# MARTIAL ARTS BENEFITS FOR CHILDREN

by

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### ABSTRACT

Research on alternative methods for improving children's self-concept is common. One often promoted method is through martial arts training, but there has been minimal study using a controlled experimental design. The purpose of this study was to examine the effectiveness of the Karate for Kids martial arts program in improving self-concept and physical fitness. Children (N=42) 7 to 12 years of age with no previous martial arts experience were randomly assigned to either a treatment group that attended martial arts classes for a period of 8 weeks, or to a control group that had no martial arts training. Results, though unanimously positive in the direction of increased self-concept and physical fitness, were not significant enough to establish statistically significant conclusions. Parent and child surveys also unanimously indicated a perceived increase in self-concept, image of their body, physical fitness and an increase in the children demonstrating respect at home. The apparent reasons for low power in the results seem to me related mainly to measurement sensitivity. Therefore there is a strong implication that martial arts training as suggested here may provide these benefits to children. This also suggests that further research, taking the lessons here into consideration, will provide statistically significant results for each area under examination in this study. In addition, counselors may want to consider martial arts classes as a potential support service for children who need improved self-concept.

### DEDICATION

This thesis is dedicated to the memory of George Christakos, an instructor at the Black Belt Academy, who died in a tragic automobile accident at the age of 19. He was an ideal example of dedication, perseverance, attitude, and compassion. This is exactly what we would like to see result from martial arts training. His memory lives on in the hearts of all of those adults and kids he taught.

### ACKNOWLEDEMENTS

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### CHAPTER 1: INTRODUCTION & LITERATURE REVIEW

Children in today's society are exposed to an increasing number of stresses and expectations. While research on improving student education is common, there may not be enough emphasis on some non-academic aspects of the children's development, such as the related constructs of self-concept and self-esteem. Research has shown these characteristics to be important to childhood development and academic performance (Burke, Ellison & Hunt, 1985). Therefore both teachers and counselors may benefit from referral options for child clients with poor self-concept. In recent years martial arts has been suggested as a method to help people improve in these areas (Prince, 1996). While there has been some research regarding martial arts and self-concept, there is little controlled experimental data regarding children specifically. This study will attempt to measure particular benefits of martial arts training, specifically self-concept and physical fitness.

### SELF-CONCEPT

There is not universal agreement about the definition of self-concept. A common assumption is that self-concept as it emerges in young children during the preschool years is a global orientation that influences behavior in social settings (Jensen, 1985). As children mature, they make more discrete self-judgements about their worth in different areas. These differential judgements do not occur until apparently about the age of 8 (Harter, 1982). Content dimensions of self-concept appear to be present in early self-concept. There are many theories of development of self-concept. Denzin (1972) presents a comparative analysis of Mead, Cooley and Piaget:

"These three theorists agree with each other on five major points. First, they emphasize the importance of affective and cognitive processes in self-development. Second, they view each stage of development as qualitatively different from the previous stage. Third, they emphasize the role of interactional processes in cognitive development and in early self-hood. Fourth, they reject associationist and stimulus-response theories of learning. To them, the organism progressively acquires the ability to stimulate its own conduct and to formulate its own plans of action: objects and stimuli carry no intrinsic meaning. (According to Kohlberg (1969;347-361), Piaget treats learning as a complex process of differentiation and assimilation, which is in itself contingent on the development of language acquisition.) Fifth, they emphasize comparable empirical methods for the study of self. Each used a variation on the ethnographic, casestudy method..... Each emphasized the importance of linguistic utterances as central indicators of self-hood... Each attended to gestures, to performances, and to non-verbal actions as indicators"(p 293-294).

The effect of a high self-concept on academic achievement has been a subject of much study (Bridgeman & Shipman, 1978;Brookover, Thomas & Paterson, 1964; Harter, 1983; Midkiff, Burke & Hunt, 1984; Purkey, 1970; Shavelson & Bolus, 1982; Glanz, 1994). Recent efforts have focused on improving the instruments by which to measure self-concept. This is due to the fact that while there has been a significant and consistent relationship between self-concept and academic achievement, the measurements of self-concept have

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not been so consistent(Burke, et al, 1985). Nevertheless, while the measurement instruments have been debated, it seems clear that a high self-concept will have a positive effect on academic achievement. Therefore, if martial arts training improves self-concept, we can expect a resultant improvement in academic performance.

### PHYSICAL FITNESS

Physical fitness is important to health and quality of life. The Surgeon General's Report on Physical Activity and Health (President's Council on Physical Fitness and Sports, 1996) summarizes existing research showing the benefits of physical activity in preventing disease and to draw conclusions that can be useful to Americans who are interested in improving their health. This report concludes:

That physical activity (exercise) can benefit people of all ages.

Physical activity reduces the risk of premature mortality

Exercise reduces the risk of heart disease, hypertension, colon cancer, and diabetes mellitus.

Exercise improves mental health and is important for the health of muscles, bones and joints.

Exercise benefits the cardiovascular, musculoskeletal, endocrine, metabolic, and immune systems.

Almost all areas of personal health is improved by physical activity.

Unfortunately, the report also says that

More then 60 percent of all American adults are not physically active, and physical activity declines during adolescence.

Daily enrollment in physical education classes has declined among high school students from 42 percent in 1991 to 25 percent in 1995. Research on understanding and promoting physical activity is at an early stage, but some interventions to promote physical activity through schools, worksites and health care settings have been evaluated and found successful.

Obviously there is a need for promoting physical fitness and perhaps starting at an early age will improve the likelihood of continuing to maintain a higher level of activity. Therefore, because research in this area (promoting activity in youth) is limited, and there are significant benefits to exercise and physical activity, more study is needed to address options for promoting physical fitness in youth.

While physical fitness is generally agreed on to be important, the term physical fitness is also a construct with many definitions. These all seem to include ability to perform to certain standards physically through exercises or drills. Some definitions also include measurement of blood pressure, posture, height/weight and blood tests to determine level of fitness. Measurement of youth physical fitness is difficult due to the variance of physical development with aging. Any measurement must take a child's age into account, as well as the wide developmental range within a specific age. It is important to note that such measures are *relative* to some standard based on others performance. One such standard used recently is the President's Challenge National Youth Fitness. This is a program based on performing five exercises and the results are compared with the 1985 National School Population Fitness Survey (Reiff, 1986). Students are given awards based on their level of performance relative to the survey. For example, the participants receive the Presidential Physical

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Fitness Award (PPFA) when they score at or above the 85<sup>th</sup> percentile in all five areas. See Appendix D and chapter 2 for more details (President's Council on Physical Fitness and Sports, 1998). This is a simple, but well recognized standard for determining physical fitness and health in youth.

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### MARTIAL ARTS

Martial arts can be generally defined as any structured system of fighting. Systems of martial arts have been around for thousands of years. While there is no exact time known, the earliest martial art is believed to have begun 3000 years ago in China. The difficulty in determining when and where martial arts began, is due to the sparse historical records available in Asia. Though originally there were only a few systems, over time a large number of martial arts styles was practiced. Some of the ones taught today include T'ai Chi, Kung Fu, Karate, Judo, and Taekwondo. Even within these styles of martial arts there are many variants and within these systems there are many variants. Some are based on the unique characteristics of the founder of the style, others are focused on a particular fighting method (Urban, 1993). Often these styles are difficult for children because they are either too militant, require too much fighting contact, are not presented in a way that kids can understand (low level of teaching training for instructors), or the curriculum is not structured for kids.

Our study will focus on the American Taekwondo Association (ATA), the largest centrally administered (single style) martial arts association in the world. (Lee, 1993) This style has programs for children in over 900 of schools across the United States and the world. Although the roots of Taekwondo can be traced

back to 300 B.C., The actual word "Taekwondo" was not adopted until the year 1955. Because of the Japanese occupation of Korea, the martial arts in Korea were only taught in secret. After Korean liberation from Japan, a war general, Hong Hi Choi began a movement to unify the styles of training into one body. The words used at that time reflected the Japanese and Chinese influence on the martial arts so he presented the name "Taekwondo" at a conference on April 11, 1955. It became recognized then as the national art of Korea. Taekwondo is made up of three words: "Tae" which means to kick or jump, "Kwon" which means the fist or the hand, and "Do" which means the way or path as a way of life. Altogether this can be translated as the "way of the hand and foot" (Lee, 1993a). One Taekwondo program from the ATA is called Karate for Kids . This program is designed for kids 7 years of age and up. The features of this Taekwondo program are based on the concept that each student is different and has different needs. The building blocks for this are based on 12 themes that are integrated into classes such as goal setting, self-control, courtesy, integrity, friendship, confidence, self-awareness, self-esteem, perseverance, selfimprovement, respect, and dedication.

A review of martial arts literature will focus on current martial arts research in related areas. The literature surrounding martial arts comes from a variety of sources. Some is academic research, some is historical, and some are from individuals with years of martial arts training, but little academic or scientific background. While all of these sources are valid and useful, we will primarily examine scholarly research.

Prince (1996) studied the differences between the self-concept of beginning, intermediate and advanced martial arts students. Students from five different martial arts schools participated, and took the Tennessee Self-concept Scale. It is a 100 question test that measures several kinds of self-concept including physical self, moral-ethical self, personal self, family self, social self, self-satisfaction, behavior and the overall self-concept. The five martial arts styles studied were: Kenpo, Isshinryu, Aikido, Jujitsu and Hapkido. A statistically significant difference was found between the scores of the beginning level students and the intermediate and advanced level students. No significant difference was found between 18 and 44 years old. This study shows that early training (to an intermediate level) may help build a positive self-concept. However this was a survey type study and was limited to 18 to 44 year old participants. In addition, it did not measure a specific treatment because it reviewed five different styles of martial arts.

In a study by Glanz (1994), students classified as "at-risk" have been part of a program that integrated martial arts training into the overall curriculum. The students who participated were 4<sup>th</sup> and 5<sup>th</sup> graders, currently in gangs, or likely to join them. This program was a structured martial arts class focused on concentration and self-control. Based at P.S. 49 in Brooklyn, New York, classes had been conducted for three years, two times a week for twenty to thirty students. The school itself served approximately 1500 students and was identified as a school in "need of assistance" because of its low reading scores. Socioeconomic data indicated 95% of the students were eligible for a free lunch. Their conclusion was that "it has proven quite successful for some students at-

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risk"(p. 3). This may suggest an improved level of self-concept based on their later improved performance in school. In addition it shows effectiveness of martial arts training for kids in the 9 to 11 year age range. The study does not address effects of martial arts training in more mainstream environments.

Columbus and Rice (1988) did a phenomenological review of martial arts participants to understand what meaning martial arts has for North Americans. This was a study of 10 men and 7 women, ages 20 to 46 (mean age of 25) at a small college in the southeastern United States. Participants were given a request to "Please describe in writing your experience of an everyday life situation in which you realized that training in a martial art is, or would be, a worthwhile activity." (p. 18) The results were organized into four categories that the participants felt martial arts would be good to know:

<u>Criminal Victimization</u>: Martial arts would be a valuable skill in defending or preventing a physical or sexual assault.

<u>Growth and Discovery</u>: Martial arts assists in the process of becoming more aware emotionally, mentally and spiritually.

<u>Task Performance</u>: Skills learned in martial arts classes apply toward, successful completion of tasks in everyday life such as "test taking or competition in other sports". (p. 23)

<u>Life Transition</u>: Discipline and organization from martial arts helped participants going through life transitions such as divorce, adaptation to college life and other "out of control" situations. Therefore, at least for adults, the results of the study indicate a wide range of benefits martial arts training has beyond physical fitness. Perhaps these benefits can also extend to younger age children.

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To study effects of Aikido training on self-esteem, anxiety and anger, a total of 69 college age students were trained in Aikido (20 students), Karate (24), Golf with a pre-test (13) and Golf without a pre-test (12). Results from the Selfesteem scale, State-Trait Anxiety Inventory and the Anger Expression Scales (from the State-Trait Anger Expression Inventory) were performed before and after the 8 weeks of training. The only significant finding was the Karate group showed significantly lower means on Trait-Anxiety). The conclusion was that the subjects should be studied for several years to evaluate changes in test scores (Foster, 1997). While it is true that mental training is integral to these sports, these activities are likely more focused on physical training and the mental benefits come as a result of this focus and concentration on the athletic task at hand. This study was based on martial arts as mostly physical training. Therefore, it is likely that college age students will have different results than in this study because the treatment program for kids is specially designed to address improvement in personality, not just with physical training, but through actual discussions in class.

Upon review of the literature on martial arts training, we can arrive at a few conclusions. Most studies are done with adults, yet thousands of kids are participating in martial arts training, though there is very little scientific study of the benefits of this training, particularly experimental data regarding self-concept. None of these studies used experimental designs. Therefore a study is needed to

examine these benefits for children using a controlled experimental design. The purpose of this effort is to investigate the effect of martial arts training on children's self-concept, and physical development.

### **HYPOTHESES**

- 1. That children who participate in the Karate for Kids martial arts program will improve their overall self-concept more than a wait list control group.
- 2. That children who participate in the Karate for Kids martial arts program will improve their attitude toward their physical characteristics more than a wait list control group.
- 3. That children who participate in the Karate for Kids martial arts program will improve their overall physical fitness more than a wait list control group.

### CHAPTER 2: METHODOLOGY

The study will be a 2 x 2 factorial design. The first independent variable is the martial arts training (treatment or non-treatment) and the second independent variable is time. The measures dependent variables are Self-Concept and Physical Fitness. Self-concept includes a Physical Appearance and Attribute subscale which will be measured as well to determine the child's attitudes concerning his or her physical characteristics. The experimental matrix is shown in Figure 1.

	Martial Arts Training		
Time	Yes	No	
Pro Tost	Self-concept	Self-concept	
F16-165(	Overall Self-concept	Overall Self-concept	
	Body Image Self-	Body Image Self-	
	concept	concept	
	Physical Fitness	Physical Fitness	
Deat Test	Self-concept	Self-concept	
Post-Test	Overall Self-concept	Overall Self-concept	
	Body Image Self-	Body Image Self-	
	concept	concept	
	Physical Fitness	Physical Fitness	

Selection and acquisition of the participants have been reviewed by Arizona State University's Institutional Review Board. See Appendix C for detailed Informed Consent form, Informed Assent form (child form), and Verbal Scripts to be used in the data collection sessions (pre and post-treatment).

Participants will be selected from schools in the north Scottsdale, Arizona area. Children in this area are generally suburban, white, upper middle class (high SES). 40 subjects (male and female, ages 7 to 11) will be recruited via a flyer sent home at elementary schools (see proposed flyer in appendix I). Additional recruitment efforts will be made if these fail to result in required numbers for study. Half of the subjects will be randomly designated in the Control Group and the other half will be in the Treatment Group. All of the subjects will be sent a packet with the proper informed consent, informed assent forms, and a cover letter describing the program and inviting them to the pre-test session(see attached forms). At the pre-test, we will be administering the Piers-Harris Self-Concept Questionnaire (a paper and pencil test), and observe them do three standardized physical fitness tests (the *curl ups*, *right angle push ups*, and the *v-sit reach*) from the President's Challenge National Youth Physical Fitness Program (see Appendix B and III for detailed information). In addition, the parent or guardian will fill out a demographics questionnaire (see Appendix C)At the Pre-Test session, The Treatment Group will also receive a martial arts uniform, white belt, and packet of information about what will be required of them over the next 8 weeks. Those selected for the Control Group will be given identical material following the Post-Test session and be allowed to participate in the same treatment program. All persons assisting with the research and instructors in the program will also complete a confidentiality statement (see

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Appendix III). In addition, any students scoring more than 2 standard deviations below the means for the inventory will be referred to either the Counselor Training Center at ASU or the Scottsdale Prevention Center.

Following the Pre-Test session, the subjects will undergo a standard 8 weeks of martial arts training by Certified Martial Arts instructors. This training will not allow any sparring or fighting to be performed (no physical contact between students), and students will be supervised at all times. At the end of the 8 weeks of training, they may graduate to Orange belt at a formal graduation where they will demonstrate their material in front of their peers and families.

### TREATMENT

Our hypothesis is that a Taekwondo program following the American Taekwondo Association's standards and procedures will improve overall selfconcept, body image, and physical fitness. The program used for children is called *Karate for Kids* (there are other ATA programs for adults and pre-school age kids). This is a standardized method of teaching Taekwondo in a structured and fun way, developed by the American Taekwondo Association (ATA), and is being used in over 800 locations around the United States and around the world. Appendix A includes the specific class planners that instructors will use throughout the treatment. Appendix B is the Karate for Kids program manual that each participant will receive, describing the program.

### Features of Karate for Kids / Taekwondo

The features of the Taekwondo program are based on the concept that each student is different and has different needs. Different methods are used to teach students many things that will apply after the lesson is over. The building blocks for this are based on 12 themes that are integrated into classes such as goal setting, self-control, courtesy, integrity, friendship, confidence, selfawareness, self-esteem, perseverance, self-improvement, respect, and dedication.

The instructors use the following 10 class management ideas in each class:

Set Mood and Tone of Class	Create Positive Climate
Use a Personal Approach	Set Direct Goals
Give Thoughtful Feedback to Student	Reinforce Positive Behavior
Response	
Give Realistic Praise	Use Positive Correction Instead of
	Criticism
Refer to Student by Name	Teach Concept of Personal Victory

Table 1 – Ten Class Management Skills

Each child wears a "V" patch on their uniform. This signifies *personal victory*. Personal victory means that their achievement is relative to them - not being better than their peers. On this patch they put small star patches. Blue stars signify great performance in class, at home or at school. Red stars are given when a child has to perform in public (i.e. competition, oral book report, etc.). Gold stars are awarded when a child has great school achievement.

A typical day will begin with a class bowing to show respect and selfcontrol. The bow is also a promise not to hurt other people. The student says their student oath : "Each Day I Will Live By Honoring My Parents And Instructors, Practicing To The Best Of My Abilities, And By Having Courtesy And Respect For Everyone I Meet". This is discussed and provides a philosophy for how the student is expected to be in class and everywhere.

During the main part of class, the student will be given positive feedback when they are demonstrating not only the physical moves they are learning, but also when they are following directions, staying on task, treating other students and instructors with respect and by having a good attitude. Negative feedback (i.e. verbal, frowns, time outs, etc.) is used occasionally as well. Positive feedback will come in many forms such as verbal recognition, stickers (happy faces, dragons, etc.), having a student lead class and special written awards that are later exchanged for bigger awards.

The curriculum in the beginner program is broken down into two month blocks labeled A, B, and C. Each block is a set of "forms" or "poomse" (the Korean word) and "one-steps" that will be learned in the two month period. When students complete the material covered they may graduate to their next belt level. Beginners start at white belt, and should graduate to orange belt following their first two month period if they attend two to three times per week. Following orange belt they will advance to yellow, camouflage, green, purple, blue, brown, red, and then different levels of black belt. Forms are a sequence of 18 to 28

moves that are learned in order. The form is a vehicle for working on the basic moves, as well as flexibility, balance, memory, timing, rhythm, power, focus and concentration. One-steps are a "transition utility" which are designed to help students react to a potential attack with a pre-determined sequence of moves. While forms help students practice balance, 1-steps help students react appropriately to an attacker. The material used in the study from the Karate for Kids manual will be block C material.

Individual moves they learn include hand techniques (blocks and attacks), kicks, and stances. Blocks are designed to deflect an attacker's move without incurring physical harm to oneself. An example of a block is a *high block* which will defend against a punch to the face. The student moves their forearm in a upward motion in front of their face and stops when the arm gets to the top of their head. Hand attacks include punches and knife hand strikes. In a knife hand strike the student starts with an open hand, fingers together and strikes with the outside edge ("knife edge") of their hand. Kicks learned at the beginner level include front kicks, side kicks and round kicks. Executing a front kick involves raising the bent leg (chamber), extending out the foot and making contact with the ball of the foot (extension), returning the foot (re-chamber) and setting it down (return). Front, middle and back stances are the beginner stances. These are specific positions to stand involving an upper body position, foot position and weight distribution. For example in a front stance the feet are pointed straight ahead, one foot three feet (of students feet length, non twelve inches) in front of the other, the body is upright and the weight distribution if 50-50. Consistent exercising in Taekwondo will develop the body in many areas. Hand techniques develop arm, abdominal, back and general upper body strength. Kicks and

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stances help develop leg strength, balance and promote flexibility. Conditioning drills (push ups, crunches, curl ups and other drills) will also contribute to the students physical growth.

The end of class contains an awards presentation where students collect their stars for their performance at home, at school, and in their martial arts class. These awards are primarily to reinforce behavior *outside* of the martial arts school. In this way the activity reaches into many areas of a child's life.

### POST-TREATMENT

Following the treatment, a Post-Test session will be performed using the identical tests performed in the pre-test session, excluding the demographics questionnaire and with the addition of qualitative questions shown in Appendix F.

# MEASUREMENT OF OVERALL SELF-CONCEPT AND SELF-CONCEPT/BODY IMAGE

The instrument we will use to measure self-concept and body image is the Piers-Harris Children's Self-Concept Scale. This is an 80 question test that is easy to take, administer, and score. The overall score is based on six sub-scales: behavior, intellectual and School Status, Physical Appearance and Attributes, Anxiety, Popularity, and Happiness and Satisfaction.

Interpretation of the Piers-Harris includes validity considerations, total and cluster scale scores, relative strengths and weaknesses and individual item responses. The first step in interpretation of the Piers-Harris is the use of the

Inconsistency Index, and the Response Bias Index portions of the scale to determine whether a student has a "all yes/ all no" bias, is "faking" positive or negative, or answering randomly (Piers, 1984).

The Behavior sub-scale represents 16 items that reflect the extent which the child admits or denies problematic behaviors. An example is item 34 "I often get into trouble". A low or moderate score on this scale suggests acknowledged behavioral difficulties, while a higher score may reflect either lack of behavioral problems or denial of the problems (Piers, 1984).

The Intellectual and School Status sub-scale reflects the child's assessment of his or her abilities regarding intellectual and academic tasks. Low scores reflect difficulties with school related tasks. And example of an item with high correlation with this scale is "I am smart" (Piers, 1984).

The Anxiety sub-scale reflects emotional disturbance and dysphoric mood. These emotions include worry, nervousness, shyness, sadness, fear and a general feeling of being left out of things. An item example is item 40 "I feel left out of things" (Piers, 1984).

The Popularity sub-scale reflect the child's evaluation of his or her popularity with classmates. Low scores may reflect shyness, lack of interpersonal skills or personality traits that isolate the child from others. Items include numbers 46 "I am among the last to be chosen for games" and 51 "I have many friends" (Piers, 1984).

The Happiness and Satisfaction sub-scale includes 10 items such as "I have a pleasant face" and "I wish I were different". Low scores are associated

with general dissatisfaction, feelings of negative self-worth, and a longing for things to be different. Children who score very low on this scale may require a referral for further evaluation (Piers, 1984).

Physical Appearance and Attributes scale consists of 13 items reflecting the child's attributes concerning his or her physical characteristics as well as attributes such as leadership and the ability to express ideas. This scale is more sensitive to sex differences than any other. For example item 29 "I have pretty eyes" was answered positively 78 percent of the time by girls compared to 53% of the boys. Item 15 "I am strong" received a 70 percent positive response by boys, and only 51 percent by girls. Item 54 "I am good-looking" had the highest correlation with the sub-scale. This scale will be reviewed to determine change following the treatment (Piers, 1984). Braun (1975) investigated the relationship between self-concept, body cathexis and sociometric status in a population of 116 institutionalized adolescents in the age range 11 to 18 years. Cathexis is a psychoanalytic term meaning the psychic energy invested in an object – in this case attitudes about one's own body. Body cathexis in this study was most closely related to this sub-scale. We would expect a significant change in the student's feelings regarding their physical appearance.

The Total Score is the single most reliable score on the Piers-Harris and it's the one with the best research support. A high score reflects a favorable selfconcept (i.e. a high level of self-esteem or self-concept). Norms for the Piers-Harris are based on 1,183 public school children in grades 4 through 12. Because no consistent grade or sex differences have been documented, the scores have been pooled for normative purposes. The mean total raw score was

51.84 and the standard deviation was 13.87. The median was 53.43. The norms were developed in one Pennsylvania school district. Percentile and T-scores are provided on the test form in addition to raw score as an interpretation aid. As is common in personality instruments, the normative data shows a negative skew (i.e. a tendency for a generally positive response). Internal consistency reliability for the total score was determined to be .90 (Piers, 1984).

Reliability of the Piers-Harris is measured through test-retest reliability and internal consistency. The test-retest reliability has been investigated in several studies. The reliability coefficients ranged from .42 (8 month interval) to .96 (3 to 4 week interval) with a median reliability of .73 and the 2 to 4 month studies are in the .71 to .72 range. This suggests that for the 8 week period of the study, there should be minimal error in self-concept scores due to test-retest instability. The Piers-Harris internal consistency measured by a Kuder-Richardson (KR-20 formula) ranged from .88 to .93 in the study by Piers (1973). Other studies resulted in similar or better (to a .92) internal consistency measure (Piers, 1985).

Validity can be considered in terms of content validity, relationship to teacher and peer ratings, and relationship to other measures. Content validity was attempted to be built into the scale by including areas children reported to like or dislike about themselves. This was improved with factor analysis where items with low discriminatory power were dropped. Unlike most children's self report scales, the Piers-Harris has also shown favorable relationships with teacher and peer ratings. Other measures of self-concept have been compared to the Piers-Harris and been shown to have good correlations as shown in table 2 below:

Table 2: Comparison of Piers-Harris with Other Self-Concept Measures

Measure	Correlation
Pictoral Self-Concept Scale	.42
Tennessee Self-Concept Scale	.51 (males)
	.61 (females)
Bills Index of Adjustment and	.42 (males)
Values	.40 (females)
Inferred Self-Concept Scale	.55
Coopersmith	.85
Children's Personality	3473
Questionnaire	
Personal Attribute Inventory for	.67 (N=75, Grade
Children	3,6)
	.32 (N=390, Grades
	3-8)
Nonsexist Personal Attribute	.49
Inventory for Children	
Lipsett's Children's Self-Concept	.68
Scale	

Convergent validity has been supported by several studies including Shavelson, Hubner and Stanton (1976) with five similar scales, Franklin et al. (1981) with the Self-Esteem Inventory (.78 correlation) and Shavelson and Bolus (1982) with the Tennessee Self-Concept Scale (a .77 correlation). Discriminant validity was also supported by both of the latter studies (Piers, 1985).

Moderator variables such as sex and age effects on the Piers-Harris should be considered but have generally not been significant. Sex differences have generally been found to have little effect on total scale score, and there seems to be relative stability between self-concept scores across age ranges from 8 to 23 based on most of the studies performed. In addition, socioeconomic status and total score has not been determined to be related, though there have been few studies performed. Intelligence has been shown to be slightly related to global self-concept (more related to academic achievement) Piers, 1985).

### PHYSICAL FITNESS

Physical fitness will be determined by using a part of the presidential fitness criteria that is derived from the normative data from the 1985 School Population Fitness Survey (Reiff, Dixon, Jacoby, Ye, Spain, Hunsicker, 1986). There are 5 "events" determining the child's level of physical fitness. These events are:

- 1) Curl-Ups Or Partial Curl-Ups
- 2) Shuttle Run
- 3) V-Sit Reach (Inches) Or Sit And Reach (Centimeters)
- 4) One Mile Run Or 1/4 Mile Run Or 1/2 Mile Run
- 5) Pull-Ups Or Right Angle Push-Ups

Participants in the presidential physical fitness challenge may be awarded 3 levels of award described in Appendix IV. These awards will not be a part of this

project. The reason for use of this criteria is the standardization of the exercises used. The detailed requirements for administration of the exercises are also listed in Appendix IV.

This study requires a standardized test (i.e. well defined requirements for each portion of the test). In addition, the level of achievement is not important, only the pre and post-test score is important. Therefore we have selected the following event subset from the presidential fitness criteria:

- 1) Curl-Ups
- 2) V-Sit Reach (Inches)
- 3) Right Angle Push Ups

These exercises will measure endurance (curl-ups and right angle push-ups), flexibility (v-sit reach), abdominal strength (curl-ups) and upper body strength (right angle push ups). The other exercises were rejected because of the difficulty of performing them in a reasonable amount of time and the appropriateness for the age 8 and younger child. Appendix C contains the form used for filling out the physical fitness scores.

### ADDITIONAL QUALITATIVE QUESTIONS.

During the Post-treatment test session, the parent and participant will be asked to complete an additional questionnaire at the end of the Piers-Harris administration. A sample of the Parent Survey form and Student Survey form is in Appendix E. This will only be administered to the treatment group participants. The purpose of the questionnaire is to see if the benefits in question are being

perceived as occurring whether they are measured as statistically significant or not.

### CHAPTER 3: DATA ANALYSIS AND RESULTS

This study was an investigation of 1) the effects of martial arts training on overall self concept, 2) the effects of martial arts training on overall self concept, and 3) the effects of martial arts training on physical fitness. Thirty three subjects completed the post-treatment test session out of fourty three who completed the pre-treatment test session. Three of the responses were eliminated due to invalid test profiles. As shown in figure 1, a 2 x 2 analysis of variance (ANOVA) was performed to determine the interaction of time and treatment on the participants. This was also performed on each sub-scale of the Piers-Harris (Piers, 1984). While for this effort, we are primarily concerned with the total self concept, physical appearance and attributes and physical fitness results, the results from each sub-scale, the parent and student survey results and demographics summary will be presented for completeness. In addition, demographics summary information will be reported for both the participants who completed both tests and for participants who only completed the first test session.

### HYPOTHESIS 1: TOTAL SELF-CONCEPT RESULTS

Hypothesis 1 was that children who participate in the Karate for Kids martial arts program will improve their overall self-concept more than a wait list control group. The total self-concept score is the most reliable and stable score on the Piers-Harris scale (Piers, 1984). Figure ?? reflects the distribution of scores for all pre and post-treatment responses. As shown it approximates a normal distribution. Figure ?? breaks out the distribution for the four experimental groups into a box plot.



Figure ?? - Total Self-Concept Score Histogram

Figure ?? - Box Plot of Total Self Concept Results



A 2 x 2 ANOVA was performed with Total Self-Concept as the dependent variable and time and treatment as the dependent variables. ANOVA results and statistics are summarized in table 3.

	Martial Art		
Time	Yes	No	Across
Pre-Test	Mean: 66.5	Mean: 66.1	Mean: 66.3
	N: 26	N: 14	N: 40
	SE: 1.7	SE: 2.3	SE: 1.4
Post-Test	Mean: 71.3	Mean: 64.7	Mean: 68.0
	N: 19	N: 12	N: 31
	SE: 2.3	SE: 2.5	SE: 1.6
Across	Mean: 68.9	Mean: 65.4	Mean: 67.4
	N: 45	N: 26	N: 71
	SE: 1.3	SE: 1.7	SE: 1.0
			SD: 8.6
F-Ratio	2.186		
Р	0.144		

Table 3 – Total Self Concept Score Results

The change in the mean was in the direction of higher self-concept after the treatment. With an F-ratio of 2.186, p=0.144, however, there was no statistically significant difference found between the control and treatment groups in terms of total self-concept. Therefore the null hypothesis was not rejected and we cannot accept hypothesis 1.

### HYPOTHESIS 2: PHYSICAL APPEARANCE AND ATTRIBUTES

Hypothesis 2 was that children who participate in the Karate for Kids martial arts program will improve their attitude toward their physical characteristics more than a wait list control group. The measure of this is the Physical Appearance and Attributes sub-scale of the Piers-Harris. Figure ?? reflects the distribution of scores for all pre and post-treatment responses. As shown it approximates a normal distribution. Figure ?? breaks out the distribution for the four experimental groups.



Figure ?? – Physical Appearance and Attributes Score Histogram


Figure ?? - Box Plot of Total Self Concept Results

A 2 x 2 ANOVA was performed with Physical Appearance and Attributes as the dependent variable and time and treatment as the dependent variables. ANOVA results and statistics are summarized in table ??.

	Martial Arts Training		
Time	Yes	No	Across
Pre-Test	Mean: 10.2	Mean: 10.4	Mean: 10.2
	N: 26	N: 14	N: 40
	SE: 0.47	SE: 0.63	SE: 0.39
Post-Test	Mean: 11.2	Mean: 9.3	Mean: 68.0
	N: 19	N: 12	N: 31
	SE: 0.54	SE: 0.68	SE: 0.44
Across	Mean: 10.7	Mean: 9.8	Mean: 10.3
	N: 45	N: 26	N: 71
	SE: 0.358	SE: 0.47	SE: 0.285
			SD: 2.4
F-Ratio	3.134		
Р	0.081		

Table ?? – Physical Attributes and Appearance Score Results

The change in the mean was in the direction of higher self-concept after the treatment. With an F-ratio of 3.134, p=0.081, however, there was no statistically significant difference found between the control and treatment groups in terms of the physical appearance and attributes sub-scale. Therefore the null hypothesis was not rejected and we cannot accept hypothesis 2.

## HYPOTHESIS 3: PHYSICAL FITNESS RESULTS

Hypothesis 3 was that children who participate in the Karate for Kids martial arts program will improve their overall physical fitness more than a wait list control group. In the physical fitness case, the scores on the three tests (curlups, right angle push-ups, and v-sit reach) were combined by converting them into a standardized z-score and then adding them up. Figure ?? reflects the scores for pre and post-treatment for both the control and treatment groups.



Figure ?? - Standardized Physical Fitness Histogram





A 2 x 2 ANOVA was performed with total physical fitness as the dependent variable and time and treatment as the dependent variables. ANOVA results and statistics are summarized in table ??.

	Martial Ar		
Time	Yes	No	Across
Pre-Test	Mean: .176	Mean:374	Mean:099
	N: 26	N: 16	N: 42
	SE: 0.461	SE: 0.588	SE: 0.373
Post-Test	Mean: .508	Mean:633	Mean: 68.0
	N: 19	N: 14	N: 33
	SE: 0.539	SE: 0.628	SE: 0.44
Across	Mean: .342	Mean:504	Mean:008
	N: 45	N: 30	N: 2.342
	SE: 0.355	SE: 0.430	SE: 0.270
			SD: 2.4
F-Ratio	0.282		
Р	0.597		

Table ?? – Total Physical Fitness Score Results

The change in the mean for the treatment group was in the direction of higher physical fitness after the treatment, while the control group actually got a lower physical fitness score. With an F-ratio of 0.282, p=0.597, however, there was no statistically significant difference found between the control and treatment groups in terms of the physical appearance and attributes sub-scale. Therefore the null hypothesis was not rejected and we cannot accept hypothesis 3.

## POST-TREATMENT PARENT AND PARTICIPANT SURVEY RESULTS

To analyze the survey results, the characteristic self-concept, physical fitness, and body image scores were rated as follows; reduction in characteristic corresponded to -1, no improvement corresponded to a score of 0, some improvement corresponded to a score of 1, and lots of improvement corresponded to a score of 2. Figure ?? reflects the scores recorded.



Figure ?? – Scores on Parent and Participant Survey (Note that scores > 0 represent positive response)

In all cases both the parents and the participants perceived an improved selfconcept, body image and a greater physical fitness level. An average score greater than zero reflects a perception of an improvement in this area. Greater than 1 reflects a perception of greater than "some improvement". There was only one answer on one participant's survey that was less than zero (indicating a reduction in ability) and there were only 22 responses out of 239 (9.2%) that were zero (indicating no change). The remaining 216 responses were positive (90.4%).

## ADDITIONAL FINDINGS

While our original hypothesis was limited to the overall self-concept score and the physical attitudes and attributes scores on the Piers-Harris, the other scales also provide important data. In fact findings indicate, particularly for the behavior sub-scale some possible significant effects.

#### **Behavior Sub-scale Results**

Figure ?? reflects the distribution of scores for all pre and post-treatment responses. As shown it approximates a negatively skewed distribution. Figure ?? breaks out the distribution for the four experimental groups. Scores on this subscale can range from zero to a maximum of16 (higher scores indicate better perception of behavior).



Figure ?? – Behavior Score Histogram

Figure ?? - Box Plot of Behavior Score Results



A 2 x 2 ANOVA was performed with Behavior as the dependent variable and time and treatment as the dependent variables. ANOVA results and statistics are summarized in table 3.

	Martial Arts Training		
Time	Yes	No	Across
Pre-Test	Mean: 13.6	Mean: 14.5	Mean: 14.0
	N: 26	N: 14	N: 40
	SE: 0.34	SE: 0.46	SE: 0.29
Post-Test	Mean: 14.9	Mean: 14.2	Mean: 14.5
	N: 19	N: 12	N: 31
	SE: 0.40	SE: 0.50	SE: 0.32
Across	Mean: 14.2	Mean: 14.3	Mean: 14.2
	N: 45	N: 26	N: 71
	SE: 0.26	SE: 0.34	SE: 0.21
			SD: 1.78
F-Ratio	3.691		
Р	0.059		

Table ?? – Behavior Score Results Marilla Arta Trainian

The change in the mean was in the direction of better behavior after the treatment. With an F-ratio of 3.691, p=0.059, however, there was no statistically significant difference found between the control and treatment groups in terms of the behavior sub-scale. It appears from the box plots that the treatment group began with much lower behavior scores than the control group.

### Intellectual and School Status Sub-scale Results

Figure ?? reflects the distribution of scores for all pre and post-treatment responses. As shown it approximates a negatively skewed distribution. Figure ?? breaks out the distribution for the four experimental groups. Scores on this subscale can range from zero to a maximum of17 (higher scores indicate better perception of intellectual and school status).



Figure ?? – Intellectual and School Status Score Histogram

Figure ?? - Box Plot of Intellectual and School Status Score Results



A 2 x 2 ANOVA was performed with Intellectual and School Status as the dependent variable and time and treatment as the dependent variables. ANOVA results and statistics are summarized in table ??.

	Martial Ar		
Time	Yes	No	Across
Pre-Test	Mean: 14.9	Mean: 15.2	Mean: 15.1
	N: 26	N: 14	N: 40
	SE: 0.383	SE: 0.522	SE: 0.324
Post-Test	Mean: 15.6	Mean: 15.3	Mean: 15.5
	N: 19	N: 12	N: 31
	SE: 0.448	SE: 0.563	SE: 0.360
Across	Mean: 15.3	Mean: 15.3	Mean: 15.2
	N: 45	N: 26	N: 71
	SE: 0.295	SE: 0.384	SE: 0.229
			SD: 1.931
F-Ratio	0.371		
Р	0.545		

Table ?? – Intellectual and School Status Score Results

The change in the mean was in the direction of higher intellectual and school status after the treatment. With an F-ratio of 0.371, p=0.545, however, there was no statistically significant difference found between the control and treatment groups in terms of the intellectual and school status sub-scale.

## Anxiety Sub-scale Results

Figure ?? reflects the distribution of scores for all pre and post-treatment responses. As shown it approximates a negatively skewed distribution. Figure ?? breaks out the distribution for the four experimental groups. Scores on this subscale can range from zero to a maximum of14 (higher scores indicate better perception of participant's response to anxiety).



Figure ?? - Anxiety Score Histogram



Figure ?? – Box Plot of Anxiety Score Results

A 2 x 2 ANOVA was performed with Anxiety as the dependent variable and time and treatment as the dependent variables. ANOVA results and statistics are summarized in table ??.

	Martial / to Training		
Time	Yes	No	Across
Pre-Test	Mean: 11.6	Mean: 11.5	Mean: 11.5
	N: 26	N: 14	N: 40
	SE: 0.472	SE: 0.643	SE: 0.399
Post-Test	Mean: 12.3	Mean: 10.8	Mean: 11.5
	N: 19	N: 12	N: 31
	SE: 0.552	SE: 0.694	SE: 0.443
Across	Mean: 11.9	Mean: 11.2	Mean: 11.6
	N: 45	N: 26	N: 71
	SE: 0.363	SE: 0.473	SE: 0.285
			SD: 2.399
F-Ratio	1.362		
Р	0.247		

Table ?? – Anxiety Score Results Martial Arts Training

The change in the mean was in the direction of better anxiety score after the treatment. With an F-ratio of 1.362, p=0.247, however, there was no statistically significant difference found between the control and treatment groups in terms of the anxiety sub-scale.

#### Popularity Sub-scale Results

Figure ?? reflects the distribution of scores for all pre and post-treatment responses. As shown it approximates a negatively skewed distribution. Figure ?? breaks out the distribution for the four experimental groups. Scores on this subscale can range from zero to a maximum of14 (higher scores indicate better perception of participant's response to popularity).



Figure ?? - Popularity Score Histogram

Figure ?? - Box Plot of Popularity Score Results



A 2 x 2 ANOVA was performed with Popularity as the dependent variable and time and treatment as the dependent variables. ANOVA results and statistics are summarized in table ??.

	Martial Ar		
Time	Yes	No	Across
Pre-Test	Mean: 9.3	Mean: 7.6	Mean: 8.5
	N: 26	N: 14	N: 40
	SE: 0.346	SE: 0.472	SE: 0.293
Post-Test	Mean: 9.9	Mean: 7.9	Mean: 8.9
	N: 19	N: 12	N: 31
	SE: 0.405	SE: 0.510	SE: 0.326
Across	Mean: 9.6	Mean: 7.8	Mean: 8.9
	N: 45	N: 26	N: 71
	SE: 0.267	SE: 0.347	SE: 0.232
			SD: 1.959
F-Ratio	0.140		
Р	0.710		

Table ?? – Popularity Score Results

The change in the mean was slightly in the direction of better popularity score after the treatment. With an F-ratio of 1.362, p=0.247, however, there was no statistically significant difference found between the control and treatment groups in terms of the popularity sub-scale.

### Happiness and satisfaction Sub-scale Results

Figure ?? reflects the distribution of scores for all pre and post-treatment responses. As shown it approximates a negatively skewed distribution. Figure ?? breaks out the distribution for the four experimental groups. Scores on this subscale can range from zero to a maximum of14 (higher scores indicate better perception of participant's response to happiness and satisfaction).



Figure ?? - Happiness and Satisfaction Score Histogram



Figure ?? - Box Plot of Happiness and Satisfaction Score Results

A 2 x 2 ANOVA was performed with Happiness and Satisfaction as the dependent variable and time and treatment as the dependent variables. ANOVA results and statistics are summarized in table ??.

	ivial lial Al		
Time	Yes	No	Across
Pre-Test	Mean: 9.0	Mean: 9.3	Mean: 9.1
	N: 26	N: 14	N: 40
	SE: 0.229	SE: 0.312	SE: 0.193
Post-Test	Mean: 9.5	Mean: 9.2	Mean: 9.3
	N: 19	N: 12	N: 31
	SE: 0.268	SE: 0.337	SE: 0.215
Across	Mean: 9.3	Mean: 9.2	Mean:
	N: 45	N: 26	9.225
	SE: 0.176	SE: 0.230	N: 71
			SE: 0.138
			SD: 1.161
F-Ratio	1.244		
Р	0.269		

Table ?? – Happiness and Satisfaction Score Results

The change in the mean was in the direction of better happiness and satisfaction score after the treatment. With an F-ratio of 1.233, p=0.269, however, there was no statistically significant difference found between the control and treatment groups in terms of the happiness and satisfaction sub-scale.

#### DEMOGRAPHICS RESULT SUMMARY:

To put the participant group into perspective, first we will discuss the sample demographics. The figures below reflect summary results of the demographics questionnaire for both the control and treatment groups including

data for participants who did not complete post-treatment tests. Figure ?? represents education level for participant parents who completed the first test session but not the second, while figure ?? represents participants who did both test sessions.







Figure ?? – Education Level Summary (Participants who completed both tests)

The average level of education for participant's mother was 2.44 (approximately "some college"), while for the father it was 2.61 (roughly "college graduate") Figure ?? is a summary of the education level represented by the participants who completed both the pre and post-tests. Figure ?? is a summary of the Income level represented by the participants.



Figure 4 – Income Level Summary

Per these results and extrapolating from the average score, the median household income levels were \$44,700 (all data) and \$43.300 (participants who finished both tests).

#### **CHAPTER 4: DISCUSSION**

While there was no statistically significant results in the total self-concept score, the physical fitness scores, or the physical appearance and attributes subscale scores, there are strong indications that the suggested benefits do exist. While not statistically significant, the results were in a positive direction, in addition, it is clear from the post-treatment parent and participant survey that they perceived a positive benefit in each of the areas under study. All of these provide evidence toward the hypothesis and suggest that these effects may be measurable with a modification of the experimental design.

#### DEMOGRAPHICS

The demographics reflect what we might guess for income and education level. These participants come from a pool of higher income and education levels than the normal population. The participant's mothers seemed to have at least some college, while the fathers had a greater level of education. Quite a few parents didn't answer the questions. Many divorced or separated parents didn't want to include the other spouse on the form.

#### SELF CONCEPT

There was no statistically significant change in the participants selfconcept following the treatment, however there are many indicators that point towards a link between this type of treatment and improved self concept. These include the actual response data, the parent survey and the supporting evidence of the sub-scales.

Firstly, the actual data showed an increase in the mean by 3 points (T-values) while the control group actually decreased by over 1 point. This not only occurred in the total score of the Piers-Harris, but also in each subscale of the questionnaire. One reason this may not provide enough power for our purposes is the test may not be sensitive enough for this group. The average total self-concept score prior to the treatment was 61.43 (T-Score). This is over a full standard deviation from the mean. This represents a raw score of 67 out of 80 questions answered in the direction of higher self-concept. That only leaves 13 more to possibly answer. At this level, we lose much of the resolution of the questionnaire. In fact, 14% had raw scores over 75, and one scored all questions positive. These participants would likely show no increase in such a high self-concept.

Both the parent of the participant and the participant responses on the post-treatment survey were very positive towards higher self-concept. Therefore we can imply that the parents and participants have at least a perception of improved self-concept.

One important factor here is that we are also showing that there is definitely no relationship between Karate for Kids training and reduction in a child's self concept. Some might think that a martial arts program would weaken a child's self image – and there are probably some martial arts programs that do have this negative effect.

All evidence points to a positive relationship between increased selfconcept and Karate for Kids training. While there was not enough power in the resulting test scores to justify statistical significance, this is most likely due to the

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difficulty in measuring such a change due to the high pre-treatment scores of the participants. In addition, all the supplementary survey data shows a very positive relationship.

#### PHYSICAL FITNESS

Like self-concept, the combined physical fitness results point to a positive relationship between martial arts training and improved fitness. The parent and participant surveys also lends support for the assertion that the training improved physical fitness. However, also like the self-concept measure, physical fitness did not measure as statistically significant. Clearly, physical fitness continues to improve over time with consistent activity, and certainly the martial arts provides consistent activity. Therefore, though we cannot be certain of the level of improvement, we can be confident that the activities will be beneficial and be more measurable with continued training.

Individually the best activity seemed to be ???? with an increase on mean from xx push ups to xx pushups (??%), followed by ??? This data might suggest which activities are more beneficial than others.

#### PROBLEMS AND LIMITATIONS

There are a number of limitations and problems that may have occurred in this study that should be considered. Some of the effects may contribute to better results, while most may have negatively biased our results. The primary problems are: self-selection and drop out effects, unbalanced control and

treatment groups, problems with the length of the study and resolution of the Piers-Harris self concept scale.

The demographics form could have been improved by more specific directions regarding family structure and adding additional data. Divorced parents didn't want to include the other parent in the questionnaire. In addition, in hindsight the sibling information appears to have been difficult to understand and fill out because many responses included the participant child as well (we had to skim out the participant data so we didn't estimate a larger family then they had). We also could add other questions regarding divorce and family organization.

One problem, common to this type of study is that self-selection may explain the results of the study. This refers to the idea that the persons with stronger self-concept will tend to have more perseverance in this program and those with poorer self-concept will tend to drop out. Layton (1989) suggested this was a primary factor in this type of research. However Layton's research was between much longer term training than presented here.

Similar to self-selection is the potential problem of drop outs (specifically participants who took the pre-test but not the post-treatment tests). The study began with 42 participants and ended with ?? participants. The control group drop outs would not tend to bias the results (unless too many of them dropped out and N was too small) because this is a measure of no treatment. The treatment group drop outs, on the other hand, beg the question "why did they drop out?". If the answer was that they were the kids that the martial arts program effected in a negative way, then the absence of their post-treatment scores would bias our current results artificially positive.

While the participants were chosen for the treatment and control groups randomly, they turned out somewhat unbalanced. The treatment group had 68.9% of the participants, and the control group had 38.1%. This is because session selection had to be performed prior to the initial pre-test session, and some participants who were confirmed for the study did not show up. This was exacerbated by the fact that the control group members had a much higher rate of dropping out prior to the post-test session. This resulted in a low sample size for the control group (post-test N<sub>control</sub>=?? compared with N<sub>treatment</sub>=??).

The study may not have been long enough to measure the effect of martial arts training. While 8 weeks is not a short amount of time, children participate in martial arts training for many years. Perhaps these effects would have been significant given a longer treatment time. Certainly the physical fitness portion of the training would be significantly more measurable. The issue with a longer treatment time, however is maintaining a matched control group. The dropout rate would likely be much higher over a longer time.

It appears that we had a ceiling effect because our pre-treatment scores were so much higher than average for the instrument. The Piers-Harris Self-Concept Scale was normed on 1183 children from a small town in Pennsylvania. The study participants iin this effort scored an average of 61.4 (T-score). This mean is well over 1 standard deviation higher than this normative group. According to the Piers-Harris Manual (Piers, 1984) this is higher than any reported average for any study other than one. This one study was by Silverman and Zigmond (1983) and reported an average of 61.9, with a sample size of 10, but this had a mean age of 13.5 – much higher than our average age of 9.2 – and

it was used with learning disabled children. (quite a different application). In raw data terms, this means that out of 80 questions on the inventory, they answered an average of 67 in the positive self-concept direction. This means they only had 13 of the questions to vary to change their response on (or only 17% of the available questions). Why did our sample score a much higher self-concept than the norm even without the treatment? It may be due to them having a higher self-concept, characteristics of kids in the generally affluent northern Scottsdale, Arizona (high SES), aforementioned self-selection effects or a combination of these factors. The result is that the test may not be representative of the actual self-concept and more importantly for our measurement purposes, such a high initial score provides much less resolution to measure a change. In other words, there is not much room for the participants to increase in score.

Regarding physical fitness, one of the difficulties in measuring physical fitness is that for convenience, we did only three simple exercises and did not repeat them. We might reconsider the type of exercises and also consider measuring three or four times the first week of the study and repeat three or four times the last week of the study. This would have provided a more stable and accurate representation of the participant's level of fitness.

#### IMPLICATIONS FOR RESEARCH

Further research should be sensitive to length of the treatment, sensitivity of the measure, and characteristics of the participant group.

It would be appropriate to say, double, the treatment time to increase the desired effect. This could possibly overcome the resolution problems with the

selected instrumentation. To maintain a control group, a program could be administered at a school or some other location to maintain a captive control group (they would not be subject to dropping out unless they moved). The issue with a different location is that the facility has a large impact on the martial arts student. It contains equipment, supplies and lots of other role models (other students) as motivators.

If this study was done with a population that was closer to the norm (or below the norm) of the Piers-Harris prior to the martial arts treatment, there would be much more room for an increased score on the instrument. While it is not suggested that the treatment is not effective with the population used herein, it simply is too close to the maximum score to hope for any resolution. If a population was selected like this one, there would be an indication to use a different instrument that has more items and / or was normed on a group more similar to the one selected.

One experimental design could be a longitudinal study over a period of 3 to 5 years. This would involve simply administering some sort of test battery (the Piers-Harris or some other self-concept, physical fitness, or other construct measurement) to students as they start their martial arts training, and at regular points in their martial arts development. This would be quite easy to implement in the Karate for Kids program – just making the test battery a normal requirement at a particular belt rank. For example they would take the test battery at their camouflage belt (about 6 months), blue belt (about 14 months) and at their black belt (about 2 to 3 years).

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An additional possible benefit would be using this sample population to gather normative data from students with high scores. This could lead to developing additional items for the Piers-Harris that would make it more useful for kids with higher self-concepts like this group.

#### IMPLICATIONS FOR PRACTICE

The evidence suggests that a referral to a karate program for kids such as the one presented here may be appropriate for kids with low self-concepts . This can be stated for three reasons. Firstly the survey given to the parents and kids shows a perceived increase in self-concept. Secondly, while the total self concept scores do not reflect an statistically significant increase in self-concept, this may be due to difficulties stated above. Lastly it certainly doesn't appear to have a negative effect and therefore would do no harm for kids with lower self-images. This may also be appropriate for other types of specific self-concept issues as described by the sub-scales of the Piers-Harris.

Referral for kids with physical fitness concerns may also be justified because of two reasons. The activities certainly will have a positive effect in the longer term because the basic physical exercises are similar to any physical education program. In a, kids with low levels of physical fitness will not be subject to reduction in their self-esteem.

Since self-concept is such as general term for mental health of children, and physical fitness is such an important concern, counselors may find many reasons to suggest a referral to Karate for Kids martial arts program.

## CONCLUSION

While the data does not disprove the null hypothesis, all of the data is in the direction of positive self-concept, and improved physical fitness. This includes each sub-scale, and all of the supporting information (parent and participant survey) is highly favorable towards our hypothesis. Given the limitations of the instrument and the high pre-treatment scores of the participants, there is much hope that with some adaptation of the experimental design, significant results will be obtained in each of the areas suggested by the hypothesis. In addition, a suggested longitudinal study would be quite easy to implement in the existing program. A counselor or other helping professional can be confident that sending a child to a Karate for Kids type martial arts program is a safe referral that may provide benefits toward a child's self-concept and physical fitness.

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# APPENDIX A

CLASS PLANS FOR TREATMENT PROGRAM

# ATTACH CLASS PLANS

Week 1
# APPENDIX B

KARATE FOR KIDS STUDENT MANUAL

# ATTACH KARATE FOR KIDS STUDENT MANUAL

Manual

"Kid Safe" Sheets

Update Page Numbers in final version

# APPENDIX C

## ADMINISTRATIVE DOCUMENTS

## Martial Arts Benefits for Children Parental Letter Consent For Minors

Dear Parent:

I am a graduate student under the direction of Professor Barbara Kerr in the Department of Psychology in Education at Arizona State University. I am conducting a research study to investigate the benefits that martial arts training has on children's selfconcept and physical fitness.

Your child's participation will involve an 8 week, two time a week program of martial art training (classes are about 45 minutes). It also requires completion of a self-concept questionnaire and a physical fitness test before and after the 8 week program. Your and your child's participation in this study is voluntary. If your child chooses not to participate or to withdraw from this study at any time, there will be no penalty. The results of the research study may be published, but your child's name will not be used.

Although there may be no direct benefit to your child, the possible benefit of your child's participation is improvements in any or all of the following self-concept, physical fitness, body image, self-esteem, attention span in school and at home, self-confidence, and coordination and the ability to protect themselves in dangerous situations.

If you have any questions concerning the research study or your child's participation in this study, please call me at 905-8688 or Dr. Kerr at 965-2193.

Sincerely,

Greg Moody

I give consent for my child \_\_\_\_\_\_ to participate in the above study.

Signature of Parent of Legal Guardian

Date

If you have any questions about your or your child's rights as a participant in this research, or if you feel you or your child has been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through Karol Householder, at 965-6788



## Informed Assent Form (for Kids)

I, understand that my parents have given permission for me to participate in a study about benefits of martial arts (Karate) classes for kids.	
I will get a uniform and if I do all 8 w Orange belt.	eeks of classes two times a week I may earn my
I am taking part because I want to. I know I can stop at any time I want and it will be okay.	
Name	Date

## Martial Arts Benefits for Children

## **Confidentiality Statement**

As a researcher working on the above research study at Arizona State University, I understand that I must maintain the confidentiality of all information concerning research participants. This information includes, but is not limited to, all identifying information and research data of participants and all information accruing from any direct or indirect contact I may have with said participants. In order to maintain confidentiality I hereby agree to refrain from discussing or disclosing any information regarding research participants, including information described without identifying information, to any individual who is not part of the above research study and in need of the information for the expressed purposes of the research program.

Signature

Date

### Martial Arts Benefits for Children

### Verbal Script for Recruitment or Information Calls

I am a graduate student under the direction of Professor Barbara Kerr in the Department of Psychology in Education Department at Arizona State University. I am conducting research entitled "Martial Arts Benefits for Children". The purpose of the research is to measure kids self-concept and physical fitness before and after an 8 week martial arts course. I am recruiting subjects to do a paper and pencil inventory and a short physical fitness exam which will take about 45 minutes. Following this your child will participate in an 8 week martial arts course called *Karate for Kids*, which is specially designed for kids in your child's age range. They will also receive a uniform, and belt and if they participate for the entire 8 weeks they may graduate to Orange belt (the first belt after white belt).

Your child's participation in the study is voluntary. If your child chooses not to participate or to withdraw, He or she may do so at any time. The results of the research may be published but your and your child's names will not be used.

Follow by asking for required information: Name, Address and give out required times and dates.

If you have any questions concerning the research study, please call me at 905-8688.

#### Martial Arts Benefits for Children

### **Verbal Script for Pre-Test Session**

I am a graduate student under the direction of Professor Barbara Kerr in the Department of Psychology in Education Department at Arizona State University. I am conducting research entitled "Martial Arts Benefits for Children". The purpose of the research is to measure kids self-concept and physical fitness before and after an 8 week martial arts course. You will be doing a paper and pencil questionnaire and a short physical fitness exam which will take about 45 minutes. Following this half of our participants will start their martial arts program immediately, and some will start following our post-test session.

Your child's participation in the study is voluntary. If your child chooses not to participate or to withdraw, they may do so at any time. The results of the research may be published but your and your child's names will not be used.

If you have any questions concerning the research study, please call me at 905-8688.



Dear \_\_\_\_\_,

I am a graduate student under the direction of Professor Barbara Kerr in the Department of Psychology in Education at Arizona State University. I am conducting research entitled "Martial Arts Benefits for Children". The purpose of the research is to measure kids self-concept and physical fitness before and after an 8 week martial arts course.

I am requesting your child's participation, which will involve a paper and pencil inventory and a short physical fitness exam which will take about 45 minutes. Following this your child will participate in an 8 week martial arts course called *Karate for Kids*, which is specially designed for kids in your child's age range. They will also receive a uniform, and belt and if they participate for the entire 8 weeks (approximately 2 times per week, class

es are about 45 minutes) they may graduate to Orange belt (the first belt after white belt).

Your child's participation in the study is voluntary. If your child chooses not to participate, or to withdraw, they may do so at any time. The results of the research may be published but your and your child's names will not be used.

If you have any questions concerning the research study, please call me at 905-8688 or Dr Kerr at 965-2193.



Sincerely,

Greg Moody

Insert Demographic Questionnaire

# APPENDIX D

PRESIDENT'S PHYSICAL FITNESS CRITERIA

ATTACH PRESIDENT'S PHYSICAL FITNESS CRITERIA

APPENDIX E

RECRUITMENT FLYER

ATTACH RECRUITMENT FLYER PG 1 ATTACH RECRUITMENT FLYER PG 2

# APPENDIX F

PARENT AND STUDENT SURVEY

ATTACH STUDENT AND PARENT SURVEY