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LOMA LINDA UNIVERSITY
School of Behavioral Health
in conjunction with the
Faculty of Graduate Studies

Adolescent Participation in Traditional Martial Arts:
Effects of Training on Risk Behaviors and Psychological Wellbeing

by

Stephanie Anne Devore Goldsmith

A Dissertation submitted in partial satisfaction of
the requirements for the degree of
Doctor of Philosophy in Clinical Psychology

September 2013

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Each person whose signature appears below certifies that this dissertation in his/her opinion is adequate, in scope and quality, as a dissertation for the degree Doctor of Philosophy.

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ABSTRACT OF THE DISSERTATION

Adolescent Participation in Traditional Martial Arts: Effects of Training on Risk Behaviors and Psychological Wellbeing

by

Stephanie Anne Devore Goldsmith

Doctor of Philosophy, Graduate Program in Psychology
Loma Linda University, September 2013
Dr. Adam Arechiga, Chairperson

Adolescence is the period of lifetime development in which many youth begin to make health and lifestyle choices that have a significant impact on overall wellbeing as they transition from childhood into young adulthood. Physical activity appears to be linked to making other healthy lifestyle choices including non-engagement in risk behaviors and improvement in mood and self-concept. The current study sought to examine the effect participation in traditional martial arts training has on overall psychological wellbeing in adolescents. This study administered two widely used and validated scales, the CDC's Youth Risk Behavior Surveillance System (YRBSS) and the Piers Harris-2 (PH-2) self-concept scale, to 55 students training in traditional styles of martial arts. It was hypothesized that students who had trained longer would engage in less risk behaviors and have higher overall wellbeing. It was also hypothesized that males would engage in more risk behaviors than female students. Lastly, it was hypothesized that the different styles of martial arts examined in the study will not have an effect on risk behaviors or wellbeing. Length of training did not significantly predict engagement in risk behavior nor did it predict perception of wellbeing. Age did account for some of the variance with younger students being less likely to engage in some risk behaviors and

reporting an increased sense of wellbeing on some of the PH-2 scales than older students. As predicted, male students proved to be significantly more likely to engage in some domains of risk than their female counterparts. The style of martial arts discipline did not have an effect on risk behavior but students who trained in one style did report better wellbeing on two domains of self-concept than the other style. A surprise finding of this study occurred when comparing the study's YRBSS results to the national data provided by the CDC. This study's sample engaged in significantly less risk behaviors overall than did a general sample of adolescents the same age. This indicates that adolescents who participate in traditional martial arts may be less likely to engage in risk behaviors than adolescents in the general population.

CHAPTER ONE

INTRODUCTION

Physical activity provides for a wide range of beneficial outcomes including increased physical health, mood, psychological wellbeing, and less participation in risk behaviors. Adolescence is a developmental period in which many youth begin experimenting with risk behaviors such as drinking alcohol, smoking, using drugs, and having sex (Willoughby et al., 2007). This is also a time when adolescents learn and develop the health behaviors they may carry into adulthood. Participation in a structured physical activity, such as martial arts, may provide immediate psychological and physical health benefits as well as provide a base of healthy living for the rest of their lives.

The literature examining the effects of martial arts participation is limited. The literature examining the effects of engaging in physical activity in general, however, is extensive. Physical activity is associated with high self-esteem (Kirkcaldy, Shephard, & Siefen, 2002; Findlay & Bowker, 2009), lower depression and anxiety symptomology (Parfitt, Pavey, & Rowlands, 2009; Prasad, St-Hilaire, M., T., & Loftin, 2009), improved mood (Vocks, Hechler, Rohing, & Legenbauer, 2009), and less engagement in risk behaviors (Kirkcaldy, Shephard, & Siefen, 2002). Participation in the martial arts is associated with better mood and self-esteem (Wargo, Spirrison, & Thorne, 2007) as well as improved relaxation, concentration, and assertiveness (Weiser, Kutz, Jacobson-Kutz, & Weiser, 1995). It is also associated with positive physiological factors including better balance, flexibility, and circulation (Kim, 1993). There are mixed findings regarding the effects martial arts has on aggression in adolescents, with the majority of research suggesting that martial arts training decreases aggression. Some studies, however, have

found that it actually increases aggression (Nosancuk & MacNeil, 1989). To the author's knowledge, there is no current research concerning the effect martial arts training has on risk behaviors in adolescents.

Risk Behaviors of Concern in Adolescence

Adolescence is a time when most youth are confronted with the need to make decisions regarding risk behaviors. This may include drug, alcohol, and tobacco use as well as engaging in sexual behavior. Most youth will consent to engage in some, if not all, of these behaviors during adolescence, but some behaviors are more common than others. Also, the degree and frequency in which these risk behaviors are engaged can vary greatly and result in vastly different outcomes on an individual basis.

Alcohol use is one of the most common risk behaviors among adolescents and can have detrimental outcomes if used in excess. In 2009 in the United States, approximately 72.5% of high school students reported having had at least one drink of alcohol in their lifetime and 41.8% of students drank alcohol in the past month. Furthermore, an estimated 24.2% of students have engaged in heavy episodic drinking meaning they have had five or more drinks within a couple of hours on the same day (Center for Disease Control, 2009). Drinking alcohol is often associated with other risk behaviors. There is an association between drinking alcohol in early adolescence and early initiation of sexual behavior in black, white, and Hispanic urban youth (Rothman, Wise, Berntein, & Bernstein, 2009). Also, some adolescents report enjoying drinking alcohol and expect for there to be positive outcomes as a result of their drinking. These adolescents are more likely to engage in oral sex (Patrick & Maggs, 2009). Those who engage in frequent binge drinking in college are more likely to experience long term detrimental effects

including being at higher risk for alcohol dependence and abuse, academic attrition, including from college, and poorer occupational outcomes (Jennison, 2004).

Tobacco use is another risk behavior in which many youth engage during adolescence. Approximately 46.3% of U.S. high school students had tried smoking cigarettes with approximately 19.5% of students having smoked in the past month. The incidence of smokeless tobacco use, such as chewing tobacco or snuff, is much less among adolescents with only 8.9% of students having had tried it within the past month (Center for Disease Control, 2009). Almost half of the US population either currently smokes or smoked in the past and cigarettes and tobacco are readily available to adolescents. Long term outcomes of tobacco use into adulthood may result in poorer functioning in several different domains including physical health, life satisfaction, depression, personal income, and academic performance and longevity (Georgiades & Boyle, 2007). Many adolescents use tobacco because they believe it is associated with specific benefits including weight control, social acceptance, and also as a means of relaxation from stressors (Seo, Bodde, & Torabi, 2009). Perhaps the perceived short term benefits of tobacco have a more meaningful allure than do the aversive consequences of possible long term detrimental effects.

Illicit drug use is also a risk behavior commonly engaged in adolescents. Marijuana is the most commonly tried illegal drug with approximately 36.8% of high school students having used it at least once ever and approximately 20.8% of students having used it in the past month. Inhalants or sniffing glue are the next most commonly tried drugs with approximately 11.7% of students having ever used these substances in order to get high. While other drugs are less commonly used amongst high school

students, an estimated 4.1% have tried methamphetamine, 3.3% have tried steroid pills or shots, and 2.8% have tried any form of cocaine (Center for Disease Control, 2009). Using marijuana in adolescence is associated with use of other illicit drugs later on in adulthood; however the association is strongest when considering shared social and environmental factors such as using with siblings or peers (Lessem, et al., 2006). Also, initiating illicit drug use during adolescence is associated with poor parent-child relationships and with deviant peer affiliations indicating poor parental nurturing and association with other adolescents that exhibit risk behaviors (Pires & Jenkins, 2007). Poor parenting style appears to be associated more with hard drug use as opposed to marijuana. Individuals who use harder drugs including ecstasy and cocaine tend to view their parents as neglectful whereas those who use only marijuana or no drugs at all tend to view their parents as authoritarian (Montgomery, Fisk, & Craig, 2008).

Sexual activity is another potentially risky behavior that many youth engage in during adolescence. Nearly half, approximately 46.0%, of high school students have had sexual intercourse at least once in their lifetime with 34.2% of high school students having had sex in the past month. Of the 34.2%, only 61.1% reported that a condom was used during last intercourse and only 22.9% used birth control pills or Depo-Provera. An estimated 13.8% of students have had sex with four or more partners (Center for Disease Control, 2009).

Quality of parental relationship is also associated with adolescent sexual activity. Better parent-adolescent relationship is associated with earlier initiation of intercourse, less unprotected sex, and a lower incidence of sexually transmitted infection (STI) diagnosis (Deptula, Henry, & Schoeny 2010). Among females, engaging in more

unprotected sex more frequently in young adulthood is associated with having an initial sexual partner who is older (Senn & Carey, 2011). Adverse consequences to engaging in risky sexual activities include contraction of STIs and unwanted conception. Adolescents between the ages of 15 and 24 account for only 25% of the sexually experienced population; however this population acquires almost half of all new STIs (Center for Disease Control, 2009). Also, nearly two-thirds of births to women under the age of 18 and more than half of those among women ages 18 and 19 in the United States were unintended (Center for Disease Control, 2009).

Minor exposure to some risk is common among adolescents and does not necessarily result in a negative outcome. There is evidence, however, that high risk involvement in several risky activities increases the chances of a poor developmental outcomes such as risk behavior attitudes, temperament, wellbeing, religiosity, academic performance, family and friend relationship quality, victimization, and unstructured activities (Willoughby et al., 2007). Adolescents who do not engage in any risk taking behaviors at all only make up only 6% of the adolescent population. These individuals consistently experience better developmental outcomes than their peers who frequently engage in high risk behaviors. On the other end of the risk taking spectrum are the adolescents who frequently engage in several different high risk activities and make up approximately 8% of youth; a population which consistently has the poorest of developmental outcomes (Willoughby et al., 2007).

Psychosocial Effects of Physical Exercise

Physical exercise can play an integral role during adolescent development. It can

help serve to alter mood and foster psychological wellbeing. It can also improve self-esteem, body perception, and reduce participation in various risk behaviors. Youth engage in physical activity for several different reasons, including as a social activity, for weight control, body satisfaction, and managing mood. The effects of physical activity are not universal and can vary greatly depending on numerous factors; some of which are gender, reason for participation, and frequency and intensity of activity.

Physical activity can affect self-esteem in different ways. In general, competitive athletes tend to report higher self-esteem than non-athletes. Furthermore, those who participate at an elite level of athletics tend to have even higher self-esteem than do those who participate at an intermediate level (Findlay & Bowker, 2009). Adolescents who participate in endurance exercise tend to have a more positive self-image, feelings of mastery, and self-efficacy (Kirkcaldy, Shephard, & Siefen, 2002). In younger children, higher self-esteem is only related to vigorous activity; children who participate in lower intensity exercise tend to actually have lower self-esteem (Parfitt, Pavey, & Rowlands). This finding seems unusual given the general finding that activity yields positive outcomes and it is possible that the difference may be accounted for by other variables such as collaborative activity, training, and focus.

There are gender differences related to self-esteem and exercise. During adolescence, weight control may be an important concern for female youth. Weight control refers to dieting and/ or exercising for maintaining a specific weight or body shape. Girls who participate in sports for weight control tend to have lower self-esteem than those who have other reasons for participation (de Bruin, Woertman, Bakker, & Oudejans, 2009). Also, females who exercise for self-objectification and appearance

related reasons tend to have poorer self-esteem; however those who exercised for functional reasons such as health, fitness, mood, and enjoyment experience higher levels of self-esteem and body satisfaction. (Strelan, Mehaffey, & Tiggemann, 2003). This is not necessarily the case for adolescent boys, because exercising for weight control and attractiveness is not associated with lower self-esteem (Furnham & Calnan, 1998). From the literature, it appears that physical activity can boost self-esteem, but the effect is moderated by the reason for participation in the activity.

Exercise can have an immediate effect on perceived body image. Many females perceive themselves as slightly slimmer immediately after exercise than prior to engaging in a physical activity. These estimations of body size, however, are influenced by the individual's initial motivation for thinness and level of dissatisfaction with body shape and weight (Vocks, Hechler, Rohing, & Legenbauer, 2009). Females who exercise for self-objectification and appearance related reasons tend to have increased body dissatisfaction and reduced self-esteem (Strelan, Mehaffey, & Tiggemann, 2003; de Bruin, Woertman, Bakker, & Oudejans, 2009). Whereas females who exercise for appearance related reasons are usually concerned with losing weight, males who exercise for appearance reasons are divided between wanting to gain and wanting to lose weight. In both cases, exercising for appearance reasons is associated with body dissatisfaction and disordered eating (Furnham & Calnan, 1998); however body dissatisfaction is associated with lower self-esteem only in females and not in males (Furnham, Badmin, & Sneade, 2002).

Engaging in physical activity has been shown to help decrease symptoms of anxiety and depression. Regular physical activity can act as a protective factor against the

onset of depression in adolescents. Conversely, having depressive symptoms may act as a predictor of being less likely to engage in physical activity (Jerstad, Boutelle, Ness, & Stice, 2010). In adolescent females, physical activity and sports participation have a positive influence on self-concept which in turn reduces depressive symptoms (Dishman, et al., 2006). The intensity of exercise can affect the impact physical activity has on depression and anxiety symptoms. Vigorous exercise has been shown to significantly reduce depressive symptoms for high school age students (Prasad, St-Hilaire, M., T., & Loftin, 2009). In school age boys and girls, very light physical activity is associated with higher symptoms of anxiety and depression whereas vigorous activity is associated with a reduction in symptoms (Parfitt, Pavey, & Rowlands, 2009). Adolescents who engage in regular physical activity are more likely to have fewer symptoms of anxiety and depression than peers who do not engage in regular exercise (Kirkcaldy, Shephard, & Siefen, 2002). In college aged students, sport participation and identification as an athlete is associated with lower depression (Miller & Hoffman, 2009). In the general college population, those who participate in some form of physical activity each week tend to have a reduced risk of hopelessness and depression (Taliaferro, Rienzo, Pigg, Jr., Miller, & Dodd, 2008). In general, it appears that engaging in regular, vigorous exercise can both reduce symptoms and act as a protective factor against depression and anxiety.

Physical activity can affect overall mood. Exercise has been shown to have an immediate positive effect on mood from pre to post exercise (Vocks, Hechler, Rohing, & Legenbauer, 2009). Positive mood and overall psychological wellbeing is also associated with endurance related physical activity (Kirkcaldy, Shephard, & Siefen, 2002). Regular exercise is associated with less overall emotional problems in children and adolescents

(Wiles, Jones, Haase, Lawlor, Macfarlane, & Lewis 2008). In obese women, exercising for the purpose of losing weight has been shown to be associated with lower levels of depression, tension, and other mood disturbances (Annesi & Whitaker, 2008). An additional consideration related to mood and exercise is the setting. It makes sense that the environment would play a role in mood which is supported by the literature. Engaging in exercise in a pleasant setting has been shown to positively increase mood, whereas exercising in an unpleasant environment can decrease mood (Pretty, Peacock, Sellens, & Griffin, 2005).

There is some evidence that engaging in physical activity can act as a protective factor against certain risk behaviors such as drug use, sexual risk taking, and self-harm behaviors. There is a relationship between specific personality traits and participation in endurance sports which also appears linked to being resistant to addiction behavior. Adolescents who participate in endurance sports tend to use tobacco, alcohol, and other drugs less than individuals who do not participate in endurance activities (Kirkcaldy, Shephard, & Siefen, 2002). Frequency and intensity also may play a role as there is evidence that adolescents who participate in frequent vigorous physical activity are less likely to use drugs than those who lead a sedentary lifestyle (Delisle, Werch, Wong, Bian, & Weiler, 2010) Even for non-athletes, exercise can decrease the urge to drink alcohol in those who have been diagnosed with alcohol dependence (Ussher, Sampuran, Doshi, West, & Drummond, 2004). In high school students, participation in either team sports or solitary exercise has been shown to act as a protective factor against sexual risk taking for females; however, for males the influence of physical activity on sexual risk taking varies across type of activity and race identification (Miller, Barnes, Melnick, Sabo, & Farrell,

2002). In college populations, identifying as an athlete decreases the likelihood of having attempted suicide in the past (Miller & Hoffman, 2009). There is also a protective factor against suicide risk for the non-athlete college students who engage in regular physical activity (Taliaferro, Rienzo, Pigg, Jr., Miller, & Dodd, 2008). Physical activity may not be protective against all risk behaviors for all adolescents. Adolescent males who participate in vigorous physical activities may actually be more likely to engage in delinquent behaviors, such as theft, truancy, and physical fights, suggesting that exercise alone may not be protective against delinquency (Faulkner, Adalf, Irving, Allison, Dwyer, & Goodman 2007). Although there is some conflicting research, it does appear that physical activity is associated with engaging in less risk activity.

Physical activity can also have a positive effect on other health behaviors. Regular vigorous exercise is associated with healthier diet, better stress management skills, and better sleep quality in adolescents (Delisle, Werch, Wong, Bian, & Weiler, 2010). Athletic participation in sports is associated with better diet, safer sex practices, lower risk of suicide, being less likely to carry a weapon, and lower rates of smoking cigarettes in male athletes. In female athletes, sports participation is associated with safer sex practice and being less likely to carry a weapon (Taliaferro, Rienzo, & Donovan, 2010). In high school females, sports participation and other physical activity is associated with having a higher grade point average whereas for high school males, only team sports participation was associated with higher grades (Fox, Barr-Anderson, Neumark-Sztainer, & Wall). Children and adolescents are more likely to engage in vigorous activity and team sports if they have parents whom believe strongly in the importance of physical activity. This may be because parents who believe exercise is important may be more

likely to enroll their children in sporting or other physical activities. Sports participation in general is related to less sedentary behavior including reduced television and computer use (Anderson, Hughes, & Fuemmeler, 2009). Although exercise is associated with mostly positive benefits, there is some association between specific activities and undesirable outcomes. Specifically, participation in power sports can increase antisocial behavior in middle school boys (Enderson & Olweus, 2005). With little exception, engaging in physical activity appears to have a positive effect on many domains including psychological wellbeing and risk behaviors. It should be noted that literature suggests that the effects may vary depending on various factors including demographic variables such as age and gender and the type, intensity, and frequency of activity.

Martial Arts and Wellbeing

The scientific literature on the psychosocial effects of participating in martial arts training is limited. There is some evidence that participation in the martial arts bolsters positive wellbeing; however, findings vary widely depending on the type of martial art and the population studied. Training in the martial arts requires focus, discipline, commitment, and respect as well as varying degrees of physical activity. As such, the psychosocial effects of engaging in this form of exercise may differ from sports participation and other forms of exercise because of the unique atmosphere associated with martial arts training. Martial arts focus on individual training as well as collaborative training. Most styles also put unique focus on aspects that are not a part of other sports such as respect, tradition, spiritual growth, and self-defense.

Traditional martial arts originated in the ancient cultures of Asia; most notably China, India, and Japan. Martial art disciplines comprise of a broad range of activities that include fighting techniques, physical exercises, mental discipline, self-defense, spiritual growth, and athletic competition. The oldest disciplines, including Qigong, are thought to be over 5,000 years old and to have originated in India and China. Training is meant to challenge individuals intellectually as well as physically and benefits include improved confidence, self-esteem, concentration, will power, stress management, balance, strength, stamina, flexibility, and posture (Dupler & Frey, 2005).

Motivational factors to participate in martial arts vary. Some reasons for beginning training in the martial arts include fun, physical fitness, aesthetics, personal growth, and cultural learning (Ko & Kim, 2010). Other reasons include defense against criminal victimization, growth and discovery, seeking change during a life transition, and learning skills to apply towards other everyday life activities (Columbus & Rice, 1998). These factors include physical as well as mental, intellectual, and social reasons for beginning training. Benefits commonly associated with martial arts training include improved efficiency in sports performance, decreased circulatory problems, stress reduction, weight management, better sleep and digestion, increased confidence, higher level of energy, decreased risk of injury, joy of participating in the activity, perception of being in control of one's life, and self-discipline (Kim, 1993). Just as motivation to initiate training varies, so do the benefits of participation. It is interesting to note that although martial arts are physical discipline; motivation for participation and associated benefits cover a wide range of lifestyle wellbeing.

There are many physiological health benefits associated with martial arts participation. Tai Chi, a non-contact and low intensity form of traditional martial arts, is prevalent in the literature pertaining to older or chronically ill populations, possibly for the specific benefits often correlated with the discipline. Participation in Tai Chi is associated with enhanced flexibility, improvements in mood, better relaxation, and stress reduction. This effect is especially profound in the senior population for those who cannot participate in vigorous exercise due to illness or other physiological limitations (Sandlund & Norlander, 2000). In middle aged women, Tai Chi has been shown to decrease blood pressure and increase dynamic balance (Thornton, Sykes, & Tang, 2004). Amongst the elderly population, Tai Chi has been shown to have a beneficial effect on bone mass density, particularly in women (Woo, Hong, Lau, & Lynn). Tai Chi exercise also appears to have beneficial outcomes within chronically ill populations including those with heart failure, hypertension, acute myocardial infarction, arthritis, and multiple sclerosis. Benefits in these populations include increased balance, strength, flexibility, and less falls among the elderly (Wang, Collet, & Lau). Tai Chi has shown to provide many benefits within a variety of populations. It is also non-contact, indicating that this form of martial arts can have a wide range of benefits that are not associated with learning hand to hand combat or self-defense techniques.

Other forms of contact martial arts also provide desirable physiological outcomes. Individuals who participate in only a few weeks of martial arts training tend to report having developed a higher pain threshold and a decrease in pain ratings (Focht, Bouchard, & Murphey, 2000). Regular Kung Fu training has also been associated with weight loss in obese and overweight adolescents (Tsang, Kohn, Chow, & Singh, 2009).

Soo Bahk Do, a Korean martial art similar to karate, is associated with greater aerobic capacity, balance, flexibility, muscle endurance, strength, and less body fat than those who do not participate in regular physical activity (Douris, et al., 2004). Although the specific styles of training are different, it appears that participation in various forms of traditional martial arts have many physiological health benefits.

Martial arts training can additionally have beneficial psychological outcomes as well. Participation in Qigong, a Chinese martial art discipline, has shown to improve mood variables including reduced depression, anger, and fatigue after completing one half hour of exercise (Johansson, Hassman, & Jouper, 2008). Also, individuals who engage in regular training are less likely to have general self-esteem issues (Wargo, Spurrison, & Thorne, 2007). Martial arts can improve self-esteem by providing physical activity in a group setting, teaching relaxation, concentration, assertiveness, and requiring direct and honest communication. As such, it has been argued to be a valid form of psychotherapy (Weiser, Kutz, Jacobson-Kutz, & Weiser, 1995). Research has also suggested that participating in martial arts can be beneficial to a variety of psychological factors including self-concept and social connectedness; making a strong argument for the improvement of overall wellbeing.

Much of the research studying martial arts participation in children and adolescents focuses on aggression behaviors and bullying. The findings across studies are varied. Some studies have found that participation in martial arts is effective in decreasing aggression. Aggression has shown to decrease after training in martial arts in adolescents who have been categorized as juvenile delinquents. In the same population, martial arts participation was also associated with decreased anxiety, increased self-

esteem, and increased social adroitness (Trulson, 1986). Martial arts participation has also been associated with increases in empathy and an increase in the likelihood of being a more helpful bystander against bullying in addition to decreasing aggression in male children (Twemlow, Briggs, Nelson, Vernberg, Fonagy, & Twemlow, 2008). Children who engage in training also show greater self-regulation in response to a challenge; however there is some difference in this finding in the literature based on gender. In a study of middle school children, boys, but not girls, tend to have less conduct problems and exhibit more pro-social behaviors as a result of martial arts training (Lakes & Hoyt, 2004). Participation in martial arts is also associated with fewer expulsions from school, less defiance of rules, less inappropriate social behavior, and more impulsivity control in male children (Zivin, Hassan, DePaula, Monti, Harlan, Hossain, & Patterson, 2001). This research supports the claim that martial arts are an effective tool in lowering aggressive and bullying behavior in children and adolescents.

Other studies have found that martial arts do not have a significant effect on aggressive behaviors. In attempting to find out if martial arts attracts children who are naturally more aggressive, one study found that children participating in beginner competitive martial arts do not exhibit more aggressive behaviors than their peers who do not train in competitive martial arts (Reynes & Lorant, 2001). Another study aimed at examining if martial arts participation improved self-control, self-confidence, concentration, and other mental health outcomes did not yield significant results when variables were assessed in the classroom setting by teachers (Strayhorn & Strayhorn, 2009). Furthermore, an additional study did find that marital arts training provided positive outcomes; however the program organizers did not find that their martial arts

programs provided results differing from participation in other sport or social activities (Theeboom, Knop, & Wylleman, 2008). One possible explanation for the differing findings across studies is the variety of style or intensity of martial arts. Modern martial arts, such as Mixed Martial Arts (MMA) are associated with an increase in aggressiveness whereas participation in traditional martial arts styles tends to reduce aggression (Nosancuk & MacNeil, 1989). The variance of findings suggests that the topic is in need of continued research.

The Present Study

The research examining the psychosocial effects of martial arts is limited. Subsequently, not much is known about the effects of martial arts training within the adolescent population. Although the literature suggests mixed findings, it appears that physical activity, and martial arts in particular, do have a positive effect on overall psychosocial wellbeing. The literature provides evidence that engaging in physical activity improves mood, self-concept, and can act as a protective factor against risk behaviors that are common amongst adolescents. The present study aims to examine the effect participation in two different styles of traditional martial arts has on specific psychosocial variables and risk behaviors in adolescents.

The study hypotheses are as follows:

Hypothesis 1: Lower engagement in risk behaviors will exist amongst higher ranking students. Risk behaviors include suicide, alcohol use, tobacco use, drug use, and sexual behaviors

Hypothesis 2: Students with higher psychological wellbeing and self-concept will be more advanced in rank.

Hypothesis 3: Males will engage in more overall risk behaviors than females in the martial arts population.

Hypothesis 4: Style of martial arts will not have an effect on risk behavior and self-concept.

CHAPTER TWO

METHOD

Settings and Participants

The participants in this study are children and adolescents ages 11-18 who are enrolled in traditional martial arts classes. Styles of traditional martial arts included in this study are Kempo and Hapkido. The projected number of research participants was initially 80 subjects. The final number of participants in the study is 55. Several factors contributed to the smaller than expected sample size, including one of the eight participating studios dropping out of the study and some of the studios being unable to obtain parental permission for the projected number of students to participate. Subjects were recruited directly from their training dojos and were not excluded on the basis of any demographic variable other than age.

Procedure

Participants were asked to complete three measures containing items covering their background in martial arts, a variety of risk behaviors, and self-concept. As incentive, participants received a coupon for 20% off of studio training gear for each completed research packet. Parents were required to provide active consent for students between the ages of 11 and 17. Parents were provided with consent letters for students in this age range describing the nature, purpose, and importance of the study and asked to provide consent prior to the administration of the measures. Only one parent's signature was required for participation. Contact information for the research investigators was provided on the consent form in case there were any concerns or questions. Students

whose parents signed consent allowing for their participation were given a student assent form to indicate their willingness to volunteer for the study. Participants who were 18 years old at the time of the study were provided with a consent form as they were legally old enough to consent to participate without parental permission.

Participants were given the study measures in an opaque folder. Participants were encouraged to answer questions honestly and were reminded of their anonymity. No identifiers were included with the surveys and participants were informed that no measures would be taken to identify them regardless of their responses. The individual discipline style would also not be indicated on the forms to protect anonymity between companies. Instead, a number code for each discipline was assigned and included with each corresponding research packet. With the completion of the measures, each student was provided with a contact number for a resource person if any problems or questions arose as a result of participation in the study.

Materials

Youth Risk Behavior Surveillance Systems (YRBSS)

The YRBSS is a measure developed by the Center for Disease Control (CDC). There are two versions of this measure developed for middle school and high school students. These surveys measure six categories of priority health-risk behaviors among youth: behaviors that contribute to unintentional injuries and violence; tobacco use, alcohol and other drug use; sexual risk behaviors; unhealthy dietary behaviors; and physical inactivity. Item responses on the questionnaire require circling the letter corresponding to the appropriate response.

Piers-Harris 2 (PH-2)

The PH-2 is a measure that identifies six subcategories of self-concept: physical appearance and attributes, intellectual and school status, happiness and satisfaction, freedom from anxiety, behavioral adjustment, and popularity. It has been widely validated for use with individuals between the ages of 7 and 18. It is a self-report measure that uses a yes or no response format.

Training Background Questionnaire

This questionnaire was developed for this study to determine the length of time, frequency, and intensity of training of each participant. It also includes items addressing satisfaction with training provided by the studios, perception of personal progress related to their martial arts training, and two items inquiring about the participant's spirituality.

CHAPTER THREE

RESULTS

Data Analysis

In order to test the first two hypotheses, composite scales were developed for each individual risk factor (Suicide, Tobacco, Drug, Sex, and Alcohol). Because the study is not comparing Middle School to High School students, the composite scales needed to represent the same data for the entire study population regardless of the YRBSS form completed. Comparable items were taken from the high school and middle school measures of the YRBSS to form the composites scales. Please see Appendix A for details.

Gender and age were included as covariates in the first and second hypotheses to control for effects on the dependent variables. Because of this, both gender and age were accounted for in the hierarchical multiple regressions performed to test the first and second hypotheses in order to explore the effects of the covariates on the hypothesized variables. Changes in *R*-Square values were used to test the effects.

Table 1

Demographics of Sample

<i>Variable</i>	<i>N</i>	<i>mean</i>	<i>sd</i>	<i>%</i>
Gender				
Male	39			70.9
Female	16			29.1
Age	55	14.49	2.01	
Ethnicity				
Latino or Hispanic	12			21.8
Native American or Alaskan	1			1.8
Asian	14			25.5
Black or African American	2			3.6
Native Hawaiian or Pacific Islander	2			3.6
White	24			43.6

Table 2

Training Profile

<i>Variable</i>	<i>N</i>	<i>mean</i>	<i>sd</i>	<i>%</i>
Discipline				
Hapkido	33			60
Kempo	22			40
Length Train	55	6.51	2.96	
Classes per Week	55	2.75	1.09	

Hypothesis 1: Length of Training and Risk Behaviors

To examine the unique contribution of Length of Training on each of the five risk scales (Suicide, Tobacco, Drug, Sex, and Alcohol), four hierarchical multiple regression analyses and one hierarchical logistic regression were performed. For each of the five analyses, variables were entered in two steps. In step 1, the particular risk scale was entered as the dependent variable and age and sex were the independent variables. Length of Training was entered in to step 2.

For Suicide Risk, the results of step 1 indicated that the variance accounted for (R^2) with Age and Sex equaled .082, which was not significantly different from zero ($F_{(2, 54)} = 2.31, p = .11$). Age was the only statistically significant independent variable, $\beta = .272, p < .05$. In step 2, Length of Training was entered into the regression equation. The change in variance accounted for (ΔR^2) was equal to .035, which was also not significantly different from zero ($F_{(3, 54)} = 2.24, p = .095$). Additional statistics for this model can be found in Table 3.

Regarding Tobacco Risk, the results of step 1 indicated that the variance accounted for (R^2) with Age and Sex equaled .031, which was not significantly different from zero ($F_{(2, 54)} = 0.82, p = .45$). Neither Age nor Sex significantly predicted Tobacco Risk. In step 2, Length of Training was entered into the regression equation. The change in variance accounted for (ΔR^2) was equal to .030, which was also not significantly different from zero ($F_{(3, 54)} = 1.10, p = .36$). Additional statistics for this model can be found in Table 4.

The results for Drug Risk in step 1 indicated that the variance accounted for (R^2) with Age and Sex equaled .094, which was not significantly different from zero ($F_{(2, 54)} = 2.70, p = .08$). Neither Age nor Sex was significantly predicted Drug Risk. In step 2, Length of Training was entered into the regression equation. The change in variance accounted for (ΔR^2) was equal to .009, which was also not significantly different from zero ($F_{(3, 54)} = 1.95, p = .13$). Additional statistics for this model can be found in Table 5

With regards to Sex Risk, the results of step 1 indicated that the variance accounted for (R^2) with Age and Sex equaled .118, which is statistically significant ($F_{(2, 53)} = 3.43, p < .05$). Age was the only statistically significant independent variable

predicting Sexual Risk, $\beta = .26, p = .05$. In step 2, Length of Training was entered into the regression equation. The change in variance accounted for (ΔR^2) was equal to .00, which was also not significantly different from zero ($F_{(3, 53)} = 2.24, p = .10$). Additional statistics for this model can be found in Table 6.

A logistic regression analysis was conducted to predict Alcohol Risk in adolescent martial arts students depending on the length of training. A test of the full model against a constant only model was not statistically significant, indicating that the predictors as a set did not reliably distinguished between those who used alcohol and those who did not ($\chi^2 = .229, p = .63$ with $df = 1$). Additional statistics for this model can be found in Table 7.

Table 3

Summary of Hierarchical Regression for Length of Training on Suicide Risk

Variables	<i>df</i>	R^2	ΔR^2	ΔF	β	<i>p</i>
Step 1	2, 54	.082	.082	2.310		
Age					.272	.046
Sex					-.548	.586
Step 2	3, 54	.117	.035	2.016		
Length of Training					-.190	.162

Table 4

Summary of Hierarchical Regression for Length of Training on Tobacco Risk

Variables	<i>df</i>	R^2	ΔR^2	ΔF	β	<i>p</i>
Step 1	2, 54	.031	.031	.820		
Age					.061	.239
Sex					-.090	.690
Step 2	3, 54	.061	.030	1.634		
Length of Training					-.176	.207

Table 5

Summary of Hierarchical Regression for Length of Training on Drug Risk

Variables	<i>df</i>	R ²	ΔR^2	ΔF	β	<i>p</i>
Step 1	2, 54	.094	.094	2.697		
Age					.257	.058
Sex					-.154	.250
Step 2	3, 54	.103	.009	.514		
Length of Training					-.097	.477

Table 6

Summary of Hierarchical Regression for Length of Training on Sex Risk

Variables	<i>df</i>	R ²	ΔR^2	ΔF	β	<i>p</i>
Step 1	2, 53	.118	.118	3.423		
Age					.164	.051
Sex					-.202	.132
Step 2	3, 53	.118	.000	.007		
Length of Training					-.011	.935

Table 7

Summary of Hierarchical Logistical Regression for Length of Training on Alcohol Risk

Variables	<i>B</i>	<i>Wald</i>	<i>df</i>	<i>P</i>	Odds Ratio
Step 1					
Age	.370	4.402	1	.036	1.447
Sex	.209	.083	1	.773	1.232
Step 2					
Length of Training	.020	.028	1	.868	1.020

Hypothesis 2: Length of Training and Wellbeing

To examine the unique contribution of Length of Training on each of the six Piers-Harris-2 self-concept scales (Behavioral Adjustment, Intellectual And School Status, Physical Appearance, Freedom From Anxiety, Popularity, and Happiness And Satisfaction), six hierarchical multiple regression analyses were performed. For each of

the analyses, variables were entered in two steps. In step 1, the particular self-concept scale was entered as the dependent variable and age and sex were the independent variables. Length of Training was entered in to step 2.

The results for Behavioral Adjustment in step 1 indicated that the variance accounted for (R^2) with Age and Sex equaled .090, which was not significantly different from zero ($F_{(2, 51)} = 2.43, p = .10$). Neither Age nor Sex significantly predicted Behavioral Adjustment. In step 2, Length of Training was entered into the regression equation. The change in variance accounted for (ΔR^2) was equal to .096, which was also not significantly different from zero ($F_{(3, 51)} = 1.70, p = .18$). Additional statistics for this model can be found in Table 8.

The results for Intellectual and School Status in step 1 indicated that the variance accounted for (R^2) with Age and Sex equaled .104, which was not significantly different from zero ($F_{(2, 48)} = 2.66, p = .08$). Neither Age nor Sex significantly predicted Intellectual and School Status. In step 2, Length of Training was entered into the regression equation. The change in variance accounted for (ΔR^2) was equal to .013, which was also not significantly different from zero ($F_{(3, 48)} = 1.98, p = .13$). Additional statistics for this model can be found in Table 9.

With regards to Physical Appearance, the results of step 1 indicated that the variance accounted for (R^2) with Age and Sex equaled .132, which is statistically significant ($F_{(2, 46)} = 3.35, p < .05$). Sex was the only statistically significant independent variable predicting Physical Appearance, $\beta = .34, p < .05$. In step 2, Length of Training was entered into the regression equation. The change in variance accounted for (ΔR^2) was

equal to .027, which approached significance ($F_{(3, 46)} = 2.27, p = .06$). Additional statistics for this model can be found in Table 10.

The results for Freedom from Anxiety in step 1 indicated that the variance accounted for (R^2) with Age and Sex equaled .079, which was not significantly different from zero ($F_{(2, 52)} = 2.15, p = .13$). Age was the only statistically significant independent variable predicting Freedom from Anxiety, $\beta = -.276, p < .05$. In step 2, Length of Training was entered into the regression equation. The change in variance accounted for (ΔR^2) was equal to .004, which was also not significantly different from zero ($F_{(3, 48)} = 1.50, p = .23$). Additional statistics for this model can be found in Table 11.

Regarding Popularity, the results of step 1 indicated that the variance accounted for (R^2) with Age and Sex equaled .087, which was not significantly different from zero ($F_{(2, 49)} = 2.25, p = .12$). Neither Age nor Sex significantly predicted Popularity. In step 2, Length of Training was entered into the regression equation. The change in variance accounted for (ΔR^2) was equal to .007, which was also not significantly different from zero ($F_{(3, 49)} = 1.60, p = .20$). Additional statistics for this model can be found in Table 12.

The results for Happiness and Satisfaction in step 1 indicated that the variance accounted for (R^2) with Age and Sex equaled .035, which was not significantly different from zero ($F_{(2, 48)} = .837, p = .44$). Neither Age nor Sex significantly predicted Happiness and Satisfaction. In step 2, Length of Training was entered into the regression equation. The change in variance accounted for (ΔR^2) was equal to .000, which was also not significantly different from zero ($F_{(3, 48)} = .552, p = .649$). Additional statistics for this model can be found in Table 13.

Table 8

Summary of Hierarchical Regression for Length of Training on Behavioral Adjustment

Variables	<i>df</i>	R ²	ΔR^2	ΔF	β	<i>p</i>
Step 1	2, 51	.090	.090	2.43		
Age					-.249	.075
Sex					.148	.284
Step 2	3, 51	.096	.096	.006		
Length of Training					-.078	.577

Table 9

Summary of Hierarchical Regression for Length of Training on Intellectual and School Status

Variables	<i>df</i>	R ²	ΔR^2	ΔF	β	<i>p</i>
Step 1	2, 48	.104	.104	2.66		
Age					-.164	.247
Sex					.263	.067
Step 2	3, 48	.117	.013	.657		
Length of Training					.117	.422

Table 10

Summary of Hierarchical Regression for Length of Training on Physical Appearance

Variables	<i>df</i>	R ²	ΔR^2	ΔF	β	<i>p</i>
Step 1	2, 46	.132	.132	3.35		
Age					.173	.227
Sex					.336	.021
Step 2	3, 46	.160	.027	1.39		
Length of Training					.169	.244

Table 11

Summary of Hierarchical Regression for Length of Training on Freedom from Anxiety

Variables	<i>df</i>	R ²	ΔR^2	ΔF	β	<i>p</i>
Step 1	2, 52	.079	.079	2.15		
Age					-.276	.048
Sex					-.071	.603
Step 2	3, 52	.084	.004	.24		
Length of Training					.068	.627

Table 12

Summary of Hierarchical Regression for Length of Training on Popularity

Variables	<i>df</i>	R ²	ΔR^2	ΔF	β	<i>p</i>
Step 1	2, 49	.087	.087	2.25		
Age					-.255	.075
Sex					.128	.365
Step 2	3, 49	.095	.007	.377		
Length of Training					.089	.542

Table 13

Summary of Hierarchical Regression for Length of Training on Happiness and Satisfaction

Variables	<i>df</i>	R ²	ΔR^2	ΔF	β	<i>p</i>
Step 1	2, 48	.035	.035	.837		
Age					-.122	.406
Sex					.127	.391
Step 2	3, 48	.036	.000	.019		
Length of Training					.021	.891

Hypothesis 3: Sex and Risk Behaviors

In order to test the third hypothesis that males tend to engage in more overall risk behaviors than females, independent samples *t*-tests were conducted to determine the relationship between gender and the five risk behavior scales. Levene's tests demonstrated that the assumption of homogeneity of variance was not met for two (Drug Risk and Sex Risk) of the five independent samples *t*-tests. Because of this, the statistics reported for Drug and Sex Risk are those of equal variances not assumed.

The results of the independent samples *t*-tests indicate that males and females differ significantly on only the Sex Risk scale with males engaging in riskier sexual behaviors than females. For three of the remaining four scales, there was no significant difference between sexes. Males reported engaging in more sexual risk behaviors than

females, $t(52) = 2.54, p < .016$. Also of interest is that the difference between risk taking behaviors with regard to reported drug use between males and females approached significance, $t(53) = 1.95, p = .058$. Males and females did not differ significantly with regards to reported risk behaviors regarding tobacco or alcohol use or suicidal intention. Means and standard deviations for each of the five risk scales variables can be found in Table 14.

Table 14

Mean Scores and Standard Deviations for Male and Female Scores on Risk Variables

<i>Variable</i>	<i>Mean</i>	<i>Standard Deviation</i>
Suicide Risk		
Male	.308	.656
Female	.188	.544
Tobacco Risk		
Male	.231	.872
Female	.125	.342
Drug Risk*		
Male	.205	.656
Female	.000	.000
Alcohol Risk		
Male	.231	.427
Female	.250	.447
Sex Risk*		
Male	.684	1.66
Female	.000	.000

**Indicates a significant p value of < .05*

Additional independent samples t -tests were conducted to determine the relationship between sex and overall wellbeing in the sample population. Levene's tests demonstrated that the assumption of homogeneity of variance was not met for one (Behavioral Adjustment) of the six independent samples t -tests. Because of this, the statistics reported for Behavioral Adjustment are those of equal variances not assumed.

The results of the independent samples *t*-tests indicate that males and females differ significantly on two of the self-concept scales. Female students reported higher overall satisfaction with their intellectual and academic abilities, $t(47) = -1.98, p = .05$ and higher appraisal of their physical appearances, $t(45) = -2.27, p = .028$ than male students. Additionally, the difference in overall self-concept between males and females approached significance, $t(44) = -1.88, p = .067$, with females reporting a higher degree of wellbeing. Means and standard deviations for each of the five risk scales variables can be found in Table 15.

Table 15

Mean Scores and Standard Deviations for Male and Female Scores on Self Concept

<i>Variable</i>	<i>Mean</i>	<i>Standard Deviation</i>
Behavioral Adjustment		
Male	52.94	9.84
Female	56.19	5.91
Intellectual and School Status*		
Male	49.75	7.28
Female	54.46	7.58
Physical Appearance*		
Male	49.06	8.37
Female	55.54	9.75
Freedom From Anxiety		
Male	53.71	10.50
Female	52.40	9.73
Popularity		
Male	45.81	8.06
Female	48.46	6.84
Happiness And Satisfaction		
Male	50.20	7.82
Female	52.64	7.80
Total		
Male	50.36	9.56
Female	56.31	9.90

**Indicates a significant p value of < .05*

Hypothesis 4: Training Style, Risk, and Wellbeing

In order to test the fourth hypothesis, independent samples *t*-tests were conducted to determine if the style of traditional martial arts will have an impact on risk taking or self-concept in adolescent martial arts students. Levene's tests demonstrated that the assumption of homogeneity of variance was met for four (excluding Suicide Risk) of the five independent samples *t*-tests. The reason for the violation is because the data are not normally distributed. The distributions were skewed because of a greater tendency for most of the participants to have indicated less risky behaviors overall. Because of this, the statistics reported for all of the scales with the exception of Suicide risk are those of equal variances not assumed.

The results of the independent samples *t*-tests confirm the null hypothesis. There was no significant difference between students who participated in Hapkido training and those who trained in Kempo on suicide, tobacco, alcohol, drug, or sexual risk taking. The difference in sexual risk taking between students of the two disciplines did approach significance with Kempo students engaging in more risk than Hapkido students, $t(52) = -1.78, p = .087$. Means and standard deviations for each of the five risk scales variables can be found in Table 16.

To test the second part of the fourth hypothesis, additional independent samples *t*-tests were conducted to determine the relationship between training style and overall wellbeing in the sample population. Levene's tests demonstrated that the assumption of homogeneity of variance was not met for one (Happiness and Satisfaction) of the six independent samples *t*-tests. Because of this, the statistics reported for Happiness and Satisfaction are those of equal variances not assumed.

The results of the independent samples *t*-tests indicate the null hypothesis was true for four of the six self-concept scales. Hapkido students reported higher satisfaction related to their Intellectual and School Status, $t(47) = 2.00, p = .051$ than Kempo students. Hapkido students also reported significantly higher overall social functioning and perceived popularity, $t(48) = 2.59, p = .013$ than Kempo students. Means and standard deviations for each of the five risk scales variables can be found in Table 17.

Table 16

Mean Scores and Standard Deviations for Training Discipline on Risk Variables

<i>Variable</i>	<i>Mean</i>	<i>Standard Deviation</i>
Suicide Risk		
Hapkido	.212	.545
Kempo	.364	.727
Tobacco Risk		
Hapkido	.091	.292
Kempo	.364	1.14
Drug Risk		
Hapkido	.061	.348
Kempo	.273	.767
Alcohol Risk		
Hapkido	.182	.392
Kempo	.318	.477
Sex Risk		
Hapkido	.156	.628
Kempo	.955	2.04

**Indicates a significant p value of < .05*

Table 17

Mean Scores and Standard Deviations for Training Discipline Scores on Self Concept

<i>Variable</i>	<i>Mean</i>	<i>Standard Deviation</i>
Behavioral Adjustment		
Hapkido	55.03	8.29
Kempo	52.45	9.65
Intellectual And School Status*		
Hapkido	52.82	6.73
Kempo	48.57	8.12
Physical Appearance		
Hapkido	51.88	8.79
Kempo	49.57	9.63
Freedom From Anxiety		
Hapkido	55.29	10.00
Kempo	50.59	10.08
Popularity*		
Hapkido	48.89	6.97
Kempo	43.45	7.85
Happiness And Satisfaction		
Hapkido	51.67	6.67
Kempo	49.95	9.09
Total		
Male	53.88	8.97
Female	49.65	10.81

**Indicates a significant p value of < .05*

Additional Findings of Interest

It is important to consider the nature of this particular sample when analyzing the results. Compared to the national data for the YRBSS, the students involved in this study engaged in significantly lower overall risk behaviors than adolescents in the general population. The CDC publishes results for the YRBSS for high school students only and as such, Table 18 below compares this study's high school students to the CDC YRBSS data.

Table 18

Comparison of Select Risk between Study Participants and CDC's General Sample

Risk Item	Study Sample	CDC Sample*	
Feeling sad or hopeless most days for two weeks or more weeks	13.3%	28.5%	**
Seriously consider attempting suicide in the past year	6.7%	15.8%	**
Make a suicide plan in the past year	6.7%	12.8%	
Ever tried cigarette smoking	16.7%	44.7%	**
Ever smoked cigarettes daily	6.7%	10.2%	
Ever tried marijuana	13.3%	39.9%	**
Ever used any form of cocaine	0.0%	6.8%	**
Ever sniffed inhalants to get high	3.3%	11.4%	**
Ever taken steroid pills or shots without a doctor's prescription	0.0%	3.6%	**
Ever taken a prescription drug without a doctor's prescription	10.0%	20.7%	**
Ever had sexual intercourse	20.0%	47.4%	**
Ever drank alcohol	33.3%	70.8%	**

* 2011 YRBSS; ** difference in percentage is significant ($p > .05$)

In looking at the study's full sample of both middle school and high school students by each of the five risk domains, the vast majority of students report engaging in no risk behaviors at all. With regards to drug use, 92.7% of the participants report never having tried any of the drugs assessed for in this study. The most common risk behavior endorsed was having tried alcohol, yet 76.4% of the study participants having never tried alcohol at least once in their lives. Additional percentages are available in Table 19.

Table 19

Percentage of Participants Who Reported No Risk Behaviors by Domain

Risk Domain	Number of Students	Percentage
Suicide Risk	44	80.0%
Tobacco Risk	49	89.1%
Drug Risk	51	92.7%
Sex Risk	47	87.0%
Alcohol Risk	42	76.4%

Also of interest is that the students in the study report generally average self-esteem and appear to have balanced self-evaluation. All mean scores for the sample were within the average range indicating that students who train in traditional martial arts do not differ significantly from a general population of their peers. Detailed statistics can be found in Table 20.

Table 20

T-scores for Self-Concept Scales

<i>Variable</i>	<i>Mean</i>	<i>Standard Deviation</i>
Behavioral Adjustment	53.94	8.89
Intellectual And School Status	51.00	7.58
Physical Appearance	50.85	9.14
Freedom From Anxiety	53.34	10.21
Popularity	46.50	7.78
Happiness And Satisfaction	50.90	7.81
Total	52.04	9.93

CHAPTER FOUR

DISCUSSION

The results of the study are mixed. Some of the outcomes were what the researchers expected but others were not. In contrast to expectations, this study did not identify an association between length of training in traditional martial arts and risk behaviors. This is the case with all five domains of risk included in the study: suicide, tobacco, drug, sex, and alcohol risk. Age did have an effect on three of the five domains. Older students were more likely to have tried alcohol, engaged in risky sexual behaviors, and were at a higher risk for suicidal behaviors than younger students in the sample population.

Similarly, this study did not identify an association between length of training in traditional martial arts and overall wellbeing. This study looked at six domains of self-concept in adolescents including behavior adjustment, intellectual and school status, physical appearance, freedom from anxiety, popularity, and happiness and satisfaction. There was an association between age and freedom from anxiety with younger students reporting less anxiety and overall unpleasant mood states than older students.

One of the aims of the study was to examine if male martial arts students would engage in more risk behaviors overall than their female counterparts. The study found that this was the case with both drug use and sexual risk taking. Male students reported using more illegal substances and taking more sexual risks than female students. It may be of interest that none of the female students in this study reported using any illegal substances at all. Additionally, all female subjects in this study reported that they had never had sex at the time the study was conducted. Contrastly, the study did not find any

significant difference between the male and female students with regards to suicide, tobacco, or alcohol risk. The study also found that males and females differed on two domains of wellbeing. The females in the study sample reported having higher overall confidence in their intellectual abilities and having greater satisfaction with regards to their physical appearance than the male students in the study. This finding does appear unique to the study population as there were no significant differences between males and females on any of domains of wellbeing in the general Piers-Harris 2 standardization sample of adolescents of the same age (Piers & Herzberg, 2009).

The study also examined if there was a difference between the two styles of martial arts related to risk behaviors and wellbeing. The hypothesis was that there would not be a difference as both styles are traditional and teach similar principles. As previously stated in the literature review, research suggests that newer styles of martial arts like Mixed Martial Arts (MMA) differ from traditional styles of training. This study attempted to examine if there were any difference between the two styles of traditional training examined in the study related to risk and wellbeing. As expected, there was no difference between the students who trained in Hapkido from those who trained in Kempo with regards to engaging in risk behaviors. There was also no difference between the students who trained in either discipline on four of the six measures of wellbeing. Contrary to the hypotheses, Hapkido students reported having higher overall confidence in their intellectual abilities and perceived themselves as more successful in their peer relationships than Kempo students.

One of the most exciting findings of this study was the comparison of the study's high school martial arts participants to the national sample collected by the Center for

Disease Control. A significantly lower percentage of the study participants indicated engaging in 10 of 12 assessed risk behaviors than did a sample of general population high school students in the United States. These findings suggest that there is a link between practicing in traditional martial arts and abstaining from engagement in specific risk behaviors such as suicidal thinking, tobacco use, alcohol use, substance use, and sexual activity.

The present study does echo some of the past research that regular engagement in physical activity may increase overall wellbeing and act as a preventive measure against risk behaviors. Although length of training did not appear to significantly impact risk behavior engagement, the martial arts study participants endorsed significantly less engagement in risk behaviors than did students of the same age in a general sample. The students also reported having a balanced sense of self-evaluation as the average reports of self-concept and overall wellbeing were in the average range.

Limitations

Several limitations may reduce the ability of these results to be generalized to the general population. There was also no control group of students who did not participate in martial arts or another structured physical activity to compare to the experimental group. The study was limited to students of only two disciplines of martial arts in a geographically limited area. It is possible that other factors that were not accounted for in this study may have also attributed to the overall low engagement in risk behaviors and the healthy sense of self-concept and wellbeing found in the study. Also, since so few students endorsed engaging in any risk behaviors at all, it may have impacted the overall

results. This is also true of the fact that the vast majority of subjects were not beginner students. The average length of training for the students who participated in the study was over six years. Because the data was skewed towards advanced students, the effect of training on the domains of interest may not be representative in this sample. Another factor is that most of the study's participants were males which may have impacted the third hypothesis comparing the risk behaviors of male and female students. Participation in the study was lower than initially projected as well due to one studio dropping out of the study completely and some of the instructors not being able to recruit as many students as they initially had hoped.

Implications and Future Directions

The study findings imply that training in the martial arts has significant psychosocial benefits. Previous research infers that it is the unique training principles and atmosphere that produce the beneficial outcomes, but there was not a lot of hard data to support this claim. The participants of this study indicated high overall wellbeing and self-concept as well as low engagement in risk behaviors as compared to the general population. This suggests that their training does indeed act to improve wellbeing and decrease risk.

The findings of this study also indicate that length of training is not a strong predictor of engaging in risk behaviors or overall wellbeing in adolescent martial arts students. It is possible that a more varied sample with a larger number of beginner students could yield different results. Of interest is that the high school students in the study sample appear to engage in much less risk than high school students in the general

sample provided in the CDC data. In the future, it might be interesting to compare martial arts students to students who do not identify as engaging in a regular structured physical exercise activity. In the battle to protect our youth against coming of age hazards like suicide risk, self-harm behaviors, drug and alcohol addiction, STI infections, and unintentional pregnancies, researchers need to identify protective and risk factors that predict risk behavior engagement in adolescents in order to create policies that will affectively combat the problem. Participation in the martial arts appears to be an under researched area that could potentially yield fruitful results.

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APPENDIX A
ITEMS AND SCALES

Demographics

Middle School YRBSS	High School YRBSS
How old are you?	How old are you?
A. 10 years old or younger	A. 12 years old or younger
B. 11 years old	B. 13 years old
C. 12 years old	C. 14 years old
D. 13 years old	D. 15 years old
E. 14 years old	E. 16 years old
F. 15 years old	F. 17 years old
G. 16 years old or older	G. 18 years old or older

What is your sex?

- A. Female
- B. Male

Training Background Question

How long have you been training at this studio?

1. Less than 6 months
2. 6 months to 1 year
3. 1 year to 1.5 years
4. 1.5 to 2 years
5. 2 to 2.5 years
6. 2.5 to 3 years
7. 3 to 3.5 years
8. 3.5 to 4 years
9. 4 or more years

Risk Variables

Middle School YRBSS	High School YRBSS
Suicide Risk	
Have you ever seriously thought about killing yourself?	During the past 12 months, did you ever feel so sad or hopeless almost every day for two weeks or more in a row that you stopped doing some usual activities?
A. Yes	
B. No	
Have you ever made a plan about how you would kill yourself?	A. Yes
	B. No

<p>A. Yes B. No</p> <p>17. Have you ever tried to kill yourself?</p> <p>A. Yes B. No</p>	<p>During the past 12 months, did you ever seriously consider attempting suicide?</p> <p>A. Yes B. No</p> <p>During the past 12 months, did you make a plan about how you would attempt suicide?</p> <p>A. Yes B. No</p> <p>If you attempted suicide during the past 12 months, did any attempt result in an injury, poisoning, or overdose that had to be treated by a doctor or nurse?</p> <p>A. I did not attempt suicide during the past 12 months B. Yes C. No</p>
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Tobacco Risk	
<p>Have you ever tried cigarette smoking, even one or two puffs?</p> <p>A. Yes B. No</p> <p>During the past 30 days, on how many days did you smoke cigarettes?</p> <p>A. 0 days B. 1 or 2 days C. 3 to 5 days D. 6 to 9 days E. 10 to 19 days F. 20 to 29 days G. All 30 days</p>	<p>Have you ever tried cigarette smoking, even one or two puffs?</p> <p>A. Yes B. No</p> <p>During the past 30 days, on how many days did you smoke cigarettes?</p> <p>A. 0 days B. 1 or 2 days C. 3 to 5 days D. 6 to 9 days E. 10 to 19 days F. 20 to 29 days G. All 30 days</p>
<p>During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?</p> <p>A. I did not smoke cigarettes during the past 30 days B. Less than 1 cigarette per day C. 1 cigarette per day D. 2 to 5 cigarettes per day E. 6 to 10 cigarettes per day F. 11 to 20 cigarettes per day G. More than 20 cigarettes per day</p>	<p>During the past 30 days, on the days you smoked, how many cigarettes did you smoke per day?</p> <p>A. I did not smoke cigarettes during the past 30 days B. Less than 1 cigarette per day C. 1 cigarette per day D. 2 to 5 cigarettes per day E. 6 to 10 cigarettes per day F. 11 to 20 cigarettes per day G. More than 20 cigarettes per day</p>
<p>Have you ever smoked cigarettes daily, that is, at least one cigarette every day for 30 days?</p> <p>A. Yes B. No</p> <p>6 2011 middle school YRBS</p>	<p>During the past 30 days, on how many days did you smoke cigarettes on school property?</p> <p>A. 0 days B. 1 or 2 days</p>

24. During the past 30 days, on how many days did you use **chewing tobacco, snuff, or dip**, such as Redman, Levi Garrett, Beechnut, Skoal, Skoal Bandits, or Copenhagen?

- A. 0 days
- B. 1 or 2 days
- C. 3 to 5 days
- D. 6 to 9 days
- E. 10 to 19 days
- F. 20 to 29 days
- G. All 30 days

25. During the past 30 days, on how many days did you smoke **cigars, cigarillos, or little cigars**?

- A. 0 days
- B. 1 or 2 days
- C. 3 to 5 days
- D. 6 to 9 days
- E. 10 to 19 days
- F. 20 to 29 days
- G. All 30 days

- C. 3 to 5 days
- D. 6 to 9 days
- E. 10 to 19 days
- F. 20 to 29 days
- G. All 30 days

35. Have you ever smoked cigarettes daily, that is, at least one cigarette every day for 30 days?

- A. Yes
- B. No

During the past 30 days, on how many days did you smoke **cigars, cigarillos, or little cigars**?

- A. 0 days
- B. 1 or 2 days
- C. 3 to 5 days
- D. 6 to 9 days
- E. 10 to 19 days
- F. 20 to 29 days
- G. All 30 days

Drug Risk Items

Have you ever used marijuana?

- A. Yes
- B. No

Have you ever used **any** form of cocaine, including powder, crack, or freebase?

- A. Yes
- B. No

Have you ever sniffed glue, breathed the contents of spray cans, or inhaled any paints or sprays to get high?

- A. Yes
- B. No

Have you ever taken **steroid pills or shots** without a doctor's prescription?

- A. Yes
- B. No

Have you ever taken a **prescription drug** (such as OxyContin, Percocet, Vicodin, codeine, Adderall, Ritalin, or Xanax) without a doctor's prescription?

- A. Yes
- B. No

During your life, how many times have you used marijuana?

- A. 0 times
- B. 1 or 2 times
- C. 3 to 9 times
- D. 10 to 19 times
- E. 20 to 39 times
- F. 40 to 99 times
- G. 100 or more times

During your life, how many times have you used **any** form of cocaine, including powder, crack, or freebase?

- A. 0 times
- B. 1 or 2 times
- C. 3 to 9 times
- D. 10 to 19 times
- E. 20 to 39 times
- F. 40 or more times

During your life, how many times have you sniffed glue, breathed the contents of aerosol spray cans, or inhaled any paints or sprays to get high?

- A. 0 times
-

- B. 1 or 2 times
- C. 3 to 9 times
- D. 10 to 19 times
- E. 20 to 39 times
- F. 40 or more times

During your life, how many times have you taken **steroid pills or shots** without a doctor's prescription?

- A. 0 times
- B. 1 or 2 times
- C. 3 to 9 times
- D. 10 to 19 times
- E. 20 to 39 times
- F. 40 or more times

During your life, how many times have you taken a **prescription drug** (such as OxyContin, Percocet, Vicodin, codeine, Adderall, Ritalin, or Xanax) without a doctor's prescription?

- A. 0 times
- B. 1 or 2 times
- C. 3 to 9 times
- D. 10 to 19 times
- E. 20 to 39 times
- F. 40 or more times

*All YRBSS High School Drug items Recoded into Dichotomous variables

Sex Risk

- Have you ever had sexual intercourse?
- A. Yes
 - B. No
- With how many people have you ever had sexual intercourse?
- A. I have never had sexual intercourse
 - B. 1 person
 - C. 2 people
 - D. 3 people
 - E. 4 people
 - F. 5 people
 - G. 6 or more people
- The **last time** you had sexual intercourse, did you or your partner use a condom?
- A. I have never had sexual intercourse
 - B. Yes

- Have you ever had sexual intercourse?
- A. Yes
 - B. No
- During your life, with how many people have you had sexual intercourse?
- A. I have never had sexual intercourse
 - B. 1 person
 - C. 2 people
 - D. 3 people
 - E. 4 people
 - F. 5 people
 - G. 6 or more people
- The **last time** you had sexual intercourse, did you or your partner use a condom?
- A. I have never had sexual intercourse
 - B. Yes

C. No	C. No
Alcohol Risk	
Have you ever had a drink of alcohol, other than a few sips?	During your life, on how many days have you had at least one drink of alcohol?
A. Yes	A. 0 days
B. No	B. 1 or 2 days
	C. 3 to 9 days
	D. 10 to 19 days
	E. 20 to 39 days
	F. 40 to 99 days
	G. 100 or more days
	*Item Dichotomized

APPENDIX B

IRB APPROVAL FORM



INSTITUTIONAL REVIEW BOARD
RESEARCH PROTECTION PROGRAMS
24887 Taylor Street • Suite 202 • Loma Linda, CA 92350
(909) 558-4531 (voice) • (909) 558-0131 (fax)

Initial Approval Notice - Expedited

IRB# 5120063

To: **Arechiga, Adam L.**
Department: **Psychology**
Protocol: **Adolescent participation in traditional martial arts: effects of training on risk behaviors and psychological wellbeing**

This study was reviewed and approved administratively on behalf of the IRB. This decision includes the following determinations:

- Risk to research subjects: **Minimal**
- Approval period begins: **16-May-2012** and ends **15-May-2013**
- Stipulations of approval:
See attached list of items (if applicable).
See Appendix A for Conditions of Approval.

Adverse events and unanticipated problems must be reported in accord with the attached Adverse Event Reporting Matrix A.

All investigators are responsible for assuring that studies are conducted according to the approved protocol. Principal investigators are responsible for the actions of sub-investigators and staff with regard to this approval.

Please note the PI's name and the assigned IRB number, as indicated above, on any future communications with the IRB. Direct all communications to the IRB c/o the Office of Sponsored Research. Thank you for your cooperation in LLU's shared responsibility for the ethical use of human subject in research.

Signature of IRB Chair/Designee: *R L Riggsby* Date: 5/21/12.

Loma Linda University Adventist Health Sciences Center holds Federalwide Assurance (FWA) No. 00006447 with the U.S. Office for Human Research Protections, and the IRB registration no. is IORG0000226. This Assurance applies to the following institutions: Loma Linda University, Loma Linda University Medical Center (including Loma Linda University Children's Hospital, LLU Community Medical Center), Loma Linda University Behavioral Medicine, and affiliated medical practices groups.

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Initial Approval Notice - Appendix A

The following are standard conditions of IRB approval:

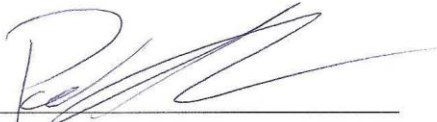
1. No subjects may be involved in any study procedure prior to the IRB approval date indicated above or after the expiration date.
2. Unless IRB has stipulated a waiver of informed consent above, the IRB-approved consent form must be used to enroll subjects. The official consent accompanying this letter may be used as the master for making copies to provide prospective study participants.
3. All protocol modifications, including changes to the informed consent document(s) or process, must be IRB approved prior to implementation unless they are intended to reduce risk.
4. All recruitment materials and methods must be approved by the IRB prior to being used.
5. Any increase in the number of subjects to be enrolled must be pre-approved by IRB.
6. IRB approval will expire on the end date indicated above; no study activities may occur after this date. To request renewal of IRB approval or to close a study, submit a Research Report Form (see <http://research.llu.edu/AdverseEvent.asp>).
7. All records relating to this project, including signed consent forms, must be kept on file for at least 3 years following completion of the study.
8. This project may not continue beyond the end-date indicated in this approval document. Prior to the expiration of this approval, the PI shall complete and submit a Research Report Form requesting renewal of IRB approval or closure. As a courtesy, copies of this form will be sent to the PI starting 60 days prior to expiration. All study activities must cease after the approval end-date unless it is determined to be in the best interests of already enrolled subjects to continue participating in the research.

APPENDIX C

STUDIO AGREEMENT FORMS

Studio Participation Agreement Form

I, Paulo S. Reynaga (print name) am a representative of Z Ultimate Self Defense Studios (name of studio) in Rancho Cucamonga California. I agree to allow Stephanie Goldsmith, MA and Adam Arechiga, PsyD, DrPH access to our students for the purposes of data collection for their study entitled *Adolescent Participation in Traditional Martial Arts: Effects of Training on Risk Behaviors and Psychological Wellbeing*.




Name of instructor

4/30/12

Date

Studio Participation Agreement Form

I, Jose F. Esparza (print name) am a representative of
Kim's Hapkido (name of studio) in Yucaipa,
California. I agree to allow Stephanie Goldsmith, MA and Adam Arechiga, PsyD,
DrPH access to our students for the purposes of data collection for their study
entitled *Adolescent Participation in Traditional Martial Arts: Effects of Training
on Risk Behaviors and Psychological Wellbeing*.


Name of instructor

6-4-12
Date

APPENDIX D

INFORMED CONSENT



LOMA LINDA UNIVERSITY
School of Behavioral Health

INFORMED CONSENT

TITLE: The Relationship between Participation in Martial Arts and Psychological Well-Being
PRINCIPAL INVESTIGATORS: Adam Arechiga, PsyD, DrPH and Stephanie Goldsmith, MA

For ease of reading, the word "you" or "your" will be used throughout this document to refer to the person who may enter the research program.

Why Is This Study Being Done?

The purpose of this study is to examine the effects of traditional martial arts training on risk behaviors and variables of psychological well-being in an adolescent population. Identified risk behaviors include drug, tobacco, and alcohol use as well as self-harm and sexual behaviors. Variables of interest related to psychological well-being in this study include physical appearance and attributes, intellectual and school status, happiness and satisfaction, freedom from anxiety, behavioral adjustment, and popularity.

You are invited to participate in this research study because you are currently a student at a traditional martial arts training studio.

How Many People Will Take Part In This Study?

Approximately 80 subjects from traditional martial arts studios in LA and San Bernardino counties will participate in this study.

How Long Will The Study Go On?

Participation in this study will take about 30-45 minutes.

How Will I Be Involved?

You must meet the following requirements to be in the study:

You can participate in this study if you are between the ages of 11 and 18 years old, are currently enrolled as a student in a traditional martial arts studio, and have the ability to read and speak English at a 6th grade reading level or better.

Participation in this study involves the following:

Participants will be asked to complete three surveys containing items covering your background in martial arts, a variety of risk behaviors, and self-concept. These surveys should take

Loma Linda University
Adventist Health Sciences Center
Institutional Review Board
Approved 5/21/12 Void after 5/15/2013
#5120063 Chair R. J. Ruppel, MD

Subject Initials _____

Date _____

Page 1 of 3

Consent Version Date: _____

A SEVENTH-DAY ADVENTIST HEALTH SCIENCES INSTITUTION
DEPARTMENT OF PSYCHOLOGY | 11130 Anderson Street, Loma Linda, California 92350
(909) 558-8577 • fax (909) 558-0171 • www.llu.edu

approximately 30 to 45 minutes to complete. If you agree to participate, you will be responsible for returning the completed surveys when you are finished.

What Are The Reasonably Foreseeable Risks Or Discomforts I Might Have?

The types of questions you will be asked may be sensitive. We will ask you about behaviors like sexual activity and the use of drugs and alcohol, however, no names will be on the survey form so this information cannot be matched up to you at any point. You may stop at any time or may choose not to answer questions. Any information you reveal on this questionnaire will remain completely anonymous, and no effort will ever be made to identify you.

Will There Be Any Benefit To Me Or Others?

The data gathered from this study will be used to understand the needs of adolescents in future prevention and education programs.

What Are My Rights As A Subject?

Participation in this study is voluntary. Your decision whether or not to participate or withdraw at any time from the study will not affect your ongoing relationship with your instructors and will not involve any penalty or loss of benefits to which you are otherwise entitled.

What Happens If I Want To Stop Taking Part In This Study?

You are free to withdraw from this study at any time. If you decide to withdraw from this study you should return the study materials to you instructor immediately.

How Will Information About Me Be Kept Confidential?

Efforts will be made to keep your personal information confidential. No student or company names will be included with the surveys. No attempts will ever be made to identify individual responses by the researchers or the instructors. Data from the surveys will be entered into an electronic database. The resulting dataset will be secured with a password and will be stored on a computer locked with a password. You will not be identified by name in any publications describing the results of this study.

What Costs Are Involved?

There is no cost to you for participating in this study.

Will I Be Paid To Participate In This Study?

You will receive a coupon for 20% off martial arts gear though your studio for your participation in this study.

Who Do I Call If I Have Questions?

If you wish to contact an impartial third party not associated with this study regarding any questions about your rights or to report a complaint you may have about the study, you may contact the Office of Patient Relations, Loma Linda University Medical Center, Loma Linda, CA 92354, phone (909) 558-4647, e-mail patientrelations@llu.edu for information and assistance. You may also call a mental health crisis hotline at 1-800-832-9119 if you experience any distress related to participation in this study.

Loma Linda University
Adventist Health Sciences Center
Institutional Review Board
Approved 5/21/12 Void after 5/15/2013
#5120062 Chair R. L. Riggins

Subject Initials _____

Date _____

Page 2 of 3

Consent Version Date: _____

Subject's Statement Of Consent

I have read the contents of the consent form given by the investigator. My questions concerning this study have been answered to my satisfaction. This protocol has been explained to my child at a level that he/she can comprehend and I give permission for my child to participate in the study. Signing this consent document does not waive my rights nor does it release the investigators, institution or sponsors from their responsibilities. I may call Adam Arechiga, PsyD, DrPH during routine office hours at (909) 558-8781 if I have additional questions or concerns.

Signature of Subject

Printed Name of Subject

Date

Signature of Parent/Guardian (if subject
is under 18 years old)

Printed Name of Parent/Guardian

Date

Loma Linda University
Adventist Health Sciences Center
Institutional Review Board
Approved 5/21/12 Void after 5/16/2013
#5120063 Chair R. L. Reynolds

Subject Initials _____

Date _____

Page 3 of 3

Consent Version Date: _____

APPENDIX E
PROMOTIONAL FLIER



**Earn 20% off your next
studio gear purchase!**

This studio, in conjunction with Loma Linda University, is conducting a study to explore the effects of participation in traditional martial arts training. Based on previous research in health and sports psychology, there is evidence that structured physical activity may act decrease risk behaviors and improve better overall wellbeing. We believe that this is also true for the traditional martial arts community. Help us find out!

Participants: Students between the ages of 11 and 18*

Materials: Three questionnaires provided by Loma Linda University Researchers

Compensation: One coupon for 20% off studio gear



*Parents must provide written consent for participants under the age of 18

APPENDIX F

STUDIO INSTRUCTION SHEET

Instructions for Martial Arts Research Study

1. Provide consent forms to eligible students (ages 11-18).
 - a. Consent forms for students between the ages of 11 and 17 must have both a parent's and the participating student's signatures.
 - b. Students who are 18 may sign their own forms and do not need a parent's signature.
 - c. Students **MUST** provide a valid consent form to participate in the study
2. Provide student with an appropriate age research packet (orange envelopes).
 - a. There are two different packets. One is for middle school students and the other is for high school students. It is very important that each student receives the appropriate packet for their age.
 - i. If the student is between middle school and high school or has just graduated high school, please give the packet for the grade they have *just completed*. For example: If a student is about to start their freshman year of high school, they will still need to complete the middle school packet.
 - ii. If there are more eligible participants of either middle school or high school age, you can replace the Youth Risk Behavior Survey for the appropriate high school or middle school version. No other forms would need to be changed.
 - b. Please remind the student that the study is anonymous and that **NO** attempt will be made to identify them from their answers.
 - i. They are **NOT** to put their name on any of the materials even if there is a space for it on the survey.
 - ii. Please encourage them to complete all of the questions.
 - c. The students **MUST** complete the surveys in the studio.
 - i. They cannot take them home as this risks their anonymity.
 - d. Instruct the students to seal their envelope when they have completed all of the surveys and to return it to you.
3. When the student completes their survey, please give them one of the provided blue 20% off coupons.
 - a. Please do not provide the student with the coupon unless they have completed all of the surveys and returned them to you in the sealed orange envelopes.
4. Call Stephanie when all of the packets are completed or when there are no more eligible participants. She will pick up the study materials. Do **NOT** release any of the study materials to anyone except Stephanie Goldsmith or Adam Arechiga.

If there are any questions at all about administration procedures, please do not hesitate to call Stephanie Goldsmith, MA at 702-524-4967. It is better to ask than to guess. Thank you for your time and effort!

APPENDIX G

STUDIO FEEDBACK REPORTS

Adolescent Participation in Traditional Martial Arts: Effects of Training on Risk Behaviors and Psychological Wellbeing

Overall Study Findings:

- The length of time students have trained in martial arts did not affect how much risk the students engaged in or how they perceived their sense of overall well-being.
- There was not much difference between the two different martial arts disciplines (Hapkido and Kempo) with regards to risk taking and perception of well-being.
- When the high school martial arts students were compared to the general population (a nationwide sample of high school students), our sample of martial arts students engaged in significantly less risk behavior overall!
 - Our martial arts students reported engaging in significantly less suicide risk, using less tobacco, alcohol, and illegal drugs, and engaging in less sexual risk taking behaviors than the general population.

Kempo Student Information:

Total participants: 22 students

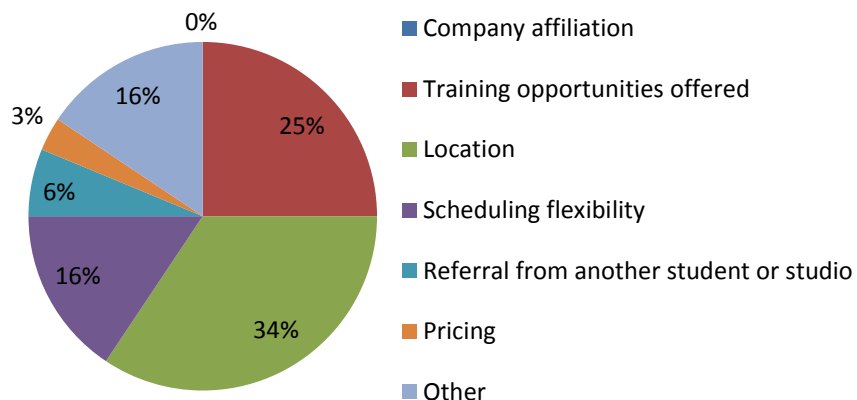
Average Age: 14.81 years

Average Length of Training: 7.32 years

Average Classes per week: 2.64 classes

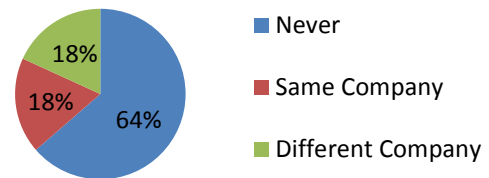
10. Why did you select to train at this studio? Please select all that apply.

Reasons for Training at this Studio



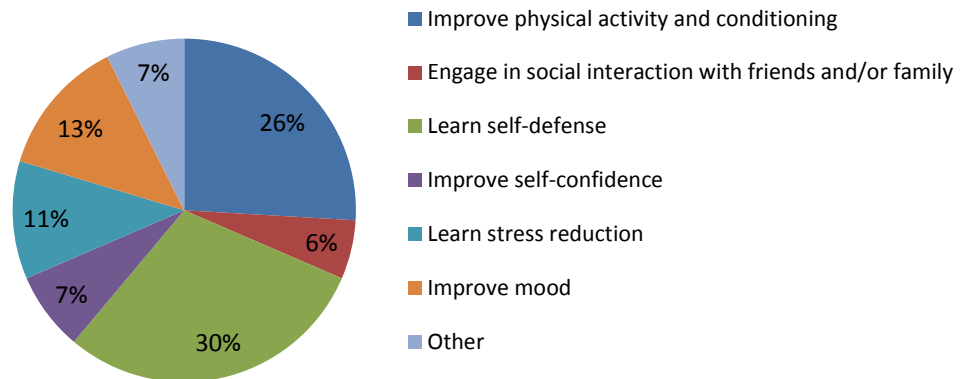
11. Have you ever trained in martial arts previous to training at this studio?

Previous Training



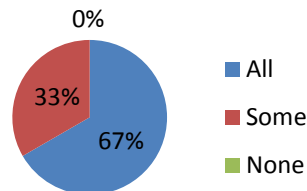
12. Why did you begin martial arts training? Please select all that apply.

Reasons for Initiating Training



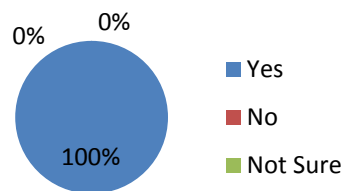
13. Do you feel you have achieved these goals in your training?

Achieved Goals?



14. Would you recommend this studio to a friend?

Recommend



Adolescent Participation in Traditional Martial Arts: Effects of Training on Risk Behaviors and Psychological Wellbeing

Overall Study Findings:

- The length of time students have trained in martial arts did not affect how much risk the students engaged in or how they perceived their sense of overall well-being.
- There was not much difference between the two different martial arts disciplines (Hapkido and Kempo) with regards to risk taking and perception of well-being.
- When the high school martial arts students were compared to the general population (a nationwide sample of high school students), our sample of martial arts students engaged in significantly less risk behavior overall!
 - Our martial arts students reported engaging in significantly less suicide risk, using less tobacco, alcohol, and illegal drugs, and engaging in less sexual risk taking behaviors than the general population.

Hapkido Student Information:

Total participants: 33 students

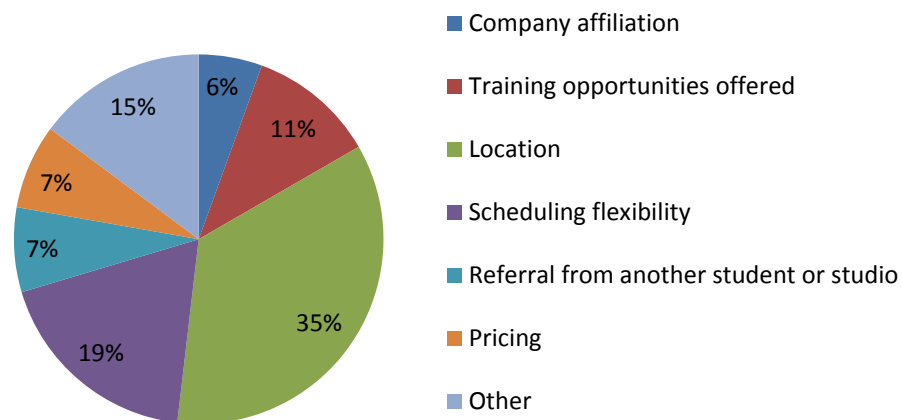
Average Age: 14.27 years

Average Length of Training: 5.97 years

Average Classes per week: 2.82 classes

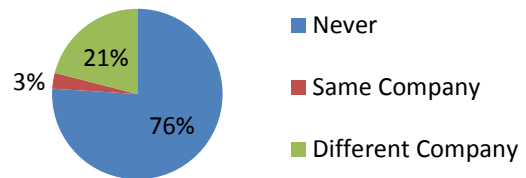
15. Why did you select to train at this studio? Please select all that apply.

Reasons for Training at this Studio



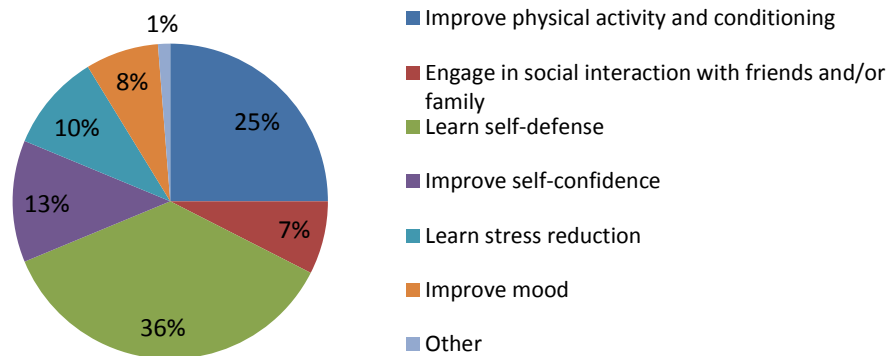
16. Have you ever trained in martial arts previous to training at this studio?

Previous Training



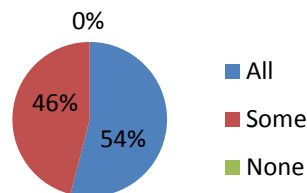
17. Why did you begin martial arts training? Please select all that apply.

Reasons for Initiating Training



18. Do you feel you have achieved these goals in your training?

Achieved Goals?



19. Would you recommend this studio to a friend?

Recommend

