non-significant for both groups: varsity athletes, χ^2 (4, n = 46) = 5.419 p = .247; non-varsity athletes, χ^2 (4, n = 32) = 1.986 p = .738. Consequently, Hypothesis I was not supported.

Hypothesis II

The second hypothesis stated that for the sample of non-varsity athletes, stereotype of exercise would be significantly associated with sexual victimization score over and above the effects of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem. As was done for Hypothesis I, sexual victimization scores were coded as a binary variable. Gender stereotype of exercise was entered into the analysis as a categorical variable: male-stereotyped, gender-neutral, female-stereotyped. With this added variable, the results remained non-significant, χ^2 (6, n = 32) = 6.243, p = .397. Results did not change when subject 42 was removed from the data set, χ^2 (6, n = 31) = 6.615, p = .358. Hypothesis II was not supported.

Post-Hoc Analysis

Though the research hypotheses were not supported, there were several results that were of interest. Results of these analyses will first be discussed for the sample as a whole, by comparing varsity athletes and non-varsity athletes, and then for non-varsity athletes alone.

Total Sample

In the analysis of the total sample, the percent of varsity athletes who reported victimization was not statistically significantly different from the percent of non-varsity athletes who reported victimization, χ^2 (1, N = 78) = 2.000, p = .157. The odds ratio indicated that non-varsity athletes were approximately 1.97 times more likely to be victimized than varsity athletes. However, when a regression equation was constructed, and the effects of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem were held constant, the adjusted odds ratio indicated that non-varsity athletes were three times more likely to be in the victimized group than varsity athletes. See Table 2 for complete results of the logistic regression analysis.

Comparisons between varsity athletes' and non-varsity athletes' scores of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem were conducted. Varsity athletes reported significantly greater frequency of exercise, intensity of exercise, and duration of exercise ($p < .05$). Though varsity athletes reported a higher mean self-esteem score, this did not reach statistical significance. See Table 3 for results of t tests.

Table 2: Logistic regression results for the total sample

Variable	B	S.E.	Wald	df	p	Odds Ratio	95% C.I. for Odds Ratio Lower	Upper
Intensity	.373	.586	.404	1	.525	1.451	.460	4.580
Frequency	-.258	.214	1.449	1	.229	.773	.508	1.176
Duration	.235	.175	1.812	1	.178	1.265	.898	1.783
Self-esteem	-.004	.008	.299	1	.584	.996	.981	1.011
Varsity	1.190	.812	2.146	1	.143	3.287	.669	16.154
Constant	-2.120	1.927	1.210	1	.271	.120		

Table 3: *T* tests comparing varsity athletes and non-varsity athletes

Variable	t	p	Mean Difference	Standard Error	d
Frequency	6.390	<.001	1.929	.302	.873
Intensity	6.350	<.001	.712	.112	.867
Duration	8.869	<.001	3.285	.370	1.211
Self-esteem	1.785	.078	13.398	7.504	.244

When subjects were separated by victimization group membership, frequency of exercise, intensity of exercise, duration of exercise, and self-esteem were not significantly different for those who reported sexual victimization from those who reported no sexual victimization ($p > .10$). See Table 4 for complete descriptive statistics by victimization group. Results of *t* tests comparing these two groups are presented in Table 5.

Table 4: Descriptive statistics of variables by victim status

Variable	Victim Group*	Mean	SD	Minimum	Maximum
Self-esteem	victim	55.85	40.793	-93	112
	non- victim	64.96	28.081	-24	108
Intensity	victim	2.5185	.52772	1.50	3.00
	non- victim	2.5588	.63755	1.00	3.00
Frequency	victim	4.6667	1.68705	1.00	7.00
	non- victim	5.1961	1.56230	1.00	7.00
Duration	victim	6.6111	2.45080	1.00	10.00
	non- victim	6.6078	2.20978	2.00	10.00

* victim $n = 27$; non-victim $n = 51$

Table 5: *T* tests comparing non-victims and victims

Variable	t	p	Mean Difference	Standard Error	d
Frequency	1.385	.170	.529	.382	.277
Intensity	.281	.779	.040	.143	.059
Duration	.006	.995	.003	.546	.050
Self-esteem	1.160	.250	9.109	7.851	.209

In order to further explore the relationship between sexual victimization with frequency of exercise, intensity of exercise, duration of exercise, and self-esteem, a regression analysis was conducted on only those subjects who reported victimization,

with sexual victimization as a continuous dependent variable. Varsity athletic status was also entered into the equation. The unadjusted R for the model was .593, and the adjusted R^2 for this model was .198, which fell short of statistical significance, $F (5, 21) = 2.284$, $MSE = 4.997$, $p = .083$. See Table 6 for details of the regression equation coefficients. Two zero-order correlations with the dependent variable were worthy of note: self-esteem, $r = -.460$, $p = .008$, and frequency of exercise, $r = -.265$, $p = .091$. Unfortunately, when subject 42 was removed from the analysis, the unadjusted R was .419, the adjusted R^2 dropped to .030, $F (5, 20) = .853$, $MSE = 4.774$, $p = .529$, and the zero-order correlations dropped to $r = -.122$, $p = .276$ for self-esteem, and to $r = -.120$, $p = .280$, for frequency of exercise.

Table 6: Regression analysis for victims

| | Unstandardized Coefficients* | | | |
	B	Standard Error	t	p
Constant	6.905	2.904	2.378	.027
Frequency	-.818	.430	-1.902	.071
Intensity	1.336	1.502	.889	.384
Duration	-.415	.331	-1.252	.224
Self-esteem	-.030	.011	-2.653	.015
Varsity	2.707	1.783	1.518	.144

*Dependent Variable: sexual victimization score

Non-varsity Athletes

Further analyses were conducted on the set of non-varsity athletes, separated by gender-stereotype of exercise. Descriptive statistics are presented in Table 7. For the non-varsity athletes, 44% of subjects who participated in female-stereotyped exercises reported victimization, 66% of subjects who participated in gender-neutral exercises reported victimization, and 18% of the sample who participated in male-stereotyped exercises reported victimization. This fell short of statistical significance, χ^2 (2) = 5.485, p = .064.

When controlling for frequency of exercise, intensity of exercise, duration of exercise, and self-esteem, subjects who participated in female-stereotyped exercises, were three times more likely to report victimization than those who reported engaging in gender-neutral athletic activities. When compared with those who reported male-stereotyped athletics, non-varsity athletes who reported that they participated in female-stereotyped activities were eight times more likely to report victimization. Again, these results did not meet conventional levels of statistical significance, see Table 8.

When investigating the independent variables by gender-stereotype of exercise, it was found that group means of self-esteem were significantly different across gender-stereotype of exercise, F (2, 29) = 3.76, MSE = 1529.47, p = .035, d = .64. Specifically, the mean self-esteem score of women who participated in female-stereotyped exercises was statistically significantly lower than women who participated in male-stereotyped exercises. Self-esteem scores of women who participated in gender-neutral exercises were not significantly different from male-stereotyped, nor from female-stereotyped self-

esteem scores. Frequency of exercise, intensity of exercise, and duration of exercise did not differ across gender-stereotype of non-varsity athletes ($p < .05$).

Table 7: Descriptive statistics for non-varsity athletes by exercise stereotype

Female-stereotyped ($n = 9$)	Mean	SD	Minimum	Maximum
Self-esteem	25.110	55.809	-93.000	93.000
Frequency of exercise	3.556	2.068	1.00	7.00
Intensity of exercise	2.278	.754	1.00	3.00
Duration of exercise	4.833	1.969	2.00	9.00

Gender-neutral ($n = 12$)	Mean	SD	Minimum	Maximum
Self-esteem	58.500	37.766	-8.000	112.000
Frequency of exercise	3.500	1.507	1.00	6.00
Intensity of exercise	2.208	.582	1.00	3.00
Duration of exercise	4.750	2.094	1.00	9.00

Male-stereotyped ($n = 11$)	Mean	SD	Minimum	Maximum
Self-esteem	72.450	19.362	31.000	100.000
Frequency of exercise	4.455	1.440	2.00	7.00
Intensity of exercise	1.909	.582	1.00	3.00
Duration of exercise	4.455	.934	3.00	6.00

Table 8: Predictor variables for non-varsity athletes

	B	S.E.	Wald	df	*p*	Odds Ratio	95% C.I. for Odds Ratio Lower	Upper
Intensity	-.181	.835	.047	1	.828	.834	.163	4.281
Frequency	-.135	.287	.220	1	.639	.874	.498	1.534
Duration	.074	.266	.078	1	.780	1.077	.639	1.815
Self-esteem	-.002	.010	.030	1	.862	.998	.978	1.018
Stereotype (total)			3.822	2	.148			
Stereotype (neutral)	1.118	1.266	.780	1	.377	3.058	.256	36.549
Stereotype (male)	2.094	1.108	3.568	1	.059	8.115	.924	71.260
Constant	-.769	1.887	.166	1	.684	.464		

CHAPTER V: DISCUSSION

Though previous analysis of these data found differences in self-esteem and victimization between varsity athletes, non-varsity athletes, and non-athletes, the current analysis was not able to account for group differences of sexual victimization based on exercise habits or self-esteem scores. The research hypotheses, therefore, were not supported by the current analyses.

Multiple regression was initially planned for data analysis, but was changed to logistic regression due to violations of the assumptions of the model. Specifically, 51 of the 78 subjects (or 65%) reported no sexual victimization. This rate of sexual victimization is consistent with previous research, and falls between two of the most recent studies in which the Sexual Experiences Scale was used. Breitenbecher (2006) reported that 46% of 416 undergraduate women reported no sexual victimization. Gross, Winslett, Roberts, and Gohm (2006) reported 27% of their sample reported unwanted sexual victimization, with 73% reporting no sexual victimization.

Analysis of Results and Relevant Research

Hypothesis I stated that frequency of exercise, intensity of exercise, duration of exercise, and self-esteem would be significantly associated with sexual victimization. This hypothesis was not supported, either for the sample as a whole, or when the sample was separated between varsity athletes and non-varsity athletes. Because there are no published studies that have considered these factors in combination with each other, the results of Hypothesis I will be discussed by first considering how self-esteem relates to

victimization, then how self-esteem relates to exercise, and finally how exercise relates to victimization.

Previous studies have found a relationship between self-esteem and victimization. Testa and Dermen (1999) found that self-esteem was significantly lower in women who had experienced sexual coercion. Sharpe and Taylor (1999) reported similar findings; collegiate women who had experienced violence in a sexual relationship had lower self-esteem than female college students who had not. The same relationship was found by Ackard and Neumark-Sztainer (2002) in high school females. Despite the results of these past studies, the current data set did not reflect that self-esteem was associated with victimization.

It may be that the relationship between self-esteem and victimization is due to another factor, and that self-esteem differences may be an artifact of it, so that group differences are evidenced by self-esteem, but do not account for it. Instead of self-esteem, assertiveness may be a better measure as a buffer against victimization. Self-esteem is usually conceptualized as an internal state that is measured by self-report. Items on the Self-esteem Rating Scale, such as "I feel good about myself" exemplify that the construct being assessed is, at least partially, self-perception. Assertiveness, however, is a behavioral attribute and a skill that can be acquired, and it may be independent of self-esteem. A woman who has positive self-esteem may lack the verbal skills to be assertive, and may find herself in a situation where she is not able to communicate her wishes or advocate for herself. Therefore, the overt factor of assertiveness may better account for risk of sexual victimization. Similarly, self-efficacy may also account for

variability in sexual victimization scores better than self-esteem. There has been some investigation into the role of self-efficacy as it pertains to sexual victimization. Diehl and Prout (2002) found that a child's self-efficacy mediated the ability to use problem-solving coping skills for dealing with the symptoms of posttraumatic stress disorder. An increase in self-efficacy has also been related to better psychological adjustment following sexual victimization (Marx, Calhoun, Wilson, & Meyerson, 2001).

Another possible explanation for the lack of relationship between self-esteem and victimization is that subjects who reported no victimization during college may have been victimized prior to entering college, and this prior victimization may have been reflected by a change in their self-esteem. Those subjects who may have been previously victimized may be more aware of signs of potential danger, and avoid situations wherein they may be victimized, resulting in a report of no victimization during college, but low self-esteem. This prior victimization may also result in social isolation, and act as a protective factor against being re-victimized. Thirdly, though it has been hypothesized that low self-esteem is a risk factor for sexual victimization (Testa & Dermen, 1999), this had not been studied longitudinally. This relationship could be clarified by following a group of subjects over a time period of several years. Such a study would potentially delineate between women who had low self-esteem and were victimized, from women with normal or high self-esteem, were subsequently victimized, and then experienced a drop in self-esteem.

Another possibility that would account for the failure of self-esteem to correlate with victimization, is that all subjects in the current analysis exercised on a regular basis,

and the scientific literature supports a relationship between exercise and self-esteem. The failure of exercise variables to significantly correlate with self-esteem in the present study may be a measurement problem. In their research on self-esteem and exercise, Streland, Mehaffey, and Tiggemann (2003) divided women into two groups for their analysis, those who exercised and those who did not, and then focused on group differences. A similar strategy was used by Maltby and Day (2001), who separated participants into two groups, those who exercised for less than six months and those who had been exercising more than six months. In both studies, degree of exercise was not taken into consideration. It could be that the current study's results did not find correlations between frequency, intensity, and duration of exercise with self-esteem scores because frequency, intensity, and duration of exercise do not matter, only the fact that one exercises, is of importance.

Possibly the most important element in the failure of the hypotheses to be supported, is that all subjects in this study engaged in some level of exercise. Exercising, regardless of frequency, intensity, and duration, may make a positive impact on self-esteem, and may contribute to a significant relationship with victimization. For those who were victimized, it could be that exercising was used as a coping mechanism for dealing with sexual victimization. Anecdotally, this has been observed to be a successful method for coping with trauma (Hayes, 1994; Nelson, 1997).

A large proportion of the population reported no victimization, which created a difficulty for the use of the Sexual Experiences Survey in multiple regression analysis. This has not been a point of discussion in published studies using the Sexual Experiences

Survey. In order to address this, it may be helpful to include measures of verbal abuse, emotional abuse, and aggression that one has experienced, instead of solely relying on sexual victimization. By including questions that address other areas of victimization or threats, the range of possible experiences would be expanded, allowing for increased variability in scores. This could potentially address the issue of the restricted range of the dependent variable as well. Additionally, this would account for individuals who are adept at perceiving a potential threat, and who may break off a relationship or avoid contact with someone with whom they do not feel comfortable, thereby preventing further distress and risk of victimization. This ability to act on a perceived threat may be tied to one's self-esteem.

Self-esteem has been tied to exercise through the use of several models, most notably, the EXSEM (Sonstroem, Harlow, & Josephs, 1994). In the current study, the mean difference in self-esteem scores between varsity athletes and non-varsity athletes did not meet conventional levels of statistical significance. Though studies have investigated self-esteem and participation in competitive sports in elementary school (Coatsworth, & Conroy, 2006) and middle school students (Pedersen & Seidman, 2004), and found that participation in competitive sports is associated with higher self-esteem, very little research has been published comparing self-esteem of varsity athletes and non-varsity athletes at the collegiate level. The failure to find a significant difference between the self-esteem scores of varsity and non-varsity athletes may be possibly due to the fact that all subjects in the study exercised. The relative skill level of the individual may not significantly impact one's self-esteem; the salient factor may simply be whether one

exercises or not. Arguably, people who exercise on a regular basis have likely found a routine that they have mastered to some degree, and as this routine is repeated, mastery of it increases, which positively impacts self-esteem (Fox, 2000). While the social accolades of competitive success as a varsity athlete may increase self-esteem, this may be transient in nature and counter-acted by negative attention of disappointed fans after a defeat, criticism by coaches, constant striving to improve one's skills, and continual comparison to other teammates and rival teams.

Post-hoc analysis of the data showed that non-varsity athletes were three times more likely to be in the victimized group than varsity athletes. Though this result does not reach conventional levels of statistical significance, it can be argued that this is a clinically relevant finding, and supports Hypothesis I. As suggested in a study by Savage and Holcomb (1999), this difference in reporting rates of sexual victimization may be due in part to the finding that varsity athletes generally have a later onset of sexual activity, and report lower frequency of sexual risk-taking. Also, the demands of being a collegiate varsity athlete may reduce the amount of time available for socializing, thereby decreasing exposure to the risk factor of sexual victimization. These results may also be due in part to sexual orientation. It has been suggested anecdotally (Enke, 2003) that there is a higher percentage of varsity athletes who are lesbians than that which is present in the general public. If true, this may be a protective factor against sexual victimization. Lesbian women would not be exposed to the risk factor of date rape perpetrated by a man, and would be less likely to be in a situation where she would need to rebuff an unwanted advance by a man. Being involved in a same-sex relationship, however, does

not preclude one from victimization of any kind, and while violence in same-sex relationships is an important avenue for study, this variable falls outside the scope of the current research.

Finally, it may be that the current study lacked the power necessary to detect differences that would be evident with a larger sample size. It is usually recommended that regression analyses be conducted with a minimum sample size of 100, a cut-off of which the current study fell short.

The second hypothesis, that gender stereotype of exercise would be associated with sexual victimization over and above the effects of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem, was not supported. While gender-stereotype of exercise did not significantly contribute to prediction of sexual victimization group membership, it is interesting to note that stereotype of exercise extracted the highest odds ratios for categorization in the victimized group. The reason for this variable not reaching statistical significance may be largely due to sample size, as only 32 subjects were used for an equation with five variables. Despite not reaching statistical significance, this finding may be clinically important. In support of this, research has investigated the assertion that men who are sexual perpetrators are more likely to victimize women who appear to espouse female-stereotypes (Anderson, Simpson-Taylor, & Herrmann, 2004; Benedict, 1997; Boeringer, 1999; O'Toole & Schiffman, 1997; Nelson, 1997). Therefore, gender-stereotype may be an important variable in identifying those who are at risk for sexual victimization.

When non-varsity athletes, separated by gender-stereotype of exercise, were compared on the independent variables, results were statistically significant. Subjects reporting male-stereotyped exercises had higher self-esteem than those who engaged in female-stereotyped exercises. As found in previous studies, stereotype of exercise has been tied to self-esteem (Butcher, 1989, Lau, 1989, Trujillo, 1983), and the current study supports those results.

In summary, for non-varsity athletes, gender-stereotype of exercise was key in two analyses. It extracted the highest odds ratio in the logistic regression equation with sexual victimization, and mean self-esteem scores were significantly different when subjects were analyzed by gender-stereotype of exercise.

Limitations and Suggestions for Future Research

There are limitations in the current analysis. One of the primary limitations of the current study was a small sample size. Regression analysis is usually performed on samples of no less than 100 due to concerns regarding statistical power. Due to this study's lack of power, results may not have reached statistical significance when there was an actual difference in the population.

Generalizability of results is limited, as only undergraduate females who reported exercising on a regular basis were included in the analysis. If women of the same age who do not attend college were sampled, they may have different results, as attending college may carry with it risks specific to that setting.

An additional limitation is that there may be variables related to sexual victimization that were not addressed in the current study. Childhood abuse may

correlate with being a victim of sexual assault later in life (Aosved & Long, 2005, Hanson & Gidycz, 1993, Messman-Moore & Long, 2000), possibly during college. Sexual abuse as a child has been shown to increase the likelihood of rape in adulthood by as much as 11 times (Fergusson, Horwood, & Lynskey, 1997) As suggested by Aosved and Long (2005), perpetrators may recognize symptoms of a history of childhood abuse in adults, and seek out these individuals as targets. Messman-Moore and Long (2000) also reported that women who were victimized as children were more likely to report various forms of victimization as adults. Therefore, using this as a control variable may be useful and could contribute to the current state of research in this area.

Frequency of victimization needs to be further investigated as the measure of sexual victimization did not ask for how many times certain events occurred. Subjects who were victimized multiple times were not able to report that information on the current measure. Additionally, exposure to or experience of domestic violence, non-sexual dating violence, or being a victim of another type of crime may also be mitigating factors. Being a victim of any crime can mitigate one's sense of security and safety and consequently affect self-esteem. As previously discussed, it is worthwhile to explore other measures of self-concept, such as assertiveness and self-efficacy, that exercise may impact, and investigate these areas for possible relationship to risk of sexual victimization.

The Sexual Experiences Survey was modified from its original version due to concerns that the Institutional Review Board may not approve of some of the language it contained. Specifically, one item was omitted which asked about sexual penetration with

an object. On items which referenced misuse of authority, specific examples of people in authority were omitted. The parenthetical phrase "get on top of you, attempt to insert his penis" was deleted following inquiries regarding attempted intercourse. Deletion of these phrases may have lowered reports of sexual victimization, as items may have been ambiguous without these clarification phrases included. This may have reduced the reliability and validity of this measure. Future research should keep this measure in its original and complete form.

A measure which may be useful in accounting for choice of type of exercise, and could account for variance in self-esteem and sexual victimization, is the Bem Sex Role Inventory. The Bem Sex Role Inventory differentiates between female and male sex roles, as well as androgynous and non-sex typed individuals (Butcher, 1989) and has been correlated with self-esteem (Novick, 1998). As suggested by Matteo (1988), sex type may provide some insight into choice of physical exercise as a young adult. Findings in this study raise the possibility that choice of exercise or sport may be potentially related to risk of victimization.

One problem that is likely to remain, is the problem of restricted range of the dependent variable of sexual victimization, and the number of study participants who have not been sexually victimized. Studies in this domain consistently show that sexual victimization does not occur to the majority of the population of women on a college campus. While this is obviously a positive finding, it is problematic in that the majority of any sample will report victimization scores of zero. Because of this, the use of multiple regression analysis will likely continue to be difficult, due to assumptions of a

normally distributed dependent variable. This can be addressed by using binary logistic regression, where subjects are categorized as either victims or non-victims, or, only those subjects who have been victimized can be considered for analysis.

In conclusion, though the research hypotheses were not statistically supported, the additional analysis of the data set addressed the question of the ability of frequency of exercise, intensity of exercise, duration of exercise, and self-esteem to account for group differences in victimization. In previous analysis of the data, group differences existed, but the current analysis did not support the assertion that differences could account for a significant proportion of the variance in sexual victimization. Though statistically not significant, clinically relevant findings of the positive impact of participation in a varsity sport, and gender stereotype of exercise, are avenues of investigation that merit further exploration.

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APPENDIX A

Sexual Experiences Survey

Since you turned 18 years of age, have you engaged in or experienced the following (circles your response):

1. Given in to sensual touching, kissing, or petting, (but not intercourse) when you didn't want to because you were overwhelmed by someone's continual arguments and pressure?   Yes   No

2. Had sensual touching, kissing, or petting, (but not intercourse) when you didn't want to because someone used their position of authority to make you?   Yes   No

3. Had sensual touching, kissing, or petting, (but not intercourse) when you didn't want to because someone threatened or used some degree of physical force (twisting your arm, holding you down, etc.) to make you?   Yes   No

4. Had someone attempt sexual intercourse when you didn't want to by threatening or using some degree of force (twisting your arm, holding you down, etc.) but intercourse did not occur?   Yes   No

5. Had someone attempt sexual intercourse when you didn't want to by giving you alcohol or drugs, but intercourse did not occur?   Yes   No

6. Given into sexual intercourse when you didn't want to because you were overwhelmed by someone's continual arguments and pressure?   Yes   No

7. Had sexual intercourse when you didn't want to because someone used his position of authority to make you?   Yes   No

8. Had sexual intercourse when you didn't want to because someone gave you alcohol or drugs?   Yes   No

9. Had sexual intercourse when you didn't want to because someone threatened or used some degree of physical force (twisting your arm, holding you down, etc.) to make you?   Yes   No

APPENDIX B

Self-esteem Rating Scale

This questionnaire is designed to measure how you feel about yourself. It is not a test, so there are no right or wrong answers. Please answer each item as carefully and accurately as you can by placing a number by each one as follows:

1 = Never
2 = Rarely
3 = A little of the time
4 = Some of the time
5 = A good part of the time
6 = Most of the time
7 = Always

_____ 1. I feel that people would *NOT* like me if they really knew me well.
_____ 2. I feel that others do things much better than I do.
_____ 3. I feel that I am an attractive person.
_____ 4. I feel confident in my ability to deal with other people.
_____ 5. I feel that I am likely to fail at things I do.
_____ 6. I feel that people really like to talk with me.
_____ 7. I feel that I am a very competent person.
_____ 8. When I am with other people, I feel that they are glad I am with them.
_____ 9. I feel that I make a good impression on others.
_____ 10. I feel confident that I can begin new relationships if I wanted to.
_____ 11. I feel that I am ugly.
_____ 12. I feel that I am a boring person.
_____ 13. I feel very nervous when I am with strangers.
_____ 14. I feel confident in my ability to learn new things.
_____ 15. I feel good about myself.
_____ 16. I feel ashamed about myself.
_____ 17. I feel inferior to other people.
_____ 18. I feel that my friends find me interesting.
_____ 19. I feel that I have a good sense of humor.
_____ 20. I get angry at myself over the way I am.
_____ 21. I feel relaxed meeting new people.
_____ 22. I feel that other people are smarter than I am.
_____ 23. I do *NOT* like myself.
_____ 24. I feel confident in my ability to cope with difficult situations
_____ 25. I feel that I am *NOT* very likable.
_____ 26. My friends value me a lot.
_____ 27. I am afraid I will appear stupid to others.
_____ 28. I feel that I am an OK person.

_____ 29. I feel that I can count on myself to manage things well.

_____ 30. I wish I could just disappear when I am around other people.

_____ 31. I feel embarrassed to let others hear my ideas.

_____ 32. I feel that I am a nice person.

_____ 33. I feel that if I could be more like other people then I would feel *better* about myself.

_____ 34. I feel that I get pushed around more than others.

_____ 35. I feel that people like me.

_____ 36. I feel that people have a good time when they are with me.

_____ 37. I feel confident that I can do well in whatever I do.

_____ 38. I trust the competence of others more than I trust my own abilities.

_____ 39. I feel that I mess things up.

_____ 40. I wish that I were someone else.

APPENDIX C

Athleticism Profile

Year in school (circle one):   Senior   Junior   Sophomore   First-year
_____ Height (feet, inches)
_____ Weight (pounds)

Do you participate in a NCAA University of Denver sport? _____Yes   _____No
If yes, which sport(s)? _____

Do you engage in physical exercise on a regular basis?   _____Yes   _____No

If you answered **yes**, please continue to the next question.
If you answered **no**, please skip to the next section.

Do you participate in any non-NCAA athletic leagues or clubs?___Yes   _____No
If so, which sport(s)? _____

For the following questions, include time spent practicing for and competing in organized sports.

On average, how many **days** during the week do you exercise?
1   2   3   4   5   6   7

On average, for **how long** do you exercise?
_____Less than 20 minutes
_____20-30 minutes
_____30-40 minutes
_____40-50 minutes
_____50-60 minutes
_____60-90 minutes
_____90 minutes – 2 hours
_____More than 2 hours (please specify number of hours) _____

How **strenuous** is your exercise?
_____ Light (moderate exercise with no effect on breathing or any light exercise)
_____ Moderate (vigorous exercise with no effect on breathing or moderate exercise
     resulting in faster breathing)
_____ Vigorous (vigorous exercise resulting in faster breathing or gasping for breath)

What **type** of exercise do you usually do? (list the one you engage in the most.)
_____

APPENDIX D

Gender Classifications Sports and Exercises

Categorization by Klomsten, Marsh, and Skaalvik (2005)	National participation by gender (National Sporting Goods Association, 2005)		Recategorization
Masculine	Percent of males	Percent of females	
Soccer	62.6%	37.4%	-
Ice hockey	86.7%	13.3%	-
Boxing	-	-	-
Motor cross	-	-	-
Martial Arts	69.2%	30.8%	-
Handball	-	-	-
Feminine	Percent of males	Percent of females	
Dance	-	-	-
Gymnastics	-	-	-
Horse riding	-	-	-
Figure skating	36.0%	64.0%	-
Aerobics	25.0%	75.0%	-
Neutral	Percent of males	Percent of females	
Tennis	53.8%	46.2%	-
Swimming	46.8%	53.2%	-
Skiing	57.4%	42.6%	-
Athletics	44.6%	55.4%	-
Bike riding	56.1%	43.9%	-
Basketball	69.0%	31.0%	Masculine
Archery	78.6%	21.4%	Masculine
Golf	76.7%	23.3%	Masculine

Not Categorized by Klomsten, Marsh, and Skaalvik (2005)	National participation by gender (National Sporting Goods Association, 2005)		Categorization
	Percent of males	Percent of females	
Kick Boxing	19.2	80.8	Feminine
Running/jogging	53.9	46.1	Neutral
Snowboarding	65.7	34.3	Masculine
Softball	53.6	46.4	Neutral
Walking	36.8	63.2	Feminine
Weightlifting	65.2	34.8	Masculine
Yoga	16.7	83.3	Feminine