

“Real World” Fights: A Preliminary Statistical Analysis

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I. BRIEF SUMMARY

This research paper examines amateur street fights and analyzes the most salient characteristics of untrained hand-to-hand combat. In addition to descriptive statistics, the following hypotheses were considered: 1) punching will be the most prevalent technique employed by combatants; 2) the first technique in a fight will likely be a punch; 3) fights that end in a knock out will be of shorter duration than fights that end in surrender, break-up, or withdrawal. Finally, based on a review of apparent trends in the data collected, future areas of inquiry are identified and discussed.

II. METHODOLOGY

The data used here come from fifty (50) amateur fight videos that were downloaded from the internet. Only relatively spontaneous videos of fights where one or both combatants appear to be untrained fighters were used. Professional and semi professional fights, tournaments, staged fights, fights involving multiple assailants, and fights involving weapons were not included in the data sample. In addition, as a practical matter, only fights that showed a clear beginning and ending, that were of sufficient clarity to allow assessment, and which offered a relatively unobstructed view of the combatants were used.

The footage collected was drawn from several different internet sites. Though not acknowledged on any of these sites it's possible that the person filming the fight and/or webmasters of the internet sites may have selected or eliminated certain fight footage based on their perception of the fights public appeal. Specifically, it may be the case that more dramatic fights, such as those involving knock-outs, unusual techniques, or extreme levels of violence, may be disproportionately represented among the videos posted on the internet. If present, this “selection bias” would skew the results obtained toward the more violent or dramatic end of the fight spectrum. In effect, to the extent that this bias is present, we would expect the data collected to reflect what happens in more violent street fights. Arguably, such a bias may render the data more, rather than less, useful for martial arts training.

Once collected, the videos were reviewed to identify the first technique typically used, the frequency with which kicks are used, the frequency with which fights go to the ground, the frequency with which grabbing is used as part of an offensive or defensive technique, and the average time until there is a knock-out, the fight is broken-up, there's a clear surrender (declared or conceded), or the combatants mutually withdraw from the fight. The techniques leading to knock-outs were also counted.

As a functional matter, it was necessary to count each combatant's techniques

¹In partial satisfaction the UCMAP 3rd Dan requirements.

separately. Except with regard to punches, no attempt was made to keep the combatant's data separate. For data collection purposes the following working definitions were used:

Grabs:

A grab was defined to include hand contact resulting in a hold, throw, or take-down and opponent. No distinction was made as to whether the grab was to the opponent's clothes, appendages, hair or other body part. A grab was only counted once, regardless of how long the grip was maintained. However, following a clear release, there was no time requirement before another grab could be counted. A grab was counted regardless of whether it occurred while on the ground or in a standing position, and even if executed in conjunction with other techniques.

Punches:

A punch was defined to include any hand technique other than a grab, shove, or block that was intended to impact the opponent. Examples of punches include slaps, hammer strikes, scratching, and of course, punches. Punches were counted regardless of whether or not contact was made, irrespective of whether they were executed from the ground or while standing, and even if executed in conjunction with other punches or techniques.²

Kicks:

A kick was defined to include any attack made with the foot regardless of whether or not contact was actually made. Such attacks were counted regardless of where executed from (i.e. standing or on the ground), the opponent's position (again, standing or on the ground) or what part of the opponent's body the kick impacted or was aimed at.

Other techniques:

Other techniques was a catch all category that included any technique not identified above. Examples of techniques that fell into this category are head butts, eye gouging, kneeing, and elbow strikes.

III. RESULTS

A. Results in general:

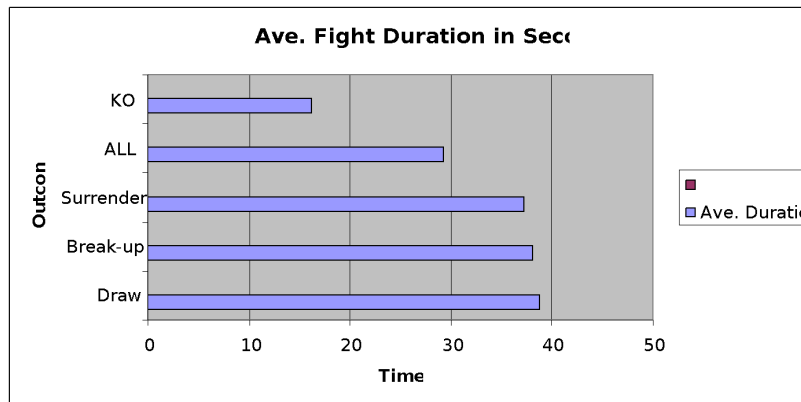
On average, fights were found to last 29.22 seconds. More than 1 in 5 (22%) fights ended in surrender, while about 1 in 4 (26%) fights ended with the fight being broken up, and in 1 of 8 (12%) fights the combatants mutually withdrew and stopped fighting. Notably, in 54% of the fights the combatants ended up on

²Consistent with this methodology, a left, right combination punch would be counted as two punches.

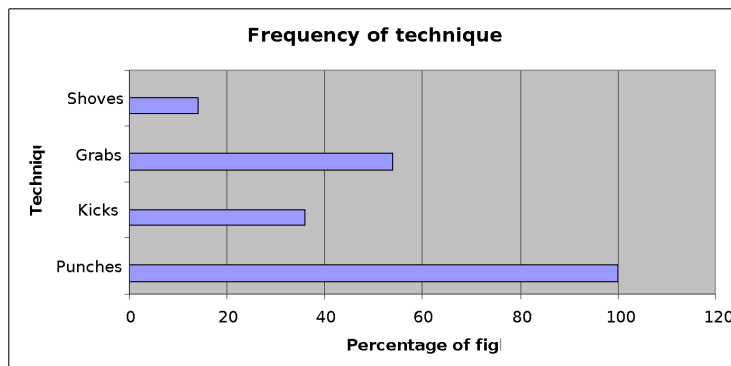
the ground at some point. Of the fifty fights reviewed, 38 involved two males while 12 involved two females.³⁴

Fights ending in a knock-out are generally of shorter duration (16.15 seconds on average) than fights that end in surrender, break-up, or withdrawal (37.18, 38.15, and 38.83 seconds, respectively). This difference, shown graphically in figure #1 below would appear to be significant.

Figure #1



While punches were a part of every fight, kicking was attempted in 36% of the fights, shoving occurred in 14% of the fights, and grabbing happened in 54% of the fights. These results are shown in figure #2 below.



B. Results by Technique:

1. Kicks:

³Only two cross gender fights were found while collecting the data. Because footage of these fights did not show a clear beginning they were not appropriate for this study.

⁴Combatants were of diverse racial and ethnic backgrounds however, the race of the combatants was not considered in this study.

- Less than half (45%) of the knock-outs that occurred were the result of kicks.
 - Kicks appear to be the more efficient knock-technique. Dividing the total number of times kicks were used by the number of knock-outs resulting from that technique shows a kick to knock-out ratio of 3.44:1 while the punch to knock-out ratio is only 8.27:1.
 - Kicking is often found where there are multiple techniques,
 - Kicking is the technique least associated with surrender.
2. Punches:
- 80% of the fights began with one combatant punching or attempting to punch the other.
 - A punch is likely to be the first technique in a fight is likely significant at the .01 level.
 - Punching occurred and was the dominant technique in every fight.
 - Punching is likely a significant feature of fighting beyond the .01 level.
3. Grabs:
- Grabbing occurred 1.60 times per fight and was the second most common technique.
 - Grabbing by itself never resulted in a knock-out.
 - Grabbing was often part of a combination attack.
4. Shoves:
- On a per fight basis, shoving was the least common activity at 0.28 shoves per fight.
 - Shoving never resulted in a knock-out.

C. Results by Fight Outcome:

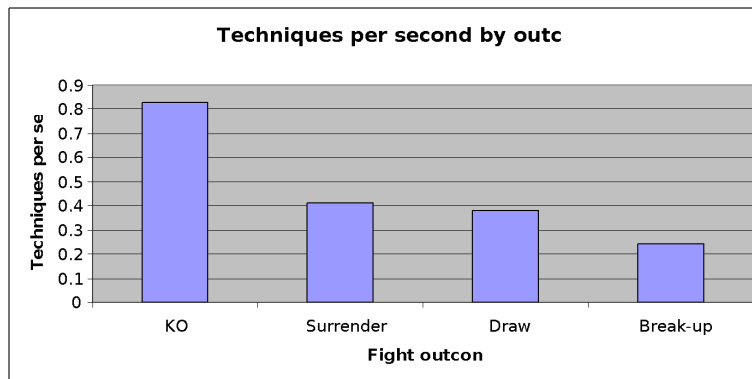
When looked at in terms of fight outcomes we find the following:

1) Knock-outs:

- Knock-outs are more likely to occur early in a fight.
- Fights that end in a knock-out rarely go to the ground.
- Knock-outs are associated with a high ratio of techniques over time.
- The majority of knock-outs are the result of punches.

- As shown in figure #2 below, fights that end in a knock-out are also associated with a greater number of techniques being used per second (17.65) than fights that end in surrender, break-up, or withdrawal (9.84, 6.5, and 6.08 seconds, respectively). The difference between these numbers is likely significant at the .01 level.

Figure #2



2) Withdraw:

- Only 12% of the fights ended in withdraw, making it the least likely of all fight endings.
- Fights that ended in withdraw were, on average, longer than other fights.

3) Surrender:

- Fights ending in surrender were second only to fights ending in a knock-out in terms of brevity - averaging 37.18 seconds in duration.
- Fights ending in surrender were at the lowest end of the spectrum in terms of number (6.08) of techniques per second.
- 22% of the fights ended in surrender.

4. Break-up:

- At 26%, fights ending by being broken up represent the second largest outcome group.
- Combatants in fights that ended by being broken-up typically displayed more diverse techniques.
- Combatants in these fights threw fewer punches. (See figure #3 below.)

- The duration and lack of activity characteristic of these fights may be a factor behind their being broken-up.

Figure #3: Average number of techniques by fight outcome

	Punch	Kick	Grab	Shove	Other
Draw	33.33	1.6	3.83	0.5	
Break-up	15.31	1.54	1.46	0.62	0.15
Surrender	29.82	0.82	0.2	0.27	0.36
K.O.	8.27	3.44	0	0	0

D. Gender differences:

While the limited sample size and in particular the small number of women in the data limits our ability to reach conclusions related to gender, the following observations are note worthy.

- No fight involving women ended in withdraw.
- The most active fight, which featured more than 100 techniques, was between two women.
- The longest fight, which lasted almost 2.5 minutes, was between two women.
- Fights between women always involved multiple techniques.

IV. DISCUSSION

Based on the data, if called upon to defend yourself in a street fight the first technique you'll likely have to defend against will be a punch. Because most people are right handed it is logical to assume the first punch will be a right handed one. At the beginning of the fight your opponent will display a high level of activity and repeatedly attempt to punch you. After the initial onslaught your opponent will continue to punch, but at a slower rate. Your opponent will also likely incorporate one or two additional techniques such as grabs, shoves, and kicks at some point in the fight. In particular, given the opportunity, your opponent will likely attempt to grab you with one hand (likely their non dominant hand) and repeatedly attempt to punch you with the other hand. Should you fall or be thrown to the ground your opponent will likely attempt to mount you (sit on top of you with your arms pinned inside their legs) and continue punching if they go down with you. Your opponent will likely try to kick you if they remain standing while you're on the ground. Though defensible, both of these positions should be avoided.

Informative though the data here may be, it should not be used to direct or define a training regime. The data is better viewed as providing real world support for the need to have a balanced training program that builds solid techniques, improves cardio vascular health (stamina) and core strength, and provides some

psycho-cognitive (i.e. emotional and intellectual) understanding of what being in a fight is like. Indeed, if nothing else, as both the data collected and the video footage from which it is derived make clear, the martial artist should better understand that street fights are violent events that should be avoided whenever possible.

As is often the case with research, the information presented here raises at least as many questions as it answers. In addition to a more elaborate analysis to determine which of the results obtained are statistically significant, there are several related areas of inquiry that should be pursued. Among other things the data should be analyzed to identify:

- What target areas techniques are most commonly directed at (such as the head).
- What tells (actions suggesting an imminent attack), if any, do trained fighters typically display.
- The frequency and effectiveness of combined rather than single techniques.
- How aggressors respond to different defensive strategies (such as fighting back, being strictly defensive, and surrendering).
- Associations between being the aggressor and the outcome of the fight.

While commentary on the questions above is beyond the analysis performed on the data to date, the existing data set appears capable of supporting these analyses.

V. CONCLUSION

Street fights typically start out with a high level of activity that quickly tapers off. If a combatant is going to be knocked-out in a street fight it will most likely happen in the early high activity period of the fight. The vast majority of the activity in street fights takes the form of punching, however other techniques are not infrequent and kicking techniques seem more likely to result in a combatant being knocked-out. Fights that last longer and where combatants become less active are more likely to be broken-up, or result in mutual withdrawal or surrender.

Martial arts training can provide functional and practical benefits that can positively impact the outcome of a street fight. Functionally, the trained martial arts should have available to them an array of defensive techniques that, in conjunction with more powerful and accurate offensive techniques should help them in the early part of the fight wherein knock-outs are most likely. More practically, given years of training and practice executing techniques, the trained martial artist should benefit from greater balance and stamina. Good stamina should allow the martial artist to maintain the high level of activity associated with the beginning of fights and become dominant in the middle and latter

parts of the fight. Good balance will prove beneficial both in that it allows the martial artist to deliver more powerful and accurate blows, and in that it allows the martial artist the opportunity to adjust for and counter the opponent's off-balancing efforts. Perhaps most importantly, by virtue of their training the martial artist will know to avoid becoming involved in a street fight.

APPENDIX A: FIGHT SYNOPSES

Fight #1

This is a fight between two teenage males (between the ages of approximately 15 – 21), at a skate board park. One combatant is heavy set, the other is smaller and more lean. There is substantial cheering and instruction from the several onlookers.

The fight lasts 40 seconds, has an above average number of punches and grabs and ends in a draw.

Fight #2

This is a fight between two teenage girls (between the ages of approximately 14-18), at a park. One combatant is heavy set, the other is smaller and more lean. There is substantial cheering and instruction from the several onlookers.

The fight lasts 18 seconds, has an above average amount of grabbing. The fight ends by being broken up by spectators.

Fight #3

This is a fight between two teenage girls (between the ages of approximately 12-16), at a high school. The combatants appear physically comparable. There is substantial cheering and instruction from the several onlookers.

The fight lasts 37 seconds, has an above average amount of grabbing. The fight ends by being broken up by a teacher.

Fight #4

This is a fight between two females. One a teacher is between 30-40, the other, a student, is between 15-18 years old. The combatants here differ substantially in size. The fight lasts 39 seconds before both combatants withdraw.

Fight #5

This is a fight between two males of clearly different sizes. The fight lasts 46 seconds and while seemingly very active, has a below average number of punches thrown. The fight ends when the fighters withdraw.

Fight #6

This is a fight between two teenage males (between the ages of approximately 19 – 28) in a parking lot. One combatant is slightly heavy the other is smaller and leaner. There fight starts with a head butt, includes an eye gouge attempt,

and ends with a round-house kick to the head that results in a knock-out. The fight lasts 20 seconds.

Fight #7

This is a fight between two teenage males (between the ages of approximately 17-23) in the street and someone's front yard. One combatant is trying to talk his way out of the fight the whole time and doesn't mount any offense. The fight lasts 40 seconds.

Fight #8

This is a fight between two teenage males (between the ages of approximately 15-19), at someone's house. The combatants appear physically comparable. There is a substantial amount of ground fighting. The fight lasts 40 seconds.

Fight #9

This is a fight between two males of comparable build between the ages of 13-19. There is ample cheering by spectators – until the fight actually starts. The fight lasts 7 seconds.

Fight #10

This is a fight between two mature males in a casino. The fight lasts 4 seconds and ends in a knock-out.

Fight #11

This is a fight between two teenage males (between the ages of approximately 15 – 19), at park. One combatant is very aggressive, the other primarily defensive. The fight lasts 10 seconds.

Fight #12

This is a fight between two teenage males (between the ages of approximately 16-21), at a parking lot. The combatants appear physically comparable. There is substantial cheering and instruction from the several onlookers. The fight lasts 40 seconds and ends when it is broken up by an adult.

Fight #13

This is a fight between two teenage males (between the ages of approximately 13-16), at a school parking lot. The combatants differ slightly in size. The fight lasts 53 seconds and techniques are limited to punching.

Fight #14

This is a fight between two large males. They appear to be between 28-35 years of age. One or both of the combatants appears to be drunk. The fight lasts 20 seconds and ends in a knock-out.

Fight #15

This is a fight between two males that appears to have been prompted by some sort of traffic incident. The fight lasts just over two minutes and has lots of talk interspersed with the physical action. The fight ends when a police officer arrives and arrests the aggressor.

Fight #16

This is a fight between two teenage females (between the ages of approximately 15 – 19). They are lean and of similar builds. The fight lasts 40 seconds, has an above average number and diversity of techniques of punches and grabs. When the fight goes to the ground spectators step in and break it up.

Fight #17

This is a fight between two males (between the ages of approximately 17-21), behind some bleachers at a high school. The combatants are physically comparable. There is substantial cheering from the several onlookers. The fight lasts 25 seconds after which the combatants withdrew.

Fight #18

This is a fight between an older convenience store clerk and a quasi customer. The fight is one-sided - one combatant never gets a technique off. There is substantial cheering and instruction from the several onlookers. The fight lasts 20 seconds, and ends with one combatant surrendering.

Fight #19

This is a fight between an older and a younger male following a traffic event. The fight is one-sided - one combatant never gets a technique off. The fight ends after 14 seconds when a woman (who started the fight) intervenes.

Fight #20

This is a fight between two males of clearly different sizes. The fight lasts 46 seconds and while seemingly very active, has a below average number of punches thrown. The fight ends when the fighters withdraw.

Fight #21

This is a fight between two teenage females (between the ages of approximately 14 – 17). One combatant is physically larger than the other. There is substantial cheering and instruction from the several onlookers. This is one of the more brutal fights - it lasts 20 seconds, has an above average number of kicks and grabs and ends in a knock-out

Fight #22

This is a fight between two teenage girls (between the ages of approximately 14-18), at a park. One combatant is physically larger than the other. This is one of the more brutal fights - it lasts 25 seconds, has an above average number of kicks and grabs. One of the combatants gets stomped, after being knocked-out.

Fight #23

This is a fight between an older security guard and a skate boarding young man. The combatants are physically very different. The fight lasts 20 seconds, before the combatants withdraw.

Fight #24

This is a fight between two very old men (between 60-70). The fight lasts 14 seconds before one combatant is knocked-out.

Fight #25

This is a fight between young males between the ages of 18-22, that are of similar builds. The fight lasts 36 seconds and is mostly one-sided. The fight ends when one of the combatants surrenders.

Fight #26

This is a fight between a female celebrity and a reporter (between the ages of approximately 29-38), in an airport. The fight lasts 10 seconds, and ends when other reporters break it up.

Fight #27

This is a fight between two males. One approximately 25 years old is singing on stage when the other, who appears drunk and is approximately 30 years old attacks him.

The fight lasts 3 seconds and ends in a knock-out.

Fight #28

This is a fight between teenage girls (between the ages of approximately 12-16) at night in a park. The combatants appear physically comparable. The fight, which lasts 10 seconds, has an above average amount of kicking. The fight ends when one surrenders.

Fight #29

This is a fight between two young males between 13-16 years of age in the street. There is a lot of activity and the crowd of adults encourages the combatants. The fight lasts 40 seconds.

Fight #30

This is a fight between a two teenagers male at a school yard. The fight lasts 8 seconds and showcases a semi skilled versus an unskilled fighter. The fight ends in a knock-out.

Fight #31

This is a fight between two teenage males (between the ages of approximately 15 – 19), at a park. There is substantial cheering from the several onlookers. The fight lasts 8 seconds.

Fight #32

This is a fight between two fairly large men (between the ages of approximately 24-28) outside. One combatant is heavy set, the other is leaner. The fight lasts 7 seconds, and is decidedly one-sided. The fight ends when one fighter surrenders.

Fight #33

This is a fight between two large males (between the ages of approximately 26-32), on the street. The combatants appear physically comparable. The fight lasts 27 seconds, has an above average variety of techniques. The fight ends after a knock-out.

Fight #34

This is a fight between two males. One is older between 25-35, the other is between 18-25 years old. The fight is entirely one-sided. The fight lasts 15 seconds before one combatant is knocked-out.

Fight #35

This is a fight between two teenage males of clearly different sizes. The fight lasts 8 seconds and has a below average number of punches thrown. The fight ends in a knock-out.

Fight #36

This is a fight between a teacher that is between 28-40 and a student that is between 15-18 years old. The combatants here differ substantially in size. The fight lasts 50 seconds before it is broken up.

Fight #37

This is a fight between two teenage girls (between the ages of approximately 14-18), in the woods. The combatants are physically similar. There is substantial cheering and instruction from the several onlookers. The fight lasts 60 seconds, has an above average amount of grabbing. The fight ends when spectators break it up.

Fight #38

This is a fight between two teenage girls (between the ages of approximately 12-16), at a high school. The combatants here differ substantially in size. There is substantial cheering and instruction from the several onlookers. The fight lasts 26 seconds and has an above average amount of grabbing. The fight ends in a knock-out.

Fight #39

This is a fight between teenage two males (approximate 13-17 years old). The combatants here differ substantially in size. The fight lasts 20 seconds before one of the two surrenders.

Fight #40

This is a fight between two males in their early to mid twenties. The fight lasts 5 seconds and ends in a knock-out.

Fight #41

This is a fight between two older males (between the ages of approximately 45 – 55), at a television studio. One combatant is heavy set, the other is tall and lean. The fight goes for 39 seconds before it is broken up.

Fight #42

This is a fight between two teenage males (between the ages of approximately 14-18), in the snow. The combatants appear to be of equal size. There is substantial cheering and instruction from the several onlookers. The fight lasts 40 seconds and ends with a knock-out.

Fight #43

This is a fight between two teenage males (between the ages of approximately 14-18), at a school. One combatant is slightly larger than the other. There is substantial cheering from the several onlookers. The fight lasts 10 seconds and ends with a knock-out.

Fight #44

This is a fight between two teenage females between 15-18 years old. The combatants appear near equal in size. At 145 seconds this is the longest fight in the sample.

Fight #45

This is a fight between an older, clearly drunk male, and a younger male seemingly sober male. The fight lasts 45 seconds and was not very active. The fight ends when the older fighter surrenders.

Fight #46

This is a fight between two males between the ages of approximately 21-29). The combatants appear near equal in size. Both combatants employ a number of kicking techniques. There is substantial cheering and instruction from the several onlookers. The fight lasts 49 seconds, and ends in a knock-out.

Fight #47

This is a fight between two teenage boys (between the ages of approximately 14-18), at a high school. The combatants appear near equal in size. There is substantial cheering and instruction from the several onlookers. The fight lasts 35 seconds and has an above average amount of grabbing. The fight ends by being broken up by spectators.

Fight #48

This is a fight between two males (between the ages of approximately 19-23), in what looks like a dorm room. The combatants appear physically comparable.

There is substantial debate and discussion among the several onlookers. The fight lasts 10 seconds and has an above average amount of punching. The fight ends by being broken up by the spectators.

Fight #49

This is a fight between two teenage males (between 15-18 years old) at a high school. The combatants here differ substantially in size. The fight lasts 3 seconds and ends in a knock-out.

Fight #50

This is a fight between two males of similar size but different builds. The fight lasts 19 seconds and has minimum activity. The fight ends in a knock-out.