Does Combat Sports Fighters' Trash-Talking Go Viral?

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Abstract

The rise in popularity of combat sports has afforded fighters' an enhanced celebrity status, especially across online platforms that provide fans the opportunity to engage with and discuss their favorite athletes. Given this growth, fighters' behaviors, both inside and outside of the arena, can have a strong influence on fans' consumption and social media activity. To evaluate this relationship, this study investigated the effect of combat sports fighters' trash-talking on subsequent fans' behaviors by collecting and analyzing 516 fighter responses during pre-fight press conferences and 32,360 fan tweets on Twitter during Ultimate Fighting Championship (UFC) events. Results demonstrated that fights featuring polarizing and popular athletes generated the highest pay-per-view numbers, and higher levels of profanity speech during trash-talking were associated with higher engagement in pay-per-view consumption and Twitter usage.

Keywords: combat sports, trash talking, social media, pay-per-view, sports fans, sentiment analysis

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Combat sports represent one of the fastest growing segments of the sports industry (Zetaruk et al., 2005). This rise in popularity has been attributed to a number of factors related to fandom, including escape and entertainment (Wann, 1995), sports interest and role modeling (Seungmo et al., 2008), skill, aesthetic, and drama (Andrew et al., 2009), and loyalty to specific fighters and weight classes (Tainsky et al., 2013). These motivations play a key role in how fans develop psychological relationships with celebrities, ultimately viewing athletes as role models in which they adopt similar values and behaviors (Fraser & Brown, 2002). While many athletes have developed positive personas, there are those that attained notoriety through destructive behaviors (i.e. trash-talking). As a result, within combat sports, the most popular fighters have established a loyal fan base that is influenced by their behaviors, regardless of if they are positive or negative (Brown et al., 2013).

Given the relationship between athletes' actions and fans' reactions, this study aims to understand how negative behaviors (i.e. trash-talking) demonstrated by combat sports fighters impact the subsequent behaviors of their fans via consumption and online social media activity. This was achieved by collecting data on both fighters and fans and then analyzing the responses and verbiage used on Twitter, as well as total event pay-per-view (PPV) viewership. In doing so, the work adds to the existing literature by unveiling the propagation effect of trash-talking in combat sports, which, in turn, reflects aggressiveness among individuals within society (Workman, 2012).

Literature Review

Combat sports participation involves more than just the physical engagement between athletes; the mental element features the utilization of specific behaviors, most notably trash-talking, that aim to negatively impact an opponent's performance (Kniffin & Palacio, 2018). In this context, trash-talking is defined as "boastful comments about the self or insulting

comments about an opponent that are delivered by a competitor typically before or during competition" (Yip et al., 2018, p. 126). This practice has an established place within competition, especially contact sports, and is used to exert dominance over others via personal skills or physical appearance (Kniffin & Palacio, 2018). By doing so, athletes gain an advantage over their opponents by intimidating or distracting them, while simultaneously boosting their own morale. Vaccaro et al. (2011) highlighted how fighters intimidate and instill fear in other fighters by using their bodies and words strategically, which is enhanced through an ability to manage emotions in stressful situations. These behaviors can increase competition between athletes and facilitate constructive and destructive actions that emerge within interactions.

With the intimate and physical nature of combat sports, trash-talking is an often-used strategy among fighters. This is especially prevalent within the Ultimate Fighting Championship (UFC), which is one of the most well-known combat sports companies featuring athletes skilled in mixed martial arts. UFC has experienced substantial growth in recent years, generating worldwide interest from fans and advertisers, securing higher cable ratings than NBA, NHL, and MLB events, and producing PPV revenues comparable to boxing and wrestling (Seungmo et al., 2008). Given the rise in popularity of the sport, understanding the impact of fighters' behaviors on fans provides an important area for further research and is the focus of this study.

Robbins and Zemanek (2017) analyzed the relationship between popular fighters and PPV purchases by evaluating the revenue generated by UFC athletes compared to their individual performance ranking. The authors discovered that celebrity status was a much stronger predictor for economic value via PPV viewership compared to fighting skill, which suggested an influence of individual athlete behavior on fans. These behaviors are enhanced through the growth of social media platforms, which provide people the opportunity to

develop and maintain relationships through direct and immediate interactions. As a result, fans are able to communicate directly with their favorite athletes, ultimately strengthening fan loyalty. The simultaneous rise of both combat sports and social media has cultivated a unique relationship in which athletes' behaviors are supported and mirrored by fans online, eliciting increased viewership and social media usage. Existing literature on social media platforms has demonstrated an ability to predict specific traits within fans based on their online behaviors, including personality (Schwartz et al., 2013), age, gender, and level of empathy (Jaidka et al., 2018), and success in life (Schumaker et al., 2016).

Given the newfound access to people's opinions online, researchers now have a wealth of information that can be used to analyze and interpret how meaning is assigned to certain situations. Previous research aimed to understand the relationship between athletes' behaviors and fans' online responses. This work was especially effective in evaluating Twitter, which is used by fans to connect with athletes, share unique insights on specific topics, and enjoy immediacy within interactions (Hambrick et al., 2010; Kassing & Sanderson, 2010). Similarly, Twitter has also emerged as a popular online social media network for professional athletes, as it provides them with the opportunity to control the narrative surrounding their brand, even in areas outside of sport (Pegoraro, 2010). This includes communicating directly with fans, sharing personal news, endorsing products and services, providing insight into their personal lives, and staying informed and engaged with other users (Cunningham & Bright, 2012; Kassing & Sanderson, 2015). With the development of tools such as the application programming interface (API), scholars have the ability to collect a considerable number of tweets instantaneously, which can be analyzed using sentiment analysis tools. This resource has been beneficial in helping to understand how athletes manage social media for promotional purposes (Hambrick & Mahoney, 2011),

fans' emotional responses online to highly regarded events (Gratch et al., 2015), and the impact of sports context on emotions (Yu & Wang, 2015).

Research Hypotheses

This study aimed to understand the influence of combat sports fighters' trash-talking on fan viewership and social media usage. Data were collected using UFC press conferences, PPV viewership numbers, and Twitter activity to evaluate the relationship between fighters' behaviors and fans' reactions. In doing so, the results will add to existing literature by demonstrating how consumption of trash-talking impacts engagement and sentiments from fans. The following hypotheses, which were grounded in the six studies summarized in Table 1, were cultivated for the study:

H1: Fans will demonstrate more aggressive behaviors online when discussing events featuring fighters with a higher tendency to engage in trash-talking.

H2: Events featuring fighters with a higher tendency to engage in trash-talking will create greater engagement of fans via viewership.

Methodology

To select the appropriate UFC events to evaluate for this study, Google Trends data were used to identify fights with the highest number of search queries during a specific period of time (Choi & Varian, 2012). Using the search query, "UFC," the region, "Worldwide," and the timeframe of 01/01/2014-01/01/2019, these criteria identified the 25 events with the highest volume of search queries over the five-year period. With respect to PPV viewership, events had been assigned specific numbers (i.e. UFC229), which were used to differentiate the fights.

With the goal of analyzing the role of fighters' trash-talking on fans' behaviors, exclusion criteria were applied to ensure only PPV events featuring a pre-fight press conference including both fighters were used. Additionally, given the evolution of emotions

over time, only the events that featured a press conference during the week of the fight were evaluated to allow for more accurate analyses of the immediate reactions of fans in engagement and interactions online (Garrett & Maddock, 2001). Finally, fights generating less than 1000 tweets on Twitter were excluded to identify the events that were most popular on social media. Through these criteria, the initial set of 25 events were narrowed down to 12 events: UFC232, UFC229, UFC217, UFC214, UFC205, UFC202, UFC199, UFC196, UFC194, UFC190, UFC189, and UFC182. From here, pre-fight press conferences from each event were reviewed to analyze and transcribe trash-talking among the two featured fighters (Mazique, 2018). This yielded 516 total responses across the 12 events.

Using the press conference transcripts, the VADER algorithm was implemented to conduct sentiment analyses. Hutto and Gilbert (2014) detailed how the VADER algorithm is effective through its reliance on features that include punctuation and capitalization and has been previously used to analyze social media text. In the context of this study, the function "polarity_scores" was established, which, for each sentence, returned four metrics: positive, negative, neutral, and compound. The compound metric reflected if the sentence was negative (compound < 0), positive (compound > 0), or neutral, (compound = 0) (Hutto & Gilbert, 2014). A profanity analysis was also performed with the "predict" and "predict_prob" functions pulled from the profanity-check Python library. The "predict" function evaluated a sentence and returned a "1" if profanity was present and a "0" if profanity was not present. The "predict_prob" function investigated the probability that each sentence was offensive (Zhou, 2019).

Following the analysis of fighters' press conference answers, the focus shifted to evaluate fans' tweets during the week of the event (Figure 1). Relevant tweets were gathered by using the name, nickname, and official Twitter account of each fighter, as well as hashtags related to the event and athletes. Table 2 outlines the extracted variables from fans' tweets,

with the status column indicating if the variable on the corresponding row was used in the analysis. Additionally, PPV viewership numbers for each event were aggregated, and an average total computed, using multiple combat sports-related websites and articles.

Once relevant tweets and responses were gathered, appropriate steps were taken to organize and prepare the data in a process similar to the press conference transcripts. This included removing duplicates and tweets written in any language other than English, identifying the specific athletes mentioned, and computing both the sentiment and profanity scores. In total, 72,919 tweets were extracted for analysis. However, the purpose of the study was to evaluate the relationship between a specific fighter's behaviors and their fans' reactions, so one final exclusionary criterion was implemented to eliminate any tweet that mentioned both fighters of an event, rather than one specific fighter. As a result, a total of 32,360 tweets remained.

It was also discovered that the initial VADER algorithm misclassified certain obscene words (i.e. "fu…ing"); therefore, to improve the VADER algorithm's accuracy, the lexicon was updated to include relevant obscene terms that were common within trash-talk among fighters. Another issue needing addressed was the classification of the word, "fight," which was initially associated with a negative sentiment in the VADER lexicon. However, since combat sports are defined in part by fighting, "fight" was reclassified into the same category as the words, "game" and "match." Figure 2 highlights examples of press conference trash-talking and subsequent fan tweets.

Results

Both negative sentiments (Figure 3) and average profanity usage (Figure 4) were used to provide a comparison of fighters' trash-talking across UFC events. Doing so provided an analysis into the presence of diversity in each individual fighter's approach to using trash-talk during pre-fight press conferences. In evaluating the results, there was a noticeable range

among fighters in the perceived value and usage of negative sentiments and profanity within press conferences. For example, both Conor McGregor in UFC 202 and Michael Bisping in UFC 217 relied on these behaviors heavily when engaging with their opponent ahead of a fight. There was also evidence of fighter variance (i.e. Conor McGregor in UFC194 vs. UFC 202) in usage of negative sentiments and profanity across different events, indicating behavior changes depending on the context of the event and their opponent.

Looking at the specific hypotheses, H1 was assessed by computing the Pearson correlation of (1) negative sentiments within fighters' trash-talking to the negative sentiments in fans' tweets and (2) average profanity within fighters' trash-talking to average profanity in fans' tweets. With respect to both negative sentiments ($R=0.165$, p-value=0.440, $n=24$) and average profanity ($R=0.072$, p-value=0.739, $n=24$), no significant linear relation was found between trash-talk and tweets. Therefore, an association between fighters' trash-talking and the aggressiveness of fans' tweets could not be established in either instance, and H1 was not confirmed.

Although H1 could not be confirmed, the results did demonstrate noticeable differences in profanity between fighters in the same event, as well as the same fighter in different events (Figure 3). One potential explanation for this is that the events take place in different time periods, often between different fighters and in different contexts. The evolving storylines and opponents could influence the behaviors of fighters and impact how fans respond to certain events. To evaluate this phenomenon, Figure 5 was established to assess if fighters using more negative sentiments and profanity ahead of an event yielded higher negative sentiments and profanity within fans' tweets.

Through this analysis, it was discovered that in 10 of the 12 events (83.3%), the fighter with higher negative sentiments during the press conference generated enhanced negative sentiments in the tweets of their fans, demonstrating a relationship between the two variables

in this specific context. In contrast, however, the fighter that used more profanity in trash-talk only generated more profanity in fans' tweets in five of the 12 events (41.66%). Therefore, the same relationship could not be established within profanity that was present within negative sentiments.

To assess H2, fan engagement was first measured by evaluating the (1) PPV viewership numbers and (2) total number of tweets generated by each event. Then, the Pearson correlation was calculated between negative sentiments and profanity usage in press conferences, the average PPV viewership, and the total number of tweets (Figure 6). No significant linear relations were found between (1) negative sentiments in press conference trash-talk and average PPV viewership numbers (R=0.332, p-value=0.292, n=12), (2) negative sentiments in press conference trash-talk and total number of tweets (R=0.021, p-value=0.949, n=12), or (3) average profanity used in press conference trash-talk and total number of tweets (R=0.247, p-value=0.439, n=12). However, the relationship between average profanity used in press conference trash-talk and average PPV viewership numbers demonstrated a 10% level statistically significant correlation (R=0.525, p-value=0.080, n=12), suggesting that higher average profanity values were associated with higher PPV values. This finding indicates that trash-talk featuring enhanced profanity usage has a direct impact on fan engagement and consumption of combat sports.

As a complement to the above findings, the researchers also conducted a fighter-specific analysis (Table 3) to understand the individual influence of athletes on fan engagement. This breakdown included: (1) number of fights, (2) PPV viewership generated, (3) percentage of total PPV viewership generated, (4) percentage of total tweets, and (5) percentage of negative sentiments generated in press conference trash-talk.

Fighter information was organized by highest percentage of PPV viewership generated. The top four fighters in this category (i.e. Conor McGregor, Nate Diaz, Khabib

Nurmagomedov, and Jon Jones) emerged as influential athletes through their impact on fan behaviors. Of the 24 potential fighters within the 12 events studied, these four athletes appeared 12 times across nine total fights. They also accounted for (1) 62.49% of the total PPV viewership generated, (2) 75.19% of the total tweets, and (3) 77.70% of the total percentage of negative sentiments within press conference trash-talk.

In analyzing the specific context surrounding each of the 12 events studied, the results demonstrated that the behaviors of individual fighters had the greatest impact on fans' responses, as opposed to the magnitude of the event itself. For example, McGregor and Diaz generated two of the top three fights in terms of PPV numbers, despite the events not featuring title bouts. More than the fights themselves, these events were most remembered for their pre-fight press conference trash-talk, which eventually even led to a physical altercation highlighted by the fighters throwing objects at each other (MMAFightingonSBN, 2016). Regardless of the stakes, McGregor, Diaz, Nurmagomedov, and Jones consistently generated the most tweeted about and viewed fights through their reliance on negative sentiments and profanity prior to the events.

To further support the evaluation that individual fighters had a stronger impact on fan behaviors than the context of the fights themselves, the study then looked at PPV viewership numbers for T.J. Dillashaw and Demetrious Johnson, who were both champions in their respective weight classes. Over the same five-year period (i.e. 2014-2019), Dillashaw and Johnson fought a combined nine times, including seven title fights, only losing once. Despite the high stakes associated with these bouts, neither champion generated top-level PPV numbers. In fact, Dillashaw only generated 640,000 PPV purchases over his three title fights, while Johnson totaled just 560,000 PPV purchases during his four title fights.

Discussion and Conclusion

The goal of this study was to evaluate how negative behaviors of combat sports fighters (i.e. trash-talking) influenced the subsequent behaviors and reactions of fans. In analyzing the data, the findings suggested that fans prefer the notoriety and storylines focused on individual fighters over the context of the specific event. This result aligns with Andrew et al. (2009), who argued that "…the fact that consumers rated drama so highly in each study indicates that people desire close fights with uncertain outcomes regardless of the level of competition" (Andrew et al., 2009, p. 207). With the engagement and consumption of combat sports centered around specific fighters, fans' behaviors and reactions to fights are more directly impacted by the athletes than the event itself. Brown et al. (2013) provided a recommendation moving forward that supported this idea, as the authors posited, "UFC should begin to more heavily promote individual fighters and storylines that may arise (rivalries, alliances, etc.) with them. This establishes more of an emotional, individual connection to the fighters, allowing the UFC to expand ratings" (Brown et al., 2013, p. 29).

Existing research has investigated the motivations that influence fan engagement and support for athletes. This study filled a gap in the literature by finding that in combat sports, events featuring popular and polarizing fighters engaged in pre-fight trash talk were more likely to yield higher PPV viewership numbers when compared to title fights between lesser-known fighters. This was exemplified by Conor McGregor and Nate Diaz, whose PPV viewership numbers were 2.5 times greater than those generated in the combined seven title fights featuring champions T.J. Dillashaw and Demetrious Johnson. Given this stark difference, the research worked to evaluate the impact that pre-fight press conference trash-talking among fighters can have on PPV viewership and social media activity.

The first hypothesis investigated if trash-talk between fighters during press conferences elicited more aggressive behaviors from fans on Twitter. Using a Pearson correlation, the results failed to establish an association between fighters' negative sentiments

and profanity used during a press conference and the presence of these aggressive behaviors within subsequent fans' tweets. Therefore, H1 was not confirmed.

The second hypothesis assessed whether events featuring fighters with a higher tendency to rely on negative sentiments and profanity (i.e. trash-talk) generated greater engagement of fans through PPV viewership and total number of tweets. By once again using a Pearson correlation, the results unveiled three key findings that included (1) a moderate association between fighters' profanity usage during press conferences and average PPV numbers for events, (2) a weak association between fighters' profanity usage during press conferences and total number of tweets from fans, and (3) a weak association between fighters' negative sentiments during press conferences and average PPV numbers for events. With respect to the relationship between fighters' negative sentiments during press conferences and total number of tweets from fans, the correlation was almost null. In evaluating these findings, profanity from fighters during pre-fight press conferences emerged as an effective means of directly impacting fan behavior through both PPV numbers and social media activity. Moving forward, as fighters' managers work to promote their athletes ahead of events, this work suggests a need to incorporate profanity into trash-talking, which will yield higher fan engagement and subsequent revenue.

Limitations

Previous research has established that emotions can change over time. In an effort to capture the instantaneous reactions and behaviors of fans from pre-fight press conferences, this study only evaluated events that featured press conferences during the week of the fight. This criterion resulted in a limited number of events available for consideration, which impacted the final results. Additionally, the Twitter API tool provided another challenge, as data could only be extracted up to a week from the current date. Therefore, a web scraping script was developed to overcome this limitation. Another constraint focused on the lack of a

universal source in collecting PPV viewership numbers for UFC events. As a result, data had to be aggregated from a number of sources, and the average was then calculated and used to complete the study. Finally, the findings suggested that the existing theory on trash-talk propagation from athletes to fans was missing important moderating variables, which remain undisclosed in literature.

Future Research

This study looked solely at the impact of the two fighters featured on the main card of each event. Therefore, scholars could build on this work by encompassing the pre-fight press conferences of all fighters within an event to evaluate the effect of trash-talk on fans. Doing so would allow researchers to assess if the popularity and polarizing nature of a fighter acts as a moderating variable in trash-talk propagation, or if trash-talk (i.e. negative sentiments and profanity) itself is what impacts the behaviors and reactions of fans. Additionally, the theoretical model between trash-talking and fan behaviors could be further developed by incorporating additional variables into a future study. Robbins and Zemanek (2017) classified combat sports fighters as celebrities, so incorporating variables borrowed from celebrity studies can investigate the role of fighters' popularity on fans' behaviors across social media and mass media platforms.

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Tables

Table 1 Literature Review of Athletes' Behaviors and Influence on Fans

Reference	Goal	Method	Findings
Andrew et al. (2009)	Explored nine motivations impacting media and purchasing behaviors of MMA consumers.	Implemented a 43-item questionnaire to evaluate 162 consumers at a professional MMA event.	Contrary to expectations, violence was not the strongest motive impacting event attendance; drama and aesthetic emerged as the strongest motivations.
Hambrick et al. (2010)	Examined the Twitter accounts of professional athletes to investigate social media usage to maintain communication with fans and fellow athletes.	Analyzed a sample of 1,962 tweets from 101 athletes' Twitter accounts.	Twitter provides a platform in which athletes' needs are met and facilitates increased fan identification with athletes and teams through more direct access.
Vaccaro et al. (2011)	Analyzed MMA fighters' fears, how they managed them, and how they adopted intimidating personas to evoke fear in opponents.	121 interviews were conducted, and 100 practices were observed. The fighters' behaviors were also observed in 10 competitions.	Fighters suppressed fear and evoked confidence, while also using language and physicality to instill fear in their opponents.
Tainsky et al. (2013)	Used a consumer-theory model to estimate UFC pay-per-view purchases.	Collected data from 93 UFC pay-per-view events (UFC33 through UFC132).	Consumer preferences focused predominantly on specific fighters, as PPV consumption increased substantially for events featuring the most popular fighters.
Yu & Wang (2015)	Analyzed the sentiments in U.S. sports fans' tweets during five FIFA World Cup matches.	Relied on two Twitter tools (i.e. API and SA) to examine U.S. soccer fans' emotional responses in real time.	Sports fans used Twitter for emotional purposes.
Robbins & Zemanek (2017)	Analyzed the influence of high-profile celebrity fighters on PPV numbers and compared the results with the highest ranked pound-for-pound fighter.	Analyzed PPV numbers of UFC events from 2005 to 2016, resulting in 155 events and 204 fighters included.	The results indicated that celebrity status has far more economic value in respect to PPV numbers than fighting skill.

Table 2 Selected or Computed Variables for Analysis

Variable Name	Source	Data Type	Variable Type	Description	Status
permanentlink [1]	Twitter	url	Output	Tweet link	Used
id [2]	Twitter	Integer	Output	Tweet identification	Used
mentions [3]	Twitter	String	Output	Mentions to other pages	Not used
hashtags [4]	Twitter	String	Output	Hashtags mentioned in tweet	Not used
hour [5]	Twitter	Hour	Output	Hour	Used
date [5]	Twitter	Date	Output	Date	Used
retweets [6]	Twitter	Integer	Output	Number of times the tweet was shared	Not used
likes [7]	Twitter	Integer	Output	Number of likes	Not used
21exto [8]	Twitter	String	Output/Input	Tweet	Used
answer	Press conference	String	Output/Input	Answers from fighters in conferences	Used
predict	Profanity_ check	Integer	Output/Input	Describes if string is offensive or not	Not used
predict_prob	Profanity_ check	Double	Output	Probability of each string containing profanity	Used
neg	VADER	Double	Output/Input	% of the sentence with negative sentiment	Not used
pos	VADER	Double	Output/Input	% of the sentence with positive sentiment	Not used
neu	VADER	Double	Output/Input	% of the sentence with neutral sentiment	Not used
compound	VADER	Double	Output/Input	Sentiment final result	Used
sentiment	Calculated	Text	Output/Input	Describes the type of sentiment	Used
NegSAConfer	Calculated	%	Output	% of negative sentiment in press conferences	Used
NegSATweets	Calculated	%	Output	% of negative sentiment of tweets	Used
AvgProfanityConf	Calculated	%	Output	Average profanity of press conferences	Used
AvgProfanityTweets	Calculated	%	Output	Average profanity of the tweets	Used
fighter	Calculated	String	Output	Name of the fighter that the tweet refers to	Used
AveragePPV	Calculated	%	Output	Average PPV by event	Used
TotalNumberTweets	Calculated	Integer	Output	Number total of tweets by event	Used

Table 3 Analysis of the Influence of Individual Fighters on Fan Engagement

Fighter	#Fights (1)	#PPV (2)	%Total PPV (3)	%Total Tweets (4)	%Total NegSA (5)
Conor McGregor	6	8,507,167	33.38%	50.25%	45.76%
Nate Diaz	2	3,036,333	11.91%	4.61%	4.12%
Khabib Nurmagomedov	1	2,233,333	8.76%	10.90%	17.90%
Jon Jones	3	2,150,000	8.44%	9.43%	9.92%
Daniel Cormier	2	1,475,000	5.79%	2.06%	2.11%
Eddie Alvarez	1	1,300,000	5.10%	0.48%	0.50%
Michael Bisping	2	1,185,750	4.65%	1.97%	2.37%
Jose Aldo	1	1,112,500	4.37%	1.22%	1.24%
Ronda Rousey	1	900 000	3.53%	11.25%	9.91%
Bethe Correia	1	900 000	3.53%	1.37%	1.74%
George St. Pierre	1	875 000	3.43%	3.65%	2.82%
Chad Mendes	1	825 000	3.24%	0.46%	0.54%
Alexander Gustafsson	1	675 000	2.65%	0.31%	0.43%
Luke Rockhold	1	310 750	1.22%	0.57%	0.64%

Figures

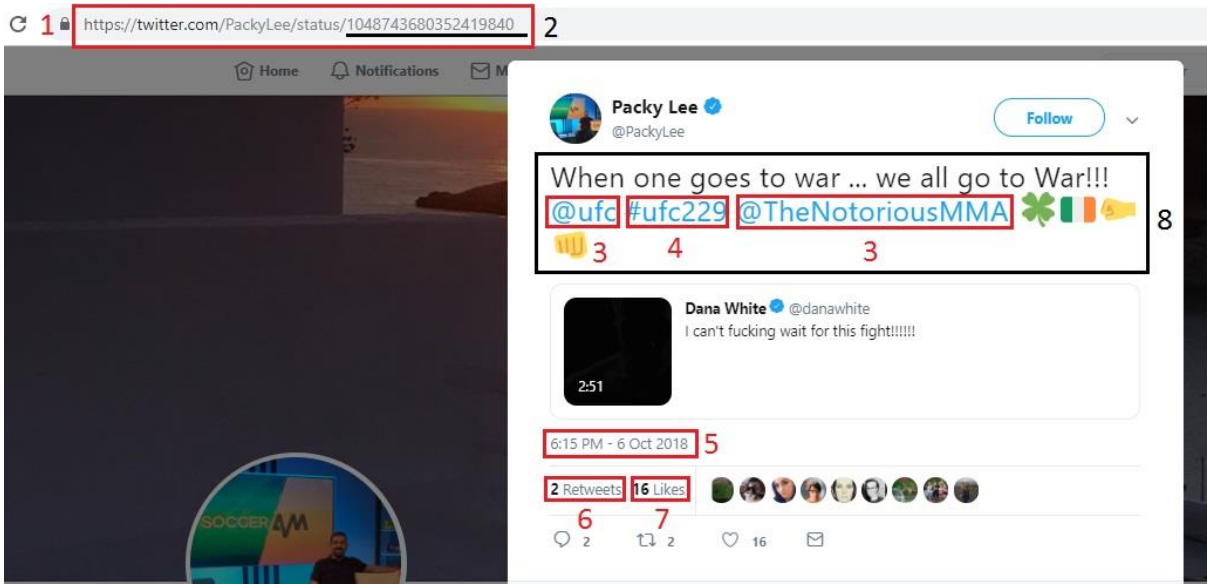

Figure 1. Example of a fan tweet

Date	Hour	Tweet	Compound	Sentiment	Avg Profanity	Fighter
07/10/2018	06:23:00	All you McGregor fans are so hurt. Unprofessional or not he got murdered on live TV.	-0.6628	Neg	0.12955496	McGregor
07/10/2018	07:19:00	Very classy message from Conor McGregor's coach... #UFC229pic.twitter.com/2j1Zzygee1	0.4927	Pos	0.1314912	McGregor

Answer	Compound	Sentiment	Avg Profanity
he knew what he signed up for. ive been late. the traffic is heavy. hes better off running anyway. you know yourself. i bet you he was saying he didnt say anything the last time so, i mean, whatever. it is what it is. these things happen.	0.4404	Pos	0.04087689
he's afraid, make no mistake. he has nervous reactions, he's a flincher we called him. he's easily backed up. i'm very prepared and i know what to expect. it's nothing that phases me.	-0.2516	Neg	0.03219235

Figure 2. Fan tweets and trash-talking with the computed values of sentiment and profanity

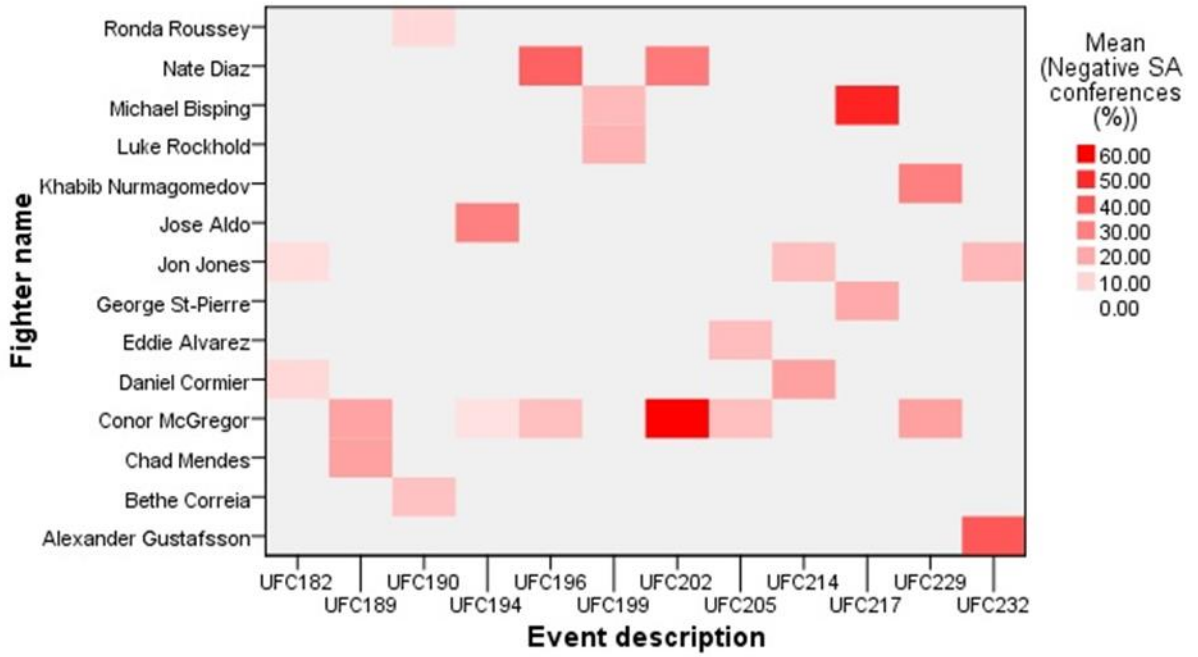

Figure 3. Negative sentiments in press conferences by fighter and event

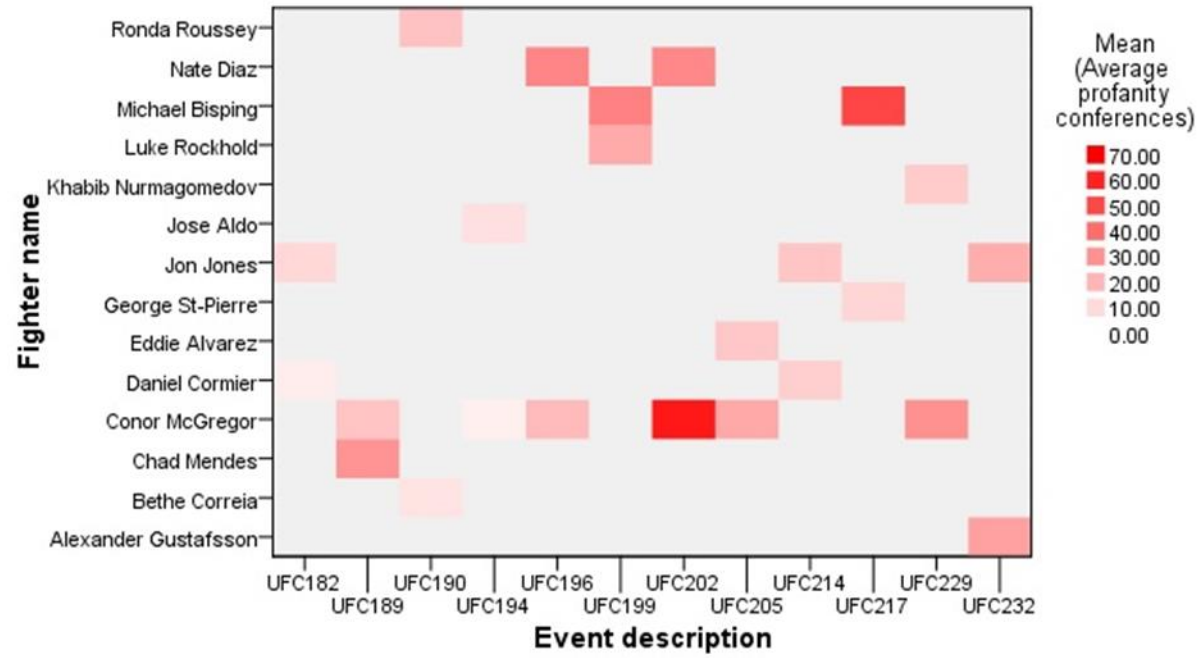

Figure 4. Average profanity in press conferences by fighter and event

Event	Fighter	Negative SA conferences (%)	Negative SA tweets (%)	Average profanity conferences	Average profanity tweets
UFC182	Daniel Cormier	9.09	21.31	5.06	11.96
	Jon Jones	7.69	20.05	10.70	16.39
UFC189	Chad Mendes	22.22	23.65	29.49	12.50
	Conor McGregor	21.43	15.19	16.12	13.71
UFC190	Bethe Correia	14.29	25.28	7.38	18.62
	Ronda Roussey	8.70	17.56	16.90	17.16
UFC194	Conor McGregor	7.14	13.10	4.02	14.49
	Jose Aldo	30.00	20.25	8.49	11.94
UFC196	Conor McGregor	14.71	22.09	18.69	14.93
	Nate Diaz	37.04	19.27	33.15	20.68
UFC199	Luke Rockhold	17.65	22.28	23.18	13.51
	Michael Bisping	16.13	10.53	34.33	12.94
UFC202	Conor McGregor	60.00	15.98	63.46	14.38
	Nate Diaz	31.25	16.76	32.76	18.27
UFC205	Conor McGregor	14.71	13.21	23.48	14.37
	Eddie Alvarez	15.38	20.78	15.38	13.77
UFC214	Daniel Cormier	22.22	19.49	13.22	13.98
	Jon Jones	15.00	14.41	15.73	14.14
UFC217	George St-Pierre	20.00	15.41	11.16	14.89
	Michael Bisping	51.72	22.19	51.07	15.15
UFC229	Conor McGregor	22.22	27.11	30.31	19.36
	Khabib Nurmagomedov	30.00	32.75	14.41	22.82
UFC232	Alexander Gustafsson	39.29	28.00	25.70	15.74
	Jon Jones	16.67	27.13	22.36	16.28

Figure 5. Analysis by event using negative sentiment and profanity variables.

		Negative SA conferences (%)	Average profanity conferences	TotalNumber Tweets	Average pay per view
Negative SA conferences (%)	R	1	0.844**	0.073	0.332
	p-value		0.001	0.821	0.292
Average profanity conferences	R	0.844**	1	0.279	0.525
	p-value	0.001		0.380	0.080
TotalNumberTweets	R	0.073	0.279	1	0.906**
	p-value	0.821	0.380		0.000
Average pay per view	R	0.332	0.525	0.906**	1
	p-value	0.292	0.080	0.000	

**. Correlation is significant at the 0.01 level (2-tailed).

Figure 6. Correlation between negative sentiments and average profanity in press conferences, average PPV numbers, and total number of tweets.