The Effects of Martial Arts on Bullying in Children

by

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A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
Doctor of Philosophy

Approved April 2012 by the
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ARIZONA STATE UNIVERSITY

May 2012

ABSTRACT

Bullying impacts as many as one in three children (or more in some studies). The impact of bullying on children is similar to other forms of abuse like sexual abuse or physical abuse, far-reaching and potentially long term. The impact isn't solely on the child who is being bullied, it also impacts the child who is doing the bullying. It may have short and long term consequences as well. Martial arts has often been suggested to reduce bullying behaviors (and sometimes suggested as increasing bullying behaviors) but there has been limited research on this level of violence between kids and martial arts as an intervention. The purpose of this study was to examine the effectiveness of martial arts (in particular the Karate for Kids™ program) on bullying behaviors. 223 children were given a standardized questionnaire (the Olweus Bullying Questionnaire) and their parents/guardians were given a short parent survey to measure bullying behaviors in beginner, intermediate and advanced martial arts students. Results showed significant differences between the groups and indicated a reduction in the incidence of children being bullied and a strong indication in a reduction in the child's tendency to bully others after extended martial arts training. These findings suggest that parents, guardians or other child professionals who are interested in reducing bullying behaviors should consider martial arts classes for children.

DEDICATION

This project is dedicated to all the children who have taken martial arts and continue to work towards excellence, in particular my son Alden Moody and my other kids, Kierstynn Wile and Chase Wile. A special mention should be made to an early inspiration for becoming an instructor, one of my first students, George Christakos.

ACKNOWLEDGMENTS

The writer would like to thank Dr. Sam DiGangi, Dr. Stanley Zucker and Dr. Sarup Mathur for their guidance and assistance in this research effort and also Dr. Sanford Cohn my long time mentor. He would also like to thank the instructors and staff at the ATA Martial Arts schools who have participated in the research. Thanks to Ms. Emma Simpson as a great support to the writer. Ms. Laura Sanborn was a huge support helping in a multitude of ways. Her contributions over many years to the writer have been greatly appreciated.

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CHAPTER 1: INTRODUCTION & LITERATURE REVIEW

Bullying prevalence is estimated as high as 1 in three children or more. The impact of bullying on children is similar to other forms of abuse like sexual abuse or physical abuse, that is, far reaching and potentially long term. In addition, this impact isn't solely on the child who is being bullied. The child who is doing the bullying may have short and long term consequences as well. (Rigby, 1997; Nansel et al., 2001; Fekkes, et al.)

Research on bullying, though started in the 1970s (Olweus, 1993), has become more popular recently in part due to United States President Obama bringing the issue to the forefront in 2010 by hosting the White House Conference on Bullying Prevention (Lee, 2011). In addition, there are now state laws in almost every state regarding bullying (Stuart-Cassel, et al., 2011).

One often suggested response to bullying is martial arts training (Burrows, 2011; Sayer, 2008; Finberg, 1999). While there are a multitude of popular and anecdotal stories about martial arts being a positive activity to reduce bullying, martial arts has not been fully researched in a project directly related to bullying. Nevertheless positive research on martial arts as an intervention for youth violence (Glanz, 1994; Burt, & Butler, 2011; Twemlow & Sacco, 1998) indicates further research may reveal a positive relationship between martial arts and reduction in bullying.

This study attempts to measure the effects of martial arts training on bullying behaviors in children. To accomplish this, we will examine what bullying is, the effects of bullying and current research on both bullying and martial arts. The study then will review the results of data collected on children involved in martial arts at various levels (beginner, intermediate and advanced) and their bullying behaviors.

BULLYING

Bullying is defined as "when someone repeatedly and on purpose says or does mean or hurtful things to another person who has a hard time defending himself or herself" (Olweus, 1997). This definition encompasses three components that distinguish bullying form other forms of peer to peer conflict:

1) Aggressive behavior
2) Typically involves a pattern of behavior repeated over time
3) Involves an imbalance of power or strength

(APA, 2005; Olweus, 1993; Nansel et al., 2001). Each of these components is reviewed below.

Aggressive Behavior

It is obvious that bullying involves aggressive behavior but often this behavior is thought to be overt physical behavior. In fact there are

many types of aggressive behavior that are used by the child who is doing the bullying including direct bullying, indirect bullying and cyber bullying.

Direct Bullying

Direct Bullying is probably the one that most adults think of. This includes hitting, hitting, kicking, shoving, spitting, taunting, name-calling, degrading comments, threatening and obscene gestures. In this case the child doing the bullying is identified clearly and it can be a physical or mental effect.

Indirect Bullying

Indirect Bullying is very common and includes Getting another person to assault someone, spreading rumors, social isolation and cyber-bullying. In this case the child doing the bullying is not always identified so the child being bullied (or the adult who is attempting to figure out what's going on) doesn't know who initiated the abuse.

Cyber Bullying

This includes the relatively new phenomena coined "cyber bullying" (also termed as "cyber-harassment", "online bullying" or "cyber harassment") which includes online and smartphone communication (Wade & Beran, 2011). This is a special category of bullying that has escalated with technological advancement. Kowalski and Limber (2007) looked at 3,767 middle school students in grades 6,7 and 8 across 6 elementary schools. Using the Olweus Bullying Questionnaire and 23

additional questions they found that 25% of girls and 11% of boys have been bullied at least once, whereas 13% of girls and 9% of boys had cyber-bullied others at least once. In another study by Agatston, Kowalski and Limber (2007), focus groups with middle and high school students were done. The students overall (and in particular the females)viewed cyber bullying as a problem. Students were not aware that they had options to request removal of objectionable websites or what other options they had to protect themselves from this form of bullying. This is also supported by a Turkish study where 7th graders also were aware of cyber bullying but did not know what to do to prevent it (Yilmaz, 2011). The Kowalski and Limber (2007) study found the methods (and frequency percentage of doing at least once) of getting cyber bullied were:

- Instant messaging: 6.6%
- Chat rooms: 24.7%
- E-mail: 24.2%
- Website: 23.%
- Text messaging: 14.7%
- In another way: 16%

Note that each category is not exclusive, the participants may have use more than one method to bully.

It is possible that the profile has changed as technology has advanced and become ubiquitous. As of 2012, 35% of U.S. children ages

10-11 had cellphones which is *twice* the average of those with cellphones in 2005 (Frommer & Angelova, 2012)

A Pattern Of Behavior Over Time

While usually bullying is repeated over time, serious hurtful behavior that only happens once is still bullying. If a less serious act is repeated over time, it is bullying, but there is a danger that the act would be excluded or ignored because it wouldn't be considered serious without the time component (Olweus & Limber, 2007).

Imbalance of Power or Strength

In a bullying situation (unlike a peer-peer conflict), the bullied student has difficulty defending himself or herself. This may be an actual imbalance (the bullied child is physically weaker for example) or a perceived imbalance. Another way a child may be in a weaker situation is when they don't know who is doing the bullying (for example if rumors about the child are spread) (Olweus & Limber, 2007).

Roles Students Play In Bullying Situations

In bullying situations with children, there are more roles active than simply the bullying child and the one who is being bullied. The Olweus Bullying Prevention Program (Olweus, 1983; Olweus & Limber 2007; Black, et al., 2010; Olweus, & Limber, 2010), presents a model for identifying the participants in a bullying situation. It is shown in Figure 1.

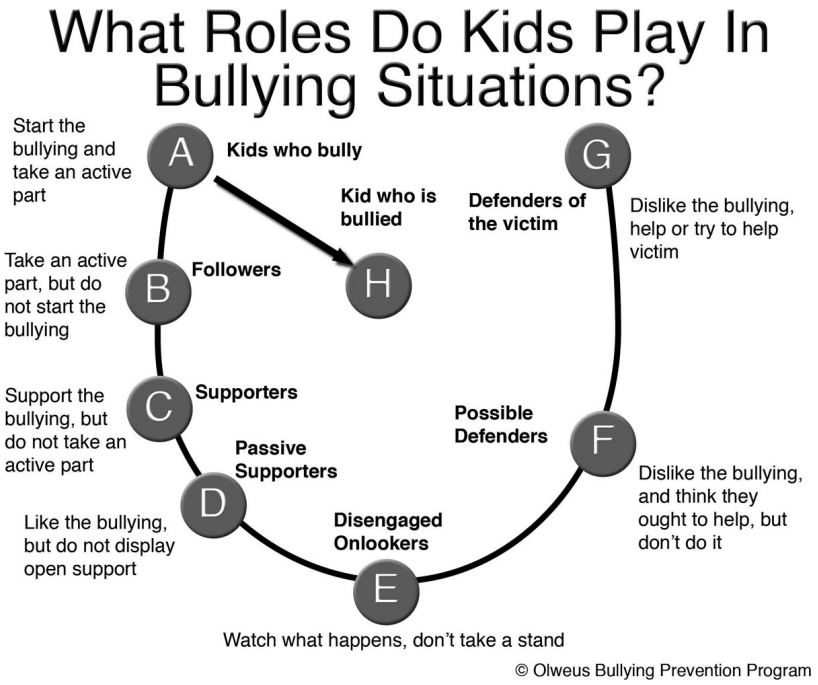

Figure 1 – Olweus Bullying Circle (Olweus & Limber, 2007, p.24)

Group Mechanisms

Because bullying is often a group phenomenon, there are a variety of group mechanisms at work (Olweus & Limber 2007). Some are summarized below.

Social contagion

Some student may participate in bullying if the student(s) who take the lead are popular and admired. The bullying behavior may become "contagious" and may spread to others—particularly those who are insecure and want to assert themselves in the group.

Weakening normal inhibitions against aggression

If bullying isn't stopped, students who bully may be viewed as "winners" and others who normally would see bullying as wrong may join in, since they are not getting the message from adults and peers that bullying is unacceptable.

Decreased sense of individual responsibility

If there are several students participating in bullying, each may feel less responsible or guilty. Psychologists refer to this as "diffusion of responsibility."

Changes in the view of the victim

If a child is repeatedly bullied (and if the bullying is not addressed), he or she may become almost "dehumanized" and viewed by others as worthless—one who "asks" to be bullied.

All of these group mechanisms can reduce feelings of guilt and remorse, often increasing bullying.

Effects of Bullying

Of course bullying affects the child who is being bullied, but recent research indicates the negative effects of bullying extend to the child who is doing the bullying and possibly the children surrounding the bullying (Olweus, 1993). This differs from other forms of aggression among children (Espelage, Basile & Hamburger, 2012).

The Child Who Is Being Bullied

The effects on the child who is being bulled are similar to other forms of abuse such as physical, mental or sexual abuse. These effects include lower self-esteem, depression, anxiety, absenteeism, poor school achievement, depression, suicidal thoughts and illness (Rigby, 1997; Eisenberg, et al., 2003; Van der Wal, et al., 2003; Nansel, Craig, Overpeck, Saluja & Ruan, 2004; Buhs, et al., 2006). Even more striking, Fekkes, et al., (2004) found the following differences in health symptoms (3rd column added):

Table 1 – Health Symptoms Related to Bullying

	Bullied	Not Bullied	Bullied / Not Bullied
Headache	16%	6%	267%
Sleep problems	42%	23%	183%
Skin problems	15%	9%	169%
Abdominal pain	17%	9%	189%
Crying	4%	2%	183%
Tense muscles	10%	4%	257%
Feeling tense	20%	9%	222%
Feeling tired	11%	3%	312%
Anxiety	28%	10%	280%
Bad appetite	20%	10%	201%
Feeling listless	10%	3%	317%
Bed-wetting	6%	2%	282%
Feeling unhappy	23%	5%	460%
Moderate depression indication	49%	16%	306%
Strong depression indication	16%	2%	800%

This highlights indicators of serious psychological and physical consequences of being bullied. The children in the “bullied” column were bullied but didn’t bully and the “not bullied” column were neither bullied nor bullied others. These health and psychological effects are significant. For some individuals these effects can carry on into adulthood (Olweus 1993; Gini & Pozzoli, 2009).

The Child Who Bullies

There are many myths about the child who bullies others. Rather than being socially isolated loners who lack self-esteem, the child who bullies typically has good self-esteem, is psychologically strong and enjoys high social standing among their classmates (Juvonen, Graham, & Schuster, 2003). These children often do, however have a variety of conduct issues including frequent fighting (and more injuries), theft, alcohol use, smoking, dropping out of school, poor academic achievement, disliking the school climate and carrying a weapon (Olweus, 1993; Byrne, 1994; Cunningham, Henggeler, Limber, Melton, & Nation 2000; Nansel, et al., 2001; Nansel, et al., 2003)

The long term outlook for kids who bully is less than optimistic. In a longitudinal study in Norway, 60% of boys who bullied others in middle school had at least one felony conviction by the age of 24 and 40% of them had three or more convictions! This incidence is three to four times

as likely as their the peers who didn't bully in middle school (Sourander, et al., 2011).

A Special Group – The Bully-Victim

The bully-victim both bullies other kids and gets bullied. They are the most troubled group "displaying the highest level of conduct, school and peer relationship problems" (Juvonen, et al,, 2003, p. 1231). These kids typically have difficulty reading social signals, often are actively disliked by adults (including their teacher) and have reading/writing problems. They may try to bully weaker students and the other children avoid them. These children are disengaged, asocial and are a particularly high risk group. They have more psychiatric symptoms than peers and even kids who are bullied. In short they display the worst effects of the child who bullies and the child who is bullied (Kumpulainen & Räsänen, 2000; Nansel, et al., 2001; Juvonen, et al,, 2003). There are a wide variety of reasons to worry about these kids.

Prevalence of Bullying

Bullying prevalence has been studied extensively. In the most extensive U.S. study, Nansel et al. (2001) did a nationwide sample of 15,600 students in grades 6-10. The findings indicated 29.9% were involved in bullying. 13% were bullying other kids, 6.3% were bullied and bullied others, 10.6% were bullied (and didn't bully other kids). This results in 16.9% of kids being bullied (10.6% were only bullied and 6.3% who also

bullied others) and 19.3% bullying others. Their conclusion was that “The prevalence of bullying among US youth is substantial” (Nansel, et al., 2001, p. 2094). The rates of some kind of bullying may be decreasing slightly, according to some reports (Rigby & Smith, 2011) however this may be due to a narrower definition of what bullying is. In another study in a small US town, 76.8% of kids (72% of females, 81% of males) self-reported as victims of bullying, indicating there may be more bullying in the USA than measured in other countries (Hoover, et al., 1992). There is little doubt, by any measure, that reported prevalence of bullying behaviors in the U.S. is significant

Nansel, et al. (2004) followed up on the 2001 study in a cross-national study across 25 nations in North America and Europe. Bullying prevalence (bullying or being bullied) ranged from 9% in Sweden to 54% in Lithuania (p. 732). Further, bullying issues are reported in every continent (except Antarctica) including Austrailia (Carr-Gregg & Manocha, 2011), South America, (in Chile, 47% of children reported bullying) (Fleming & Jacobsen, 2009), Africa (Dussich & Maekoya, 2007). and Asia (Lai Ye & Chang, 2008).

Bullying May Result In More Violent Behavior

Bullying shouldn’t be thought of as normal child development as it may be a marker for future violent behavior. Nansel, et al. (2003) found that bullying others and being bullied were related to a variety of

measured violent behaviors in both boys and girls including carrying a weapon (5.9 times as many kids who bullied others away from school carried a weapon than those who weren't involved in bullying), frequent fighting (2.3 times as many kids who were bullied weekly were frequently fighting compared to those who weren't) and injury from fighting (7.1 times as many kids who bullied weekly were injured in a fight vs. those who were not bullying).

Bullying Prevention Programs

Because bullying has been such a "hot topic" there has recently been particular focus on prevention programs. Craig, et al., 2007 evaluated students response to bullying and stated "it is important to provide children and youth with strategies that are effective, as they are most likely to implement strategies that are only going to increase the victimization over time" (p. 465). There are a variety of programs that purport to improve bullying behaviors – some with strong research backing and some without.

The OSEP Technical Assistance Center on Positive Behavioral Interventions and Supports (PBIS) offers a program titled "Bully Prevention in Positive Behavior Support" (BP-PBS) which outlines a program for students (and to be deployed school-wide) to reduce bullying behavior. This program starts with a "stop signal" – a three step response to problem behavior which (depending school situation such as age of the

students) is typically “stop”, “walk” or “talk”. The entire school must accept the terminology for these signals. The information is delivered with 6 lessons which teach how to use the stop/walk/talk response in 10-15 minutes, twice a week. These lessons encourage a child to take personal responsibility and give them alternative actions in problem situations. In a study across three elementary schools, bullying behavior was decreased (Ross & Horner, 2009). Possible weaknesses of the program are how it continues to be implemented long term (will the program be represented with fidelity for years?) and whether it addresses the students indirectly involved in a bullying situation. In addition this program was implemented in schools that used the complementary Positive Behavior Support (PBS) program. Nevertheless the BP-PBS program shows promise for future implementation and research. In a longitudinal randomized controlled trial with 12,344 children analysis indicated lower teacher reported incidents of bullying and peer rejection than schools without PBIS (Waasdorp, Bradshaw & Leaf, 2012).

Bullying is not just a United States phenomena, the United Nations Children’s Fund (UNICEF) Office for Croatia implemented a bullying prevention project entitled “For A Safe And Encouraging Environment In Schools” for five years. Schools are encouraged to participate to sustain a “Violence-Free” status. The research included a sample of 4,939 students, 1,205 teachers and 1931 parents in 39 schools. The results of the evaluation suggested the levels of teacher’s feeling of helplessness and

confusion was lowered and a proactive network developed to suppress bullying. Student reports indicate the number of incidents of abusive behavior was reduced by half (Tomic-Latinac, & Nikcevic-Milkovic, 2009).

The “No Bullying Allowed Here” program is a curriculum based set of lessons for elementary schools. The program addresses students, staff and parents. The participant goals are:

Goals for Students:

1. Students will learn that bullying includes all behaviors that are hurtful to others such as teasing, name calling, interfering with work and exclusion from games.
2. Students will learn what to do when confronted by a bully.
3. Students will learn what they can do when they see someone else being bullied.
4. Student will develop a sense of the class and school as a community that respects the rights, feelings, and uniqueness of each person.

Goals for Staff:

1. Staff will learn what bullying is and to recognize when it is happening at school both in the classroom as well as other areas.

2. Staff will learn to support students in their efforts to stop bullying through coaching, supervision, and discussion with them about how to apply the skills learned.
3. Staff will learn to respond and intervene appropriately to student complaints about bullying behaviors.

Goals for Parents:

1. Parents will learn the techniques that are being taught to their children at school for responding to bullying behavior toward themselves and others.
2. Parents will learn how to help their child apply the skills being learned.

(Rock, Hammond, & Rasmussen, 2007, p. 232) These goals are part of the lessons and ongoing program. The lessons require a minimum of eight weeks to present in sessions which last approximately 45 minutes. The program was implemented in one school in grades 3-5. Students reported less fear about being bullied following the instruction (Rock, et al., 2007).

Not all programs evaluated demonstrated positive results. The Strengths in Motion (SIM) program is designed to foster each individual's strengths and develop them to promote mental health and happiness. (Duckworth, Steen & Seligman, 2005). These strengths may encompass many facets of an individuals well-being. The SIM program was implemented at a Canadian school with 265 children in kindergarten

through 8th grade. This intervention did not result in a decrease in bullying (and in fact a very slight increase in bullying was observed). One challenge with this approach is the extensive and broad implementation required Rawana, Norwood & Whitley, 2011). Another project looked at an arts-based curricula based on a children's opera and also didn't report significant reductions in bullying (Haner, Pepler, Cummings & Rubin-Vaughan, 2010).

The Olweus Bullying Prevention Program (OBPP) is based on the belief that bullying need not be a commonplace experience for children (Olweus & Limber, 2010). The OBPP is not a curriculum based system but a systemic culture change in the school environment (Olewus & Limber, 2007). It addresses bullying through five program components covering: the school, the classroom, the individual student, the parents and finally the local community (which may fund raise or support awareness of bullying). Initially a school will use the Olweus Bullying Questionnaire (OBQ) to determine a baseline of bullying behaviors in the school including: where bullying is happening, who is bullying, what kind of bullying is happening, when it is happening, and who is getting bullied. The school will also establish a Bullying Prevention Coordination Committee (BPCC) to plan and monitor implementation of the program. The Olweus program changes depending on the school situation (such as existing rules, bullying profile and budget).The BPCC meet for 2 days of training with an Olweus Certified "Trainer of Trainers" to educate the

committee on bullying, review their OBQ results and setup future training. At the classroom level the teacher will host weekly “class meetings” so the students can discuss and role play through situations that occur and how to deal with them. The individual student interventions are called “on-the-spot” interventions which support the student being bullied, and enforce consequences for the child doing the bullying (as well as any other children involved who support the bullying behaviors). Parents are typically called (both the parent of the bullied and the child who is bullying) and the teacher implements the preplanned discipline system of the school. Studies have shown that while the results are not always consistent, the OBPP does decrease bullying behavior in schools (Olweus, 1991; Olweus, 1997, Olweus 2005; Olweus & Limber, 2010). Empirical evaluation of results showed reductions in student self-reports of bullying – in the 1983-84 evaluation the reduction of being bullied was 62%, and a 33% reduction in bullying other students 8 months after the initial program implementation. Reports from teachers on antisocial behavior and improved discipline were consistent with this improved school climate (Roland, 2011). The OBPP is widely considered the premier bullying prevention program even by proponents of other programs (Rawana, Norwood, & Whitley, 2011).

MARTIAL ARTS

Martial arts can be generally defined as any structured system of self defense and combat. 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 were 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 while 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 children can understand (low level of teaching training for instructors), or the curriculum is not structured for children.

History

Our study will focus on the particular martial art taught by 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 nearly 1,500 of schools across the United States and the world (Facts About ATA, 2012). Although

the roots of Taekwondo can be traced back to 300 BC, 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 children 3 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, self-improvement, respect, and dedication (Lee, 1993).

Research

A review of martial arts literature is much more limited than a review of literature on bullying because there is comparatively little research that related to our topic. This review 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 components of self-concept including physical self, moral-ethical self, personal self, family self, social self, self-satisfaction, behavior and 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 the scores of the intermediate and advanced level students. The participants were 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 4th and 5th 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-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 children 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:

- Criminal Victimization: Martial arts would be a valuable skill in defending or preventing a physical or sexual assault.
- Growth and Discovery: Martial arts assists in the process of becoming more aware emotionally, mentally and spiritually.
- Task Performance: 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)
- Life Transition: 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.

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 Self-esteem 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 children is specially designed to address improvement in personality, not just with physical training, but through actual discussions in class. Other studies also suggest martial arts may improve self esteem in children (Prince, 1996; Foster, 1997).

Research Related to Bullying

There is very little serious academic work relating martial arts and bullying, however a variety of popular publications have included articles, press releases or opinion pieces. One example of this is a wrestling league, Total Nonstop Action (TNA) “put a headlock on bullying” by doing a marketing program to communicate the negative aspects of bullying. A variety of newspaper articles support martial arts as an intervention including an Israeli martial art (Burrows, 2011), an American Taekwondo Association school offering a “Kidz n’ Power” program (Sayer, 2008) and various other martial arts stories (Finberg, 1999).

There is some clinical research indirectly relating to martial arts helping violent or at risk kids (Glanz, 1994). As a more clinical intervention for adolescent aggression, a Brazilian martial art, Capoeira was suggested as a positive intervention for youth who refuse or don't want to engage in talk therapy (Burt, & Butler, 2011). This was simply a suggested model though and there has been no experimental data to date to support this premise. Also similarly a martial arts program was suggested for treating violent adolescents (Twemlow & Sacco, 1998), however it is a program design only. Twemlow, Sacco & Fonagy (2008) suggested martial arts, yoga or other physical therapies as an intervention for violent (or nonmentalizing) individuals. One study was done with 60 boys in a large urban middle school where a Koga Ha Kosho Shorei Ryu Kempo martial art was taught for 10 weeks (3 classes per week). The results were fairly good as 12 out of 14 measured variables were improved and improved self reported measure of happiness and schoolwork. While this study didn't measure bullying, it may be an indicator of potential for bullying intervention.

The relationship of sports to increasing antisocial and aggressive behavior was also examined by Endresen & Olweus (2005). A sample of 477 boys, aged 11 to 13 years old was studied over a two year period. They participated in boxing, weightlifting, wrestling and oriental martial arts (karate, judo and taekwondo) and were surveyed at three different times in a longitudinal design. The results suggested that participation in power

sports leads to an increase in antisocial involvement in terms of violent and antisocial behavior. Martial arts based on oriental systems like what is examined in this study, however, did show a very weak positive correlation with violent behavior unless it was combined with one of the other studied sports.

Summary of Martial Arts Literature Review

There are many other newspaper and popular journal articles and stories about martial arts and bullying yet there is scant significant research on the benefits of martial arts training in spite of much anecdotal support. Therefore 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 children are participating in martial arts training.
- That there is very little scientific study of the benefits of this training, particularly controlled experimental data.
- There is *similar* related academic research on related topics of violence, self-esteem and happiness that may suggest martial arts will improve bullying behaviors – and one study weakly supports martial arts may could create more bullying behaviors (Endresen & Olweus, 2005).
- There is even less research available on the specifics of effects of martial arts on bullying, yet there is much popular opinion that there are benefits.

We simply don't have much academic insight into how martial arts benefits kids and in particular kids involved in bullying situations. The purpose of this effort is to investigate the effect of martial arts training on bullying.

RESEARCH QUESTIONS

We have extensively reviewed the literature on bullying. In summary it is very common (best estimates at about 1/3 of kids are bullying or being bullied (Nansel, et al., 2001). There are interventions like the Olweus Bullying Prevention Program (Olweus & Limber, 2007), the UNICEF program (Tomic-Latinac, & Nikcevic-Milkovic, 2009), Bullyproof (Hallford, Borntrager, & Davis, 2006), "No Bullying Allowed Here" (Rock, Hammond, & Rasmussen, 2007) and others which seem to help, but these interventions are for schools, not for an individual who may be in a school environment (or other environment) where they may bully or be subject to bullying. If an individual's school doesn't have a bullying prevention program they may be left "on their own". Martial arts has often been said to help kids protect themselves from bullying, though there is not much academic support for this. In addition there is little focus on whether martial arts may decrease or *increase* a participant's inclination to bully (i.e. do martial arts kids bully more?). Therefore, further study is needed to determine whether martial arts is effective for bullying issues.

This study will answer:

1) Do children who take martial arts for some time get bullied less than children who just started?

2) Do children who take martial arts for some time bully others more or less than children who just started?

CHAPTER 2: METHODOLOGY

Design

The study will use a parent survey and a child questionnaire to measure bullying characteristics across three groups and against the national sample of the child questionnaire shown in Table 2.

Table 2 – Group Matrix

Comparison	Martial Arts Training Level: White –Orange Belt (Beginner)	Yellow-Red Belt (Intermediate)	Black Belt (Advanced)
White-Orange Belt		child questionnaire & parent survey	child questionnaire & parent survey
Yellow-Red Belt	child questionnaire & parent survey		child questionnaire & parent survey
Black Belt	child questionnaire & parent survey	child questionnaire & parent survey	

The questions on the parent survey and the child questionnaire are extensive across the bullying spectrum of issues.

Participants

Selection and acquisition of the participants was reviewed by Arizona State University's Institutional Review Board. See Appendix A for detailed Informed Consent form / Parent Letter and Appendix B for Informed Assent form (child form).

Participants were selected from 22 martial arts schools in the American Taekwondo Association across the United States. Children who take these martial arts classes are generally suburban, middle class (medium to high SES). The goal for number of participants was 200. 660 survey/questionnaire packages were mailed to the school owners (see Appendix C for package materials). Additional recruitment was done at a national tournament event held in Las Vegas, Nevada which resulted in 10 samples.

Instruments

Olweus Bullying Questionnaire

The Olweus Bullying Questionnaire (OBQ) was given to the children to evaluate these bullying issues. It was filled out anonymously by the students and defines bullying within various questions so the child isn't simply asked whether they have been bullied (though they are asked that as well) but are asked questions on whether they were bullied in the past couple of months in ways such as "I was called mean names, was made fun of, or teased in a hurtful way" or "I was hit, kicked, pushed, shoved

around, or locked indoors". During analysis for example, if a child answers any of these type positively, they will be designated as being bullied in that way. In addition the OBQ has a time frame reference. Typical responses to the questions are:

- it hasn´t happened to me in the past couple of months
- only once or twice
- 2 or 3 times a month
- about once a week
- several times a week

These are designed to be a clear time frame that is thought to be a natural way that's not too long that the students can remember. These are coded on a 1 to 5 point scale. Many of the questions have a clear spatial reference such as "at school" as well.

While the OBQ has been reported to have high internal consistency and good conceptual design (Kyriakides, Kaloyirou & Lindsay, 2006; Cheng, Chen, Liu & Chen, 2011), there are some criticisms of the questionnaire. First, since the data are self reported by the child there is questionable concurrent validity with other measures. In an unpublished summary of a study for the Virginia Violence Youth Project, Lee, Cornell & Cole, (n.d.) reported that the incidence of peer nominated bullying and counselor reported bullying were different than measured by the OBQ. Chiefly this concern is for measuring absolute amounts of bullying and not

for comparative uses like in this study. Other issues of concern include multicultural application of the OBQ. Is it translatable to other cultural groups? While consistent results were found in a study with Greek students, (Kyriakides, et al., 2006), further refinements will likely improve it across cultural groups not from the USA or Norway (where it was originally developed). The subjects are all English speaking and from the USA so this should not affect these results. Lastly, there have been concerns about lack of cyber bullying specific questions, but 2 cyber bullying questions were added to the 2007 revision so this is not a concern for use of this version of the OBQ (Cheng, et al., 2011). The version used in this study was the 2004 version (same as the 2007 version without the cyber bullying questions). This was used because the questions could be separately analyzed (the later versions of the questionnaire required a scanned analysis). This study's research questions do not require evaluation of specific types of bullying so missing the cyber bullying questions from the questionnaire is not critical.

Parent Survey

An anonymous parent (guardian) survey was developed to determine the perception of the benefits of the martial arts program. During the test session, the parent or guardian of the participant was asked to complete an additional questionnaire while the student did the OBQ. A sample of the Parent Survey form is in Appendix D. The purpose

of the questionnaire is to measure subjective responses to the treatment regarding the same variables measures with the OBQ instrument.

Procedure

The martial arts school staff were asked to give one third of the survey / questionnaire packages to white and orange belts (beginners, who have 16 or less weeks of martial arts training), one third to yellow through 1st degree recommended black belts – a "pre-black belt" (intermediate students who have 16 weeks to 2 years of training) and finally the final third to black belts (who typically have 2 and a half years or more of training). Because each school has different numbers of students in each of these groups, these are rough requests and some schools were expected to return more samples in one group than another. All of the parents were given an Informed Consent form (which also explained the process) and the children were given an Informed Assent form both of which were filled out first. Then these forms were put into a separate return mailer and the OBQ and parent survey were then distributed. Finally the completed survey and questionnaire were put into a return mailer (again, separate from the one the consent forms went into).

The martial arts schools had one week to collect data and return it. This timeframe was extended another week because some of the schools didn't get the packets in time and a few were on spring break.

Summary of Features of the Martial Arts Program

The features of the martial arts program are based on the concept that each student is different and has different needs. The style of martial art is Taekwondo which has been described earlier. Different methods are used to teach students many things that will apply after the lesson is over. The building blocks for the Karate for Kids™ program is based on themes that are integrated into classes such as goal setting, self-control, courtesy, integrity, friendship, confidence, self-awareness, self-esteem, perseverance, self-improvement, respect, and dedication.

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

Table 3 – Ten Class Management Skills

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

Each child typically 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 begins with a class bowing to show respect and self-control. 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 behave in class and everywhere.

During the main part of class, the students are 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 (like blue stars for their patch).

The curriculum in the program includes sets of “forms” or “poomse” (the Korean word), “one-steps”, safety weapons, self-defense and other materials that will be learned in a designated period. When students complete the material covered they may graduate to another belt level or do a midterm. Beginners start at white belt, and should graduate to orange belt following their first two month period if they attend class 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 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.

Individual moves learned 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 an 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. Some examples of kicks learned include front kicks, side kicks and round kicks while advanced students may do these while jumping, spinning or in a combination of complex movements. 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 is 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 stances help develop leg strength, balance and promote flexibility. Conditioning drills (push ups, crunches, curl ups and other drills) also contributed to the students physical growth.

The end of each class contains an awards presentation where students receive rewards 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 the child's life.

Ethical Considerations

All of the participants will be treated in accordance to the ethical guidelines of the American Psychological Association (APA) and the Arizona State University Institutional Review Board (IRB). The main concern is for confidentiality of the data. The parent survey and the children's questionnaire are coded so the data can be correlated but the name of the participant is not used. The consent forms were mailed back separately and are kept in a locked file cabinet.

Analysis

Analysis of the data includes analysis of variance (ANOVA) on each research question and further analysis of questions in the OBQ and parent surveys (and particular combination of questions) in the OBQ and parent survey as well as graphic interpretation of the raw data. This was performed using Excel and XLSTAT2012.

CHAPTER 3: DATA ANALYSIS AND RESULTS

This study was an investigation of the effects of martial arts on bullying behaviors in kids. 227 subjects (54 beginners, 92 intermediate and 81 advanced) completed the survey (227 parents/guardians) and questionnaire (227 children). 4 subjects were rejected because they were under 8 and they may have had their parents fill out the questionnaire. The final number of subjects analyzed was 223 (51 beginners, 91 intermediate and 81 advanced). We are primarily concerned with the global research questions of whether a child doing martial arts seems to *be bullied* less (which is represented if the 4th question in the OBQ is answered as bullied 2-3 times a month or anything higher) and whether child doing martial arts seems *to bully* less (which is represented if the 24th question in the OBQ is answered as bullies others 2-3 times a month or anything higher). In addition, demographics information from the parent surveys will be presented.

Demographics Data

Sample Descriptive Statistics

223 subjects completed the survey and questionnaire (144 boys and 79 girls). Table 4 shows the age statistics (the mean age is 11.3 years old) and Table 5 and 6 shows the statistics by gender.

Table 4 – Descriptive statistics by age

Statistic	Age
No. of observations	223
Minimum	7.986
Maximum	16.027
1st Quartile	9.684
Median	10.745
3rd Quartile	12.021
Mean	10.964
Variance (n-1)	2.771
Standard deviation (n-1)	1.665

Table 5 – Age statistics (female participants only)

Statistic	Gender
No. of observations	79
Minimum	8.079
Maximum	14.833
1st Quartile	9.407
Median	10.816
3rd Quartile	12.212
Mean	10.862
Variance (n-1)	2.798
Standard deviation (n-1)	1.673

Table 6 – Age statistics (male participants only)

Statistic	Gender
No. of observations	144
Minimum	7.986
Maximum	16.027
1st Quartile	9.821
Median	10.699
3rd Quartile	11.955
Mean	11.020
Variance (n-1)	2.767
Standard deviation (n-1)	1.664

The gender breakdown for the study is shown in Figure 2.

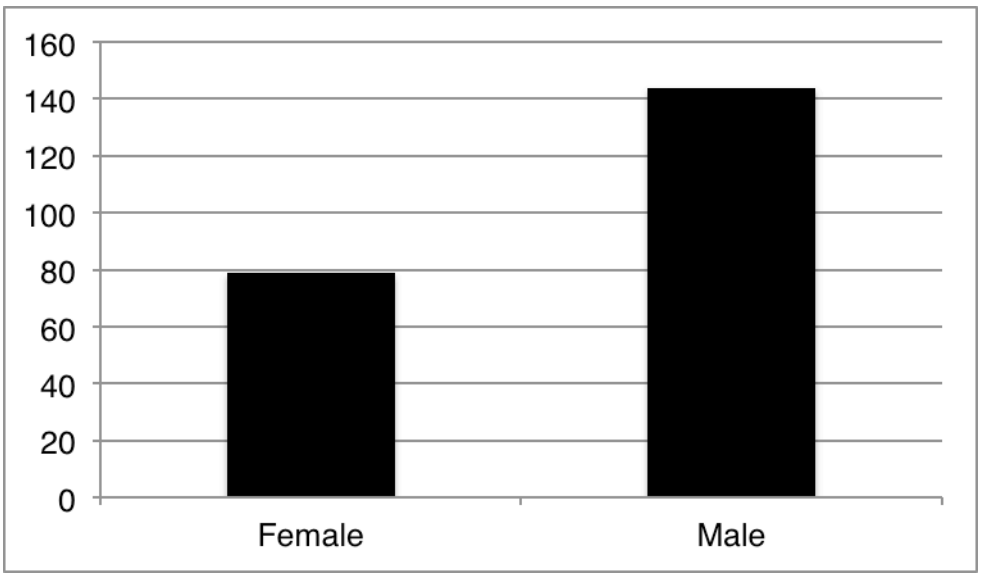

Figure 2 – Gender Distribution.

Martial Arts Data

Rank of Student

Figure 3 represents the martial arts ranks of the students surveyed. Figure 4 represents the number of students in each grouping (white are beginners, orange through 1st degree recommended black belt (pre-black belt) are intermediate and black belt are advanced).

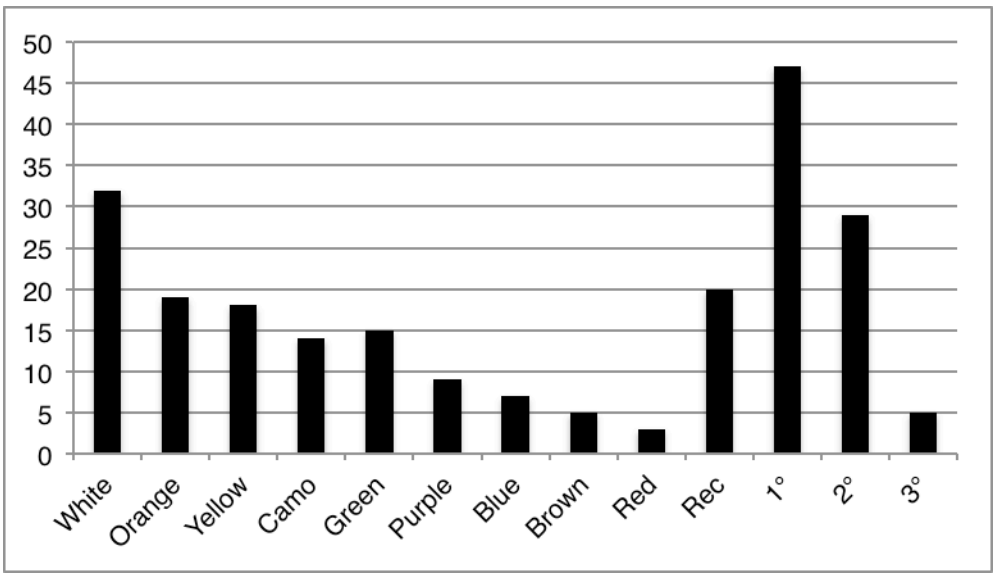

Figure 3 – Sample Distribution by Martial Arts Rank

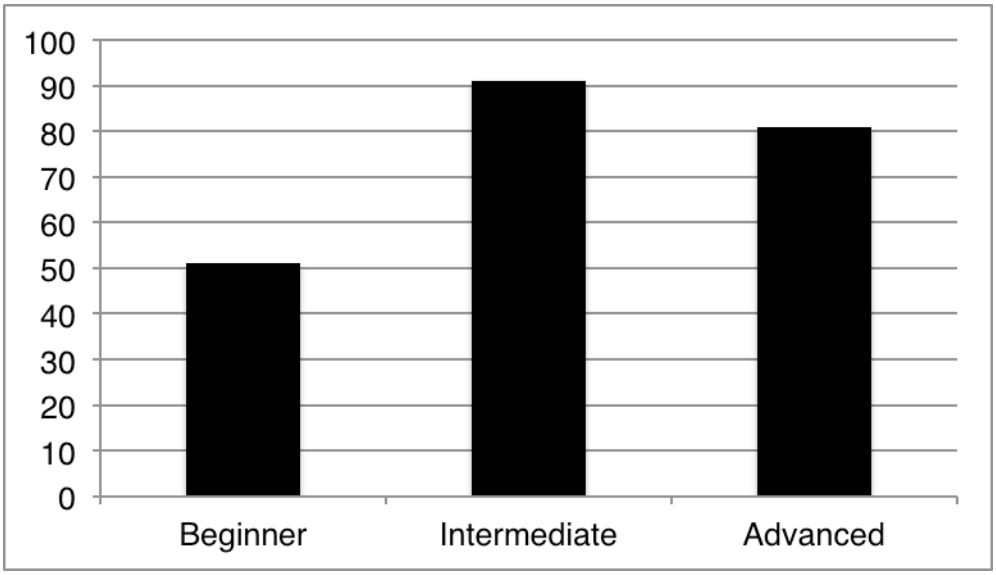

Figure 4 – Sample Distribution of Rank By Analysis Groups

Parent Data

Education

Figure 5 represents the education level of the martial arts students' parents and Table 6 shows the statistics for combined parent education level.

Table 6 – Parent education (combined) statistics

Statistic	Mother's Education Level	Father's Education Level	Combined Parent Education Level
No. of observations	223	223	223
Minimum	1.000	1.000	0.000
Maximum	6.000	6.000	11.000
1st Quartile	2.000	2.000	4.000
Median	3.000	3.000	5.000
3rd Quartile	3.000	3.000	7.000
Mean	2.899	2.785	5.381
Variance (n-1)	1.656	2.022	6.183
Standard deviation (n-1)	1.287	1.422	2.487

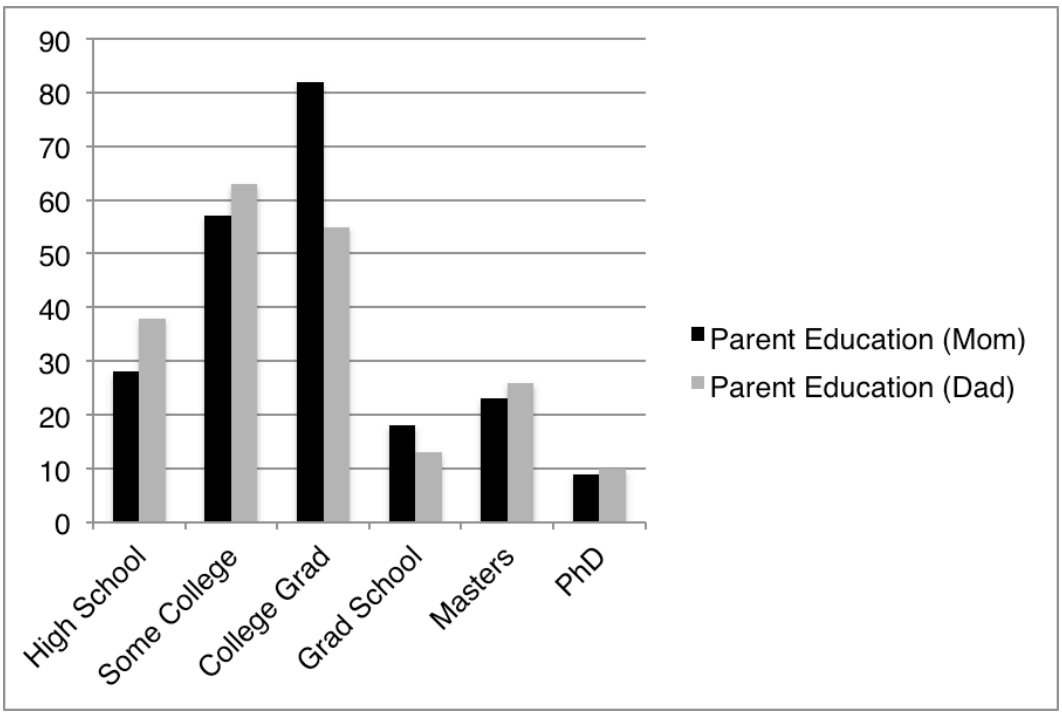

Figure 5 – Parents education level (number of responses).

Total Household Income

Table 7 and Figure 6 represent the total household income in the families surveyed.

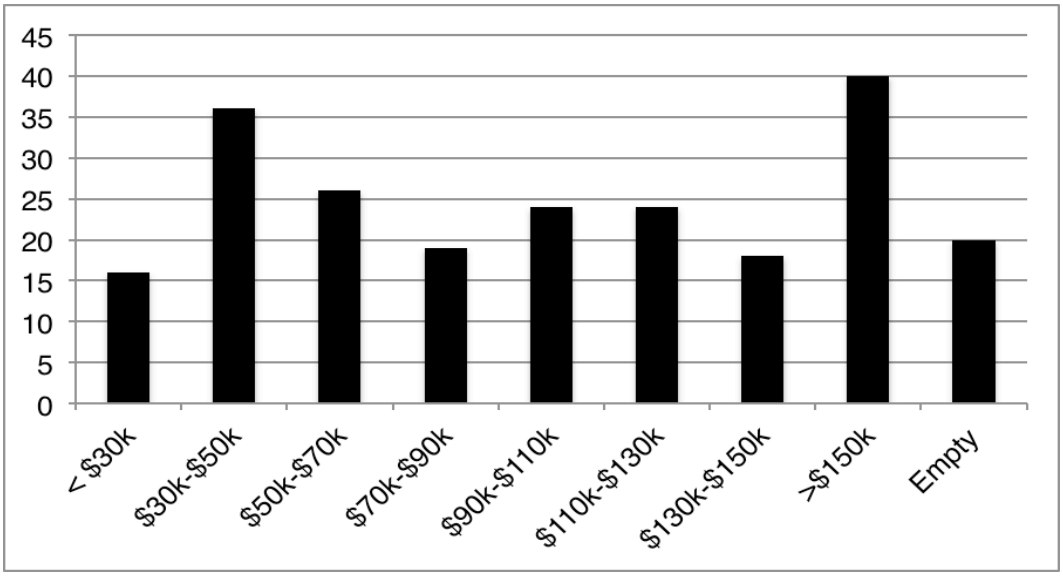

Figure 6 – Total household income.

Table 7 – Household Income Statistics

Statistic	Household Income
No. of observations	223
Minimum	1.000
Maximum	8.000
1st Quartile	2.000
Median	5.000
3rd Quartile	7.000
Mean	4.690
Variance (n-1)	5.641
Standard deviation (n-1)	2.375

Grade Summary

Figure 7 represents the school grades of the students surveyed.

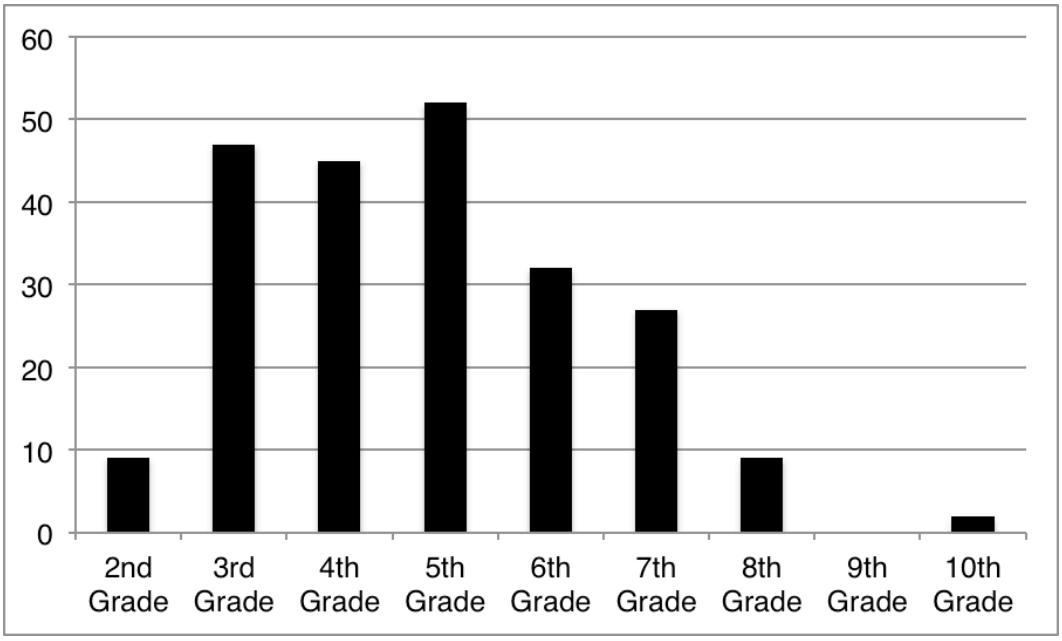

Figure 7 – Sample distribution by grade level.

Research Question 1: Do children who take martial arts for some time get bullied less than children who just started?

Hypothesis 1 was that children who participate for a time in martial arts will not get bullied as much as kids who are beginners. This is best described by question 4 (Q4) in the OBQ. For clarity, question 4 and the answers are:

How often have you been bullied at school in the past couple of months?

- I haven´t been bullied at school in the past couple of months
- it has only happened once or twice

- 2 or 3 times a month
- about once a week
- several times a week

If this question is answered as “bullied 2-3 times a month”, “about once a week” or “several times a week” the question is recoded as “true”, otherwise it is coded as “false”. Any of the last three answers indicate that the student is being bullied regularly. The national average of children answer 2 or 3 times a month or greater is 15.4% (Olweus & Limber, 2010). The study statistics by group are shown in Table 8 and Figures 8 and 9.

Table 8: OBQ Q4: How often have you been bullied at school in the past couple of months?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
None	22 (43%)	47 (52%)	56 (69%)	125 (56%)
once or twice	15 (29%)	27 (30%)	17 (21%)	59 (26%)
2 or 3 times a month	5 (10%)	5 (5%)	4 (5%)	14 (6%)
about once a week	5 (10%)	6 (7%)	1 (1%)	12 (5%)
several times a week	4 (8%)	6 (7%)	3 (4%)	13 (6%)
Total	51	91	81	223

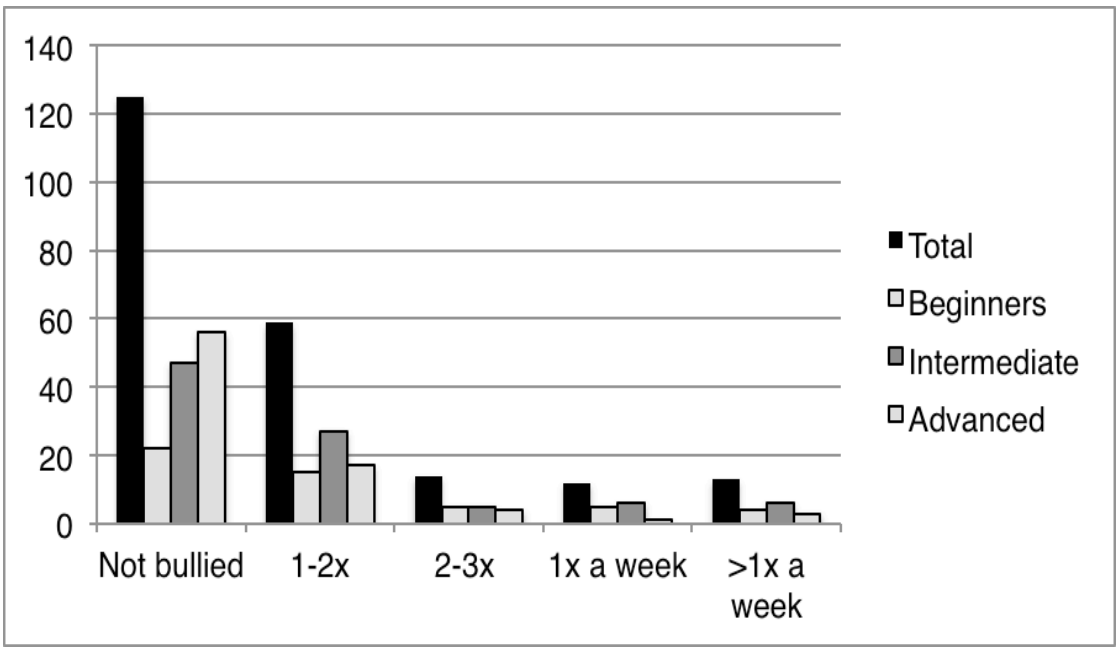

Figure 8 – Answers by group on the question “How often have you been bullied at school in the past couple of months”.

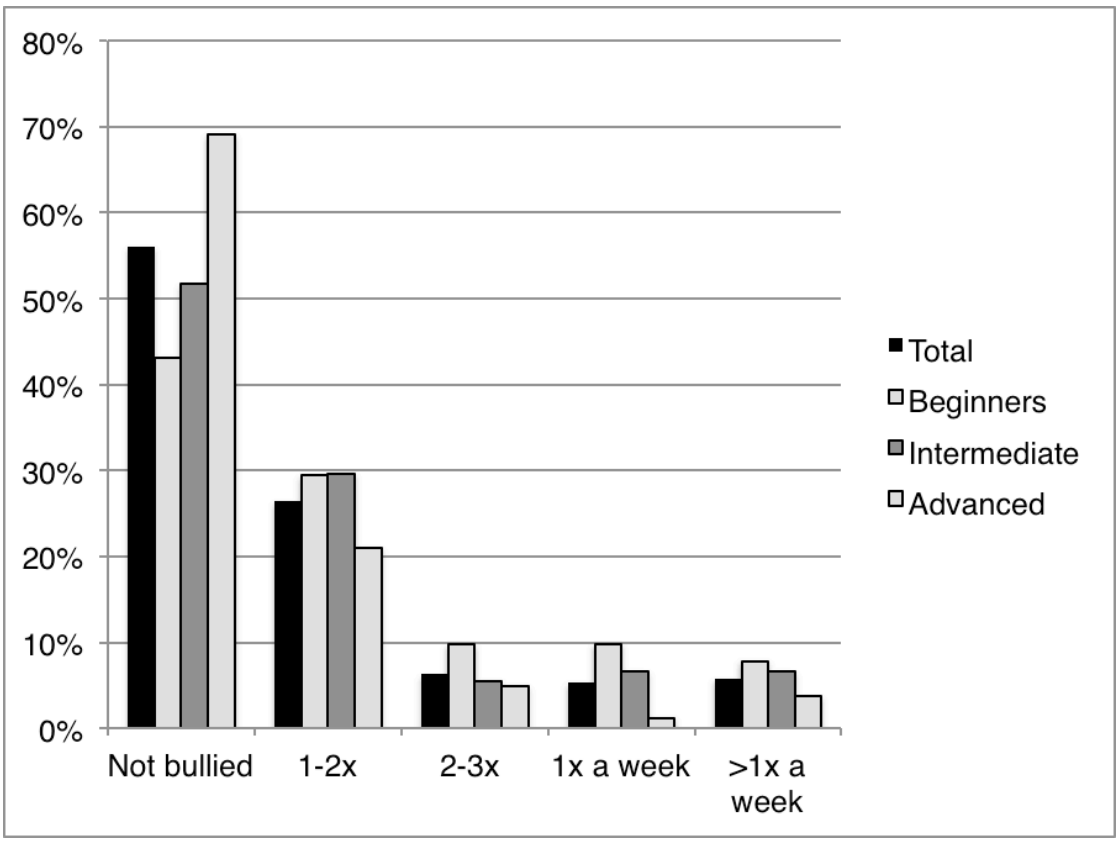

Figure 9 – Answers by group on the question “How often have you been bullied at school in the past couple of months” by percentage of total in group.

Both figures indicate a decreasing prevalence of bullying for progressively advanced groups. Table 9 examines Q4 for the answers indicating more serious bullying (2 to 3 times a month or more):

Table 9: OBQ Q4 dichotomized

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
2 or 3 times a month or more	14 (27%)	17 (19%)	8 (10%)	39 (17%)
Compared to Beginner		47% Less	64% Less	

Which by percentage at least indicates decreasing occurrence of bullying. It also indicates that beginner students are bullied more than the non-martial arts average which may indicate a reason for parents choosing martial arts as an activity. This is also shown in Figure 10.

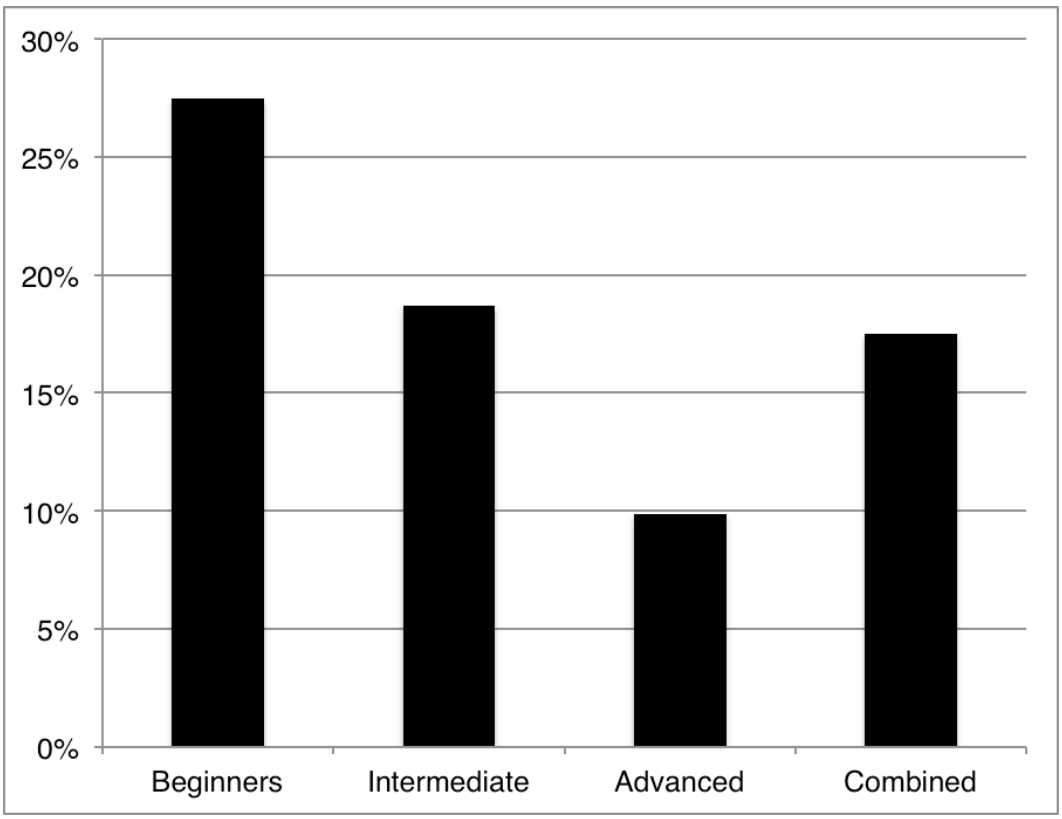

Figure 10 – Percentage of children bullied 2-3 times a month or more by group.

Based on percentage of self-reported bullying for this sample it appears as if there is a decreasing number of kids bullied as they continue martial arts training (64% less at advanced / black belt ranks).

Analysis of Question 4 (Q4) Dichotomized

To further determine whether these results are statistically significant an analysis of variance (ANOVA) was run on the dichotomized value (that is, coded as zero if the answer was they were not bullied, or "once or twice" and 1 if they were bullied 2 or 3 times a month or more. The ANOVA results showed statistical significance ($F=3.486$, $p< 0.032$).

The results are shown below. Table 10 shows the correlation matrix – it shows a stronger correlation between the beginner group and being bullied than the other groups. Table 11 provides the ANOVA results.

Table 10 – Correlation Matrix, child being bullied (Q4 dichotomized)

Variables	Beginner	Intermed	Advanced	Been Bullied 2-3x or more
Beginner	**1.000**	-0.452	-0.411	0.143
Intermediate	-0.452	**1.000**	-0.627	0.026
Advanced	-0.411	-0.627	**1.000**	-0.151
Been Bullied 2-3x or more	0.143	0.026	-0.151	**1.000**

Table 11 – ANOVA results, child being bullied (Q4 dichotomized)

Source	DF	Sum of squares	Mean squares	F	Pr > F
Model	2	0.988	0.494	3.486	0.032
Error	220	31.191	0.142		
Corrected Total	222	32.179			

The box plot of the measured variable (standardized coefficient) for the groups is shown in Figure 11.

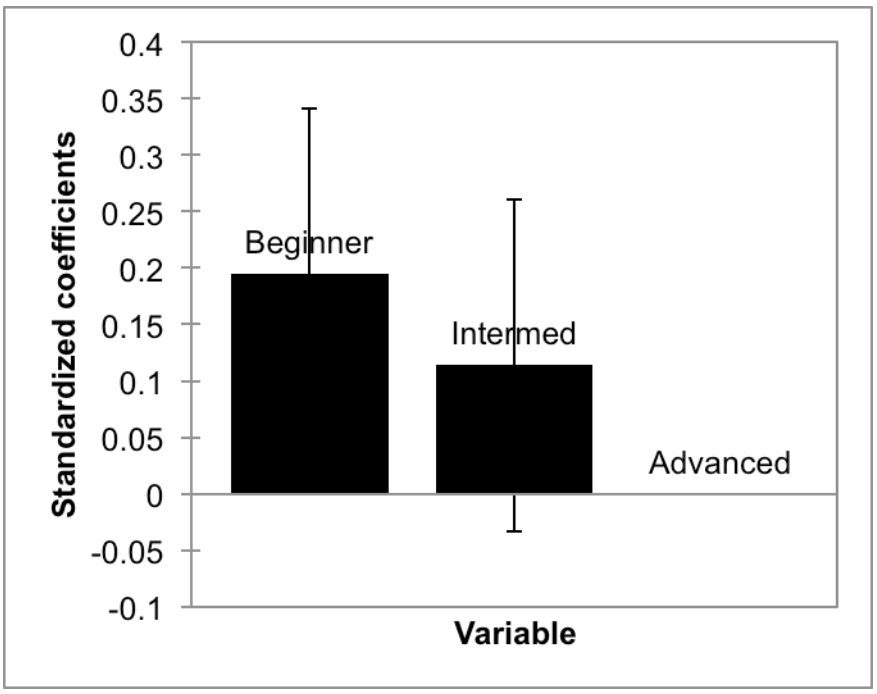

Figure 11 – Box plot for "How often have you been bullied at school in the past couple of months" dichotomized against groups

Analysis of Question 4 (Q4) Raw Score

Analysis was also done on the non-dichotomized Q4 and showed a stronger statistical significance ($F=4.88$, $p<0.008$). The results of this analysis are shown in Tables 12, 13 and Figure X.

Table 12 – Correlation Matrix, child being bullied (Q4 raw)

Variables	Group-1	Group-2	Group-3	q4
Group-1	**1.000**	-0.452	-0.411	0.149
Group-2	-0.452	**1.000**	-0.627	0.060
Group-3	-0.411	-0.627	**1.000**	-0.191
q4	0.149	0.060	-0.191	**1.000**

Table 13 – ANOVA results, child being bullied (Q4 raw)

Source	DF	Sum of	Mean	F	Pr > F

		squares	squares		
Model	2	12.494	6.247	4.888	0.008
Error	220	281.174	1.278		
Corrected Total	222	293.668			

The box plot of the measured variable (standardized coefficient) for the groups is shown in Figure 12.

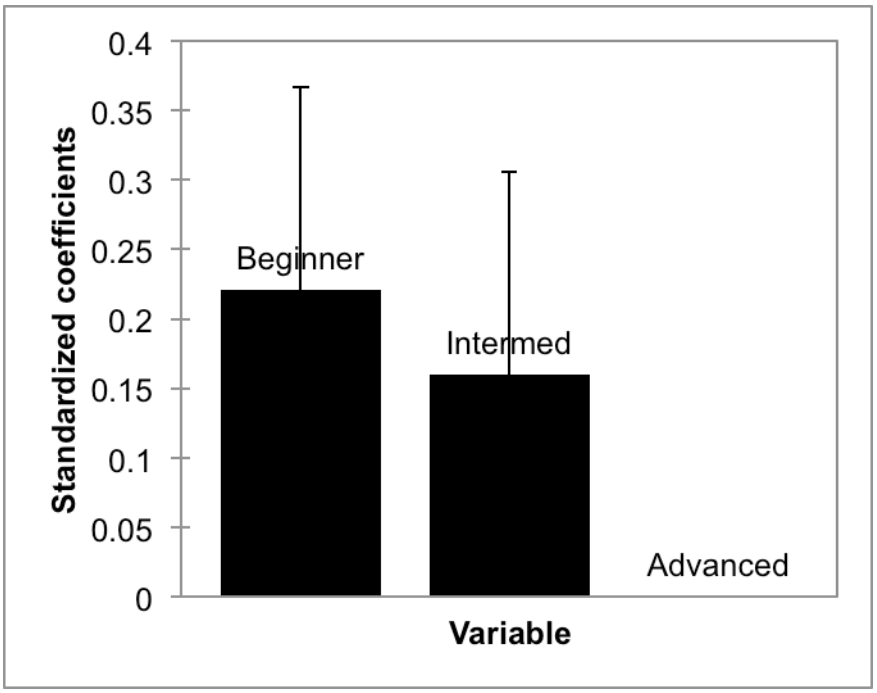

Figure 12 – Box plot for "How often have you been bullied at school in the past couple of months" (Raw Q4 Response)

Additional Analysis of Combined Question Scores

Additional analysis should be considered here because some of the questions asked (Q5-Q18) indicate bullying and sometimes the child will answer that they are not bullied in Q4 but indicate otherwise. To further investigate the results, questions Q4-Q18 were summed and an additional ANOVA was run. These results also showed a strong statistical

significance (F= 4.734, p<0.010). The results of this analysis are shown in Tables 14, 15 and Figure X.

Table 14 – Correlation Matrix, child being bullied (Q4 – Q18 totaled)

Variables	Group-1	Group-2	Group-3	Total Bullied Measure
Group-1	**1.000**	-0.452	-0.411	0.093
Group-2	-0.452	**1.000**	-0.627	0.119
Group-3	-0.411	-0.627	**1.000**	-0.203
Total Bullied Measure	0.093	0.119	-0.203	**1.000**

Table 15 – ANOVA results, child being bullied (Q4 – Q18 totaled)

Source	DF	Sum of squares	Mean squares	F	Pr > F
Model	2	1259.546	629.773	4.734	0.010
Error	220	29267.844	133.036		
Corrected Total	222	30527.390			

The box plot of the measured variable (standardized coefficient) for the groups is shown in Figure 13.

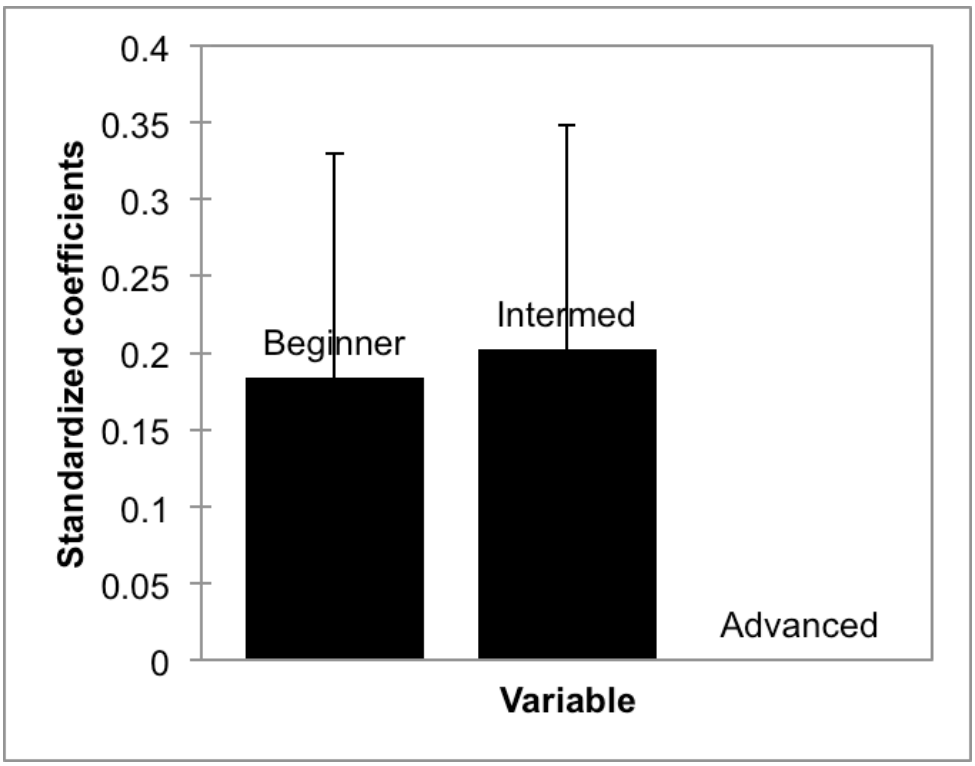

Figure 13 – Box plot for "How often have you been bullied at school in the past couple of months" (Q4-Q18 totaled)

While this analysis did show significance between the groups and much less bullying from the advanced group, it did indicate slightly more bullying occurring (on the collective bullying questions) in the intermediate students than the beginners (though this isn't directly interpretable).

Analysis of Broader Grouping

One more analysis of variance was performed to compare the "very" new martial arts students – the white belts (32 students) and black belts (81). In this case the Q4 dichotomized score was used as a broader

indicator of bullying. The ANOVA showed statistical significance in this case as well ($F=5.181$, $p<0.024$).

Analysis of Alternative Explanations of Reduction in Bullying

To attempt to control for other factors in this quasi-experimental design there are alternative explanations that were examined as possible predictors of the reduction in bullying including child's age, parents' education level, household income

Analysis of Alternative Explanations of Reduction in Bullying – Age/Grade

It's possible that the older a child gets (and therefore increasing his or her rank in martial arts), they naturally are less susceptible to bullying. We therefore should see if age or grade level is a possibly better explanation of the observed reduction in bullying. First the grade breakdown (roughly the same as age) by group is presented in Table 16 and Figure 14.

Table 16: Age statistics by group

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
No. of observations	51	91	81	223
Minimum	8.427	7.986	8.307	7.986
Maximum	14.833	14.268	16.027	16.027
1st Quartile	9.581	9.456	9.932	9.684
Median	10.592	11.027	10.641	10.745
3rd Quartile	11.299	12.477	11.910	12.021
Mean	10.688	11.020	11.075	10.964
Variance (n-1)	2.077	3.168	2.763	2.771

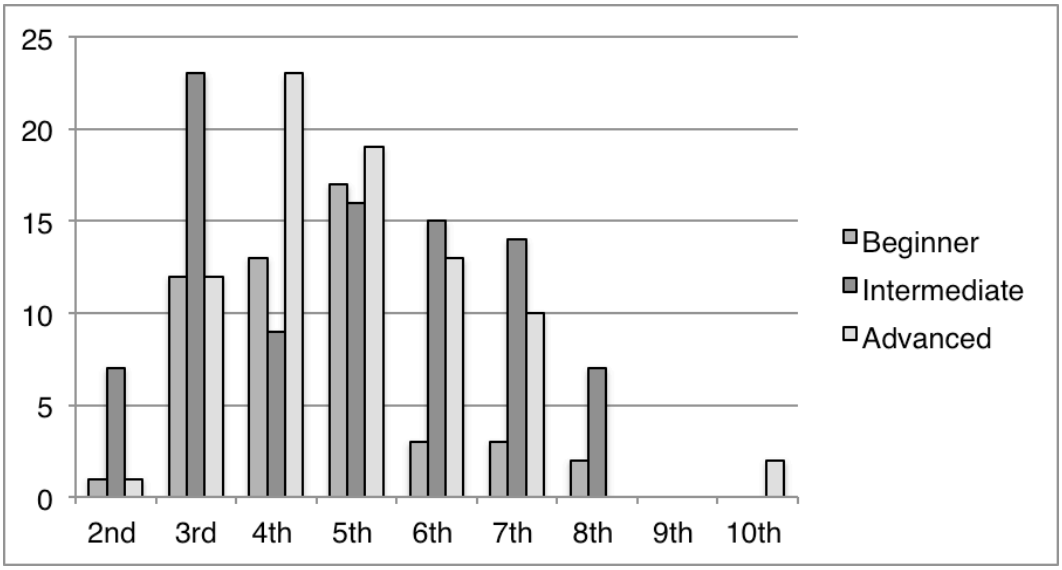

Figure 14 – Grade level distribution by group.

At a glance, there is not obvious difference in age distribution across groups, nevertheless an ANOVA was run to determine if age or more specifically grade level was a more significant factor for research question 1. The results were not statistically significant ($F=.659$, $p<0.707$) and therefore do not support age or grade level as a more important factor in determining reduction in bullying.

Analysis of Alternative Explanations of Reduction in Bullying – Parents Education Level

A case could be made that the parents education level may correlate to a reduction in bullying, and perhaps more educated parents tend to have their kids "stick with it" longer – which would explain the reduction in bullying better than martial arts. The possible scores are shown in Table 17.

Table 17: Combined parent education scores

Score	Parent Education
1	High School
2	Some College
3	College Graduate
4	Grad School
5	Masters Degree
6	Doctorate

Which was scored for both parents/guardians and summed to get a total parent education score that ranged from 2 (both high school) to 12 (both doctorate level). The combined parent income statistics are presented in Table 18 and Figure 15.

Table 18: Combined parent education statistics by group

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
No. of observations	50	91	81	223
Minimum	0.000	1.000	0.000	0.000
Maximum	11.000	11.000	11.000	11.000
1st Quartile	3.000	4.000	4.000	4.000
Median	5.000	5.000	5.000	5.000
3rd Quartile	6.750	6.500	8.000	7.000
Mean	5.120	5.231	5.704	5.381
Variance (n-1)	7.128	5.446	6.486	6.183

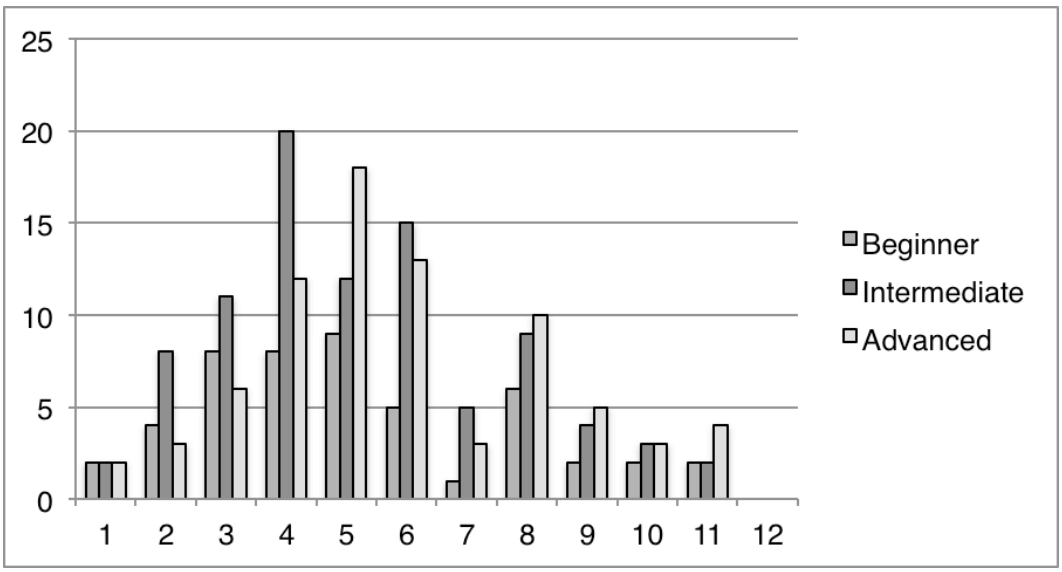

Figure 15 – Combined parent education distribution by group (combining both parents' income).

At a glance, there are not obvious differences in parent education across groups, nevertheless an ANOVA was run to determine if parent education was a more significant factor for research question 1. The results were not statistically significant ($F=0.983$, $p<0.463$) and therefore do not support combined parent education level as a more important factor in determining reduction in bullying.

Analysis of Alternative Explanations of Reduction in Bullying – Household Income Level

A case could be made that the household income level may correlate to a reduction in bullying, that perhaps, higher income households will continue with lessons longer and this may be true as the average household income scores are presented in Table 19 which

indicates an increasing mean equivalent to about $20,000 difference.

Figure 16 shows the household income by group.

Table 19: Household income statistics by group

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
No. of observations	51	91	81	223
Minimum	1.000	1.000	1.000	1.000
Maximum	8.000	8.000	8.000	8.000
1st Quartile	2.000	2.000	3.000	2.000
Median	3.000	5.000	5.000	5.000
3rd Quartile	6.000	7.000	8.000	7.000
Mean	3.978	4.636	5.232	4.690
Variance (n-1)	4.822	5.866	5.416	5.641

There is however, a wide variance for each group mean.

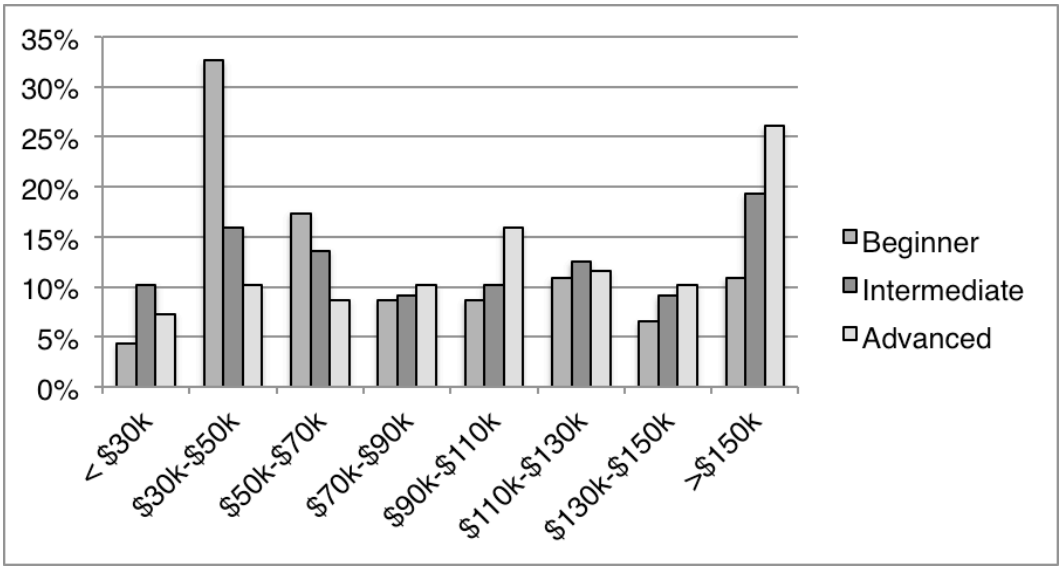

Figure 16 – Household income distribution by group.

As with the other alternative measures, at a glance, there is no obvious difference in household income across groups except at the very low and high end of the income spectrum. An ANOVA was run to determine if household level was a more significant factor for research question 1. The results were not statistically significant ($F= 1.063$, $p<0.389$) and therefore do not support household income level as a more important factor in determining reduction in bullying.

Summary of Research Question 1

Based on the primary analysis (Q4 dichotomized) showing statistical significance and the additional support analysis (Q4 raw, Q4-Q18 totaled and white / black comparisons) and a decreasing percentage of bullying for each progressive group based on Q4, we can accept Hypothesis 1.

Research Question 2: Do children who take martial arts for some time bully others more or less than children who just started?

Hypothesis 2 was that children who participate for a time in martial arts will not bully others as much as kids who are beginners. This is best described by question 24 in the OBQ. For clarity, question 24 and the answers are:

How often have you taken part in bullying another student(s) at school the past couple of months?

- I haven´t bullied another student(s) at school in the past couple of months
- it has only happened once or twice
- 2 or 3 times a month
- about once a week
- several times a week

So any of the last three answers indicate that the student is bullying others regularly. The average reported by Olweus & Limber (2010) is 9% of children answer 2 or 3 times a month or greater. The study results by group are shown in figure 9. The study statistics by group are shown in Table 20 and Figure 17 and 18 (by percentage of total in group).

Table 20: OBQ Q24: How often have you taken part in bullying another student(s) at school the past couple of months?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
None	40 (78%)	79 (87%)	74 (93%)	193 (87%)
once or twice	9 (18%)	8 (9%)	5 (6%)	22 (10%)
2 or 3 times a month	0 (0%)	3 (3%)	0 (0%)	3 (1%)
about once a week	1 (2%)	1 (1%)	1 (1%)	3 (1%)
several times a week	1 (2%)	0 (0%)	0 (0%)	1 (0%)
Total	51	91	80	222

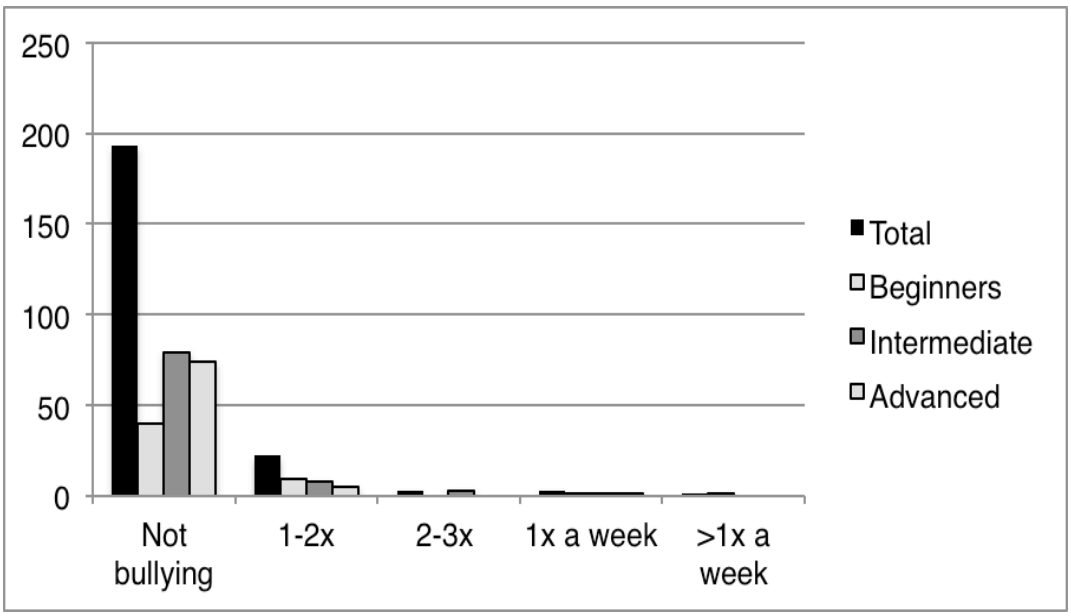

Figure 17 – Answers by group on the question “How often have you taken part in bullying another student(s) at school the past couple of months?”

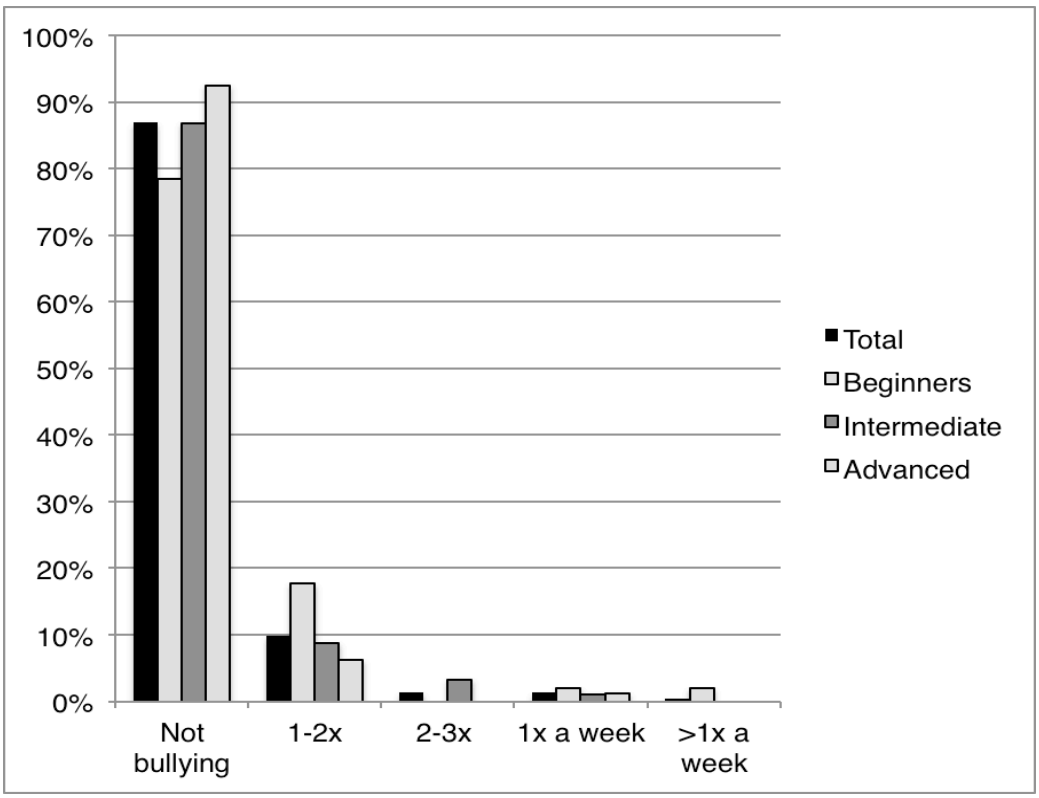

Figure 18 – Answers by group on the question “How often have you taken part in bullying another student(s) at school the past couple of months?” by percentage.

Table 21 examines Q24 for the answers indicating more serious bullying of others (2 to 3 times a month or more):

Table 21: OBQ Q24 dichotomized

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
2 or 3 times a month or more	2 (4%)	4 (4%)	1 (1%)	7 (3%)
Compared to Beginner		Same	68% Less	

Because there is so little bullying reported by students there doesn't seem to be any appreciable difference between the groups. This may indicate that parents of children who bully may not think of martial arts when selecting an activity to do. This is also shown Figure 19.

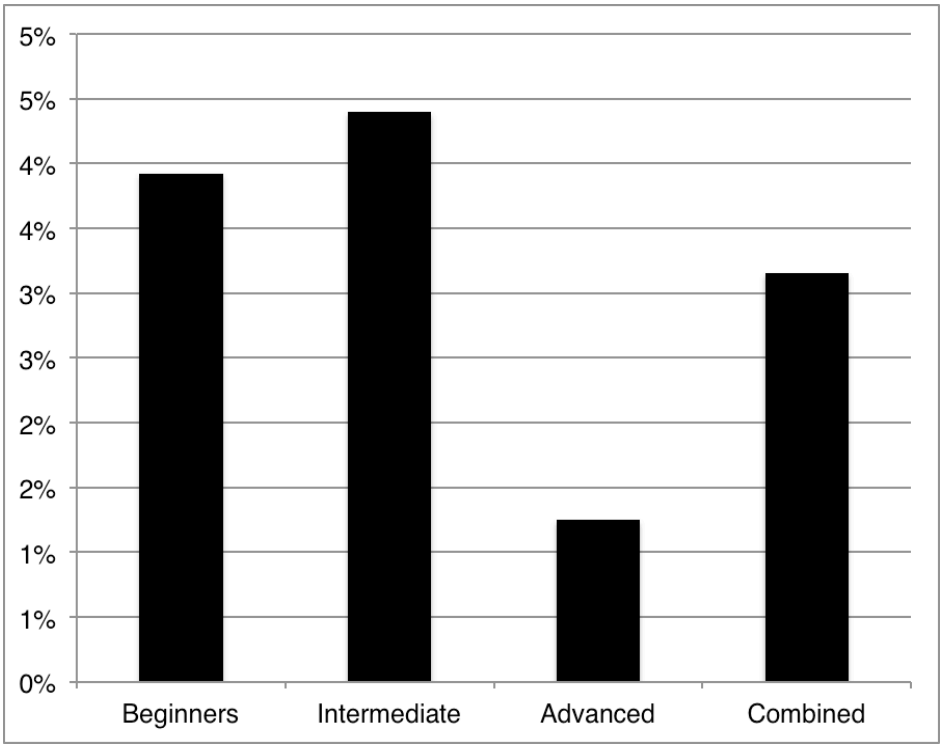

Figure 19 – Percentage of children who bully 2-3 times a month or more by group.

Based on percentage of self-reported bullying of others for this sample it will be very difficult to be confident about any between group differences.

Analysis of Question 24 (Q24) Dichotomized

To determine whether these results are statistically significant an analysis of variance (ANOVA) was run on the Q24 dichotomized value (that is, coded as zero if the answer was they were not bullied, or "once or twice" and 1 if they were bullied 2 or 3 times a month or more. The ANOVA results did not show statistical statistical significance ($F=0.766$, $p< 0.466$). The results are shown below. Table 22 shows the correlation matrix. Table 23 provides the ANOVA results.

Table 22 – Correlation Matrix, bullying others (Q24 dichotomized)

Variables	Group-1	Group-2	Group-3	Bullied others 2-3x a month or more
Group-1	**1.000**	-0.452	-0.411	0.024
Group-2	-0.452	**1.000**	-0.627	0.060
Group-3	-0.411	-0.627	**1.000**	-0.082
Bullied others 2-3x a month or more	0.024	0.060	-0.082	**1.000**

Table 23 – ANOVA results, bullying others (Q24 dichotomized)

Source	DF	Sum of squares	Mean squares	F	Pr > F
Model	2	0.047	0.023	0.766	0.466
Error	220	6.733	0.031		
Corrected Total	222	6.780			

The box plot of the measured variable (standardized coefficient) for the groups is shown in Figure 20.

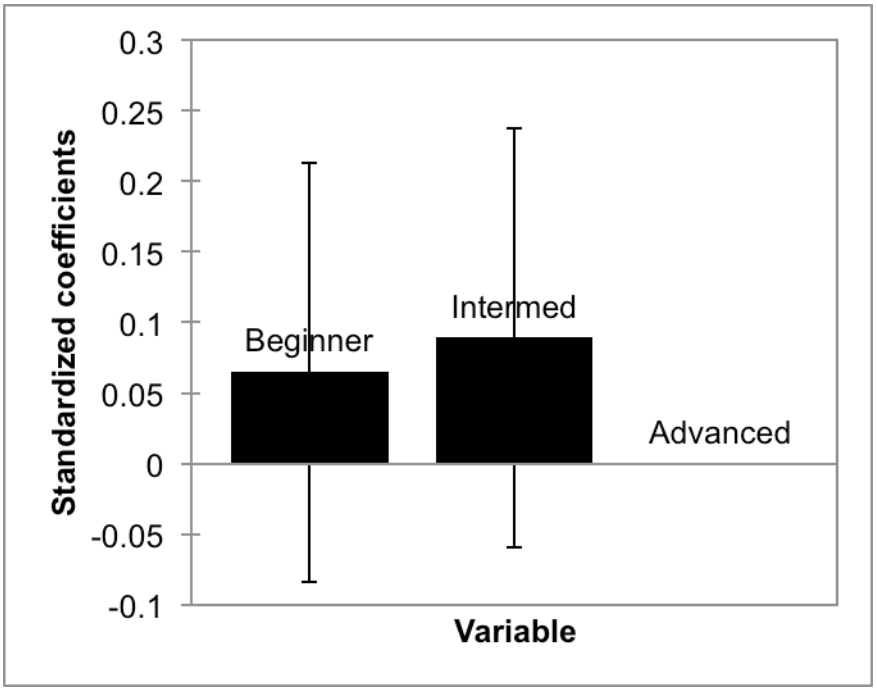

Figure 20 – Box plot for "How often have you taken part in bullying another student(s) at school the past couple of months?" (Q24 dichotomized against groups).

Additional Analysis of Combined Question Scores

Analysis on the raw Q24 (non-dichotomized) isn't likely to show significance, however, as in the prior question, additional analysis should be considered here because some of the questions asked (Q25-Q35) indicate bullying others (and whether they have been talked to about bullying others) and sometimes the child will answer that they are not bullying in Q24 but indicate otherwise in further questions. To further investigate the results, questions Q24-Q35 were summed and an additional ANOVA was run. These results did show a strong statistical significance ($F= 5.523$, $p<0.005$). The results of this analysis are shown in Tables 24, 25 and Figure X.

Table 24 – Correlation Matrix, child bullying others (Q24 – Q35 totaled)

Variables	Group-1	Group-2	Group-3	Total Bullying Measure
Group-1	**1.000**	-0.452	-0.411	0.187
Group-2	-0.452	**1.000**	-0.627	0.016
Group-3	-0.411	-0.627	**1.000**	-0.180
Total Bullying Measure	0.187	0.016	-0.180	**1.000**

Table 25 – ANOVA results, child being bullied (question 4 dichotomized)

Source	DF	Sum of squares	Mean squares	F	Pr > F

Model	2	79.204	39.602	5.523	0.005
Error	220	1577.621	7.171		
Corrected Total	222	1656.825			

The box plot of the measured variable (standardized coefficient) for the groups is shown in Figure 21.

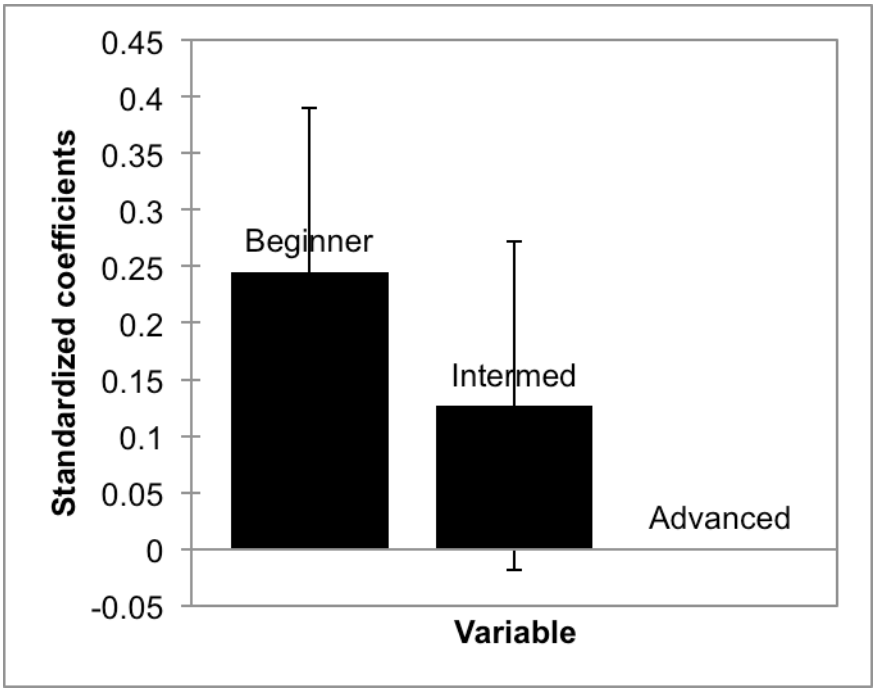

Figure 21 – Box plot for "How often have you taken part in bullying another student(s) at school the past couple of months?" (Q24-Q35 totaled against groups)

This analysis provides more data range as the raw Q24 data simply indicates there is very little bullying going on in the beginner group so its very difficult to measure differences between the groups.

Summary of Research Question 2

Based on the primary analysis (Q24 dichotomized) showing poor statistical significance and the very low indication of bullying of others within any group, we cannot accept Hypothesis 2. However with the additional analysis (Q24-Q35 totaled), there is a strong indication that there may be an effect of reduced bullying of others with more martial arts training and that increasing the sample size in a future study may show that martial arts does indeed reduce bullying of others.

Further Analysis

Parent Survey Analysis

The parent survey was designed to provide demographics and some qualitative comparisons related to the research questions. Questions 1-4 were previously analyzed in the demographics section.

Parent Survey Question 5: Before starting martial arts, as far as you know, how often was your child bullied over a 2 month period?

Parent Survey question 5 is titled and answered the in a similar way to OBQ question 4 except the parent is estimating pre-martial arts bullying. The possible responses are:

- none
- once or twice
- 2 or 3 times a month
- about once a week

- several times a week

The summary results are presented in Table 26.

Table 26: Parent Survey Q5: “Before starting martial arts, as far as you know, how often was your child bullied over a 2 month period?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
None	26 (53%)	43 (47%)	53 (67%)	122 (56%)
once or twice	15 (31%)	26 (29%)	17 (22%)	58 (26%)
2 or 3 times a month	4 (8%)	8 (9%)	3 (4%)	15 (7%)
about once a week	2 (4%)	7 (8%)	0 (0%)	9 (4%)
several times a week	2 (4%)	7 (8%)	6 (8%)	15 (7%)
Total	49	91	79	219

The parents reported 18% of the time that their kids were bullied 2-3 times a month or more.

Parent Survey Question 6: Since starting martial arts, as far as you know, how often was your child bullied over the last couple months?

Parent Survey question 6 is titled and answered the in a similar way to OBQ question 4 except the parent is estimating post-martial arts bullying. The possible responses are:

- none
- once or twice

- 2 or 3 times a month
- about once a week
- several times a week

The summary results are presented in Table 27.

Table 27: Parent Survey Q6: “Since starting martial arts, as far as you know, how often was your child bullied over the last couple months?”

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
None	34 (71%)	54 (59%)	53 (68%)	141 (65%)
once or twice	12 (25%)	27 (30%)	20 (26%)	59 (27%)
2 or 3 times a month	1 (2%)	4 (4%)	2 (3%)	7 (3%)
about once a week	1 (2%)	5 (5%)	2 (3%)	8 (4%)
several times a week	0 (0%)	1 (1%)	1 (1%)	2 (1%)
Total	48	91	78	217

The parents report a lower percentage since they started martial arts at 8% so it appears they feel that martial arts is effective.

Parent Survey Question 5 and 6 Combined Analysis: What was the parent's perceived change in bullying?

Answers for questions 5 and 6 are progressively increasing from not being bullied to being bullied often. A comparison was done between these results subtracting the post martial arts bullying from the pre-martial arts bullying score.

The summary results are presented in Table 28.

Table 28: Parent Survey Q5-Q6

	Beginner	Intermediate	Advanced	Total
Sum of Differences	20	37	14	72
Average Difference	.429	.407	.177	.329

So it does appear that the average difference in the parent's perception between pre and post martial arts training was slightly positive increasing .329 "score points". Interestingly the Beginner and Intermediate groups were just about the same whereas the Advanced students' parents felt there was less difference pre and post training. This may be due to the fact that the higher ranking students had been training for more than 2 years and the parents perception of the bullying situation had changed.

This cannot really be compared against the research question as the children gave a static snapshot of their current bullying status only.

Another way to compare is to dichotomize the Q6 score the same way as the OBQ question 4 as done in Table 29.

Table 29: Parent Survey Q6 dichotomized

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
2 or 3 times a month or more	2 (4%)	10 (10%)	5 (7%)	17 (8%)
Compared to PS5	12%	13%	5%	10%
Compared to PS5 - % reduction	74%	55%	44%	56%
Compared to beginner		150% more	75% more	

As seen here the parents do perceive a reduction (overall 56%) in bullying however it is inconsistent with the student reports.

Parent Survey Question 7: Before starting martial arts, as far as you know, how often did your child bully another child or help another child bully someone?

Parent Survey question 7 is titled and answered the in a similar way to OBQ question 24 except the parent is estimating pre-martial arts bullying of others. The summary results are presented in Table 30.

Table 30: Parent Survey Q7: Before starting martial arts, as far as you know, how often did your child bully another child or help another child bully someone?"

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
None	44 (90%)	85 (94%)	75 (93%)	204 (93%)
once or twice	5 (10%)	3 (3%)	6 (7%)	14 (6%)
2 or 3 times a month	0 (0%)	0 (0%)	0 (0%)	0 (0%)
about once a week	0 (0%)	1 (1%)	0 (0%)	1 (0%)
several times a week	0 (0%)	1 (1%)	0 (0%)	1 (0%)
Total	49	90	81	220

So clearly it's rare that these parents report their child bullies another child.

Parent Survey Question 8: Since starting martial arts, as far as you know, how often is your child bullying other children or helping another child bully someone?

Like the prior question, Parent Survey question 8 is titled and answered the in a similar way to OBQ question 24 except the parent is estimating post-martial arts bullying of others. The summary results are presented in Table 31.

Table 31: Parent Survey Q8: Since starting martial arts, as far as you know, how often is your child bullying other children or helping another child bully someone?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
None	46 (96%)	85 (94%)	78 (96%)	209 (95%)
once or twice	2 (4%)	3 (3%)	3 (4%)	8 (4%)
2 or 3 times a month	0 (0%)	2 (2%)	0 (0%)	2 (1%)
about once a week	0 (0%)	0 (0%)	0 (0%)	0 (0%)
several times a week	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	48	90	81	219

Like the previous question, parents are rarely perceiving that their child is bullying others and for our sample group of children who start martial arts, based on their self-reported answers on the OBQ, this is likely to be accurate.

Parent Survey Question 7 and 8 Combined Analysis: What was the parent's perceived change *in bullying others?*

Answers for questions 7 and 8 are progressively coded from 1 to 5 along the scale increasing from not bullying others at all to bullying others often. A comparison was done between these results subtracting the post martial arts bullying others score from the pre-martial arts bullying others score. The summary results are presented in Table 32.

Table 32: Parent Survey Q7-Q8

	Beginner	Intermediate	Advanced	Total
Sum of Differences	4	3	3	6
Average Difference	.082	.033	.037	.027

This is a very minor difference between the groups and because of the low beginner score there is a ceiling effect is unlikely to be much change. This supports that the children who enter a martial arts program are unlikely to start out in a situation where they bully others.

Parent Survey Question 9: How much improvement in your child's ability to avoid being bullied has occurred since beginning your martial arts program?

This question measures the parents opinion of whether the martial arts program has contributed to their child's ability to avoid bullying. The summary results are presented in Table 33.

Table 33: Parent Survey Q9: How much improvement in your child's ability to avoid being bullied has occurred since beginning your martial arts program?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Lots of Improvement	11 (25%)	37 (42%)	37 (46%)	85 (40%)
Some Improvement	22 (50%)	47 (53%)	30 (38%)	99 (46%)
No Improvement	8 (18%)	4 (4%)	11 (14%)	23 (11%)
It's Worse	0 (0%)	0 (0%)	0 (0%)	0 (0%)
No Answer	3 (7%)	1 (1%)	2 (3%)	6 (3%)
Total	44	89	80	213

The parents seem to be generally feeling there is either "Lots of Improvement" or "Some Improvement" as these sum up to 86% of the answers.

Parent Survey Question 10: How much improvement in your child's ability to not bully others has occurred since beginning your martial arts program?

This question measures the parents opinion of whether the martial arts program has contributed to their child's ability to avoid bullying other kids. The summary results are presented in Table 34.

Table 34: Parent Survey Q10: How much improvement in your child's ability to not bully others has occurred since beginning your martial arts program?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Lots of Improvement	12 (27%)	33 (39%)	31 (40%)	76 (37%)
Some Improvement	12 (27%)	23 (27%)	21 (27%)	56 (27%)
No Improvement	13 (30%)	11 (13%)	15 (19%)	39 (19%)
It's Worse	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Coded as "No Issue"	7 (16%)	18 (21%)	11 (14%)	36 (17%)
Total	44	85	78	207

This question should have been worded differently and given a "No Bullying Issue" option. Quite a few parents made a comment that their child doesn't bully others so therefore the question (or the possible answers) didn't make sense. The parents seem to be generally feeling there is either "Lots of Improvement" or "Some Improvement" as these sum up to 64% of the answers, however the quality of the question is poor.

Parent Survey Question 11: How much improvement in your own understanding of bullying has occurred since your child began martial arts?

Does the martial arts program explain bullying to parents – at least give them a new understanding? The summary results are presented in Table 35.

Table 35: Parent Survey Q11: How much improvement in your own understanding of bullying has occurred since your child began martial arts?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Lots of Improvement	10 (24%)	32 (39%)	31 (39%)	73 (36%)
Some Improvement	18 (43%)	36 (44%)	36 (45%)	90 (44%)
No Improvement	12 (29%)	13 (16%)	11 (14%)	36 (18%)
It's Worse	0 (0%)	0 (0%)	2 (3%)	2 (1%)
Coded as "No Issue"	2 (5%)	1 (1%)	0 (0%)	3 (1%)
Total	42	82	80	204

This question also was problematic because the written answers indicated there needed to be a "The Same" answer. Nevertheless, "Lots of Improvement" or "Some Improvement" are the most typical answers so far (80% of the responses).

Parent Survey Question 12: When YOU were a child how often were you bullied?

To explore the parents' prior history of bullying, they were asked how often it occurred to them. The summary results are presented in Table 36.

Table 36: Parent Survey Q12: When YOU were a child how often were you bullied?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Never	15 (32%)	24 (26%)	26 (33%)	65 (30%)
once or twice	19 (40%)	44 (48%)	36 (45%)	99 (45%)
2 or 3 times a month	5 (11%)	11 (12%)	11 (14%)	27 (12%)
about once a week	6 (13%)	4 (4%)	3 (4%)	13 (6%)
several times a week	2 (4%)	8 (9%)	4 (5%)	14 (6%)
Total	47	91	80	218

If the question is dichotomized to sum "2 or 3 times a month" or more we get the results with their % of total in Table 37.

Table 37: Parent Survey Q12 dichotomized

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
2 or 3 times a month or more	13 (28%)	23 (25%)	18 (23%)	54 (25%)

This indicates that the parents who bring their kids to martial arts have a past recollection of bullying higher than the proportion reported by Nansel et al. (2001) of 16.9% (48% more). Perhaps parents who have had a prior history of bullying are more likely to bring their children to a martial arts class.

Parent Survey Question 13: When YOU were a child how often did you bully others?

To explore the parents' prior history of bullying, they were asked how often they bullied others. The summary results are presented in Table 38.

Table 38: Parent Survey Q13: When YOU were a child how often did you bully others?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Never	35 (73%)	64 (70%)	52 (65%)	151 (69%)
once or twice	13 (27%)	25 (27%)	25 (31%)	63 (29%)
2 or 3 times a month	0 (0%)	2 (2%)	0 (0%)	2 (1%)
about once a week	0 (0%)	0 (0%)	1 (1%)	1 (0%)
several times a week	0 (0%)	0 (0%)	2 (3%)	2 (1%)
Total	48	91	80	219

If the question is dichotomized to sum “2 or 3 times a month” or more we get the results with their % of total in Table 39.

Table 39: Parent Survey Q13 dichotomized

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
2 or 3 times a month or more	0 (0%)	2 (2%)	3 (4%)	5 (2%)

This indicates that the parents who bring their kids to martial arts have a past recollection that they bully much less than the proportion reported by Nansel et al. (DATE) of 19.3%.

Parent Survey Question 14: How much improvement in your child's self concept has occurred since beginning your martial arts program?

Adding another exploratory qualitative variable of self-concept, the summary results are presented in Table 40.

Table 40: Parent Survey Q14: How much improvement in your child's self concept has occurred since beginning your martial arts program?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Lots of Improvement	19 (37%)	50 (56%)	52 (66%)	121 (55%)
Some Improvement	31 (61%)	38 (42%)	25 (32%)	94 (43%)
No Improvement	1 (2%)	2 (2%)	2 (3%)	5 (2%)
It's Worse	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	51	90	79	220

In 98% of the cases the parents report was "Some Improvement" or better and in no case did the parent indicate worse.

Parent Survey Question 15: Do you feel your child has learned valuable safety awareness skills (such as stranger danger, 911 or other skills) since beginning your martial arts program?

Adding another exploratory qualitative variable of whether the parents feel the children improved safety skills, the summary results are presented in Table 41.

Table 41: Parent Survey Q15: Do you feel your child has learned valuable safety awareness skills (such as stranger danger, 911 or other skills) since beginning your martial arts program?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Very Valuable	32 (63%)	68 (75%)	71 (89%)	171 (77%)
Somewhat Valuable	17 (33%)	22 (24%)	9 (11%)	48 (22%)
Not Valuable	0 (0%)	1 (1%)	0 (0%)	1 (0%)
Reduction in Awareness	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Coded as “No Answer”	2 (4%)	0 (0%)	0 (0%)	2 (1%)
Total	51	91	80	222

In 99% of the cases the parents report was “Somewhat Valuable” or better.

Parent Survey Question 16: For Parents with Siblings (in the program or not in the program) Only: How much improvement has your child shown in interacting with their siblings at home or school since beginning your martial arts program?

This question was designed to see if sibling bullying was reduced with the martial arts program, the summary results are presented in Table 42.

Table 42: Parent Survey Q16: For Parents with Siblings (in the program or not in the program) Only: How much improvement has your child shown in interacting with their siblings at home or school since beginning your martial arts program?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Lots of Improvement	10 (20%)	17 (19%)	16 (20%)	43 (20%)
Some Improvement	18 (35%)	34 (38%)	27 (34%)	79 (36%)
No Improvement	9 (18%)	12 (13%)	10 (13%)	31 (14%)
Reduced Ability	0 (0%)	1 (1%)	0 (0%)	1 (0%)
Coded as “No Sibling”	14 (27%)	25 (28%)	26 (33%)	65 (30%)
Total	51	89	79	219

This question was poorly worded and should be restructured to allow an answer of “No Sibling” and “No Problem In The Past”. Nevertheless this does indicate the parents do feel there is some improvement. If the “no

sibling" responses are removed, 79% of the parents reported "some" or "lots" of improvement.

Parent Survey Question 17: Overall, how do you like your child's martial arts experience?

This question was designed to evaluate the overall perception of the martial arts program, the summary results are presented in Table 43.

Table 43: Parent Survey Q17: Overall, how do you like your child's martial arts experience?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Great	32 (63%)	66 (73%)	60 (76%)	158 (72%)
Good	16 (31%)	22 (24%)	19 (24%)	57 (26%)
Fair	3 (6%)	2 (2%)	0 (0%)	5 (2%)
Poor	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Bad	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Total	51	90	79	220

Overwhelmingly this was positive – 98% felt the program was "Good" or "Great".

Further OBQ Analysis

There are a variety of questions and analysis that is interesting on the OBQ including whether fear of being bullied is reduced with martial arts treatment, children's attitudes about bullying, etc..

Are Children's Fear of Being Bullied Different Because of Martial Arts?

Perhaps martial arts also changes a students fear about being bullied. OBQ question 38 (Q38) asks: "How often are you afraid of being bullied by other students in your school?" and the possible answers are:

- Never
- Seldom
- Sometimes
- Fairly often
- Often
- Very often

Which is scored on a 1-6 scale for analysis. The Q38 score data is presented in Table 44 and Figure 22.

Table 44: OBQ Q38: How often are you afraid of being bullied by other students in your school?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Never	24 (47%)	43 (48%)	52 (66%)	119 (54%)
Seldom	5 (10%)	11 (12%)	13 (16%)	29 (13%)
Sometimes	9 (18%)	14 (16%)	9 (11%)	32 (15%)
Fairly often	4 (8%)	7 (8%)	2 (3%)	13 (6%)
Often	4 (8%)	5 (6%)	1 (1%)	10 (5%)
Very often	5 (10%)	10 (11%)	2 (3%)	17 (8%)
Total	51	90	79	220

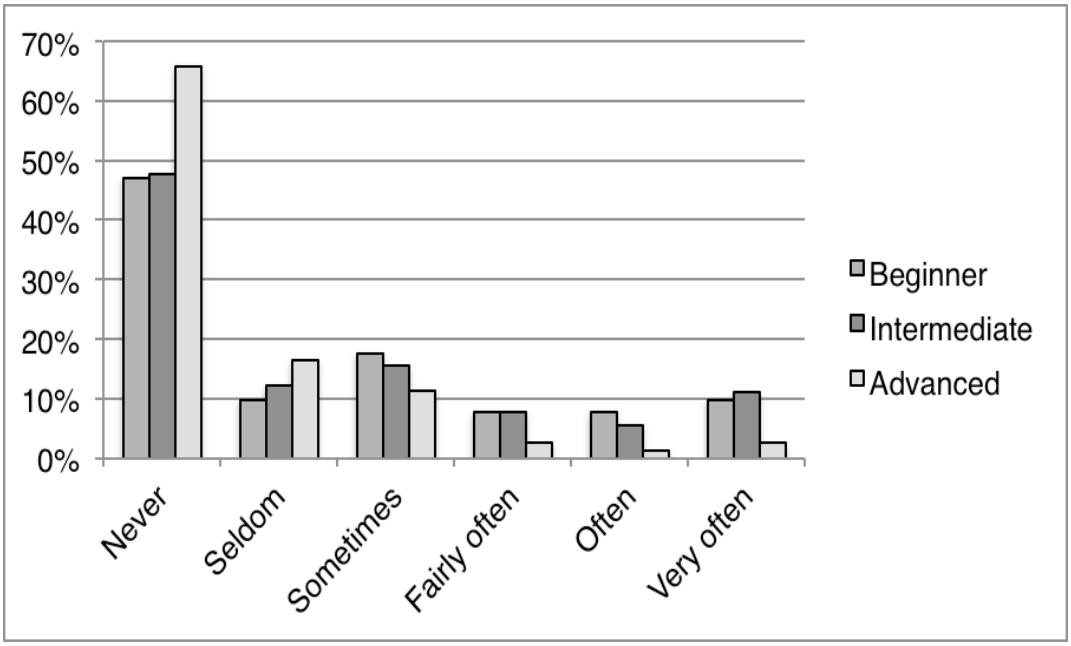

Figure 22 – Answers by group on the question “How often are you afraid of being bullied by other students in your school?” by percentage.

By glance at the chart by percentage it looks like the advanced students are much less afraid of being bullied. To confirm this assertion an ANOVA was performed on Q38. The ANOVA did not return statistically significant results ($F= 2.454$, $p< 0.088$), the score of the beginner and intermediate groups were too close. Further data is in Table 45, Table 46 and Figure 23.

Table 45 – Correlation Matrix, fear of bullying (Q38)

Variables	Group-1	Group-2	Group-3	q38
Group-1	**1.000**	-0.458	-0.409	0.007
Group-2	-0.458	**1.000**	-0.624	0.128
Group-3	-0.409	-0.624	**1.000**	-0.138
q38	0.007	0.128	-0.138	**1.000**

Table 46 – ANOVA results, fear of bullying (Q38)

Source	DF	Sum of squares	Mean squares	F	Pr > F
Model	2	88.181	44.090	2.454	0.088
Error	218	3916.118	17.964		
Corrected Total	220	4004.299			

The box plot of the measured variable (standardized coefficient) for the groups is shown in Figure 23.

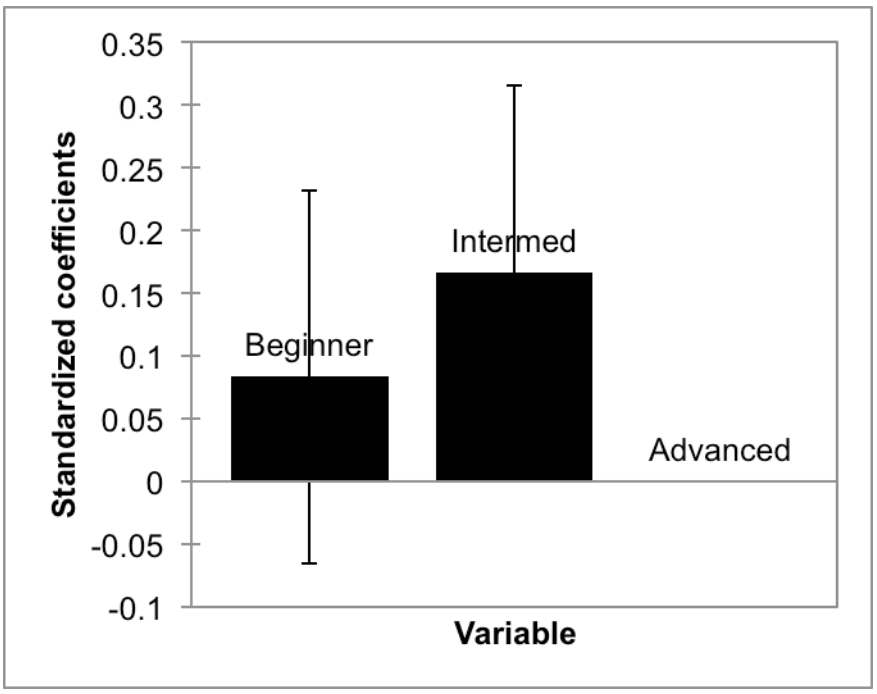

Figure 23 – Box plot for "How often are you afraid of being bullied by other students in your school?"

To continue examination, and because of the dramatic difference between the advanced (black belt) students and others, an additional ANOVA was performed comparing white belts and black belts. This analysis did return statistically significant results ($F= 11.194$, $p< 0.001$). The relevant statistics are in Table 47, Table 48 and Figure 24.

Table 47 – Correlation Matrix, fear of bullying (Q38), white vs. black belts

Variables	White Belt	Black Belt	q38
White Belt	**1.000**	-1.000	0.284
Black Belt	-1.000	**1.000**	-0.284
q38	0.284	-0.284	**1.000**

Table 48 – ANOVA results, fear of bullying (Q38), white vs. black belts

Source	DF	Sum of squares	Mean squares	F	Pr > F
Model	1	22.110	22.110	11.194	0.001
Error	128	252.821	1.975		
Corrected Total	129	274.931			

The box plot of the measured variable (standardized coefficient) for the groups is shown in Figure 24.

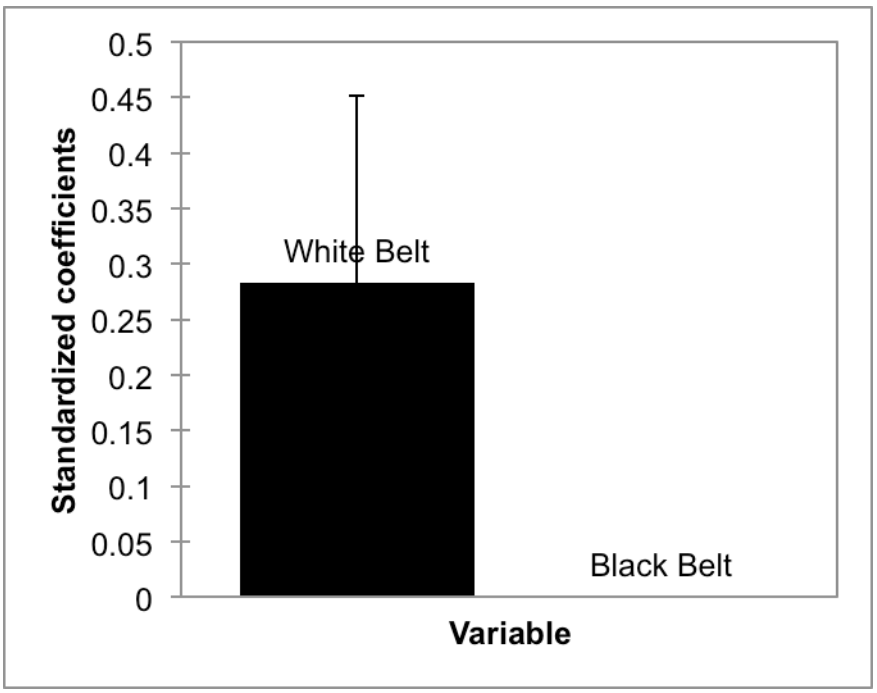

Figure 24 – Box plot for "How often are you afraid of being bullied by other students in your school?" (Q38), white vs. black belts only.

While the main group effects do not appear statistically significant, the effect of martial arts over a 2 year period or more (white to black belt) does appear to be strongly statistically significant. It does appear that martial arts training, if done long enough, reduces fear of being bullied.

Do Children Who Do Martial Arts Help Other Kids Who Are Being Bullied?

Martial arts certainly should encourage a child to help if another kid is being bullied. OBQ question 37 (Q37) asks: “How do you usually react if you see or understand that a student is being bullied by other students?” and the possible answers are:

- I have never noticed that students my age have been bullied
- I take part in the bullying
- I don´t do anything, but I think the bullying is OK
- I just watch what goes on
- I don´t do anything, but I think I ought to help the bullied student
- I try to help the bullied student in one way or another

Which is scored on a 1-6 scale for analysis. The Q37 score data is presented in Table 49 and Figure 25.

Table 49: OBQ Q37: How do you usually react if you see or understand that a student is being bullied by other students?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Never Noticed	14 (27%)	23 (26%)	12 (15%)	49 (22%)
Take part	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Don't do, but its ok	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Just watch	3 (6%)	1 (1%)	2 (3%)	6 (3%)
Don't do but should	8 (16%)	12 (13%)	6 (8%)	26 (12%)
Help	26 (51%)	53 (60%)	59 (75%)	138 (63%)
Total	51	89	79	219

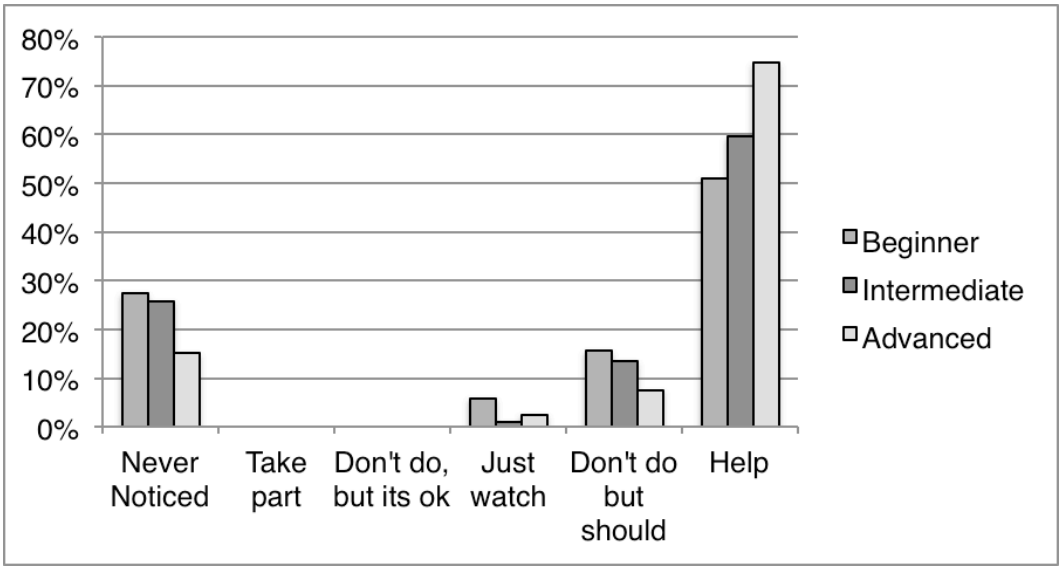

Figure 25 – “How do you usually react if you see or understand that a student is being bullied by other students?” by percentage.

To confirm the question of whether there are any between group differences an ANOVA was performed on Q37. As with Q39, the ANOVA did not return statistically significant results ($F= 2.634$, $p< 0.074$), The

scores of the beginner and intermediate groups (as in Q37) were too close. Further data is in Table 50, Table 51 and Figure X.

Table 50 – Correlation matrix, helping others (Q37)

Variables	Group-1	Group-2	Group-3	q37
Group-1	**1.000**	-0.456	-0.414	-0.096
Group-2	-0.456	**1.000**	-0.622	-0.064
Group-3	-0.414	-0.622	**1.000**	0.150
q37	-0.096	-0.064	0.150	**1.000**

Table 51 – ANOVA results, helping others (Q37)

Source	DF	Sum of squares	Mean squares	F	Pr > F
Model	2	21.653	10.826	2.634	0.074
Error	216	887.644	4.109		
Corrected Total	218	909.297			

The box plot of the measured variable (standardized coefficient) for the groups is shown in Figure 26.

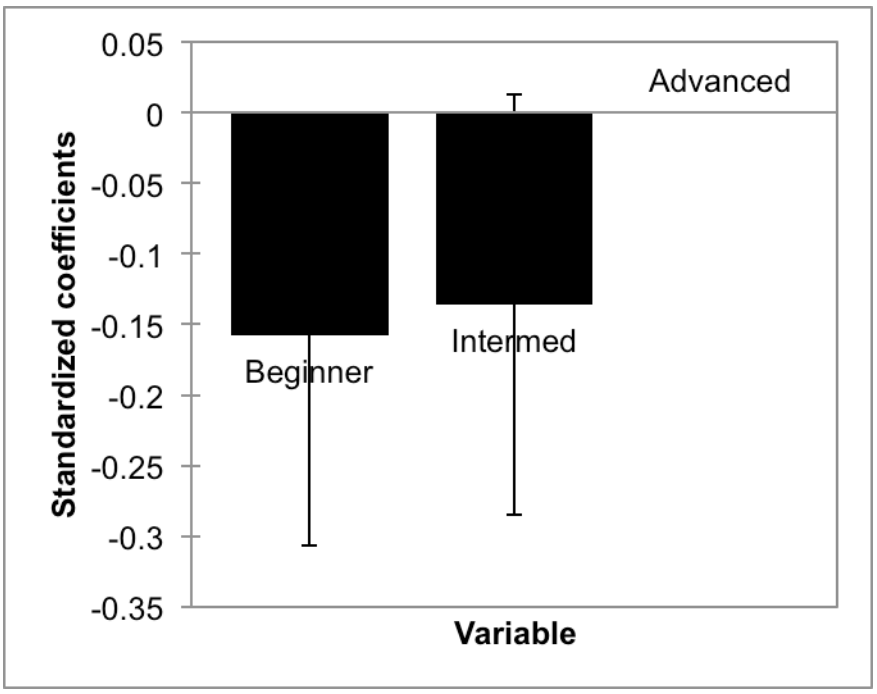

Figure 26 – Box plot for Q37 “How do you usually react if you see or understand that a student is being bullied by other students?”

Like Q38, because of the dramatic difference between the advanced (black belt) students and others, an additional ANOVA was performed comparing white belts and black belts. This analysis did return statistically significant results (F= 4.977, p< 0.027). The relevant statistics are in Table 52, Table 53 and Figure 27.

Table 52 – Correlation matrix, helping others (Q37), white vs. black belts

Variables	White Belt	Black Belt	q37
White Belt	**1.000**	-1.000	-0.150
Black Belt	-1.000	**1.000**	0.150
q37	-0.150	0.150	**1.000**

Table 53 – ANOVA results, helping others (Q37), white vs. black belts

Source	DF	Sum of squares	Mean squares	F	Pr > F
Model	1	20.386	20.386	4.977	0.027
Error	217	888.910	4.096		
Corrected Total	218	909.297			

The box plot of the measured variable (standardized coefficient) for the groups is shown in Figure 27.

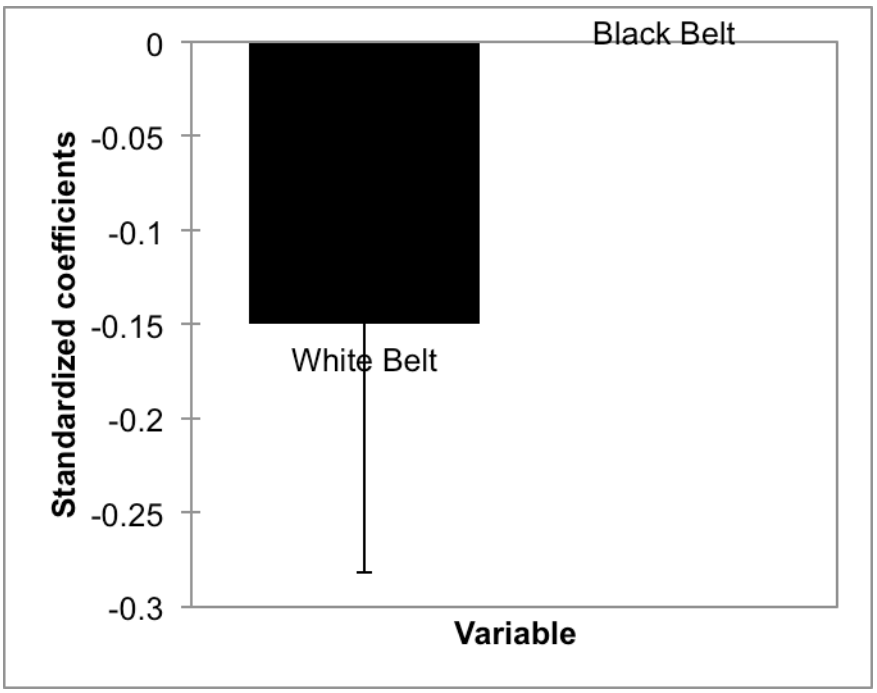

Figure 27 – Box plot for "How do you usually react if you see or understand that a student is being bullied by other students?" (Q37), white vs. black belts only.

While the original group effects do not appear statistically significant, the effect of martial arts over a 2 year period or more (white to black belt) does appear to be strongly statistically significant. It does appear that

martial arts training, if done long enough, increases the chances that a child will help in a situation when another child is being bullied.

Does Martial Arts Affect a Student's Attitude About School?

Martial arts instructors and the parents of martial arts students would like to think that their kids have a better attitude about school. This is addressed by OBQ question 1 (Q1) which asks: "How do you like school?" and the possible answers are:

- I dislike school very much
- I dislike school
- I neither like nor dislike school
- I like school
- I like school very much

Which is scored on a 1-5 scale for analysis. The Q1 score data is presented in Table 54 and Figure 28.

Table 54: OBQ Q1: How do you like school?

Answer	Beginner n (%)	Intermediate n (%)	Advanced n (%)	Total n (%)
Dislike very much	1 (2%)	3 (3%)	1 (1%)	5 (2%)
Dislike school	0 (0%)	1 (1%)	0 (0%)	1 (0%)
Neither like or dislike	7 (14%)	17 (19%)	20 (26%)	44 (20%)
Like school	25 (49%)	47 (52%)	30 (38%)	102 (47%)
Like school very much	18 (35%)	22 (24%)	27 (35%)	67 (31%)
Total	51	90	78	219

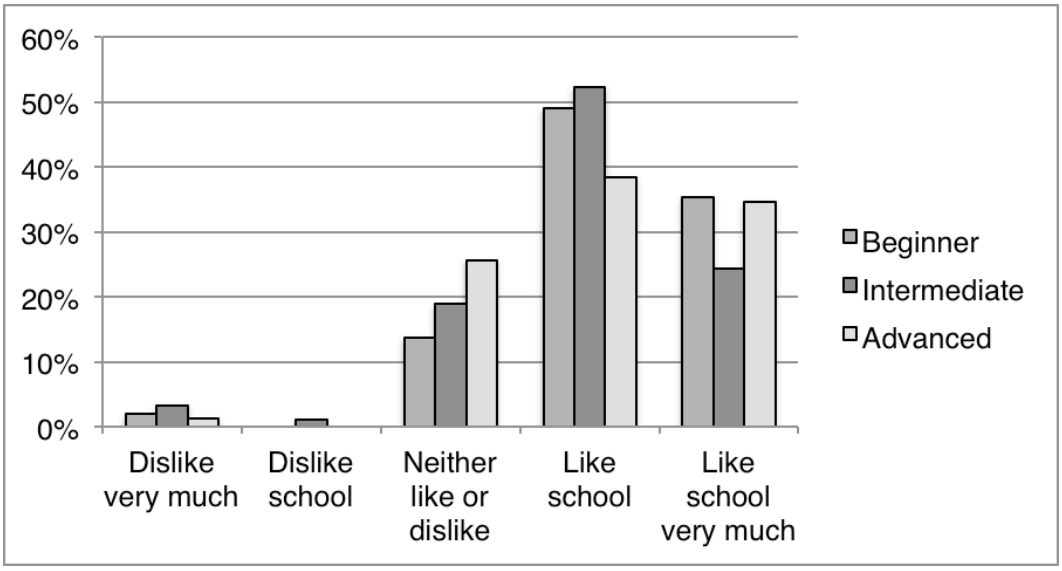

Figure 28 – “How do you like school?” by percentage.

To confirm the question of whether there are any between group differences an ANOVA was performed on Q1. The ANOVA did not return statistically significant results ($F= 1.158$, $p< 0.316$) so there don’t seem to

be any statistical differences between the groups. Martial arts students overall like school about 78% of the time and only 2% dislike school.

"Portrait of" Group Results

The beginner group (white and orange belts), intermediate group (yellow through recommended black belt) and advanced (black belt) students certainly have different characteristics based on these results. Below is a brief summary of what each group's data shows.

Portrait of the Beginner

Who they are: Beginners are white and orange belts, that is, students who have just started martial arts within the last 4 months.

Do they get bullied? The beginners appear to get bullied more than an average child as 27% of beginners are bullied vs. 16.9% reported by Nansel et al. (2001) or 62% more. This is likely to be a reason parents bring their kids into martial arts classes.

Do they bully others? Entering students don't seem to prone to bullying other kids. Only 4% of beginners bully other kids vs. 19.3% reported by Nansel et al. (2001) which is 80% less. This suggests there is a strong self-selection effect where parents who have kids who bully don't typically want to bring them to a martial arts program or kids who bully may not want to participate in an activity that requires discipline and self-control.

Are they afraid of being bullied? Beginners are afraid of being bullied 26% of the time and "very afraid" 10% of the time.

Do they help other kids who are being bullied? Beginners do report that they help (51%) of the time, but it's much less than the advanced students (75%).

Do they like school? Beginners report that they "like school" or "like school very much" (84%) of the time – not statistically significantly different from the intermediate or advanced students.

Portrait of the Intermediate Student

Who they are: Intermediate students are yellow through 1st degree recommended black belts (pre-black belts). Typically this is between 16 weeks and 2 years of training.

Do they get bullied? The intermediate students appear to get bullied about the same or slightly higher than an average child. 19% of intermediate students report being bullied vs. 16.9% reported by Nansel et al. (2001) or just 4%% more.

Do they bully others? Intermediate students don't seem any more likely to bully others than the beginners. A few Intermediate students answered positively to Q24 but this was not statistically significant

Are they afraid of being bullied? Intermediate students are afraid of being bullied about the same as the beginners (25% vs 26% for the beginners).

Do they help other kids who are being bullied? Intermediate students report that they help (60%) of the time, more than the beginners (51%) but less than the advanced students (75%).

Do they like school? Intermediate students report that they "like school" or "like school very much" (76%) of the time – not statistically significantly different from the beginner or advanced students.

Portrait of the Advanced Student

Who they are: Advanced students are black belts. Children can achieve the rank of 1st degree, 2nd degree or 3rd degree black belt. Typically takes between 2 and a half years of training for 1st degree black belt and 6 years or more for 3rd degree black belt.

Do they get bullied? The advanced students appear to get bullied much less than an average child. Only 10% of advanced students report being bullied vs. 16.9% reported by Nansel et al. (2001) or 42% less. What's more impressive is that compared to the typical entry (beginner) student, they get bullied 64% less (10% vs 27% for beginners).

Do they bully others? Advanced students rarely bully others. Only one advanced student answered positively (that they bully others) to Q24.

Are they afraid of being bullied? Advanced students are afraid of being bullied much less than either group (only 7% vs 26% for the beginners).

Do they help other kids who are being bullied? Intermediate students report that they help (60%) of the time, more than the beginners (51%) but less than the advanced students (75%).

Do they like school? Advanced students report that they “like school” or “like school very much” (73%) of the time – not statistically significantly different from the beginner or intermediate students.

CHAPTER 4: DISCUSSION

The present study investigated the effects of martial arts on bullying behaviors in kids. The martial arts skills were taught through the American Taekwondo Association (ATA) Karate for Kids™ program and included physical moves and discussions related to personal growth. Participants (beginner, intermediate and advanced) were recruited from martial arts schools in 22 states across the United States. Demographics showed the parents to be relatively affluent and educated.

The procedure used a parent survey and a child questionnaire. The questionnaire was the broadly used Olweus Bullying Questionaire (OBQ) and analysis of variance was performed on the scores from the OBQ to answer the research questions. The parent survey determined demographic information, martial arts rank information and qualitative opinions from the parents. The surveyed groups were beginners (as measured by the two beginner martial arts ranks of white belt or orange belt (approximately zero to 18 weeks of training), intermediate (as measured by their martial arts rank of camouflage (camo), green, purple, blue, brown, red belt or 1st degree recommended black belt (approximately 19 weeks to 100 weeks of training) and advanced (as measured by their martial arts rank of black belt which is typically more than 2 and a half years to as many as 10 years of training for that age group).

Analyses of variance were performed on specific scores from the OBQ.

Summary of Findings

1) Hypothesis 1 was that children who participate for a time in martial arts will not get bullied as much as kids who are beginners (a 64% reduction in amount of bullying). The analysis did show a decrease in reported bullying (less advanced students were bullied than intermediate students and less intermediate students were bullied than beginners) and the analysis of variance showed a statistically significant difference ($F=3.486$, $p< 0.032$) between the groups. Further confirmatory analyses of variance were performed on a variety of additional OBQ questions and all showed statistically significant results in the direction of reduction in bullying due to martial arts. In addition, additional analyses of variance were run to determine if household income, parent education or age/grade level were better explanations of the change and none were shown to be statistically significant. Hypothesis 1 may be accepted.

2) Hypothesis 2 was that children who participate for a time in martial arts will not bully others as much as kids who are beginners. Because very few beginners reported bullying others (far less than typically reported levels) there were very slight

differences between the groups and analysis of variance did not show a significant difference ($F=0.766$, $p<0.466$). Further analysis of OBQ questions related to bullying did show statistically significant results ($F=5.523$, $p<0.005$). While hypothesis 2 may not be accepted, based on the further analysis there is a trend for the more advanced students to bully less than the beginners

3) Children who participated in martial arts long enough to earn their black belt decreased their fear of being bullied. Beginners were afraid of being bullied “fairly often” or more 26% of the time, intermediate students were about the same at 25%, however the advanced students reported afraid of being bullied 7% of the time. The main group effects were not statistically significant but further analysis of variance comparing only white belts (less than 8 weeks of experience) to black belts were significant ($F=11.194$, $p<0.001$).

4) Children who participated in martial arts long enough to earn their black belt were more likely to indicate they would help other kids being bullied. Because many of the students indicated they would help if they saw a child being bullied, the effect between the beginner, intermediate and advanced groups was not statistically significant, however comparing white belts

to black belts showed a strong statistical significance ($F=4.977$, $p<0.027$).

5) There was no indication that martial arts training affected the students' attitude towards school. The students who start martial arts like school just as much as the advanced ones.

6) Summary of parent survey findings

    a. On their children being bullied:

        i. The parents feel the martial arts program did help reduce the amount their child was bullied. The beginners parents' reported a 74% reduction, intermediate 55% advanced 44% and overall the parents reported a 56% reduction.

        ii. The parents don't have a very accurate perception of how much their children are bullied:

            1. The beginner group parents thought their children were bullied far less than the children themselves (parents 4% vs. children report 27%)

            2. The intermediate group parents thought their children were bullied about half as much the

children themselves (parents 10% vs. children report 19%)

3. The advanced group parents thought their children were bullied a little less than the children themselves (parents 7% vs. children report 10%).

iii. The parents also reported the child's "ability to avoid being bullied" was improved "some" or "lots" in 86% of cases.

b. On their children bullying other children:

i. The parents rarely reported their children bullied at all so no determination could be made on this, however they reported in 64% of the cases that the child's "ability to not bully" was improved.

ii. The parents feel the martial arts program did help improve the child's ability to not bully others. In 74% of the cases they answered the child has improved "lots" or "some" in their "ability to not bully others".

c. The parents perceived improvement in their own "understanding of bullying" since starting their child in martial arts in 80% of the cases.

d. The parents reported that they were bullied almost 50% more than typical when they were a child.

e. The parents reported they rarely bullied others as a child (reported only 2% of the time).

f. 98% perceived their child's self concept was improved since beginning martial arts.

g. 99% perceived their child's learned valuable safety awareness skills .

h. 79% of the parents felt there was improvement in the child's ability to interact with their siblings (with the "no sibling" or unanswered responses are eliminated).

i. 98% of the parents felt the martial arts program was "good" (26%)or "great" (72%).

Discussion of Results

The study showed statistically significant results in many of the exploratory questions and particularly for the primary research question of whether martial arts reduces the prevalence of kids getting bullied. Almost

every indicator was in a direction showing martial arts was beneficial for children and this was consistent with the parent reports.

Demographics

The demographics reflect what might be guessed for income and education level. These participants come from a pool of middle to higher income (they can afford martial arts classes) and education levels around a normal population. The participant's mothers seemed to have at least some college, while the fathers had a greater level of education. Divorced or separated parents didn't want to include the other parent on the form in some cases.

Does Martial Arts Reduce Bullying?

The study showed statistically significant results for the primary research question of whether martial arts affects children getting bullied. Students in martial arts classes of this type, when taken for more than 2 months, do not get bullied as much as beginner kids and they seem to get bullied much less than the averages typically reported for the Olweus Bullying Questionnaire and progressively less as they receive more training. Beginners report being bullied 27% of the time, intermediate students 19% and advanced students only 10% (advanced students reported being bullied 64% less than beginners). Supporting analysis was done by combining all of the "getting bullied" questions, the raw single "getting bullied" question and also comparing the white and black belts.

Each analysis of variance showed statistical significance. Extensive additional analysis to attempt to explain the effect another way were performed with household income, parent education or age/grade level supports the conclusion that martial arts did indeed effect the amount of bullying the student endures in a positive way.

Does Martial Arts Affect The Amount Children Bully Others?

To the question of whether martial arts students bully more or less after training for a time, there was a weak relationship between the measured groups, however when additional analyses were run the results did indicate a positive effect.

The main reason for the weak relationship was simply that it appears kids who bully are not beginning martial arts. This is also supported by the parent reports and the parent survey analysis. As discussed earlier typically children report that they bully about 19.3% of the time. The beginner group only reported bullying others 4% of the time – 84% less than Nansel et al. (2001). This resulted in a very small effect size and weak significance.

However two other analyses suggest that martial arts does effect bullying of other kids. Firstly the combined question analysis, which summed up all the questions in the OBQ which referenced bullying others, did in fact provide stronger results. These questions referred to the actions the child took rather than the general “do you bully others” question so

there were more opportunities to identify instances where they bully. When these questions were summed and equally weighted the combined score analysis did show statistical significance ($F=5.523$, $p<0.005$) and a clear difference between the groups.

The parent surveys also supports the premise that martial arts may reduce bullying. The parents overwhelmingly reported that the child's ability to not bullying others improved (74% of the cases were improved "lots" or "some" if the "no prior issue" scores are excluded) even though they rarely indicated that the child bullied.

It is important to note that there is no data suggesting an increase in bullying behavior because of the martial arts program. The combined score analysis and the parent surveys both indicate that there is little danger that a child who bullies will get worse following a martial arts program. This is contrary to the Endresen & Olweus study (2005) which found a slight increase in bullying of others in martial arts (the study did suggest systems based on oriental martial arts didn't show a significant increase).

While the "gold standard" OBQ question analysis didn't indicate martial arts has a positive effect on children bullying others because of low frequency of positive response, the combined question analysis clearly did show that martial arts had a positive effect on reducing the behavior of kids bullying others. However, because there are no weighting criteria to

compare the combined question analysis to, this is not enough to support accepting Hypothesis 2.

Other Discussion Points

Data was collected as part of the study on a variety of variables.

Fear of Being Bullied

Children who earned their black belt report far less fear of being bullied. Beginners were afraid of being bullied “fairly often” or more 26% of the time, intermediate students were about the same at 25%, however the advanced students reported afraid of being bullied 7% of the time. One explanation of the relative closeness of the intermediate and beginner groups is that the psychological benefit of earning the black belt may create important additional feelings of self-confidence – thereby reducing fear of being bullied. The more likely explanation is that the effect takes longer to manifest because reducing fear (or improving self confidence) is a longer term process than awareness or safety training that may affect the other measures. While main group effects were not statistically significant, further analysis of variance comparing only white belts (less than 8 weeks of experience) to black belts were significant ($F=11.194$, $p<0.001$). Future study may concentrate on a wider range of ranks (perhaps only white and black belts) and increasing the sample size in these rank areas only.

Black Belts Defend Others

Children who earned their black belt are more likely to defend other kids when they see them being bullied. A large number of students indicated they would help if they saw a child being bullied so the effect size between the beginner, intermediate and advanced groups was not statistically significant. When comparing white belts to black belts, however, a strong statistical significance ($F=4.977$, $p<0.027$) was revealed. This is not unexpected and like the “fear” factor above, the confidence and drive to protect another child likely takes longer to develop than some of the other characteristics measured. As with the discussion of fear of being bullied, future study may concentrate on a wider range of ranks and increasing the sample size in these rank areas only.

Attitude Towards School Unaffected

There are two possibilities that may explain why there was no significant effect regarding school attitude (after all if they are bullied less as they advance, wouldn’t you think they would like school better?) Firstly the beginners already liked school a lot in general (84%) and this creates a strong ceiling effect. This could be because kids who are brought to karate already like school and perhaps if a child doesn’t like school the parent wont have them do an extra activity (they may need to concentrate on school). The other possibility is that liking or disliking school is not affected as much by safety or confidence issues and be a personal preference of the child.

Parent Survey

The parent survey is largely a qualitative measure, however there were some interesting comparisons and discoveries of interest. The parents results on some questions were very different from what their child reported, while in some cases they were representative. The survey also showed the parents very much looked like their kids. They were bullied more than typical (50% more) and rarely bullied others (only 2% of the time). In addition the parent surveys indicated a very strong positive opinion of the martial arts school they attended.

Regarding the questions regarding the child being bullied, the parents tended to poorly recognize how much their child was bullied. The parents of the beginner students only thought their child was bullied regularly in 4% of the cases (it was reported in 27% of the students reports) and for the parents of the intermediate group only 10% of the cases (children: 19%). That's two to 7 times less than the kids report. The parents of the advanced students were much closer (7% parents vs. 10% kids) and this may be due to the parents being more sensitive to these kinds of issues than the lower ranking students' parents who haven't heard as much about safety. Another possibility is that the parents typically don't recognize bullying very well. The parents all seemed to be positive about the program's effect on bullying as 86% answered that their child's ability to avoid being bullied was improved.

As far as the parents perception of their child bullying of other kids, they rarely reported that their children bullied. In comparison to the child's self reported answers, this was very consistent. Because the amount of reported bullying are so low it is very difficult to determine any effect size. They did feel that in 74% of the cases that their child had improved in the area of "ability to not bully others". They also reported improvement in "understanding of bullying".

The last few questions on the parent survey indicated a strong safety and self concept benefit from the martial arts program. 98% of the parents reported their child's self concept was improved "some" or "lots" since beginning martial arts and 99% perceived the safety skills "were valuable" or "very valuable". In addition 98% of the parents selected that the overall experience of the martial arts program was "great" or "good" and 72% selected the highest possible response of "great". This is an overwhelmingly positive suggestion that the martial arts program created a good climate for the families. This could be a contributing factor in the main effects covered by this study.

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 have caused higher reported results, while most would tend to negatively bias our results. The primary problems are: self-selection, generalizability,

unbalanced groups, the alternate explanation that the martial arts program may simply be filtering out the kids who are getting bullied, process issues and finally that the survey environment may have skewed the results.

One problem, common to this type of study is that self-selection may explain some 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 (1988) suggested this was a primary factor in this type of research. A similar self-selection issue is that the students who continue training may be the kind of student (or have parent support) that lends itself to not being bullied, and the children who are more likely to be bullied drop out and don't make it to black belt. It does appear, based on the data, that children who bully typically do not choose martial arts.

Another limitation of the research was that the participants were all students at martial arts schools in the American Taekwondo Association. The martial art class is a particular type (the Karate for Kids™ program). The programs were relatively consistent in their curriculum and instruction even across different U.S. states. These results may not be repeatable across all martial arts, kids martial arts or taekwondo programs.

While it was requested that the beginner, intermediate and advanced groups were to be equally surveyed, in the age range required for the OBQ, some martial arts schools wouldn't have had as many

available beginners (this would represent 2-4 months of incoming new students) as intermediate (about two years worth of new students) or as advanced (which represent years of new students starting and continuing). The study then had 23% of the samples from the beginner group, 41% from the intermediate groups and 36% from the advanced – so the groups are not evenly represented.

Another problem with the study and perhaps the biggest design issue is that another explanation for the results is that children who get bullied may tend to drop out earlier than kids who don't. In other words, the training requires an enormous amount of work to become a black belt and perhaps this training filters out children who are more susceptible to bullying. If this is the case then martial arts training really has no beneficial effect. There is no indication that this is true, though to control for this would require a longitudinal study where the students would be tested all along their martial arts training.

There are a few process issues on the construction of the study. The parent survey should have included more specific directions and should have included a selection for the parents to select "my child isn't bullied" or "no siblings" for some of the questions. The directions for the administrator may have been confusing and should be rewritten to make sure the administrators put the forms in the correct places. The administrators should be trained that when asking participants to fill out

the survey and questionnaire, should be more assertive (keeping the surveys in the martial arts school). The parent survey gender question should have been written in the same direction as the OBQ (i.e. in the OBQ it was girl coded as 1 and boy as 2 so it would have been easier for data entry to code the parent survey female first then male). The instructions for returning the surveys should have been clearer because the parent and OBQ surveys were often returned in the envelope they came in which was extra work for the administrator, made them fit poorly in the return box, and was extra data entry work. On the parent survey, question 1 – birthday should have specified the child's birthday (a few parents entered *their* birthday). There also should be more than one spot to enter the martial arts rank – perhaps the student enters as well because sometimes the rank wasn't entered on the parent survey (and therefore the sample wasn't useable. The parent survey statement: "Please answer the following questions." Should have said: "Please answer the following questions about <u>your child</u>." In a few cases the parent put their own information in (for example, if they were in martial arts, they entered their own rank). The administration directions needed to be clearer that the surveys are for 9-13 year olds and the children themselves need to do the questionnaire. In a very few cases it was obvious the parent did the surveys for the children and these samples were rejected.

It is also possible that the results were skewed because of the test environment. Normally the OBQ is done in a school environment where

the parents are not present during the questionnaire administration. It is possible that the child may answer differently when his or her parent or guardian is in close proximity. In addition it is likely that the study participants assumed that the desired outcome of the study would be in a particular direction. They may have wanted to please the instructors and school owners who were administering the surveys and answered differently than they would have in a more neutral environment.

Implications for Research

Further research should increase the sample size to encompass a more varied range of ranks (age ranges), use the OBQ as a diagnostic tool to identify other martial arts schools (outside of the American Taekwondo Association) and further analysis of the individual questions to expand the resolution of the findings. Analysis across individual schools may reveal specific characteristics or techniques specific to the location that can be learned from. The positive results indicate that other effects such as self-concept, self-discipline and safety may be excellent research topics.

Implications for Practice

The evidence suggests that a referral to a martial arts school using the ATA Karate for Kids™ program for children may be appropriate for children with bullying issues. There is a measurable positive effect of this

kind of martial arts training. This is likely but not certain to apply to children who are bullying others as well and our study indicates that there is little to no danger that martial arts makes bullying issues worse. This may also be appropriate for other types of specific child issues. Care should be taken when referring to a martial arts facility that does not meet Karate for Kids™ program standards.

Conclusion

The data confirms our initial hypothesis that martial arts does have the effect of decreasing how much a child is bullied. It also provides some support for the second hypothesis that martial arts training decreases the likelihood a child will bully others. All of the data appears to be in the direction that doing martial arts training in the format presented does indeed reduce all indicated bullying behaviors, in particular a 64% reduction in the amount the child is bullied by the time they achieve black belt. This is supported by parent survey responses and cross-analyses. In addition, there is strong parent report that martial arts training improves self concept, teaches valuable safety lessons and is an overall positive experience which may contribute to the results in improving bullying behaviors. Given the results presented here, there is also a strong outlook that expanding the research to other effects of martial arts may provide additional insight on the benefits of martial arts for children. A referral for a child by a children's practitioner to a martial arts school which

uses the ATA Karate for Kids™ program is likely to help with all bullying behaviors and is unlikely to be detrimental for kids who are bullying others.

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APPENDIX A

INFORMED CONSENT FORM

The Effects of Martial Arts on Bullying in Children

2/28/12

Dear Parent

I am a graduate student working under the direction of Professor Sam DiGangi in the Division of Education Leadership & Innovation at Arizona State University. I am conducting a research study to evaluate whether martial arts classes have an effect on bullying – that is, do martial arts classes help kids avoid bullying and is an increase or reduction in bullying behavior.

I am inviting your child's participation, which will involve your child's completion of a questionnaire (the Olweus Bullying Questionnaire, which will take about 30 minutes) and your completion of a parent survey (which will take about 10 minutes). You have the right not to answer any question, and to stop the interview at any time.

Your participation in this study is voluntary. If you choose not to participate or to withdraw from the study at any time, there will be no penalty.

Although there is no benefit to you, the possible benefits to your participation are to provide information to improve future martial arts training on bullying and help children avoid bullying or being bullied. There are no foreseeable risks or discomforts to your participation.

Your responses will be confidential – the documents with your name will be stored in a locked file cabinet at Arizona State University. The results of this study may be used in reports, presentations, or publications but your name will not be used.

If you have any questions concerning the research study, please contact the research team: Greg Moody (480) 442-4395 or Dr. Sam DiGangi (480) 965-2047. If you have any questions about your rights as a subject/participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Office of Research Integrity and Assurance, at (480) 965-6788. Please let me know if you wish to be part of the study.

Sincerely,

Greg Moody

By signing below, you are giving consent for your child _____ (Child's name) to participate in the above study.

_____	_____	_____
Signature	Printed Name	Date

ASU IRB Approved
Sign
Date 2/2/2012 - 3/11/2013

APPENDIX B

INFORMED ASSENT FORM

Kids Informed Assent Form

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 need to fill out a test and all my answers will be kept confidential.

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

_____ _____

Printed Name Date

ASU IRB Approved
Sign
Date 3/12/2012 - 3/11/2013

Research Use Only
R#: _____ Date: ___/___/___ Page1 of 1

APPENDIX C

PACKAGE OF MATERIALS SENT TO MARTIAL ARTS SCHOOLS

Effects of Martial Arts On Bullying In Children

Directions for School Owner

Thank you for helping with this study. I am working under the direction of Professor Sam DiGangi in the Division of Education Leadership & Innovation at Arizona State University. We are conducting research entitled "Effects of Martial Arts On Bullying In Children". The purpose of the research is to evaluate whether martial arts classes have an effect on bullying – that is, do martial arts classes help kids avoid bullying and is an increase or reduction in bullying behavior. The primary measure of this is the Olweus Bullying Questionnaire (OBQ) and secondarily a parent survey.

We would like you to select the following:

- Kids between the ages of 9 and 13
- Try to split as closely as possible between boys and girls
- Approximately 10 White belts
- Approximately 10 Orange and Yellow belts (if you need to, extend to Green belt)
- Approximately 10 Black belts (any rank)

Please administer the entire package of material for each child selected. Its very important that one child / parent get the package that's attached together as there is a code on the bottom so the data can be connected later. This package includes

- Administration Steps (for the person giving the test/survey)
- Recruiting Script (which you can read to the parent/student)
- 2 Informed Consent Forms (for parent/guardian to fill out), and you to sign and confirm – they get to keep one copy and one goes in the envelope marked for these forms.
- 2 Informed Assent Forms (for child to fill out) – they get to keep one copy and one goes in the same envelope as the consent forms.
- Information letter for parent (they can keep)
- Parent Survey
- Olweus Bullying Questionnaire (OBQ) – the child should be able to fill this out without any assistance

Once you have all the data gathered or by March 24th – **whichever comes first** – please put all of the data and any unfilled paperwork into the supplied FedEx envelope and mail. If you have any trouble getting the data by the date, please call me at 602-421-2340 and we can make arrangements.

Again, thank you very much for helping on this research project!

Greg Moody

Greg Moody

Effects of Martial Arts On Bullying In Children

Administration Steps

Thank you for helping with this study. Whoever is giving the package to the parent/guardian and student (you're the "Administrator") needs to follow these steps:

- ❑ **Step 1**: Give the student's parent or guardian the package and ask them to read and sign the informed consent form, fill in and sign both copies. Put these in the prepaid marked envelope for the consent forms.
- ❑ **Step 2**: Remove package staple and give the parent/guardian the "Parent Survey" to complete. At the same time:
- ❑ **Step 3**: Give the student the Olweus Bullying Questionnaire to complete
- ❑ **Step 4**: When both are complete, YOU sign both copies of the "Informed Consent" form and return ONE copy to the parent along with ONE copy of the "Informed Assent" form.
- ❑ **Step** 5: Thank them for taking the survey!
- ❑ **Step 6**: Put the Olweus Bullying Questionnaire and Parent Survey in the other marked envelope.

That's IT! Again, thank you very much for helping on this research project!

Greg Moody

APPENDIX D

PARENT SURVEY

Parent / Child Demographics Information

Thank you for allowing your kids to participate in this study. Please answer the following questions. If you do not wish to answer any or all items you do not have to. The answers will be confidential and while some of the data may be published your and your child's names will not be used.

1) Martial Arts Info:

Martial Arts Rank (color of belt or Black Belt Degree)	**Birthday**	**Gender**	**ATA Number** optional for orange belt & up	**Is it OK to access ATA information?**
	___/___/____	M / F	-	Yes / No

2) Parent Education:

	Highest Level of Education (Circle)
Mom	HS / Some College / College Grad / Grad School / Masters / Doctorate
Dad	HS / Some College / College Grad / Grad School / Masters / Doctorate

3) Total Household Income (Check One):

☐ Less Than $30,000	☐ $90,000 to $110,000
☐ $30,000 to $50,000	☐ $110,000 to $130,000
☐ $50,000 to $70,000	☐ $130,000 to $150,000
☐ $70,000 to $90,000	☐ Over $150,000

4) Please fill in your home zip code: _____

Parent Survey

For these questions, the definition of **Bullying** is: "when someone repeatedly and on purpose says or does mean or hurtful things to another person who has a hard time defending himself or herself."

5) Before starting martial arts, as far as you know, **how often was your child bullied over a 2 month period**? (Circle one)

None **Once or Twice** **2-3 Times a Month** **About Once a Week** **Several Times a Week**

Comments: _____

6) Since starting martial arts, as far as you know, **how often has your child been bullied over the last couple months**? (Circle one)

None **Once or Twice** **2-3 Times a Month** **About Once a Week** **Several Times a Week**

Comments: _____

7) Before starting martial arts, as far as you know, **how often did your child bully another child or helped another child bully someone**? (Circle one)

None **Once or Twice** **2-3 Times a Month** **About Once a Week** **Several Times a Week**

Comments: _____

8) Since starting martial arts, as far as you know, **how often is your child bullying other children or helping another child bully someone**? (Circle one)

None **Once or Twice** **2-3 Times a Month** **About Once a Week** **Several Times a Week**

Comments: _____

9) How much improvement in your child's **ability to avoid being bullied** has occurred since beginning your martial arts program? (Circle one)

Lots of Improvement **Some Improvement** **No Improvement** **It's Worse**

Comments: _____

10) How much improvement in your child's **ability to not bully others** has occurred since beginning your martial arts program? (Circle one)

Lots of Improvement **Some Improvement** **No Improvement** **It's Worse**

Comments: _____

11) How much improvement in **your <u>own</u> understanding of bullying** has occurred since your child began martial arts? (Circle one)

Lots Of Improvement **Some Improvement** **No Improvement** **I'm More Confused**

Comments: _____

12) When <u>YOU were a child</u> **how often were you bullied?** (Circle one)

Never **Once or Twice** **2-3 Times a Month** **About Once a Week** **Several Times a Week**

Comments: _____

13) When <u>YOU were a child</u> **how often did you bully others?** (Circle one)

Never **Once or Twice** **2-3 Times a Month** **About Once a Week** **Several Times a Week**

Comments: _____

14) How much improvement in your child's **self concept** has occurred since beginning your martial arts program? (Circle one)

Lots Of Improvement **Some Improvement** **No Improvement** **Reduced Self-Concept**

Comments: _____

15) Do you feel your child has learned valuable **safety awareness skills** (such as stranger danger, 911 or other skills) since beginning your martial arts program? (Circle one)

Very Valuable **Somewhat Valuable** **Not Valuable** **Reduction in Awareness**

Comments: _____

16) **For Parents with Siblings (in the program or not in the program) Only:** How much improvement has your child shown in **interacting with their siblings** at home or school since beginning your martial arts program? (Circle one)

Lots of Improvement **Some Improvement** **No Improvement** **Reduced Ability**

Comments: _____

17) Overall, how do you like your child's martial arts experience? (Circle one)

Great **Good** **Fair** **Poor** **Bad**

Comments: _____

18) Please list any further comments

Comments: _____

_____

_____

_____

APPENDIX E

IRB APPROVAL LETTER

ASU Knowledge Enterprise Development

Office of Research Integrity and Assurance

To:	Samuel Digangi ED 434G
From:	Mark Roosa, Chair Soc Beh IRB
Date:	03/12/2012
Committee Action:	**Expedited Approval**
Approval Date:	03/12/2012
Review Type:	Expedited F7
IRB Protocol #:	1202007498
Study Title:	The Effects of Martial Arts on Bullying in Children
Expiration Date:	03/11/2013

The above-referenced protocol was approved following expedited review by the Institutional Review Board.

It is the Principal Investigator's responsibility to obtain review and continued approval before the expiration date. You may not continue any research activity beyond the expiration date without approval by the Institutional Review Board.

Adverse Reactions: If any untoward incidents or severe reactions should develop as a result of this study, you are required to notify the Soc Beh IRB immediately. If necessary a member of the IRB will be assigned to look into the matter. If the problem is serious, approval may be withdrawn pending IRB review.

Amendments: If you wish to change any aspect of this study, such as the procedures, the consent forms, or the investigators, please communicate your requested changes to the Soc Beh IRB. The new procedure is not to be initiated until the IRB approval has been given.

Please retain a copy of this letter with your approved protocol.