



ATTEMPTING A FLYING ARMBAR  
(BOB COOK VS. TIKI GHOSHEN).

# MIXED MARTIAL ARTS: A TECHNICAL ANALYSIS OF THE ULTIMATE FIGHTING CHAMPIONSHIP IN ITS FORMATIVE YEARS

DANIELE BOLELLI, M.A.



## INTRODUCTION

In the modern history of martial arts, the 1990's will be remembered as the decade of the revolution. The revolution we are referring to is the advent on the martial arts scene of a new brand of combat sport that captured much popular attention and altered the training methods, philosophies, and outlooks of thousands of martial artists around the globe. Many names have been used to baptize this new combat sport—Valetudo, Ultimate Fighting, No Holds Barred Fighting, Shootfighting, etc.—but the most appropriate is perhaps Mixed Martial Arts, since these competitions were designed to test the strengths and weaknesses of different styles under a set of very permissive rules that did not favor any particular art.

Videogames and movies had played with the idea of tournaments open to all styles of martial arts for a while. In Brazil, Valetudo competitions had been taking place for a good part of the twentieth century. In ancient Greece, Pankration, an ancestor of Mixed Martial Arts that allowed kickboxing, throws, groundfighting and submissions (i.e. chokes and leverages), used to be a main event of the Olympic Games (Poliakoff, 1987; Vale, 2001). But in recent history, in the Western world, this form of competition was a complete novelty. Until the 1990's, in fact, the different styles of martial arts organized tournaments with such restrictive rules that made the confrontation of different arts on an even ground virtually impossible. This state of things, however, was about to change when in 1993 the first Ultimate Fighting Championship (UFC) was held in the US. Soon thereafter, the number of organizations promoting similar tournaments grew exponentially—Shooto, Rings, Pride, World Extreme Fighting, Extreme Fighting, Pancrase (actually the Japanese Pancrase predated UFC by a couple of months), King of the Cage, Absolute Fighting Championship, etc. The days of Pankration were indeed back (Bolelli 2003).

*All photos courtesy of the  
Ultimate Fighting Championships.*

The implications of this revolution are so many—on a moral and philosophical as well as a technical level—that entire volumes could be written on the topic. For the sake of brevity, this essay will focus exclusively on one aspect: the technical evolution of Mixed Martial Arts during its formative years. To be more precise, I will analyze a sample of 176 matches that took place between November 12, 1993 and September 24, 1999 under the UFC umbrella.<sup>1</sup> This sample covers UFC events I through XXII. The categories include the size and age of the fighters, the length of the matches, and the techniques used to win the matches. By providing detailed statistics, this essay will create a concrete basis for any further discussion of this popular, albeit misunderstood, topic.

#### RULES

What set the Ultimate Fighting Championship (and its imitators) apart from other kinds of martial arts competitions were its rules, so it is imperative to consider what was so unique about these rules. At first, the rules were extremely simple: there were hardly any. Two fighters from any discipline (including Western styles of wrestling, boxing, and Brazilian Jiu-jitsu, as well as many traditional Asian martial arts) would meet in an octagon surrounded by a steel cage and could use virtually any kind of martial art techniques to defeat the opponent. The only explicit prohibitions were against biting, eye gouging, and fish hooking. This was in drastic opposition to most martial arts tournaments, which allowed only a very limited range of techniques and, therefore, gave a tremendous advantage to the practitioners of those arts that focused almost exclusively on such techniques.

The UFC's very liberal rules generated much media controversy about the "savagery" of this kind of contest, with many people comparing it to gladiatorial shows and asking for its prohibition (Shamrock, 1997). The result was that it became very difficult for the UFC to obtain a license to hold its events in certain states and to get pay-per-view contracts. So, in an effort to clean-up its image and ensure increasingly more safety to its fighters, the UFC adopted slightly more stringent rules. Strikes with the head, leverages against any small joint, use of pressure points, hair pulling, strikes to the groin, elbow strikes against the back of the neck, kicking a downed opponent, and holding on to the cage were some of the techniques banned in later events.

Since the sport is still evolving, more rules are being added virtually every year. However, the basics of the sport have not changed. Mixed Martial Arts still allow striking with the hands, forearms, legs, knees, and elbows both while standing and on the ground; the execution of any kind of throwing technique; as well as chokes and leverages against almost all joints.

#### MATCH LENGTH

During the early UFC tournaments, matches had no time limitations: every match would continue until one fighter was either knocked out or submitted. Later, the UFC set time limits because in a few occasions they were forced to refund cable viewers because fights often went beyond the pay-per-view time block.

The time limitations changed considerably depending on the event. At first, 30 minute-matches were implemented. Later, depending on the importance of the match, anywhere between 10 and 18 minutes were allowed. It was not until UFC XXI that a formal system was developed: preliminary matches were scheduled for two five-minute rounds, matches that were part of the main event were scheduled for three five-minute rounds, and title matches were scheduled for five five-minute rounds. If the match reached its full length, three judges would award the victory in a system reminiscent of Western boxing.



After having introduced the rules regarding time limitations, let us now turn to the actual statistics regarding the length of the matches. As a warning to the reader, let me state that I ignored the official timing of the matches provided by the UFC since they often stopped the clock a few seconds after the match truly ended. For this reason, there may be a slight difference between the information I provide and the official statistics.

The shortest match in UFC history lasted a mere eight seconds and ended with Don Frye knocking out Thomas Ramirez, a man who outweighed him by 200 pounds, at UFC VIII. The longest match was the 35-minute battle between Ken Shamrock and Royce Gracie at UFC V (this bout ended in a draw since judging had not been established at this time).

Out of the 176 matches considered, the average match length is five minutes and 45 seconds. What is interesting to note here is that the match length nearly doubles in later events. If we exclude from the pool three special matches that lasted about 30 minutes each, the average for the first 91 fights (from events I through XI) was only four minutes and 35 seconds. This average would increase to five minutes and 46 seconds in the 34 matches that took place between UFC XII and XV, would increase further to eight minutes and 57 seconds in the 35 matches that took place between UFC XVI and XX, and would eventually level off at just under seven minutes in the 13 matches from UFC XXI and XXII.

The reason for this rather substantial change is that the later matches pitted against each other martial artists of similar weight and skill. The earlier ones, on the other hand, were often mismatches featuring fighters of different sizes and very different abilities. The result of this was that in the first editions of the UFC fights rarely lasted more than a minute or two, whereas in the later events, when the competitors were more evenly matched, the length of the contest would increase considerably. While the first tournaments often looked like crazy brawls with the competitors trying to overwhelm each other in the shortest possible amount of time, in the later matches the fighters would pace themselves better and rely on more sophisticated techniques.

SHONIE CARTER BRIDGING  
OUT OF A SUBMISSION ATTEMPT  
BY MATT SERRA.

COMPETITORS' AGE,  
HEIGHT, AND WEIGHT

The range in the size of ultimate fighters was truly staggering. We go from the 158 pounds of the smallest competitor (Lowell Anderson in UFC XXII) to the 616 of the heaviest (Sumo wrestler Emmanuel Yarbrough in UFC III).

The tallest fighter stood 6'8" (still Emmanuel Yarbrough in UFC III), while the shortest stood only 5'4" (Joe Son in UFC IV and Marcello Mello in UFC XX). The average height for all the fighters sampled is almost exactly 6'-1/2". The height of competitors seems to have gone slightly down from the nearly 6'1" average of UFC I through XV to the barely 5'11" average of UFC XVI through XXII.

The same can be said about the competitors' weight. The total average is 236.5 pounds. Whereas earlier competitors often exceeded this number (the average for UFC I through XI was 238.5 pounds, and for UFC XII through XV was slightly above 227). In the later events, the average is much closer to the 200 mark (under 208 for UFC XVI through XX and slightly over 212 for UFC XXI and XXII).

The reason for this sizable reduction in the competitors' height and weight is to be found in the later introduction of weight divisions that gave a chance to smaller fighters to participate in what otherwise would have been a big man's sport. In fact, reflecting the old idea that size does not matter much in martial arts, until UFC XII there were no weight divisions. Anyone entering the tournament could be paired against anyone else regardless of height and weight. Although some smaller fighters managed to fare extremely well (Royce Gracie, the winner of UFC I, II, and IV, weighed less than 180 pounds), the bigger competitors certainly had a major strength advantage. This advantage became an increasingly important factor as the competitors' skill levels became more uniform. At first, in fact, a smaller, but extremely skilled fighter could hope to defeat a bigger, less skilled opponent. But as everyone began to train similarly and spend equal amounts of time preparing for the fights (in other words, turning the sport from an amateur to a professional endeavor), size and strength became progressively more important. This is why weight divisions were eventually put in place.

At UFC XII, two weight divisions were set up: heavyweight (above 200 pounds) and middleweight (under 200 pounds). After UFC XVI, the lightweight category (under 170 pounds) was added. After UFC XXII (which is beyond the scope of this essay), even more weight categories were established, which allows increasingly smaller fighters to enter the octagon.

Contrary to height and weight, one category which has not changed much throughout UFC history is the age of the participants. The oldest Ultimate Fighter ever was Ron Van Clief, who entered UFC IV when he was 51 years old. The youngest were Vitor Belfort and David Roberts who entered their first UFC at 19 years of age. The total average age is slightly above 29 years old. This value is one of the few that has remained fairly constant in UFC history, with the vast majority of participants being in their late 20's and early 30's.

A STANDING GUILLOTINE CHOKE (AKA FRONT CHOKE), THE MOST SUCCESSFUL SUBMISSION TO BE APPLIED WHILE STANDING UP (PAUL RODRIGUEZ VS. TONY DESOUZA).



WINNING TECHNIQUES

The first type of division to categorize the matches is between matches that ended because of one technique (whether a strike or submission) and matches that did not. This second category include matches that ended in a draw, in a no-contest verdict, because of the judges' decisions, or with one fighter giving up because of exhaustion or because he felt he could not get out of an unfavorable position. Out of the 176 matches considered, 36 (21.6%) belong to this category (28 decisions and draws, 1 no contest, 7 because of one fighter giving up).

The remaining matches have been divided into the following categories: matches that ended with successful techniques executed on the ground versus matches that ended with successful techniques executed standing up, and striking versus submissions (joint locks and chokes that force the opponent to quit). The vast majority of winning techniques occurred on the ground (106, or 60.2%) compared to standing up (34, or 19.3%).

Submissions were used to end 67 matches (38.1%) whereas strikes were used in 72 matches (41%). Only one throw successfully ended a match (the throw has been included with the standing techniques).

To further break down the techniques, we can now analyze them separately under the following categories:

- ❶ ground submissions,
- ❷ ground strikes,
- ❸ standing submissions,
- ❹ standing strikes,
- ❺ throws.



TOP: GENKI SUDO APPLYING A REAR NAKED CHOKE TO LIEGH REMEDIOS. THIS TECHNIQUE STOPS THE BLOOD FLOW TO THE BRAIN AND CAUSES THE OPPONENT TO TAP OR LOSE CONSCIOUSNESS. MIDDLE: A TEXTBOOK EXAMPLE OF AN

ARMBAR (JUJIGATAME) EXECUTED BY BRAZILIAN JIUJITSU SPECIALIST MURILO BUSTAMANTE. BOTTOM: A TRIANGLE CHOKE FROM THE GUARD (IVAN SALAVERRY VS. ANDREI SEMENOV).



TOP: PETE SPRATT ATTEMPTING AN ARMBAR FROM THE BOTTOM POSITION ON ZACH LIGHT. BOTTOM: RICARDO ALMEIDA LOOKING FOR A TRIANGLE CHOKE DURING A MATCH WITH EUGENE JACKSON.

The division between some of these categories is not as clear-cut as it may sound. In a few cases, which technique ended a match may be open to interpretation. For example, many people tend to classify Frank Shamrock's victory over Tito Ortiz in UFC XXII as the result of strikes executed by a standing Shamrock against a downed Ortiz. I file that victory as a ground submission. A few seconds before the end of the match, in fact, Shamrock had Ortiz in a guillotine choke on the ground. Although Ortiz did not tap out as a result of the choke, he did not have any energy or oxygen left to do anything once Shamrock stood up. The slaps on the head executed by Shamrock at that point were not what won the match. With this warning in mind, let us turn to the statistics.

Most matches (63, which is 35.8% of the 176 matches considered) ended because of a submission applied while on the ground. This came as a surprise to most viewers who, because of some stereotypical ideas regarding how martial arts are supposed to look, expected standing kicks and punches to take the lion's share.

Out of these submissions, 41 were either chokes or neck cranks (23.3% of all matches and 65% of all ground submissions). The most common was the choke executed from behind the opponent known in judo as *hadaka jime* (16 times) (Kano, 1986; Koizumi, 1960; Takagaki & Sharp, 1998). The second one was a choke executed with the forearm against the windpipe while on top of the opponent (six times). The next was what is commonly referred to as guillotine choke or front headlock (four times). The fourth is the arm triangle choke (three times). Next was the triangle

choke, known in judo as *sankaku jime* (two times) (Kano, 1986; Koizumi, 1960). Last were three different kinds of neck cranks and three different chokes.

Another category of ground submissions was the arm lock, which accounted for 15 matches (8.5% of all matches and 23.8% of all ground submissions). In this division, the judo technique known as *juji gatame* (Kano, 1986; Koizumi, 1960; Takagaki & Sharp, 1998), or arm bar, was the most common (11 times, eight of which occurred while in the guard position, two from the top mount, and one from the side mount). The next successful one was *ude garami* (Kano, 1986; Koizumi, 1960; Takagaki & Sharp, 1998), known in Brazilian Jiu-jitsu circles as the American Lock, which occurred four times (three times from a side mount and once from a top mount).

The last category of ground submissions was the leg lock, which ended seven matches (about 4% of all matches and slightly more than 11% of all ground submissions). Three of these leg-locks were Knee Bars, two were Heel Hooks, and two were Achilles Locks. It is interesting to note that all but two of the leg locks were executed by fighters who had trained at the Lion's Den, a Mixed Martial Arts school founded by Ken Shamrock, a veteran of the Japanese Pancrase association where leg-locks account for a much higher percentage of successful submissions (Shamrock, 1997).

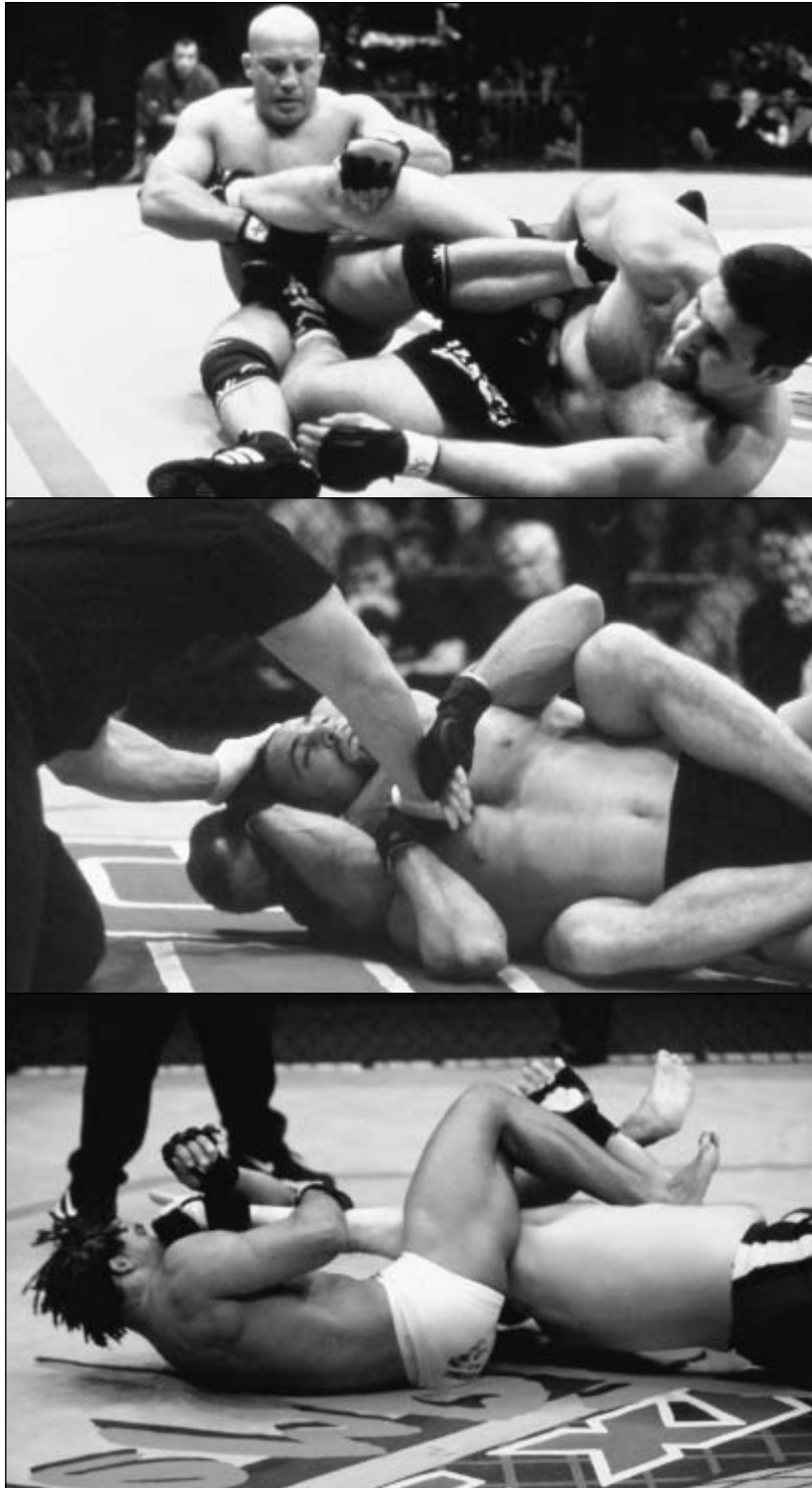
In addition to submissions, many matches were won on the ground by striking (43 times, or 24.4% of all matches). Nearly all of the winning strikes were delivered by the fighter on top (either from a top, back, or side mount, with only very few from inside the guard). The favorite ways to strike were elbows, punches, and, when they were still legal, strikes using the head.



TOP: CARLOS NEWTON APPLYING A KEY-LOCK (AKA "KIMURA") AGAINST PETE SPRATT.

MIDDLE: FRANK MIR WORKING AN ARMLock FROM HIS GUARD ON PETE WILLIAMS.

BOTTOM: A GUILLOTINE CHOKE ON KEITH ROCKEL, COURTESY OF EUGENE JACKSON.



TOP: A LEG-LOCK ATTEMPT DURING UFC 24 (ADAMS VS. FREEMAN).  
MIDDLE: A REAR NAKED CHOKE (BOB COOK VS. TIKI GHOSEN), ONE OF THE MOST COMMON TECHNIQUES IN MIXED MARTIAL ARTS COMPETITION.

BOTTOM: CARLOS NEWTON, ONE OF THE MOST EXCITING FIGHTERS IN UFC HISTORY, GOING FOR AN ARMBAR (JUJIGATAME) ON BOB GILSTRAP.

Strikes delivered while standing ended 29 matches (16.5%). Eight were striking combinations (where no single blow was decisive, but rather the cumulative effect of three or four strikes in sequence forced the opponent to quit or caused a knockout). Seven were hooks (four right and three left directed at jaw, nose, or ear). Two were right crosses, two were knee strikes to the face, two were punches against a downed opponent, two were knee drops on a downed opponent's head (a technique that was among the first UFC officials outlawed), one was a roundhouse kick to a downed opponent's face, one was a foot stomp to a downed opponent's head, one was a foot stomp to a downed opponent's ribs (these 3 techniques also became illegal fairly soon), one was a roundhouse kick to the face (interestingly this was the only fight-ending high kick in 176 matches), one was a downward elbow, and one was a roundhouse kick to the thigh.

Standing submissions only ended 4 matches (2.3%), and all were guillotine chokes (front headlocks).

Only one throw successfully ended a match (Frank Shamrock's spectacular knock out of Igor Zinoviev in Shamrock's first middleweight title defense). In this regard, it is useful to remember that this is a factor of the relatively soft surface on which the matches take place. On a harder surface, we could expect throws to have played a more important role.

It is interesting to note that out of 176 matches, not a single one was won as a result of a joint lock executed while standing.

#### TECHNICAL EVOLUTION

If we are to analyze how the relative importance of the winning tech-

niques used by Ultimate Fighters has changed, we can begin to understand how the technical aspect of the sport has evolved.

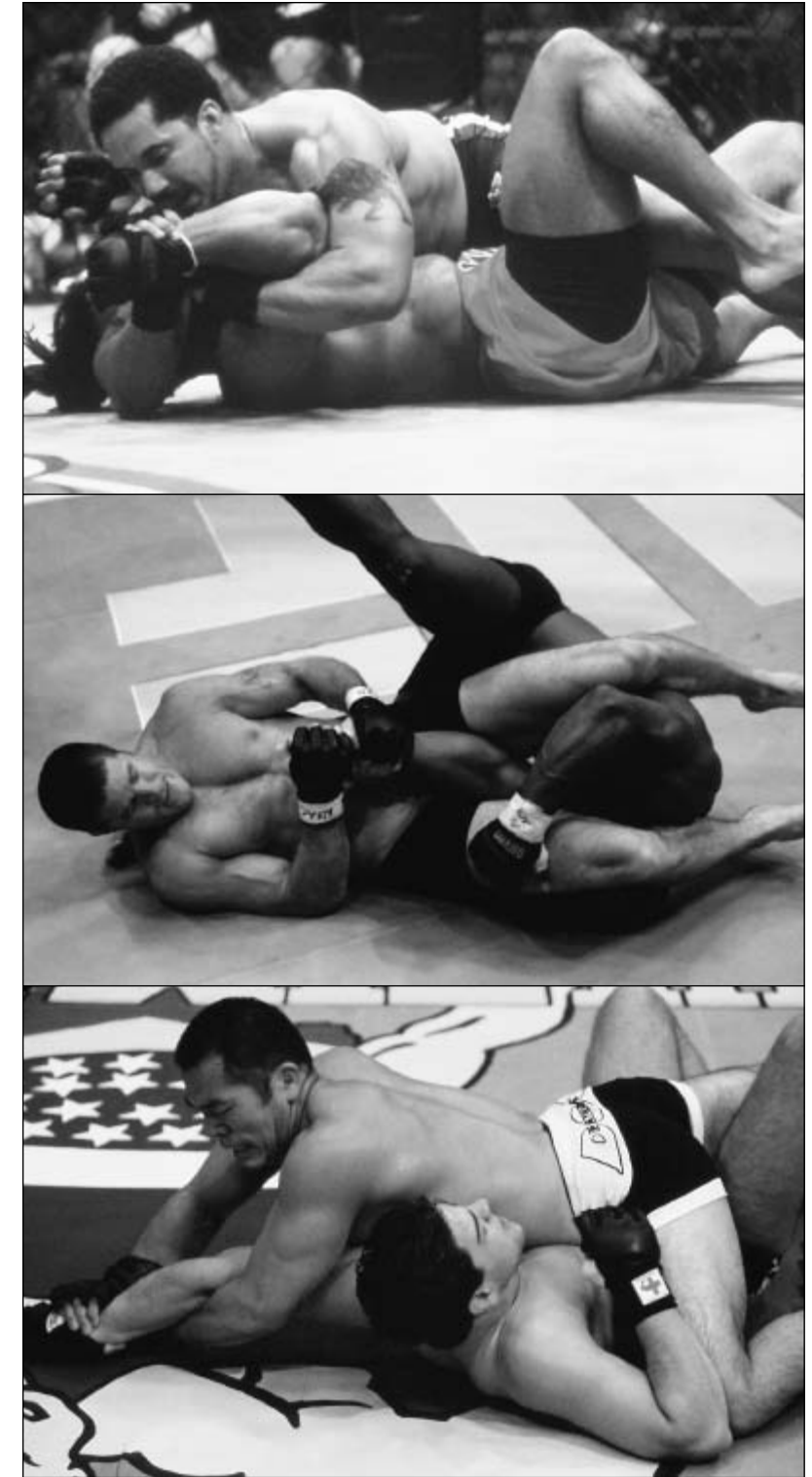
One category that has certainly decreased in importance is striking on the ground. Whereas striking on the ground successfully ended 30.8% of all matches in UFC I through XI (including Ultimate Ultimate I and II), the percentage dropped to 23.5% between UFC XII and XV, and then dropped even further to 12.5% between UFC XVI and XII.

Ground submissions also decreased from 38.3% between UFC I and XI and 41.2% between UFC XII and XV to 27.1% in UFC XVI through XXII.

On the other hand, striking executed while standing up became increasingly more popular: from a mere 12.8% between UFC I and XI and 8.8% between UFC XII and XV to 29.2% between UFC XVI and XXII.

Throws and stand-up submissions account for such a small percentage of successful winning techniques that the change in percentage is not particularly indicative.

The significance of these changes is especially enlightening. In the beginning, most people (including most martial artists and UFC fighters) believed that the technical key to martial arts proficiency rested on kicks and punches, and perhaps a few takedowns. The first UFC events proved this assumption wrong time and time again as most fights were won by good grapplers who regularly took their opponents to the ground, taking advantage of those trained in traditional styles emphasizing strikes who did not know what to do on the ground. For this reason, submissions and strikes on the ground decided most matches.



TOP: A KEY-LOCK (AKA "KIMURA") TECHNIQUE DURING UFC BRAZIL (JERMAINE ANDRE VS. LANCE GIBSON).  
MIDDLE: A CLASSIC ARMBAR (EVAN TANNER VS. HOMER MOORE).

BOTTOM: ANOTHER KEY-LOCK TECHNIQUE DURING UFC BRAZIL (PETE WILLIAMS VS. TSUYOSHI KOSAKA).



TOP: "THE RONIN" CARLOS NEWTON APPLYING AN ARMBAR TECHNIQUE FROM THE GUARD POSITION ON BOB GILSTRAP. BOTTOM: KEVIN RANDLEMAN ON THE WRONG SIDE OF A TRIANGLE



CHOKES BY REANTO SOBROL. THIS CHOKE IS OBTAINED BY THE BOTTOM PLAYER'S LEG APPLYING PRESSURE ON ONE SIDE OF THE NECK AND THE TOP PLAYER'S ARM BEING SQUEEZED TIGHTLY AGAINST HIS NECK BY THE BOTTOM PLAYER'S OTHER LEG RESULTING IN BOTH CAROTID ARTERIES BEING SHUT.

Eventually, when shock and disbelief went away and most fighters began adjusting their game, a major technical change took place. No more would we see a fighter trained in only one style enter the octagon. Rather, much as Bruce Lee had advocated several decades earlier, different martial artists started borrowing from each other and ended up creating new fighting systems by taking the best from various arts and testing the techniques in combat (Lee, 1971, 1975; Bolelli, 2003). The UFC shortly became a laboratory for testing fighting efficiency. Most fighters found out that the best combination was to train in a few grappling styles such as Western Freestyle and Greco-Roman Wrestling, Brazilian Jiu-jitsu, judo, Sambo, or Submission Wrestling and a couple of striking arts such as Western boxing and Muay Thai. Now that everyone began sharing a similar technical repertoire, mismatches became less common and dominating on the ground became more difficult. Even people who specialized in striking arts, in fact, knew enough about grappling to know how to sprawl well, make it difficult for the opponent to take them down, and avoid the simplest submissions if they did end up on the ground. The days when a grappler could take advantage of a naïve striker who knew nothing about ground-fighting were over. Although ground submissions and to a lesser degree striking while on the ground were still very important, striking while standing up turned from a relatively minor aspect of the game to an equally important component.

The facts just outlined above are primarily responsible for the dramatic evolution of Mixed Martial Arts during the formative decade of the 1990's.

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#### NOTE

- <sup>1</sup> Statistics were derived by watching the tapes of every UFC event (numbers I through XXII, plus Ultimate Japan, Ultimate Brazil, U.U.I and U.U. II), noting the techniques utilized, timing the matches, then analyzing and recording the information provided for this article.