

CULTURAL CONSENSUS MODELS OF STRATEGY
AMONG BRAZILIAN JIU JITSU PRACTITIONERS
IN ATLANTA, GA

by

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ABSTRACT

This study utilizes mixed methods and cultural consensus analysis to understand how the cultural model of strategy among Brazilian jiu jitsu athletes in a gym in Atlanta, Georgia mediates the relationship between culture and embodied knowledge. Fighting is ubiquitous in societies, both ancient and modern, and the study of codified fighting systems has been undertaken predominantly by researchers in the field of martial arts studies. Researchers in this field utilize qualitative methods with the aim of linking embodied knowledge and culture but face difficulty in doing so given their self-imposed methodological constraints. This study demonstrates how cognitive anthropological mixed methods can be used to quantify and link culture to embodied knowledge through a cultural model of strategy. Results show that strategy in Brazilian jiu jitsu revolves around the hierarchy of positional dominance. Low level belt-ranked athletes utilize shared understandings of positional dominance to guide their personal strategic selection of techniques which they habitually practice to the point of embodied reflexivity. High belt-ranked athletes eventually reach a level of expertise at which retaining the cultural model of strategy hinders their performance in competition. These advanced athletes develop a personal model of strategic fluidity within the context of the cultural model of strategy which focuses on adaptation to specific opponents and circumstances.

LIST OF ABBREVIATIONS AND SYMBOLS

ANOVA	Analysis of variance
BJJ	Brazilian jiu jitsu
IBJJF	International Brazilian Jiu Jitsu Federation
LOC	Locus of Control
MDS	Multidimensional scaling
n	Sample size
p	Probability of results or outcome
SD	Standard deviation
SPSS	Statistical Package for the Social Sciences
UFC	Ultimate Fighting Championship
±	Plus or minus
%	Percent
<	Less than
>	Greater than
=	Equal to

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CHAPTER 1

INTRODUCTION

Fighting, in one form or another, is found throughout both ancient and modern societies (Poliakoff, 1995; Green, 2001). Furthermore, fighting is observed in non-human primates (Poirier and Smith, 1974) as well. The universal nature of fighting among primates has even led some researchers to conclude that fighting shaped human physiology and cognition (Pinker, 2002; Carrier and Morgan, 2015). Fighting is worthy of study by anthropologists due to its ubiquity among and impact on humans.

The earliest evidence of a codified system of fighting, or martial art, is found in Ancient Egypt and dates to 3000 B.C.E. (Poliakoff, 1995). Since Classical antiquity, fighting competitions with defined rulesets have been a popular recreational activity (Poliakoff, 1995). Moreover, in the modern era, a multitude of combat sports draw in large audiences worldwide (Green, 2001). One such combat sport, Brazilian jiu jitsu, pits athletes against one another with the objective of forcing their opponent to concede via a choke hold or joint lock.

Despite the long-term anthropological interest in games of physical skill (Roberts, 1959), relatively little academic attention has been given to martial arts and combat sports. The research that has been conducted on combat sports comes out of the field of martial arts studies (Garcia and Spencer, 2013b) as well as the work of the anthropologist Greg Downey, focusing primarily on the Brazilian art form of *capoeira* (Downey, 2005). The focus of this research has been primarily aimed at connecting culture to embodied knowledge in combat athletes.

Research in the field of martial arts studies has generally utilized qualitative ethnographic methods to understand the connection between culture and embodied knowledge and identifies embodied knowledge as resulting from the habitual practice of martial techniques (Hogeveen, 2013), but does not attempt to quantify either culture or embodied knowledge (Garcia and Spencer, 2013a). Greg Downey links culture to embodied knowledge through strategy and has quantified embodied knowledge but has not attempted a quantification of culture or strategy (Downey, 2007). A cognitive theoretical approach utilizing cultural consensus analysis is ideally suited to quantifying both culture and shared understandings of strategy in order to illuminate their link to embodied knowledge.

Cognitive anthropological theory posits that culture is shared knowledge which manifests as cultural models (Romney, Weller, and Batchelder 1986, Gatewood, 2012). The content and distribution of cultural knowledge is measured through cultural consensus analysis (Romney, Weller, and Batchelder, 1986). Strategy is a form of knowledge of how to achieve goals (Swidler, 1986), and shared knowledge regarding the achievement goals comprises a cultural model of strategy.

In Brazilian jiu jitsu (BJJ), the primary objective is to win matches, and shared knowledge regarding how to win comprises a cultural model of strategy in BJJ. Athletes utilize the cultural model of strategy to select techniques to practice to the point of reflexive embodied knowledge. In this way, the cultural model of strategy mediates cultural and embodied knowledge.

This study utilizes mixed methods, cultural consensus analysis, and cognitive anthropological theory to explore the link between culture and embodied knowledge through the cultural model of strategy among Brazilian jiu jitsu athletes at a gym in Atlanta, GA. Brazilian

jiu jitsu athletes were selected as the target population because BJJ has been noted to be a highly strategic sport in which athletes heavily utilize embodied knowledge (Hogeveen, 2013). Atlanta, GA was selected as the research location because it is home to one of the highest internationally ranked BJJ gyms, Alliance HQ.

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

In almost all cultures, both historical and modern, humans have fought one another for sport. Play fighting has been observed in other species of primates, and it is safe to say that human ancestors have probably fought one another even before there were humans. The earliest evidence for a codified system of hand-to-hand combat comes from the Egyptian tombs at Beni Hasan (Poliakoff, 1995). Since then, from the gladiatorial matches of Rome to modern day pugilistic bouts, combat sports have been a staple of entertainment in Western Civilization. Combat sports in the modern world come in a vast array of different rulesets and objectives. Submission grappling-based combat sports consist of two humans using their bodies to choke and break the bodies of their opponent. Anthropology, the study of humans, is ideally suited for understanding a sport where humans are both the players and the equipment. Modern day anthropological interest in fighting centers on the connection between culture and embodied knowledge. This study links culture more directly to embodied knowledge of the martial arts by examining shared cultural models of strategy in a Brazilian jiu jitsu gym in Atlanta, GA.

2.2. Human Cooperation and Conflict

Fighting has been observed in both modern day humans as well as our modern day primate relatives (Poirier and Smith, 1974). Additionally, contests of physical skill are widespread among modern humans (Roberts, 1959). This leads some researchers to consider intra-human fighting to be a pervasive force that shaped our physiological and cognitive

development as a species (Carrier and Morgan, 2015). Whether or not fighting is inherent to modern society, evidence of fighting in non-human species (Poirier and Smith, 1974) indicates that there is some universal component to fighting and that it is not purely the product of specific human cultures (Pinker, 2002).

Fighting has developed a negative connotation due to large scale warfare that has become widely associated with it; however, fighting can be both recreational and lethal. Fighting is part of a process of socialization that is observed in primate species from wrestling rhesus macaques to collegiate grappling matches (Poirier and Smith, 1974). Similarly, fighting is a tool used for the acquisition of power that is observed in both the schoolyard hector and in the international scale warfare characterized by the first half of the 20th century.

Fighting is worthy of study regardless of one's political objectives. It has shaped human development, history, and sport to a large degree, and remains salient in modern society. Considering the scale of both positive and negative impacts of fighting on humans, anthropological research aimed at understanding fighting is considerably lacking. This research aims to contribute to a larger anthropological dialogue on fighting among humans.

2.3. History of Grappling Based Martial Arts and Combat Sports

Grappling sports and martial arts were commonly practiced in the ancient world, and a multitude of grappling sports are practiced around the world in the modern era. In many cases the connection between modern grappling styles and their historical origins is unclear; however, feudal Japanese *jujutsu* provides a case study in the evolution and dispersion of grappling styles over time. Ultimately, the dispersion and evolution of feudal Japanese *jujutsu* led to the development of modern day Brazilian jiu jitsu.

Martial arts can refer to both the military application of fighting techniques as well as generically to a codified style of fighting. Combat sports are recreational competitive events in which participants utilize a limited scope of techniques from fighting styles to achieve the objectives outlined in the rules. For the purposes of this paper, “martial art” will be used to refer generically to a codified style of fighting and “combat sport” will refer specifically to the application of techniques from a certain style in a recreational competitive setting with a defined ruleset.

The early history of martial arts and combat sports is largely speculative, and while martial arts defined broadly logically developed alongside social stratification and specialization, the earliest evidence of a codified unarmed human combat system comes from Beni Hassan and dates to 3000 B.C.E. (Poliakoff, 1995). The techniques depicted on the walls of this Egyptian tomb are grappling based and easily identified as techniques used in modern day collegiate wrestling matches. Ancient Greek wrestling involved many of these same techniques and is thought to have additionally involved the use of a limited number of submission holds. Matches were won on the basis of “falls,” either pinning the shoulder blades of an opponent against the ground for a specified number of times, or the application of a submission hold forcing the opponent to concede the match. While there is clear evidence that competitive wrestling existed in other ancient societies such as the Sumerians and Hittites, not enough is known to warrant in depth discussion (Poliakoff, 1995).

The exact spread and development of grappling based combat sports is unclear, but it is certain that a myriad of societies both historical and modern practiced grappling sports. Various forms of belt wrestling exist in the central Asian nations. Senegal is home to the religiously-inspired cultural phenomena of *laamb* wrestling. Indian *kushti* is widespread on the subcontinent.

Shuai jiao is thought to have ancient origins and is still practiced in China, while both greco-roman and freestyle wrestling have been mainstays of the modern summer Olympics since 1986. *Sambo* is a Russian grappling sport with roots in the Soviet Union, among many others (Green, 2001). Despite this multitude of grappling styles, very few cases exist where it is possible to trace their development. Japanese *jujutsu* and its resulting iterations provide rare exceptions to this rule.

Japanese *jujutsu* was originally practiced by the samurai of feudal Japan, and is thought to have its origins in China (Henning, 2001). While many schools of *jujutsu* have existed historically—some of which taught striking techniques—Japanese *jujutsu* is predominantly grappling based (Long, 2001). A 19th century practitioner of *jujutsu*, Jigoro Kano, went on to create judo. Judo retained many of the techniques of *jujutsu* but added a sportive component (Long, 2001). Techniques that could be practiced at full speed were incorporated into what became the Olympic sport of judo (Long, 2001). Practitioners of judo dispersed the martial art worldwide and went on to directly influence the Russian martial art *sambo*, as well as Brazilian jiu jitsu (Long, 2001).

2.4. History of Brazilian Jiu Jitsu

Brazilian jiu jitsu (BJJ) is a combat sport and martial art defined by its focus on ground based grappling techniques with the goal of submitting an opponent via joint lock or strangle hold. Competitions in Brazilian jiu jitsu are held internationally, and the popularity of BJJ is rapidly expanding. The history of BJJ lies in Japan with its roots in Japanese *jujutsu* and judo.

Japanese *jujutsu* refers to the unarmed martial arts techniques employed by the samurai in feudal age Japan which included many grappling maneuvers (Kano, 1986). Jigoro Kano, a practitioner of *jujutsu*, became critical of the underlying guiding principles of *jujutsu* and in 1882

founded the school of Kodokan judo in response (Kano, 1986). By the early 1900's, judo had developed a strong combat sportive element and judo tournaments were a regular occurrence in Japan (Green and Svinth, 2003). During this time, a judoka named Maeda Mitsuyo became a prominent competitor (Green and Svinth, 2003). While competing in wrestling tournaments in the new world, Maeda met Gustao Gracie, a boxing manager in Brazil, and taught his son Carlos basic judo techniques (Green and Svinth, 2003).

Carlos Gracie and his brothers, most notably Helio, began to practice these basic techniques and innovated by focusing on leverage and groundwork as opposed to the high-impact throws characteristic of judo (Green and Svinth, 2003). The resulting system was developed over the first half of the 20th century and referred to as Gracie Jiu-Jitsu (Green and Svinth, 2003). Members of the Gracie family used their system of fighting with much success in the no-holds-barred “*vale tudo*” fights in Brazil (Green and Svinth, 2003). This success in their home country prompted Royce Gracie, Carlos Gracie's nephew, to enter and win the first Ultimate Fighting Championship (UFC) in 1993 as the smallest competitor (Green and Svinth, 2003). Gracie's success in the UFC led to the rapid and widespread proliferation of what became known as Brazilian jiu jitsu across the world, and especially in the United States.

2.5. Anthropological Interest in Combat Sports: Origins of Martial Arts Studies

Games of physical skill have long been of interest to anthropologists (Roberts, 1959); however, Alter's (1992) *The Wrestler's Body* is the first work to bring mainstream anthropological attention to combat sports. Alter's text focuses on the identity and ideology of Indian wrestlers as expressed through their physicality (Alter, 1992). While Alter does not utilize the concepts of habitus and carnal sociology (explored more fully below) present in modern

works on combat sports, *The Wrestler's Body* paved the way for future anthropological research with its focus on bodily aspects of combat athletes.

Wacquant's (2004) *Body and Soul* is widely acknowledged as the apical text of modern day martial arts studies (Garcia and Spencer, 2013b). In *Body and Soul*, Wacquant explores the "pugilistic habitus" of members of a boxing gym in urban Chicago in part by participating in boxing practices and matches himself. This text serves as the proof of concept for Wacquant's proposed theory of "carnal sociology" operationalized by "observer participation" (Wacquant, 2004).

Drawing heavily from the work of his academic advisor Pierre Bourdieu, Wacquant (2004) argues that embodied boxing knowledge, or "pugilistic habitus," is transferred through the physical enactment of boxing via gestures and mimetics. He proposes his theory of carnal sociology as a means to understand the pugilistic habitus of boxers. Carnal sociology posits that full understanding of a culture can only occur when the researcher experiences the same bodily sensations as those being studied, in essence, deploying the body as a tool of inquiry (Wacquant, 2004). Wacquant (2004) dubs the method of deploying the researcher's body as a tool "observer participation." Wacquant's work has heavily contributed to the development of the modern day field of martial arts studies.

2.6. Martial Arts Studies

Stemming from the work of Loic Wacquant, the newly created field of martial arts studies is the self-proclaimed torch bearer for the interdisciplinary study of martial arts and combat sports (Garcia and Spencer, 2013b). Drawing on Wacquant's theory and methods, martial arts studies aims to understand the embodied knowledge of "martial habitus" through qualitative ethnographic methods supplemented by observer participation rooted in carnal

sociological theory (Garcia and Spencer, 2013b). Research within martial arts studies establishes that practitioners of combat sports develop embodied knowledge (Hogeveen, 2013).

Furthermore, some researchers attempt to identify and explain cultural variation within this embodied knowledge (Brown and Jennings, 2013). Ultimately, prominent scholars in the field acknowledge the limitations of martial arts studies' purely qualitative methods to tackling larger questions regarding the relationship between culture and embodied knowledge (Garcia and Spencer, 2013a).

Although martial arts studies is an interdisciplinary field, scholars within the field are unified by the utilization of ethnography to understand the embodied knowledge of martial arts through "habitus," "body techniques," and "technologies of the self" (Garcia and Spencer, 2013b). Ethnography is the favored methodological approach because it allows for a combination of the "flesh and blood" practice of martial arts with scholarly thought (Garcia and Spencer, 2013b). "Habitus," "body techniques," and "technologies of the self" are forms of embodied knowledge and conceptually rooted in phenomenology and the work of Mauss, Merleau Ponty, and Bourdieu, as articulated by Crossley (2001). Scholars within the field of martial arts studies collectively refer to the "habitus," "body techniques," and "technologies of the self" acquired by martial artists and combat athletes as "martial habitus" (Garcia and Spencer, 2013b).

Following the theoretical paradigm outlined by Crossley (2001), Hogeveen (2013) observes that habitual drilling and practice of techniques enable grapplers to gain embodied knowledge to the degree that they no longer think about techniques; instead, they recognize techniques and then automatically perform them. Martial habitus is comprised of this embodied knowledge. While Hogeveen's work is significant in that it identifies the origins of embodied

knowledge as lying in the habitual practice of techniques, he falls short of identifying why certain techniques are practiced as well as the cultural distribution of technique practice. In other words, he does not identify why certain individuals and groups practice certain techniques and why other individuals and groups practice other techniques.

Brown and Jennings (2013) attempt to link the practice of certain techniques to cultural “schemas of dispositions.” They conceive of martial habitus as being particular to specific martial arts and not martial arts in general. Furthermore, Brown and Jennings (2013) posit the existence of multiple schematic dispositions within the martial habitus of a single martial art which account for intracultural variation in the practice of techniques within specific martial arts. Through this theoretical lens, Brown and Jennings (2013) utilize ethnographic methods to identify three underlying schematic dispositions within the martial habitus of Kung Fu practitioners. This research is significant as it identifies that there is indeed intracultural variation in the practice of techniques within a single martial art.

While research within the field of martial arts studies has produced significant findings—predominantly in identifying the origins of embodied knowledge as lying in habitual practice and attempts at identification of intracultural variation in martial practice—the self-imposed theoretical and methodological constraints of the field make it an unlikely candidate to carry on the search for the link between embodied knowledge and culture. Habitus as a guiding concept is problematic as it lacks any methodological operationalization outside of qualitative ethnographic study which would allow for hypothesis-testing research to build upon the already present in-depth descriptive research. (Garcia and Spencer, 2013a). Garcia and Spencer (2013a) state “Other possible limitation is that all of the [martial arts studies scholars] are committed to studying martial arts and combat sports through qualitative research.” Furthermore, Garcia and

Spencer (2013a) note the limitations of qualitative methods and the concept of habitus as tools for understanding the embodied knowledge of martial arts but do not attempt to incorporate quantitative methods due to what they perceive to be an incompatible relationship between carnal sociology and quantitative methods. Instead, they point to the cognitive sciences for future lines of research, specifically neuroanthropology and the work of Greg Downey (Garcia and Spencer, 2013a).

2.7. Neuroanthropology

Downey's neuroanthropology presents a new paradigm for the study of martial arts and combat sports outside of the field of martial arts studies. His work is significant because it is aimed at producing quantifiable measurements of embodied knowledge and links variation in embodied knowledge to variation in culture through strategy. While Downey resolves some of the issues encountered in martial arts studies by utilizing mixed methods and a theory of strategy to account for intracultural variation in embodied knowledge, he does not attempt to quantify strategy itself or the way in which it varies intraculturally.

Downey diverges from the mainstream of martial arts studies by discarding habitus as a guiding concept to study the embodied knowledge of martial arts and takes a neuroanthropological approach instead (Downey, 2005). He explores cultural patterns of training in Capoeira through ethnography but extends his research to include data outside the established realm of martial arts studies (Downey, 2005). Downey's research includes how cultural patterns of training may influence the mental and physical structures of participants based on research from the neurosciences—such as changes in visual perception based on eye movement patterns.

Downey (2007) also diverges from mainstream martial arts studies through his conceptualization of technical skills in mixed martial arts as “bodily technology,” composed of

“know how” and physical capacity, as opposed to embodied knowledge. He proceeds to outline how strategies developed in mixed martial arts competition based on the constraints and allowances of the ruleset and how these strategies influence the acquisition of culturally embodied “bodily technology” (Downey, 2007). In this way, he links the culturally defined strategic selection of techniques to embodied knowledge. Despite this research regarding strategy, Downey does not clearly define strategy, and for the purposes of this thesis Swidler’s (1986) definition of strategy will be used (see next section).

Downey contributes an attempt at the quantification of variation in embodied knowledge, and that strategy is a factor in the embodiment of martial knowledge. While his research aids in understanding the link between culture and embodied knowledge, he leaves both culture and strategy as unquantified entities, which does not allow for hypothesis-testing research involving these variables. Conceiving of strategy as a form of shared cultural knowledge allows for the quantification of strategy as it relates to linking culture to embodied knowledge.

2.8. Cognitive Theoretical Approach

Previous research has attempted to link culture to embodied knowledge through strategy, but has not quantified the concepts of strategy or culture. The quantification of culture and strategy allows for hypothesis-testing research to build on descriptive in-depth qualitative research. A cognitive theory of culture posits that culture is shared knowledge observable through cultural models, the study of which is operationalized with cultural consensus analysis. Shared ideas regarding strategy can be observed through a cultural model of strategy and measured through cultural consensus analysis.

In cognitive anthropological theory, culture is defined as shared knowledge used by individuals to function in their respective social environments (Romney, Weller, and Batchelder,

1986). Cultural models are the implicit shared frameworks of how to interpret experience and function within a social setting (Gatewood, 2012). Anthropologists have used cultural models to understand how decisions are made by individuals within groups.

Consensus analysis, created by Romney, Weller, and Batchelder (1986), is used to quantify the degree to which knowledge of a cultural model is shared within a group—referred to as consensus—and the degree of knowledge of the cultural model possessed by each individual—referred to as competence (Borgatti and Halgin, 2011). Consensus analysis places cultural knowledge and personal biography as the constituent parts of the individual model. Knowledge possessed by individuals has the potential to be shared or personal knowledge. Consensus analysis determines cultural knowledge by examining only what knowledge is shared and to what degree it is shared. Agreement on shared knowledge is tested by comparing every individual informant to one another. A weighted average of shared knowledge is calculated with the informant with the most agreement with every other informant, or “best informant”, having more weight in the final result. Once the consensus model is established, individual competence in the model is determined by comparing an informant’s knowledge with the cultural model.

Shared ideas regarding strategy comprise a cultural model of strategy. Strategy, in the conventional sense, is a plan of action used to achieve a goal (Swidler, 1986). Cultural consensus analysis can be used to measure the level to which individuals agree on what actions to take in order to achieve culturally defined goals.

2.9. Cultural Model of Strategy in Brazilian Jiu Jitsu Studied Through Mixed Methods

A cultural model of strategy refers to the shared knowledge of what to do in specific situations to achieve a goal. In Brazilian jiu jitsu, the *goal* is to win matches via the application of a submission hold on the opponent, and *strategy* is the selection of techniques to learn and use

to win matches. Thus, a cultural model of strategy in BJJ is the shared knowledge of *what* techniques to use in certain situations in order to win a match. This research conceptualizes of the cultural model of strategy as the mediator between culture and embodied knowledge which it explores through a joint cognitive anthropological and carnal sociological lens operationalized by consensus analysis, observer participation, interviews, and ethnography.

A model of strategy guides the acquisition and application of techniques to be used in a BJJ match which become embodied. BJJ practitioners select techniques to learn and use to the point of reflexivity by considering what techniques will allow them to win. In BJJ, techniques are cultural knowledge of how to manipulate an individual's body which are the result of hundreds of years of globalized knowledge exchange. Once an individual has selected a technique that will help him or her win based upon shared ideas of how to win, they begin training the technique and implementing the technique in matches. The technique becomes embodied knowledge after the individual has trained and implemented the technique over an extended period of time. Thus, a cultural model of strategy links cultural knowledge to embodied knowledge.

Knowledge of strategy is possessed by individuals and groups. Individuals develop strategies based what has worked for them and what has worked for others. When these individuals effectively apply their strategy to win matches, it influences the strategy of others (Downey, 2007). A cultural model of strategy allows for the application of cognitive methods to determine the contents of the cultural model of strategy and how knowledge of the model is distributed among martial arts practitioners. The cultural mode of strategy in BJJ is broad and multifaceted, but this research focuses specifically on the central feature of the model which is the positional dominance hierarchy.

To understand the cultural model of strategy among Brazilian jiu jitsu athletes in this study, a dual cognitive anthropological and carnal sociological approach was taken. Cultural consensus analysis was conducted regarding the positional dominance hierarchy—a salient aspect of the cultural model of strategy. A carnal sociological ethnographic approach of observer participation and interviews was taken for the purposes of interpreting the results of consensus analysis and providing cultural context for this study. These steps were taken to test the hypothesis that there is a relationship between belt-rank and competence in the cultural model of strategy among BJJ athletes at Alliance HQ. An ethnography of the Alliance HQ jiu jitsu gym provides the cultural context for the study.

CHAPTER 3

ETHNOGRAPHY OF A BRAZILIAN JIU JITSU GYM

My interest in pursuing anthropological research on Brazilian jiu jitsu was borne from over a decades' worth of experience in grappling based combat sports culminating in my current standing as a BJJ purple belt in combination with my undergraduate education in the anthropological perspective. Knowing I wanted to pursue graduate level studies in anthropology but unsure of a research topic, I found inspiration in Loic Wacquant's carnal sociological exploration of a Chicago boxing gym as outlined in *Body and Soul* (2004). As a participant in grappling sports, I understood the concept of embodied knowledge and the necessity of observer participation on an intuitive level. Upon further research, I found a distinct lack of anthropological research on combat sports. The following study draws upon both my academic knowledge as well as my experience in practicing grappling arts—but especially from my time spent at Alliance HQ in Atlanta, GA in the summer of 2017.

In the modern age, Brazilian jiu jitsu is both a martial art *and* combat sport taught globally with a rapidly expanding base of practitioners. BJJ's popularity was originally derived from the success of its utilization in no-holds-barred and mixed martial arts competitions, but many athletes now participate in BJJ competitions. An emphasis on technique over athleticism has led many to compare the technique-counter-technique style of BJJ competitions to the strategically driven cerebrality of a chess match.

Competitions in BJJ largely disallow striking and come in a vast multitude of formats and rules but can be generally understood through the dichotomies of gi versus nogi and points

versus submission only. Gi competitions require athletes to wear a full-body, thick cotton uniform called a “gi.” The gi can be used to grip opponents and used to apply choke holds with their material. Additionally, gi jiu jitsu generally disallows the use of neck crank based submission holds and some knee locking techniques. Nogi competitions require athletes to wear shorts and a rashguard and are generally more tolerant of neck cranks and all leg locks—albeit with some exceptional organizations. Points based competitions are timed and allow athletes to finish a match at any point by submitting their opponent. However, if the match time runs out, the matches are judged based on who accumulated the most points. Points are accumulated in points based competitions through the acquisition of certain positions generally deemed to be dominant as well as through takedowns. Submission only competitions are usually timed, though sometimes not, and are considered a tie unless an athlete submits their opponent. The lack of a point system allows for athletes to be more experimental and forces them to attempt submissions as opposed to achieving points and waiting out the clock. While competitions can be any combination of gi or nogi and points or submission only, the largest regulating body in the sport (International Brazilian Jiu Jitsu Federation) hosts only points based competitions and errs on the side of gi over nogi.

The recent surge in popularity of sport jiu jitsu has led to a professionalization of the sport with many athletes being sponsored. Within the IBJJF, international jiu jitsu affiliations field their best athletes with the goal of winning the overall competitions. Each athlete who places in his or her division adds points to their respective affiliation’s overall score. The past few years of IBJJF competitions has been dominated by a small handful of affiliations, one of the oldest and most respected of which is Alliance.

The Alliance Jiu Jitsu Atlanta gym (Alliance HQ) is located in the northeast corner of Atlanta, GA less than a mile outside “the perimeter” around the city created by I-285 which delineates the Atlanta metro core from the surrounding suburbs. Alliance HQ is the headquarters location of the larger Alliance Jiu Jitsu affiliation which is comprised of several hundred gyms worldwide. The Alliance Jiu Jitsu affiliation is one of the largest and most decorated jiu jitsu affiliations in the world with 11 International Brazilian Jiu Jitsu Federation (IBJJF) World Championships to their name. The Atlanta location of the Alliance affiliation is recognized internationally as a very important gym because of its position as the headquarters of one of the most internationally competitive jiu jitsu affiliations.

Alliance Jiu Jitsu was founded by Romero “Jacare” Cavalcanti¹ who remains the current owner and an instructor of Alliance HQ. Jacare began training jiu jitsu as a young boy in Rio de Janeiro, Brazil before continuing his training in both New York and Brazil during the 70’s and 80’s. Jacare’s training partners and instructors during this time period read like a list of who’s who in the jiu jitsu world. After serving as head instructor at a few gyms, Jacare founded Alliance Jiu Jitsu affiliation in 1992 alongside several of his prominent students. Jacare is revered as a living legend in the modern jiu jitsu community and spends much of his time traveling and developing the Alliance Jiu Jitsu affiliation worldwide but also instructs at Alliance HQ.

Alliance HQ serves as the training grounds for prominent members of the Alliance affiliation, usually former world champions, who wish to start their own branch of the Alliance affiliation. These gym-owners-in-training serve the role of being the primary instructors at

¹ A pseudonym was not used for Jacare because he is internationally famous and prominently featured in media reports about BJJ

Alliance HQ for several years before going on to open their own gym locations. During the time of my research at Alliance HQ (Summer 2017), the primary instructor was Leonardo “Leo” Nogueira.²

Leo is a five-time IBJJF world champion, winning a championship at all 5 belt-ranks, who switched from another affiliation to Alliance in order to take the position he currently occupies as head instructor at Alliance HQ. He began training jiu jitsu in Brazil at age 14 after coming from an athletic background in swimming and karate. Leo began competing in the early 2000’s and moved to Miami in 2014 to work at a gym. He began his current duties at Alliance HQ in 2015 after Jacare offered the position to him.

In addition to Jacare and Leo, the Alliance HQ staff was comprised of other instructors whose primary functions were teaching beginners’ and childrens’ classes as well as two supporting staff members whose primary roles involved working the front desk, assisting members with payments, and keeping attendance records.

Members of Alliance HQ were predominantly white and male; however, the cosmopolitan nature of Atlanta was reflected in the gym with multiple nationalities and ethnicities being represented. Furthermore, Alliance HQ had several female members including a few at advanced ranks. Alliance HQ catered to all age groups, and members ranged from young children to elderly adults.

The building which houses Alliance HQ is plain white-painted brick with windows along the front of the building facing the street. To the left of the building is a set of pull-up bars. Directly inside the entrance is the front desk and through a small doorless entryway is a set of

² A pseudonym was not used for Leo because he is internationally famous and prominently featured in media reports about BJJ

couches facing Mat 1 where most training takes place. In a room adjacent to Mat 1 is Mat 2, used when Mat 1 has too many people. The aesthetic is simplistic but not quite minimalistic. The white walls feature a few decorations including an overblown image of the Alliance Logo, a triangle with a hawk's head and "ALLIANCE" written on the base of the triangle, as well as a black and white photo appearing to be from the 80's with a young Jacare having his hand held up in victory after a competition. Additionally, several other more recent photos in artistic black and white commemorating important moments in Alliance's history such as a belting ceremony and Jacare holding a 1st place trophy over his head, a "No shoes allowed on the mat at any time" sign, and a "know your roots" framed poster featuring historical figures important to BJJ are displayed on the walls. The mat space on Mat 1 is approximately 40x40 feet with 4 red rectangles on the grey mats representing a competition space. These space-delineating rectangles are completely ignored during training. The space also features a water fountain as well as men's and women's dressing room with showers. In the back of the building, there are private offices used by the staff.

The class schedule of Alliance HQ is slightly different every day; however, during the week, most days offer a morning class, a noon class, a kids' class, a beginners' class, and an advanced class. Weekend classes include kids' classes and open mat times. All classes range in time from one to one-and-a-half hours. Instructors lead classes based on experience and availability. Morning classes are usually taught by an advanced member of the gym who is available during the time period, noon classes are taught by Leo and/or Jacare, kids' and beginners' classes are generally taught by lower level instructors, and advanced classes are again taught by Leo and/or Jacare. The exact structure of classes varies day to day and instructor to instructor but usually follows a common pattern.

Members generally begin to arrive around fifteen minutes before the listed class start time and file back to the locker rooms to dress for class. Most classes are listed as “gi” indicating that the appropriate attire is a cloth uniform resembling a kimono; however, some classes are listed as “nogi” indicating that shorts and rashguards are appropriate attire for the class. Regardless of whether gi or nogi, once students are dressed out, they stand against the far wall of the room in order of belt-rank with their attendance cards awaiting the instructor. At the listed class time, the instructor walks on the mat, collects members’ attendance cards, and begins the class.

Classes usually begin with warmup drills in which students line up at the end of the mats and proceed to make their way towards the other end through gymnastic maneuvers including bear crawls, forward rolls, break falls, etc. After the initial warm up drills, students are instructed to pair off to perform partner drills. Partner drills involve the synchronized performance of a technique by one partner counted off by the instructor, after which partners switch roles so the second partner can perform the movements. After these warmups, the instruction begins. Students encircle the instructor who demonstrates a technique on a student or co-instructor. Details of the techniques are verbalized by the instructor, and the technique is repeated several times at increasing pace until it is performed by the instructor at full speed. After a technique has been demonstrated to the class, students partner up and drill the technique at their own pace. While students drill, instructors walk around the room to correct any mistakes they see in the students’ performance. After this process of instruction has been repeated from two to seven times with varying techniques, students are given the opportunity to utilize the bathroom, drink water, and prepare for sparring.

After this brief break, students again line up on the wall in the same way as the beginning of class. At this point the instructor will indicate if the class will be conducting limited-scope sparring or begin free sparring (also known as “rolling”). If the instructor indicates that the class will begin limited-scope sparring, he will select anywhere from three to six individuals from the line to go to an open space on the mats. The exact parameters of the limited-scope sparring are defined by the instructor, such as “begin in guard and pass guard to win,” “begin standing and takedown to win,” “begin with side control and escape to win,” etc. Students on one side of the wall begin to walk onto the mats to pair off and spar with the students already selected to go onto the mats. The winner of each pair’s limited-scope sparring session stays on the mats, while the loser goes back into the line to await his turn to spar with another opponent.

Either after instruction or limited-scope sparring, rolling commences. Rolling is a form of free sparring in which the goal is to submit the opponent via a joint lock or chokehold and most closely replicates an actual jiu jitsu competition. The instructor chooses partners for every student before each round, and rounds typically last from five to ten minutes. Timers are set, and when a round begins partners “slap and tap,” meaning they slap one another's hands followed by bumping fists to indicate that they are both ready and as a sign of mutual respect. Additionally, opponents will sometimes say “oss” to one another, a term indicating respect that is a holdover from Brazilian jiu jitsu’s Japanese roots. Rolling typically begins on the knees rather than on the feet in order minimize the risk of injury during training as well as to emphasize the ground phase of combat. While rolling, students vie for dominant positions in order to ultimately achieve a joint lock or choke hold, forcing the opponent to submit via “tap out” or verbal submission. “Tapping out” is the act of tapping the opponent or mat with one’s hand and verbally submitting involves saying “Tap!” loud enough for the opponent to hear. Once an opponent has submitted to

a hold, the partners begin again from the knees and continue this cycle for the duration of the round. After the round, students line up again on the wall for the instructor to select new pairings.

After rolling is over, students line up on the wall one last time. The instructor faces the students and usually makes announcements regarding upcoming events involving the gym and proceeds to bow and say “oss” to the students. The students bow and say “oss” in return and line up to shake everyone's hand. After the close of class, students cycle into the dressing rooms or chit chat on the mats and leave.

While the tone of practice varies from instructor to instructor and day to day, the overall atmosphere is serious but not stifling. Jokes may be made but never at the expense of sacrificing drilling or sparring quality. No music is played and students are engaged with the current activity—not looking around the room. Sparring sessions are usually intense, especially between similarly ranked students. When students in advanced classes do not adhere to protocol, such as being late or not lining up properly, they are reprimanded by the instructor. Usually students recognize their faux pas and apologize to the instructor preemptively. Additionally, students always display the appropriate gestures of regard to their sparring partners before and after rolling sessions as well as after class. These factors give classes at Alliance HQ an air of professionalism and discipline balanced by friendliness and respect. It was hypothesized that there is a relationship between belt-rank and competence in the cultural model of strategy among BJJ athletes at Alliance HQ, and this hypothesis is tested in the following sections.

CHAPTER 4

METHODS

4.1. Introduction

This case study utilized three phases of research including preliminary open ended interviews, structured interviews testing for cultural consensus, and follow up semistructured interviews—all with the ultimate aim of understanding cultural models of strategy among BJJ athletes at Alliance HQ. It was hypothesized that there is a relationship between belt-rank and competence in the cultural model of strategy among BJJ athletes at Alliance HQ. This study was approved by the University of Alabama Institutional Review Board on May 19, 2017 (IRB# 17-OR-179). All data collection took place during the months of May and June 2017 in Atlanta, GA.

4.2. Phase I: Preliminary Open Ended Interviews

Exploration of the cultural model of strategy was initiated through informal open ended interviews with prominent members of the gym. Non-random purposive sampling was used to select 5 black belts based on availability as well as official and unofficial recognition of authority within the gym. They were asked if they would be willing to participate in a series of interviews over the next few weeks. The potential participants were informed that they would not receive any compensation for their participation and verbal consent was acquired. Multiple short interviews were conducted with several participants after they indicated that this interview strategy would be more convenient for their schedules than a single long interview. Interviews were conducted individually and recorded with the participants' permission.

The 5 selected gym members were asked general and personal questions regarding history, philosophy, and strategy in BJJ. When participants' responses were vague, they were asked to clarify their statements; when their responses were perceived as being particularly salient to the identification of elements of the cultural model of strategy, they were probed further.

In-field analysis of interview recordings and notes taken during the interviews were analyzed for the purposes of creating the Phase II interview schedule. Analysis was conducted informally with thorough reviews of recordings and notes collected during the preliminary open ended interviews. The results of the in-field analysis, along with the researcher's personal experience of training at Alliance HQ, were used to develop the consensus interview schedule which explicitly explored the cultural model of strategy.

Transcription and further analysis of the interview recordings were conducted after the researcher left the field. Transcription was conducted with Transcriber software program and qualitative analysis of the transcribed recordings was conducted with NVivo software program. The results of this analysis were used to inform both the ethnographic portion of this thesis as well as aid in the interpretation of the Phase II consensus analysis results.

4.3. Phase II: Structured Interviews and Cultural Consensus Analysis

Stratified convenience sampling was utilized to select 10 participants from each belt-rank (white, blue, purple, brown, and black) at Alliance HQ to participate in structured interviews, resulting in a total of 50 structured interviews. Participants were recruited during moments when they appeared available and according to their belt-rank which was readily visible on the members' uniforms. Selected gym members were asked if they had 15-30 minutes of time to be interviewed for the researcher's thesis project. Gym members who agreed were told that they

could end the interview at any time, were asked to sign a consent form, and given a sports drink as compensation for their time.

4.3.1. Structured interviews. The interview schedule for Phase II structured interviews consisted of a demographic information section (sex, belt-rank, height, weight, education, employment status, and competition frequency), a rank order/pile sort section, a multiple choice vignette section, and a section testing for locus of control (Rotter's Locus of Control Scale; Rotter, 1966). The creation of the rank order/pile sort section and the multiple choice vignette section was informed by the results of the Phase I open ended interview data analysis along with the researcher's personal experience training at Alliance HQ.

For the rank order/pile sort section of the interview, participants were presented with 14 laminated note cards, with a position commonly encountered in BJJ written on each card. Participants were asked to group together cards and then order those groups in terms of positional dominance. Participants were informed that the position of cards within the same group was not considered, only the position of each group relative to other groups and the contents of those groups. Additionally, participants were informed that they could make as many or few groups as they felt appropriate.

The multiple choice vignette section consisted of 9 hypothetical scenarios in which a BJJ athlete chooses one action or concept over another. Participants were then asked "Is this a good idea?" and given the options of "Definitely No," "No," "Yes," and "Definitely Yes." Using these vignettes, participants were probed on their attitudes regarding the relative importance of topics such as offense, reactionism, control, and position in competitions. While data was collected for the vignette section, it did not contribute salient information to the study and is not presented in the results section.

4.3.2. Data analysis.

4.3.2.1. Descriptive statistics. Data collected for the demographic and locus of control sections of the interview schedule was coded and analyzed in SPSS. Descriptive statistics were obtained from the demographic data.

4.3.2.2. Rank order and consensus analysis. Data collected from the rank order/pile sort exercise was first coded as rank order data, and consensus analysis was performed in ANTHROPAC. Each participant's response was coded as rank ordered data, with each BJJ position being assigned a value dependent upon which group it was classified into. BJJ positions belonging to groups of BJJ positions considered to be more dominant were given higher values than those assigned into groups of BJJ positions considered to be less dominant. Additionally, participants with more groups of BJJ positions had higher values associated with the group they indicated as most dominant. For example, a participant who created 9 groups of BJJ positions had a value of 9 given to all the BJJ positions in the group of BJJ positions they categorized as most dominant, whereas a participant who created 5 groups had a value of 5 given to all the BJJ positions in the group of BJJ positions they categorized as most dominant. Regardless of how many groups of BJJ positions a participant created, all positions they grouped in the lowest group were given a value of 1. This led to the total range of possible values being totally dependent on the number of groups of BJJ positions created by the participant. Consensus analysis was conducted in ANTHROPAC which yielded an eigenvalue indicating the level of consensus among the group as well as competence values for each individual. The competence values for each individual participant were input into SPSS in order to perform hypothesis testing.

4.3.2.3. Pile sort and multidimensional scaling. In addition to being coded as rank order data, data collected from the rank order/pile sort exercise was also coded as pile sort data.

Nonmetric multi-dimensional scaling coordinates from the pile sort data were obtained using ANTHROPAC and a nonmetric multi-dimensional scaling plot was obtained using SPSS. Each participant's response was coded as pile sort data with the number of groups created by participants and the contents of those groups being considered but not the order in which they placed the groups. For example, whether or not participants considered a group of BJJ positions more dominant than another was not coded—only that they created a certain number of groups comprised of certain individual BJJ positions. This pile sort data was input into ANTHROPAC to create an aggregate proximity matrix which displays the proportion of times two positions appeared in the same pile. The values from the aggregate proximity matrix were then used to obtain coordinates for a nonmetric multi-dimensional scaling plot. These coordinates were then input into SPSS to create the nonmetric multi-dimensional scaling plot. A nonmetric multi-dimensional scaling plot places elements onto a two dimensional space based upon their level of association with each other. The nonmetric multi-dimensional scaling plot used the values from the aggregate proximity matrix to display the 14 BJJ positions on a plot based on the 50 participants' shared perceived association between each position.

4.3.2.4. One way ANOVA and nonparametric ANOVA. To test the hypothesis that competence in the cultural model of strategy is higher in individuals with higher belt-rank, SPSS was used to conduct a one way analysis of variance (ANOVA) test. ANOVA tests compare the measure of central tendency of a variable between groups. In this ANOVA, the mean competence scores were compared between the 5 different belt-ranks (white, blue, purple, brown, and black). Belt-rank was set as the independent variable and competence was set as the dependent variable. The alpha level was set at .05. A nonparametric ANOVA was also conducted to ensure accuracy of the one way ANOVA results due to non-normality in the data.

4.3.2.5. Rotter's locus of control scale. Data collected using Rotter's Locus of Control Scale was coded and analyzed in SPSS. For each participant responses indicating an internal locus of control (LOC) were coded with one point and, and responses indicating an external locus of control were coded as 0 points. A new variable was created in SPSS representing each participants' sum total of points; the higher number of points, the more internal locus of control of a participant. Additionally, a Spearman's correlation testing the relationship between LOC and cultural competence was conducted.

4.4. Phase III: Follow Up Semistructured Interviews

Semistructured follow up interviews were conducted in Phase III to determine how individual strategy at different belt-ranks relates to the cultural model of strategy. Non-random purposive sampling was used to select one white belt, one blue belt, one purple belt, one brown belt, and three black belts based on their availability. They were asked to participate in these interviews. Participants were recruited during moments when they appeared available and according to their belt-rank which was readily visible on the members' uniforms. Selected gym members were asked if they had 15-30 minutes of time to be interviewed for the researcher's thesis project. Gym members who agreed were told that they could end the interview at any time, were asked to sign a consent form, and given a sports drink as compensation for their time. Interviews were conducted individually and recorded with the participant's permission.

Participants were asked questions regarding their personal history in the sport, defining aspects of their personal strategy, development of their personal strategy, and for elements of their strategy which defy generally understood strategic conventions. When participants' responses were vague, they were asked to clarify their statements. When their responses were

perceived as being particularly salient to the identification of elements of their personal strategy that contrasted the cultural model of strategy, they were probed further.

Transcription and analysis of the interview recordings were conducted after the researcher left the field. Transcription was conducted with Transcriber software program and qualitative analysis of the transcribed recordings was conducted with NVivo software program. The results of this analysis were used to inform both the ethnographic portion of this thesis as well as aid in the interpretation of the Phase II consensus analysis results.

CHAPTER 5

RESULTS

5.1. Phase I: Preliminary Open Ended Interview Results

Five black belts at Alliance HQ were interviewed individually with the objective of eliciting salient information regarding the cultural model of strategy at the gym. To achieve this goal, the five selected gym members were asked general and personal questions regarding history, philosophy, and strategy in BJJ. In-field analysis was conducted on the resulting data aimed at informing the creation of the Phase II interview schedule, and further analysis was conducted by the researcher after leaving the field.

The in-field analysis of the interviews yielded several themes—the most common and salient of which was the “position over submission” theme—which was considered to be fundamental to strategy by participants in jiu jitsu. This theme indicates the strategic preference for BJJ athletes to favor maintaining positions of control over attempting low probability submission holds at the risk of losing dominant positions. Further exploration of this theme yielded information regarding commonly encountered positions in BJJ.

In-field analysis results along with the personal experience of the researcher training at Alliance HQ indicated 14 positions commonly encountered in jiu jitsu competitions. These 14 positions form the basis of the Phase II rank order/pile sort exercise used for consensus analysis and are as follows:

- A- Mount
- B- Kesa Gatame
- C- Half Guard

- D- Back Mount
- E- Top Sprawl
- F- Both Standing
- G- North South
- H- Side Control
- I- Knee on Belly
- J- Top Half Guard
- K- Open Guard
- L- Kneeling in Guard
- M- Standing in Guard
- N- Closed Guard

Participants indicated that they considered some of these positions as being more similar than other positions. Furthermore, participants indicated that some positions were more dominant than others but that positions considered dominant were not necessarily *more* or *less* dominant than other positions also considered dominant. For example, “Mount” and “Back Mount” were both considered more dominant than “Both Standing,” but “Mount” was not necessarily considered more or less dominant than “Back Mount.” These results informed the hybrid rank order/pile sort data collection method used in Phase II.

After leaving the field, recordings were transcribed using Transcriber software program and qualitative analysis was conducted using NVivo software program. The results of the qualitative analysis were used in the creation of the ethnography of a Brazilian jiu jitsu gym. Results of the qualitative analysis also yielded a general categorization of the 14 positions identified. The results of this qualitative analysis were used to aid in the interpretation of the Phase II and III results.

5.1.1. Risky positions. Risky positions are identified as such because both athletes are considered to have high degrees of mobility but low control over their opponent. This indicates the possibility for a rapid change in positional dominance. Positions in this category include

“Both Standing,” “Top Sprawl, and “Kesa Gatame.” “Both Standing” is the default position at the beginning of a BJJ match. Both competitors have a high degree of mobility, and the possibility of a takedown leading to one athlete gaining positional dominance is very high. “Top Sprawl” position is the result of a failed takedown attempt by one athlete. While the athlete in “Top Sprawl” position has a slightly higher chance of achieving further positional dominance, his opponent has high enough mobility to quickly turn the tables. Finally, “Kesa Gatame” is considered to be a relatively dominant position from which the athlete can attempt a submission hold, but the low level of control over the opponent indicates that this position is also considered very risky. “Kesa Gatame” was considered more dominant than “Top Sprawl,” which was considered more dominant than “Both Standing,” but the defining factor of this category is that none of these positions were considered to truly fit into other categories because of the risks associated with them.

5.1.2. Guard positions. This category includes all positions related to the guard but can be further categorized into top guard and bottom guard positions. Bottom guard positions are those in which the athlete is on bottom with his legs wrapped around the body or legs of his opponent and include the “Closed Guard,” “Half Guard,” and “Open Guard” positions. The goal of an athlete in a bottom guard position is to “sweep” his opponent—meaning a transition to a top side finishing position—in order to achieve a more dominant position or to attempt a submission from the guard. Top guard positions are those in which the athlete is entangled by the legs of his opponent and include “Standing in Guard,” “Kneeling in Guard,” and “Top Half Guard” positions. The goal of an athlete in a top guard position is to “pass” the guard of his opponent in order to achieve a finishing position. The distinguishing characteristic of guard positions collectively is that both athletes have a high degree of control over their opponent

allowing for them to pit their techniques against one another in a controlled fashion.

Additionally, both athletes are generally attempting to transition into finishing positions. Both top guard and bottom guard positions are considered to be of equal positional dominance, and preference for one over the other was considered an element of personal strategy. Despite the perceived positional equality of guard positions among themselves, all guard positions were considered less dominant than finishing positions.

5.1.3. Finishing positions. Finishing positions were considered the most dominant group of positions. The goal of an athlete in a finishing position is to maintain that position and attempt high percentage submissions resulting in winning a match. Positions included in this group are “Mount,” “Back Mount,” “Side Control,” “North South,” and “Knee on Belly.” Generally, these positions were all considered to be of equal dominance, but some participants noted that “Mount” and “Back Mount” were more dominant than the other three positions.

5.2. Phase II: Structured Interviews and Cultural Consensus Analysis Results

5.2.1. Descriptive statistics results. Fifty members of Alliance HQ, 10 from each belt-rank (white, blue, purple, brown, and black) participated in Phase II data collection. All participants were male with an average age of 36.6. The median age of white belts was 30, blue belts was 37, purple belts was 34, brown belts was 34, and black belts was 38. The highest level of education achieved by 2 participants was high school (4%), some college by 8 participants (16%), a four year degree by 26 (52%), and a graduate degree by 14 (28%). Five participants (10%) were either working as unskilled laborers or unemployed, 28 (56%) worked in technical positions or as low level managers, and 17 (34%) worked in high level professions or were business owners. Descriptive statistic results are displayed in Table 1.

Table 1

Descriptive Statistics

	Total Sample (n=50)	White Belt (n=10)	Blue Belt (n=10)	Purple Belt (n=10)	Brown Belt (n=10)	Black Belt (n=10)
Age in Years	36.56 (±9.04)	33.80 (±12.57)	37.90 (±6.40)	37.30 (±11.55)	34.60 (±5.27)	39.20 (±7.89)
Highest Level of Education						
High School (%)	4	0	0	0	10	10
Some College (%)	16	30	10	10	0	30
4 Year Degree (%)	52	60	50	60	50	40
Graduate Degree (%)	28	10	40	30	40	20
Occupation						
Unskilled/unemployed (%)	10	10	0	10	0	30
Low Level Occupation (%)	56	60	70	60	70	20
High Level Occupation (%)	34	30	30	30	30	50

5.2.2. Rank order and consensus analysis results. Participants were instructed to create groups of cards with positions in BJJ listed on them and then instructed to rank order each group in relation to the other groups according to the perceived level of BJJ positional dominance. Each BJJ position was assigned a value based on the group the participant placed it in. Consensus analysis was conducted on this data in ANTHROPAC.

Consensus analysis yielded an eigenvalue ratio of 8.138—well above the 3.0 threshold indicating consensus. The elicitation of cultural consensus indicates the existence of a single

cultural group within the study population. This result was expected considering the generally shared understandings of positional dominance among members of Alliance HQ.

The mean competence value within the cultural model was .7902 and the median was .8600. The average competence score among white belts was .7390, blue belts was .8890, purple belts was .7770, brown belts was .8530, and black belts was .6930. The smallest range in competence scores was among blue belts (.18) and the largest range was among black belts (.73). These results were interesting due to the similarity in competence scores between white and black belts—the highest and lowest belt-ranks. Additionally, the range in competence scores among black belts is disproportionately high at .73 and nearly accounts for the competence score range of the entire sample (.75). Statistics regarding cultural consensus analysis are displayed in Table 2, and the cultural answer key for the entire sample is displayed in Table 3.

Table 2

Cultural Consensus Analysis Results

	Total Sample (n=50)	White Belt (n=10)	Blue Belt (n=10)	Purple Belt (n=10)	Brown Belt (n=10)	Black Belt (n=10)
Mean Competence	.79 (±.15)	.74 (±.11)	.89 (±.05)	.78 (±.12)	.85 (±.09)	.69 (±.25)
Min. and Max. Competence	.19-.94	.60-.90	.76-.94	.55-.92	.64-.92	.19-.92
Eigenvalue Ratio	8.138					

Table 3

Cultural Answer Key of Entire Sample

<u>Item</u>	<u>Answer Key</u>
D- Back Mount	4.22
A- Mount	4.17
I- Knee on Belly	3.68
H- Side Control	3.53
G- North South	3.46
B- Kesa Gatame	3.07
J- Top Half Guard	2.69
E- Top Sprawl	2.20
N- Closed Guard	2.20
C- Half Guard	1.97
M- Standing in Guard	1.96
K- Open Guard	1.85
L- Kneeling in Guard	1.78
F- Both Standing	1.28

5.2.3. Pile sort and multidimensional scaling results. In addition to being coded for rank ordering, the results of the BJJ position notecard exercise explained above were coded for pile sorting. The number of groups created by participants and the contents of those groups were coded but not the order in which they placed the groups. ANTHROPAC was used to derive a set of nonmetric multidimensional scaling coordinates from this data which were then used to create a nonparametric multidimensional scaling plot in SPSS. This plot is displayed in Figure 1.

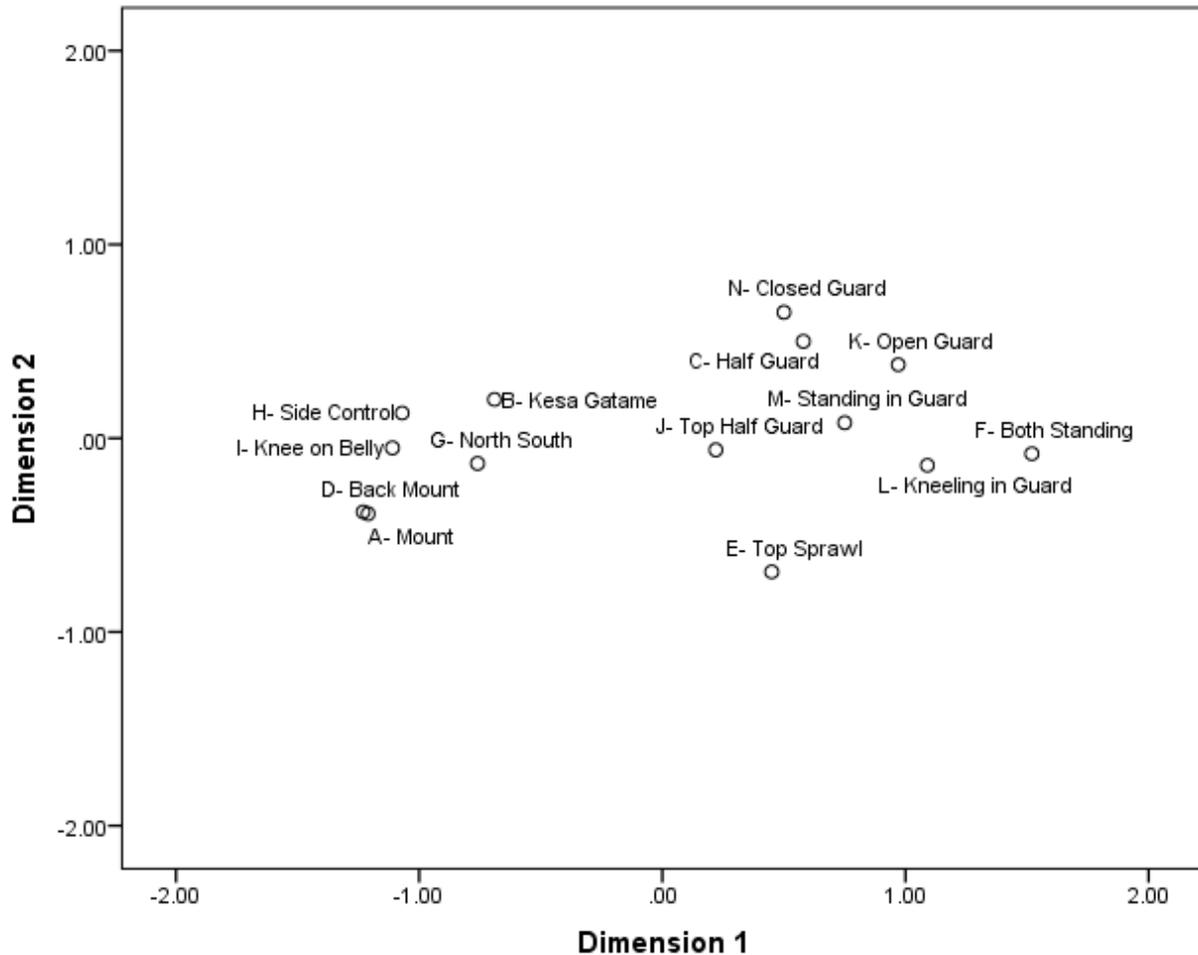


Figure 1: Nonmetric Multidimensional Scaling Plot

5.2.4. One way ANOVA and nonparametric ANOVA results. SPSS was used to conduct a one way ANOVA in order to test the hypothesis that competence in the cultural model of strategy is higher in individuals with higher belt-ranks. In this test, belt-rank was set as the independent variable and competence score was set as the dependent variable with the alpha level at .05. The one way ANOVA yielded significant results ($p < .02$) with Tukey's test indicating a significant level of difference between blue and black belts ($p < .03$). Due to the small sample size and lack of normality in the data, a nonparametric ANOVA was conducted to ensure

the accuracy of the significant findings from the one way ANOVA. This test utilized the Kruskal-Wallis test and also yielded significant results ($p < .02$). The nonparametric ANOVA indicates a significant level of difference between blue and white belts ($p < .02$). Table 4 displays the results of the one way ANOVA, and Figure 2 shows an error bar chart visually displaying these results.

Table 4

Competence Scores One Way ANOVA Results

	<u>Degrees of Freedom</u>	<u>F Ratio</u>	<u>Significance</u>
Between Groups	4	3.306	.019
Within Groups	45		
Total	49		

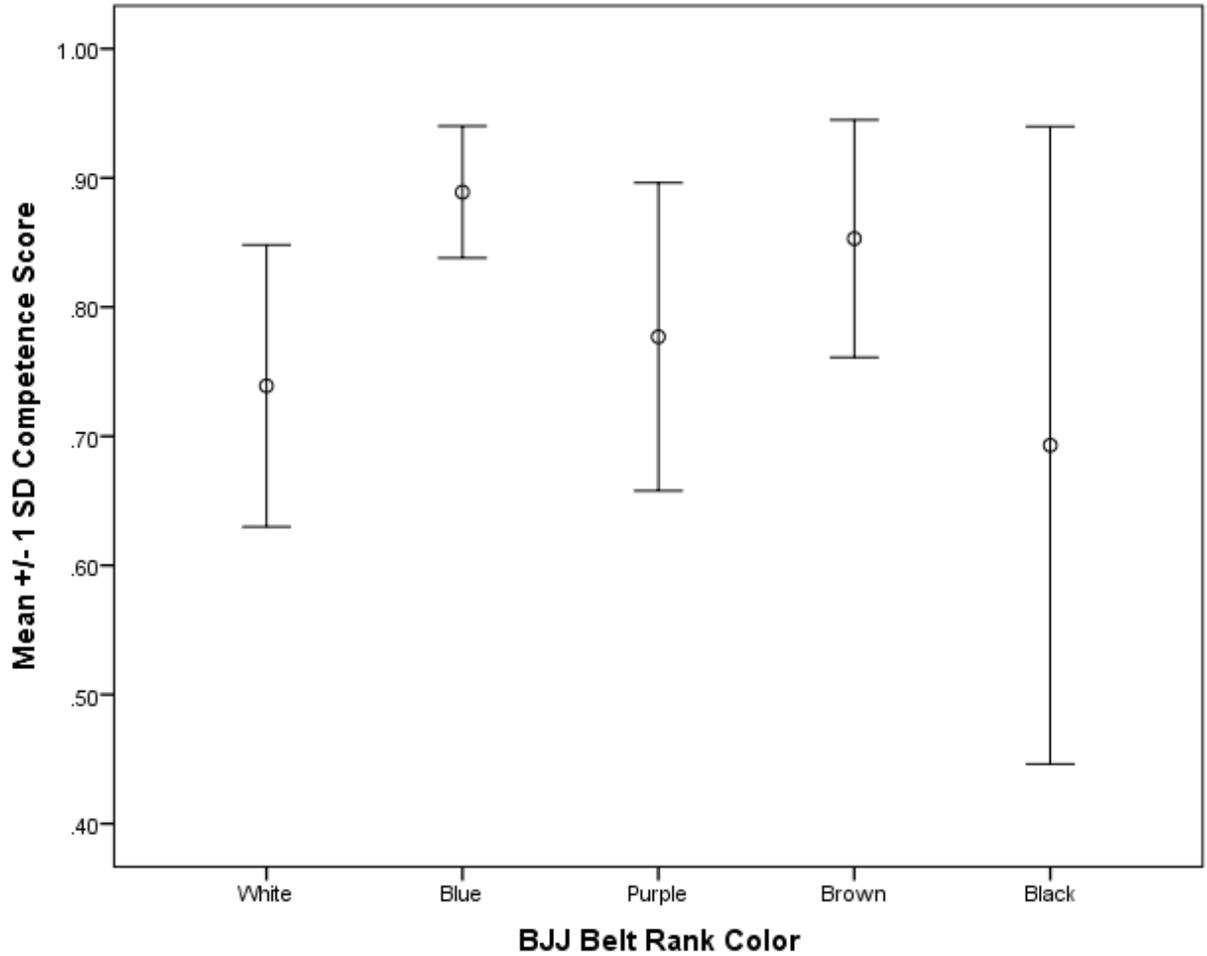


Figure 2: Error Bar Chart with Mean Competence Score and S.D. by Belt-rank

5.2.5. Locus of control results. Rotter’s Locus of Control Scale was utilized to test for the locus of control of each participant. Higher scores indicate a more internal LOC and lower scores indicate a more external LOC. The results of this locus of control scale are presented by belt-rank in Figure 3. Additionally, a Spearman’s correlation was conducted testing the relationship between cultural competence and LOC. This correlation bore insignificant (.662) results with weak strength (-.06).

The similarity between the LOC scores of each belt level indicates that belt-rank is not related to LOC. Additionally, the lack of a strong or significant correlation between LOC and competence indicates that these two items are not related. Controlling for variation in competence between belt-ranks as a result of LOC provides evidence that the significant findings related to variation in competence in the cultural model between belt-ranks is not the result of LOC, and strengthens the validity of these findings.

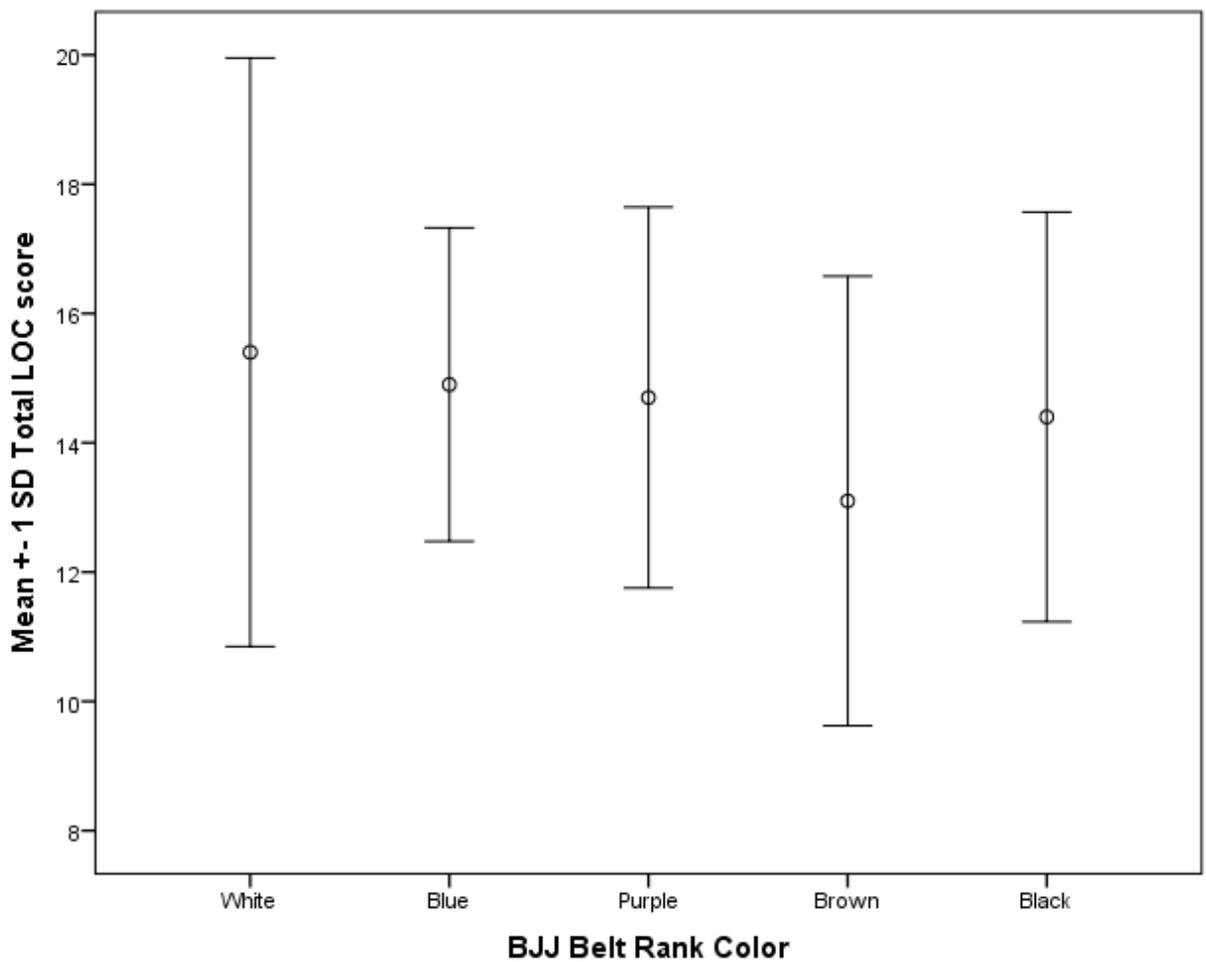


Figure 3: Mean LOC by Belt-rank

5.3. Phase III: Follow Up Interview Results

Semistructured interviews aimed at eliciting the relationship between individual strategy and the cultural model of strategy were conducted with one white belt, one blue belt, one purple belt, one brown belt, and three black belts at Alliance HQ. Questions probed participants on their personal strategy and its development. These interviews resulted in the elicitation of three primary themes.

5.3.1. Fluidity. Fluidity refers to the degree to which athletes adapt their personal strategies to conform to the strengths and weaknesses of their opponents. Generally, but not always, higher belt-ranked participants demonstrated higher fluidity in their personal strategy than lower belt-ranked participants. At the highest levels, participants' personal strategies were so fluid and adaptive to specific circumstances that they did not identify as having a fixed concept of personal strategy.

The lower belt-ranked participants interviewed in this section immediately understood what was meant by "personal strategy" and easily articulated specifics of their personal strategy. Participants at these belt-ranks generally applied a single strategy against every opponent, thereby demonstrating a fixed concept of personal strategy. When asked for defining aspects of their personal strategy, one participant in this category replied:

"So I'll do like a double leg takedown, but I'll finish it the right way, sometimes in jiu jitsu they kinda just do the toreando, or they'll pull the legs back up, but I'll finish it off at side control. So I'll take the legs to the side, so stuff like that."

In this quotation, the participant immediately responds with a sequence of techniques that form the core of his strategy. He does not qualify that he performs this series of techniques against certain opponents in certain situations, and it is assumed that this is his default strategy against all opponents. This quote is exemplary of lower belt-ranked athletes because it demonstrates a fixed notion of strategy as a sequence of techniques performed without regard for the strengths or weaknesses of an opponent.

The higher belt-ranked participants did not as readily identify the distinct elements of their personal strategy. They did not see themselves as having a fixed strategy, but instead as having an adaptive strategy which they employ based upon the current circumstances of a match. A higher belt-ranked participant explained this multifaceted strategy type in the following quote:

“I think a lot of it has to do with just adapting, being able to adapt during the fight and apply...it's like playing video games—you've got the mage, the ranger beats the mage, mage beats the knight, the knight beats the ranger. So you need to be able to look into this diagram and understand how these positions can be applied against other positions to beat them. It's the same thing in jiu jitsu. For example if the guy's on his knees, I can't play de la riva, he just countered my de la riva guard, so now I have to play either spider or maybe butterfly or something, so then he wants to stand up and then I gotta lay back down and now I can play de la riva.”

This participant explicitly states that strategy is adaptive and conceptualizes that adaptiveness in terms of countering techniques in real time. Higher belt-ranked athletes view strategy as a fluid entity which changes in accordance to the circumstances of a match. This is a markedly different

approach than the lower belt-ranked athletes who conceptualize strategy as a fixed formula applied indiscriminately against every opponent.

The most advanced participants did not identify as having any fixed sense of personal strategy, but instead noted that whatever strategy they employed in a particular instance was entirely dependent upon the perceived strengths and weaknesses of their opponent. This sentiment is exemplified by the following participant, a very high level BJJ athlete:

“Yeah, strategy is gonna depend on who I'm fighting, you know? uh, if I'm fighting Buchecha [a high level BJJ competitor] I'm gonna have one strategy, but if I'm fighting Mohammed Ali I'm gonna have another strategy, you know? It's like different style guys, they're not the same. I cannot use the same technique with both, with one it might work really good—with the other one, I can get caught in the triangle [choke], you know?”

The sentiments of this athlete summarize the peak of strategic fluidity by de-emphasizing the fixed sense of personal strategy and emphasizing a reactive and adaptive sense of strategy.

Furthermore, participants in this category acknowledged their proficiency in certain techniques—but that proficiency alone did not dictate which techniques they employed in a match. Instead, techniques were selectively employed based entirely on the perceived strengths and weakness of their opponent, not the perceived strengths and weaknesses of themselves.

Overall, the theme of strategic fluidity trended towards lower belt-ranked athletes having a more fixed sense of personal strategy and higher belt-ranked athletes having a more fluid and adaptive sense of strategy.

5.3.2. Personal history and physicality. Participants commonly cited personality attributes, participation in other athletic endeavors, and physical attributes as the origin of peculiarities and preferences in their personal strategy. For example, the blue belt interviewed in this phase cited his background in the military as cultivating an aggressive predisposition which manifested in his “acrobatic” and “strong” submission attempts that define his personal strategy. The white belt interviewed in this phase cited his participation in high school wrestling as the origin of his takedown and side control oriented personal strategy. Additionally, one of the black belts interviewed in this phase indicated that his top-heavy physical build led to his preference for achieving top side positions in his personal strategy. Notably, the tendency to point to these factors as contributing to personal strategy—or even to having a fixed personal strategy—generally decreased with experience level as noted in the fluidity theme.

5.3.3. Weaknesses into strengths. Related to the theme of personal history and physicality, participants noted that some aspects of their personal strategy that they identified as particularly effective were the result of compensation for weaknesses in other aspects of their game. This included physical weaknesses and technical weaknesses. For example, the purple belt interviewed in this phase indicated that his highly developed guard game was a result of never being able to achieve top positions early in his jiu jitsu career due to physical weakness. Additionally, the brown belt interviewed pointed to his unique attacks from within his opponents’ guard as being the result of technical deficiencies which prevented him from passing guard early in his jiu jitsu career. Furthermore, one of the black belts interviewed noted that his preference for deep half guard developed from a lack of requisite flexibility to achieve other guard positions. In all of the above instances, participants pointed to their former weaknesses as eventually leading to their competitive strengths. Again though, more advanced athletes were

generally less likely to point to their weaknesses as playing a role in their strategy—presumably because they were less likely to point to having a defined personal strategy in general as indicated in the fluidity theme.

5.4. Connecting the Qualitative and Quantitative Findings

The primary quantitative findings include the elicitation of cultural consensus, the creation of a multi-dimensional scaling plot visually displaying the degree of relatedness between the 14 BJJ positions, and the one way ANOVA demonstrating a significant degree of difference between the mean competence scores of belt-ranks.

5.4.1. Consensus. The elicitation of cultural consensus regarding the positional dominance hierarchy element of the cultural model of strategy was expected after Phase I qualitative analysis. Participants in Phase I interviews widely agreed that finishing positions were more dominant than transition positions and that risky positions involved little control of an opponent. The eigenvalue ratio of 8.138 demonstrates that this general categorization of BJJ positions was widely shared among the sampled population. This interpretation of the data is further supported by the results of the multidimensional scaling plot.

5.4.2. Multidimensional scaling plot. The multidimensional scaling plot displays a clustering of the positions identified as finishing positions in Phase I on the left side of the plot, including “Mount,” “Back Mount,” “Side Control,” “North South,” and “Knee on Belly.” Additionally, another cluster further to the right contains all of the positions identified as guard positions. Finally, not fitting neatly into either of these clusters, the risky positions of “Both Standing,” “Top Sprawl,” and “Kesa Gatame” are positioned outside of the other clusters.

Interestingly, the finishing positions in the multidimensional scaling plot are closely clustered together, whereas the guard positions are loosely clustered. This demonstrates high

levels of association regarding finishing positions and low levels of association regarding transition positions. Additionally, the three risky positions are interspersed throughout the plot and not clustered together at all. The difference in the cluster density between finishing and transition positions as well as the wide dispersion of risky positions is explained by qualitative evidence from Phase I and III interviews.

Participants in Phase I noted that guard positions were further grouped into bottom guard and top guard positions but that both bottom and top guard were considered to be of equal dominance. The differentiation between top guard and bottom guard positions in relation to personal strategy was further explicated in Phase III. The relatively larger cluster size of guard positions in the multidimensional scaling plot is a result of the acknowledgment of individual strategic variation within the guard position category. Simply put, practitioners recognize that while personal preference for top guard “passing” or bottom guard “sweeping” strategies are distinct from each other, both are of equal dominance. The differentiation between top and bottom guard strategies is displayed on the multidimensional scaling plot. The multidimensional scaling plot displays positions identified as bottom guard positions towards the top of the cluster, and positions identified as top guard positions towards the bottom of the cluster. Regardless of personal strategy, the goal of all athletes is to achieve a finishing position. The finishing positions cluster is denser due to all finishing positions being considered more similar than different relative to the guard positions cluster which displays the divergence of top and bottom guard strategies.

The three positions identified as risky are interspersed throughout the plot and not clustered in a coherent fashion. These positions are distributed in this manner on the plot because of the identified variation in dominance between these positions. The highly dominant finishing

positions are clustered on the left of the plot, and the less dominant guard positions are clustered towards the right of the plot which indicates that positions become more dominant when going right to left. This explains the distribution of the risky positions because “Both Standing,” which was considered the least dominant of the three, is on the far right of the plot. Furthermore, “Top Sprawl” was identified as more dominant and is further left of the “Both Standing” position. Finally, “Kesa Gatame” was identified as the most dominant position and is positioned furthest left of all three positions identified as risky. The labelling of these positions as risky explains why they are not clustered with either the categories of finishing or guard positions, and the identification of a dominance hierarchy within risky positions explains their distribution on the plot.

5.4.3. ANOVA. The ANOVA test conducted regarding the relationship between belt-rank and competence score in the positional element of the cultural model of strategy indicated a significant difference in the mean competence scores between belt-ranks. In particular, competence scores of blue belts, the second lowest belt-rank, were significantly higher ($p < .02$) than those of black belts, the highest belt-rank. Additionally, the competence scores of black belts (.6930) were closest to the competence scores of white belts (.7390), the lowest belt-rank. The competence scores of brown belts (.8530), the second highest belt-rank, were similar to blue belts; however, the competence scores of purple belts, the middle belt-rank, were relatively low (.7770). Finally, the range of competence scores among black belts (.73) was the largest of any group, and nearly accounted for the range of competence scores of all belt-ranks in the sample (.75). The high competence scores of blue and brown belts, the similar and relatively low competence scores of white and black belts, and the disproportionately large range in black belt

competence scores are explained by the qualitative data collected in Phases I and III; however, the low competence scores of purple belts are not.

The competence scores of blue and brown belts are high simply because that is where they would be expected to be considering the average training time of 2 years to acquire a blue belt-ranking, and much longer to acquire a brown. The immersive and controlled environment of BJJ classes at Alliance HQ indicates that members who have attended classes for extended periods of time will understand the shared model of strategy better than a beginning level white belt. Basically, cultural consensus exists regarding the cultural model of strategy, and members of the gym who attend long enough become familiar with this model. By default, this explanation also explains the low competence scores of white belts, because they are beginners not yet enculturated in the model. However, it does not account for the relatively low competence scores of black belts.

The relatively low competence scores of the black belts, the highest belt-rank, are a result of low levels of agreement regarding the cultural model and are explained by the theme of fluidity elicited in Phase III. Fluidity in strategy is the idea that strategy is an adaptive and fluid entity changing according to particular circumstances. Black belts in Phase III interviews exhibited the trait of fluidity strongly. Because fluidity eschews the idea of a single fixed notion of strategy, it explains why black belts scored relatively low on competence measures. Basically, black belts have low levels of agreement regarding a fixed shared model of strategy because they have a more idiosyncratic perspective of strategy that transcends the idea of a single fixed strategic model. The strategic fluidity observed in black belts also explains the disproportionately wide range in their competence scores.

Competence scores among black belts had the largest range of any group because of the variability in concepts of strategy produced by adopting a fluid conception of strategy. Black belts do not conceive of strategy as a single fixed ideal, but instead as changing according to the strengths and weaknesses of a particular opponent in a particular instance. Having a fluid concept of strategy leads to individual nuance in knowledge regarding strategy, and thus a wide variety of interpretations regarding questions related to strategy. The varying interpretations of the questions asked of them in Phase II interviews led to the large range in observed competence scores among black belts.

The low average competence score of purple belts is not explained by any of the collected data. It was expected for the competence of purple belts to be similar to blue and brown belts if not slightly higher to produce a true curvilinear relationship between belt-rank and competence. This prediction did not prove accurate in the data, and the competence scores of purple belts are closer to those of white and black belts. Confounding circumstances regarding this discrepancy are offered in the discussion section.

CHAPTER 6

DISCUSSION

6.1. Primary Findings

The primary findings of this study include the elicitation of cultural consensus regarding the positional hierarchical aspect of the cultural model of strategy, the identification of the relationship between elements of the positional hierarchical aspect of the cultural model of strategy, the identification of the salient factors that dictate the relationship between personal and cultural strategy, and the identification of strategic fluidity as a salient factor in explaining intracultural variation in competence.

Consensus analysis conducted on the positional hierarchical aspect of the cultural model of strategy yielded an eigenvalue ratio indicating high levels of consensus among members of Alliance HQ. This demonstrates that members of Alliance HQ agree upon a single cultural model of strategy as it relates to the relative dominance of positions encountered in BJJ. Generally, members of Alliance HQ categorize positions as either guard, finishing, or risky positions. Guard positions are considered less dominant than finishing positions, and the goal of an athlete in a guard position is to transition to a finishing position. Finishing positions are the dominant category and athlete's goals in finishing positions are to attempt submission holds to win the match. Risky positions can be varyingly dominant but offer an athlete little control over their opponent's body. Among guard positions, members recognize both top guard and bottom guard positions. Both top and bottom guard are considered to be of equal dominance, and individual preference for top or bottom guard positions is dictated by the personal history and

physicality of athletes. In some instances, weaknesses of some athletes force them to prefer certain positions, and athletes often become highly proficient in these positions. Black belts display low levels of agreement regarding the cultural model of strategy because they have developed an idiosyncratic perspective regarding strategy. This idiosyncratic perspective of strategy is largely informed by the theme of fluidity and results in low levels of agreement regarding a fixed model of strategy among black belts.

6.2. Unexpected Findings

Unexpectedly, purple belt participants scored low competence scores. Athletes at this belt-rank were expected to score similarly to blue and brown belts—the belts before and after purple. The discrepancy between the anticipated and observed results are not explained by the data; however, the answer may lie in a few confounding factors related to sample size and peculiarities of membership at Alliance HQ.

The unexpectedly low competence scores of purple belts may be a result of small sample size. This study utilized a total sample of 50 participants, only 10 of which were purple belts. This small sample size may not accurately reflect the actual mean competence scores of all purple belts at Alliance HQ.

Additionally, the notoriety of Alliance HQ in the BJJ community at large draws many experienced practitioners to switch gyms to train at this location. Purple belt is generally thought to be the belt-rank at which BJJ practitioners are considered to be serious competitors, and many purple belts start taking their training more seriously at this belt-rank. Many of the purple belts that participated in this study had come from other gyms, but data was not collected specifically regarding training time at Alliance HQ and other gyms. The relatively low competence score of purple belts at Alliance HQ may be the result of many of the participants having recently

transitioned to training at Alliance HQ and not having as much exposure to the peculiarities of the cultural model of strategy at Alliance HQ.

6.3. Limitations and Further Lines of Research

The theoretical implications of this research are limited largely by its scope. A sample size of only 50 participants, 10 from each belt-rank, was utilized in this study. Furthermore, this study occurred at a single gym location. Also, the cultural model of strategy is broad and encompassing, and this study focused only on the elements of the cultural model of strategy which were deemed most salient. Finally, no attempt was made at quantifying how competence in the cultural model of strategy affects the actual performance of athletes. Further research on this topic would utilize a larger sample size, take place at more gym locations, identify more elements of the cultural model of strategy, quantify the effect of competence in the cultural model of strategy on athletic performance through cultural consonance analysis, and explore the unexpectedly low competence scores observed among purple belts in this study.

Interestingly, the results of this research regarding differences in cultural competence between novices and experts in a cultural model contrast with those found in the work of other anthropologists. Boster and Johnson (1989), in their study of sport fishermen, posit that experts differ from novices in that the experts rely on alternative cultural models to those utilized by novices. Conversely, the results presented in this thesis suggest that novices and experts share a common cultural model, but that experts develop nuanced individualistic variations within the context of the shared cultural model. This highlights the domain of expert knowledge as ripe for further anthropological investigation. Additionally, further lines of research would explore differences in the cultural model of strategy between BJJ and other grappling based martial arts,

such as *sambo* and catch wrestling, which compete on the common ground of submission only grappling competitions.

6.4. Implications of Study and Conclusion

This study resolves many of the issues encountered in other research aimed at understanding the relationship between culture and embodied knowledge, specifically within martial arts and combat sports. Additionally, this research demonstrates how cultural knowledge becomes embodied knowledge through the cultural model of strategy. Finally, this study demonstrates how individuals formulate their personal strategy based on shared concepts of strategy.

Garcia and Spencer (2013a) point to a lack of quantitative data collection and a sole focus on the concept of martial habitus as limiting factors in the current study of martial arts. Greg Downey's research quantifies embodied knowledge and links it to culture through strategy but does not quantify culture or strategy. This research resolves these issues in current research on martial arts by utilizing a cognitive anthropological framework to both qualitatively and quantitatively understand the link between culture and embodied knowledge through the cultural model of strategy.

Techniques in BJJ exist as a form of cultural knowledge varying known to athletes. The cultural model of strategy provides a shared framework for the acquisition of techniques to achieve goals in BJJ. Competence in the cultural model of strategy provides athletes with knowledge which guides their selection of techniques to incorporate into their personal strategy. These techniques are habitually practiced to the point of reflexivity at which point they become embodied knowledge.

New athletes begin adopting the cultural model of strategy and tailor it to their individual strengths and weaknesses. Larger, stronger, and more aggressive athletes tend to favor utilizing top guard positions and guard passing to reach finishing positions from which they can employ submission attempts. Weaker and more flexible athletes tend towards utilizing bottom guard positions to launch submission attacks or sweeps to reach more dominant finishing positions. Generally though, variation between the personal strategies of athletes at this level is encompassed by the cultural model of strategy.

As athletes advance in belt-rank, they acquire increasing amounts of embodied knowledge, but they begin to see the fixed cultural model of strategy as an impediment to their growth as competitors. Competition at high levels requires adaptation to the strengths and weaknesses of particular opponents in particular situations. The repeated and indiscriminate application of a single fixed strategy eventually leads to competition losses, and a fluid strategic framework is adopted which provides idiosyncratic nuance to the cultural model.

The cultural model of strategy is adopted by new athletes to guide the acquisition of embodied knowledge and heavily influences their personal strategies. As athletes progress to advanced levels, they acquire a large degree of embodied knowledge, and the cultural model of strategy becomes an impediment to their performance in competitions. The embodied knowledge acquired by advanced athletes as part of the process of enculturation in the cultural model of strategy is retained, but the application of this embodied knowledge is now guided by a personal model revolving around adaptation to specific circumstances. In this manner, personal strategy is heavily influenced by the cultural model of strategy as athletes gain competence in the model early in their careers. Among advanced athletes, personal strategies of fluidity are developed

within the context of the cultural model of strategy and become the primary source of information regarding strategy for the individual's application of embodied knowledge.

In conclusion, the history of fighting among humans is long and multifaceted, but Brazilian jiu jitsu provides an example of a highly strategic and refined modern day combat sport. Athletes in BJJ utilize a cultural model of strategy to select techniques which they practice to the point of embodied reflexivity. Variation in the personal strategies of low belt-ranked athletes is a result of personal history and physicality. The low levels of agreeance in the cultural model observed in high ranked athletes is the result of the development of personal models of strategic fluidity within the cultural model which are then used for the application of embodied knowledge gained through the cultural model of strategy.

“Be like water making its way through cracks. Do not be assertive, but adjust to the object, and you shall find a way around or through it. If nothing within you stays rigid, outward things will disclose themselves. Empty your mind, be formless. Shapeless, like water. If you put water into a cup, it becomes the cup. You put water into a bottle and it becomes the bottle. You put it in a teapot, it becomes the teapot. Now, water can flow or it can crash. Be water, my friend.”

-Bruce Lee (1971)

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APPENDIX A
PHASE II INTERVIEW SCHEDULE

For the first set of questions, I will be asking you for basic background information.

Please respond as accurately as possible.

1. Sex
2. What is your BJJ belt rank?
3. How tall are you?
4. How much do you weigh?
5. What is your highest level of education attained?
6. What is your employment status?
7. If you are employed, what are you employed in?

For the next set of questions I am going to be asking you about techniques and strategies in BJJ. In each of the following scenarios, indicate whether the actions taken by the BJJ athlete are good ideas or not. Assume that all techniques described are legal in the ruleset of the competition.

8. A BJJ athlete consistently employs pressure points and pain inducing techniques.

Is this a good idea? Definitely No No Yes Definitely Yes

9. A BJJ athlete attempts a triangle choke rather than an Americana from guard.

Is this a good idea? Definitely No No Yes Definitely Yes

10. A BJJ athlete prioritizes movement patterns over techniques in their training.

Is this a good idea? Definitely No No Yes Definitely Yes

11. A BJJ athlete exposes their back to their opponent rather than give side control.

Is this a good idea? Definitely No No Yes Definitely Yes

12. A BJJ athlete keeps weight on his/her toes rather than knees on top in side control.

Is this a good idea? Definitely No No Yes Definitely Yes

13. A BJJ athlete prioritizes attempting submissions over maintaining position.

Is this a good idea? Definitely No No Yes Definitely Yes

14. A BJJ athlete consistently uses a large number of techniques.

Is this a good idea? Definitely No No Yes Definitely Yes

15. A BJJ athlete consistently passes guard while standing.

Is this a good idea? Definitely No No Yes Definitely Yes

16. A BJJ athlete highly values strength.

Is this a good idea? Definitely No No Yes Definitely Yes

17. A BJJ athlete passes to mount rather than side control.

Is this a good idea? Definitely No No Yes Definitely Yes

18. A BJJ athlete consistently uses a small number of techniques.

Is this a good idea? Definitely No No Yes Definitely Yes

19. A BJJ athlete attempts an armbar from back control rather than rear naked choke.

Is this a good idea? Definitely No No Yes Definitely Yes

20. A BJJ athlete uses Kesa Gatame (scarf hold) rather than standard side control.

Is this a good idea? Definitely No No Yes Definitely Yes

21. A BJJ athlete consistently uses rubber guard.

Is this a good idea? Definitely No No Yes Definitely Yes

22. A BJJ athlete attempts a hip toss rather than a double leg from standing position.

Is this a good idea? Definitely No No Yes Definitely Yes

23. A BJJ athlete consistently uses standard closed guard.

Is this a good idea? Definitely No No Yes Definitely Yes

24. A BJJ athlete attempts a neck crank from within their opponent's guard rather than a guard pass.

Is this a good idea? Definitely No No Yes Definitely Yes

25. A BJJ athlete controls the head of an opponent rather than the hips of an opponent in side control.

Is this a good idea? Definitely No No Yes Definitely Yes

26. A BJJ athlete attempts leglocks more frequently than armlocks.

Is this a good idea? Definitely No No Yes Definitely Yes

27. A BJJ athlete attempts to move first rather than wait to react to their opponent.

Is this a good idea? Definitely No No Yes Definitely Yes

28. A BJJ athlete attempts leg locks rather than pass their opponent's guard.

Is this a good idea? Definitely No No Yes Definitely Yes

29. A BJJ athlete attempts double leg takedown rather than pulling guard.

Is this a good idea? Definitely No No Yes Definitely Yes

30. A BJJ athlete consistently uses open guard.

Is this a good idea? Definitely No No Yes Definitely Yes

31. A BJJ athlete consistently passes guard while on ground.

Is this a good idea? Definitely No No Yes Definitely Yes

32. A BJJ athlete keeps weight on his/her toes rather than on knees in opponent's guard.

Is this a good idea? Definitely No No Yes Definitely Yes

33. A BJJ athlete highly values endurance.

Is this a good idea? Definitely No No Yes Definitely Yes

34. A BJJ athlete consistently uses straight ankle locks rather than heel hooks.

Is this a good idea? Definitely No No Yes Definitely Yes

35. A BJJ athlete highly values flexibility.

Is this a good idea? Definitely No No Yes Definitely Yes

For the following set of questions, please answer these items carefully but do not spend too much time on any one item. Be sure to find an answer for every choice. In some instances you may discover that you believe both statements or neither one. In such

cases, be sure to select the one you more strongly believe to be the case as far as you're concerned. Also try to respond to each item independently when making your choice; do not be influenced by your previous choices.

- 36.** a. Children get into trouble because their parents punish them too much.
b. The trouble with most children nowadays is that their parents are too easy with them.

- 37.** a. Many of the unhappy things in people's lives are partly due to bad luck.
b. People's misfortunes result from the mistakes they make.

- 38.** a. One of the major reasons why we have wars is because people don't take enough interest in politics.

- b. There will always be wars, no matter how hard people try to prevent them.

- 39.** a. In the long run people get the respect they deserve in this world.

- b. Unfortunately, an individual's worth often passes unrecognized no matter how hard he tries.

- 40.** a. The idea that teachers are unfair to students is nonsense.

- b. Most students don't realize the extent to which their grades are influenced by accidental happenings.

- 41.** a. Without the right breaks one cannot be an effective leader.

- b. Capable people who fail to become leaders have not taken advantage of their opportunities.

- 42.** a. No matter how hard you try some people just don't like you.

- b. People who can't get others to like them don't understand how to get along with others.

- 43.** a. Heredity plays the major role in the determining one's personality.
b. It is one's experiences in life which determine what they're like.
- 44.** a. I have often found that what is going to happen will happen.
b. Trusting to fate has never turned out as well for me as making a decision to take a definite course of action.
- 45.** a. In the case of the well-prepared student there is rarely if ever such a thing as an unfair test.
b. Many times exam questions tend to be so unrelated to course work that studying is often useless.
- 46.** a. Becoming a success is a matter of hard work, luck has little or nothing to do with it.
b. Getting a good job depends mainly on being in the right place at the right time.
- 47.** a. The average citizen can have an influence in government decisions.
b. This world is run by the few people in power, and there is not much the little guy can do about it.
- 48.** a. When I make plans, I am almost certain that I can make them work.
b. It is not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune anyhow.
- 49.** a. There are certain people who are just no good.
b. There is some good in everybody.
- 50.** a. In my case getting what I want has little or nothing to do with luck.
b. Many times we might just as well decide what to do by flipping a coin.

- 51.** a. Who gets to be the boss often depends on who was lucky enough to be in the right place first.
- b. Getting people to do the right thing depends upon ability; luck has little or nothing to do with it.
- 52.** a. As far as world affairs are concerned, most of us are the victims of forces we can neither understand, nor control.
- b. By taking an active part in political and social affairs the people can control world events.
- 53.** a. Most people don't realize the extent to which their lives are controlled by accidental happenings.
- b. There really is no such thing as "luck".
- 54.** a. One should always be willing to admit mistakes.
- b. It is usually best to cover up one's mistakes.
- 55.** a. It is hard to know whether or not a person really likes you.
- b. How many friends you have depends upon how nice a person you are.
- 56.** a. In the long run the bad things that happen to us are balanced by the good ones.
- b. Most misfortunes are the result of lack of ability, ignorance, laziness, or all three.
- 57.** a. With enough effort we can wipe out political corruption.
- b. It is difficult for people to have much control over the things politicians do in office.
- 58.** a. Sometimes I can't understand how teachers arrive at the grades they give.
- b. There are direct connections between how hard I study and the grades I get.
- 59.** a. A good leader expects people to decide for themselves what they should do.
- b. A good leader makes it clear to everybody what his or her jobs are.

- 60.** a. Many times I feel that I have little influence over the things that happen to me.
b. It is impossible for me to believe that chance or luck plays an important role in my life.
- 61.** a. People are lonely because they don't try to be friendly.
b. There's not much use in trying too hard to please people, if they like you, they like you.
- 62.** a. There is too much emphasis on athletics in high school.
b. Team sports are an excellent way to build character.
- 63.** a. What happens to me is my own doing.
b. Sometimes I feel that I don't have enough control over the direction my life is taking.
- 64.** a. Most of the time I can't understand why politicians behave the way they do.
b. In the long run the people are responsible for bad government on a national as well as on a local level.

APPENDIX B
IRB APPROVAL LETTER

May 19, 2017

William Dressler, Ph.D.
Dept. of Anthropology
College of Arts and Sciences
Box 870210

Re: IRB # 17-OR-179, "Cultural Consensus Models of Strategy Among Brazilian Jiu Jitsu Practitioners in Atlanta, GA"

Dear Dr. Dressler:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your application will expire on May 17, 2018. If your research will continue beyond this date, please complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, please complete the Modification of an Approved Protocol Form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, please complete the Request for Study Closure Form.

Please use reproductions of the IRB approved stamped consent forms to obtain consent from your participants.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,



Carpantano T. Myles, MSM, CIM, CIP
Director & Research Compliance Officer
Office for Research Compliance