



Deriving pleasure from other people's pain: The influence of vicarious pain on viewing intentions for violent sports[☆]

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ABSTRACT

The current study used the example of mixed martial arts to explore how empathetic vicarious pain and everyday vicarious sadism influence viewing intentions in violent sports in addition to service quality and perceived value. Structural equation modeling of data from 797 respondents revealed that service quality (a formative construct comprising athletic performance, outcome uncertainty, violence, and excitement) predicted future intentions. Violence and excitement contributed most strongly to perceived service quality, with athletic performance and outcome uncertainty as supporting factors. Everyday vicarious sadism had a positive influence on future viewing intentions but a slight negative impact on satisfaction, underscoring its complex role in viewers' motivations. Empathetic vicarious pain is weakly linked to lower viewing intentions. Necessary Condition Analysis showed that service quality was the only necessary condition for viewing intentions, underscoring its importance in sustaining spectator engagement. These findings contribute to consumer behavior research by demonstrating the impact of violence on service quality and by highlighting the roles of empathetic vicarious pain and everyday vicarious sadism in shaping viewers' engagement with violent sports.

1. Introduction

The global sports entertainment industry has witnessed significant growth in violent contact sports, with mixed martial arts (MMA) drawing millions of viewers worldwide. In 2023, the UFC – the sport's largest organization – reported revenues exceeding USD1.3 billion, underscoring the sports growing importance (Pekios, 2024). This growth highlights a fundamental paradox in consumer behavior: why do audiences voluntarily engage with entertainment centered on violence, pain, and physical harm, traits widely not accepted in modern society? Traditionally, service marketing research has focused on consumers' preferences for pleasurable and risk-averse experiences (Prelec & Loewenstein, 1998), but the increasing popularity of MMA suggest changing consumer interests in emotionally intense, morally ambiguous experiences.

High-impact contact sports, such as MMA, allow viewers to engage with physical confrontation vicariously. The appeal is layered, with viewers experiencing a mix of excitement, tension, and visceral fascination. The resulting emotional complexity generates a form of consumption that extends beyond spectacle, involving mechanisms such as

empathy for athletes in pain and, in some cases, a darker pleasure in witnessing suffering. The emotional realism of these vicarious experiences is highlighted by recent neuroscientific studies showing that observing others' pain activates brain regions associated with affective and sensory components of pain (Tan et al., 2024; Zebarjadi et al., 2021).

Despite increasing interest in the emotional drivers of sports consumption, prior research has largely overlooked two phenomena: empathetic vicarious pain and everyday vicarious sadism. While violence, defined as the deliberate use of physical force that has the potential to cause harm (Krug et al., 2002) has been acknowledged in sports marketing (Cornwell et al., 2023; McDaniel et al., 2007), few studies have examined how these specific psychological responses influence sustained viewer engagement. As MMA has moved from being a socially stigmatized spectacle to one of the world's most popular spectator sports (Watanabe et al., 2023), understanding what draws and retains audiences becomes both theoretically and practically urgent.

The study presented in the following addresses recent calls for further research on the darker aspects of consumer behavior (Kastanakis et al., 2022). Specifically, it integrates traditional service quality factors

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such as athletic performance and outcome uncertainty with emotional responses unique to violent sports to investigate whether violence and pain are not only sufficient conditions for attracting audiences but also necessary to sustained engagement.

To this end, structural equation modeling (SEM) and necessary condition analysis (NCA) served to explore how service quality, perceived value, satisfaction, vicarious pain and sadism influence viewing intentions in sports perceived as violent, notably MMA. Our aim was to contribute to consumer behavior theory by obtaining new insights into the motivations driving engagement in controversial but increasingly mainstream entertainment formats and to help marketers develop more effective campaigns and engagement strategies that resonate with their audience by determining how the allure of violence and pain attracts consumers.

2. Theoretical background and hypotheses

2.1. Vicarious pain and core service quality in sports demand: The conceptual model

Scholars have long explored the factors that drive demand for sports and entertainment, with early research focusing on variables like competitive balance, ticket pricing, and athletic performance (e.g., Rottenberg, 1956; Sloane, 1971). More recent studies have explored emotional and experiential factors (Biscaia, 2013; Funk et al., 2009), but little is known about how viewers' psychological reactions to violence and pain affect their desire to engage with violent sports.

This study addresses that gap by proposing an integrative framework to explain why people watch – and continue to watch – mixed martial arts (MMA). The framework integrates established sports marketing concepts with emerging emotional drivers, helping to explain how traditional service factors and psychological responses jointly shape viewer engagement in violent sports. The framework comprises five key constructs: empathetic vicarious pain, everyday vicarious sadism, core service quality (a second-order construct comprising athletic performance, outcome uncertainty, excitement, and violence), perceived value, and satisfaction. We expected empathetic vicarious pain and everyday vicarious sadism to influence intentions directly, and core service quality to influence intentions indirectly through satisfaction. The following describes the suggested relationships in more detail (see

Fig. 1). In addition to testing whether the suggested relationships between these factors are statistically significant, the empirical study also assessed whether the antecedents represent necessary conditions for continued engagement.

2.2. Core service quality (athletic performance, outcome uncertainty, excitement, violence)

Service quality is a well-established concept in marketing, often defined as consumers' overall evaluation of a service provider's performance. Zeithaml (1988) described perceived service quality as a consumer's overall judgment of an organization and its offerings. In experience-based settings, service quality is closely linked to customer satisfaction. In sports, core service quality depends on the athletes' performances due to their skill and the overall experience the event creates for viewers (Hansen & Gauthier, 1989). High-quality performances are essential for meeting viewer expectations and shaping positive perceptions of an event. Additionally, excitement, outcome uncertainty (Kelley & Turley, 2001) and controlled violence strongly influence spectators' experience. In combat sports like MMA, these factors are central to the viewing experience. Viewers often value the technical aspects of MMA fights, such as skillful strikes, tactical grappling, and momentum shifts, which elevate a fight's intensity and excitement (Andrew, Kim, et al., 2009). Cornwell et al. (2023) note that violence, when well-integrated into a sport, can create a distinct form of thrill that appeals to certain audience segments.

Excitement in sports arises when events are dynamic and emotionally intense. In high-impact sports, dynamism and emotional intensity result from high-stakes competition, visible risk, and athletes' displays of resilience and skill. Excitement and thrill-seeking theory posits that individuals are inherently drawn to activities that provide exhilarating and challenging experiences (Kremer & Greene, 1999) charged with thrills and adrenaline. The emotionally charged atmosphere of such events is central to the appeal of live sports (Murray & Howat, 2002).

Catharsis theory suggests that audiences may be drawn to controlled violence as a socially acceptable outlet for aggression and emotional release (Jewell et al., 2012). While violence is regulated and controlled, it remains controversial yet compelling for many spectators. Thus, promoters of MMA and similar sports carefully manage violence through rules and oversight to align with entertainment goals, while minimizing

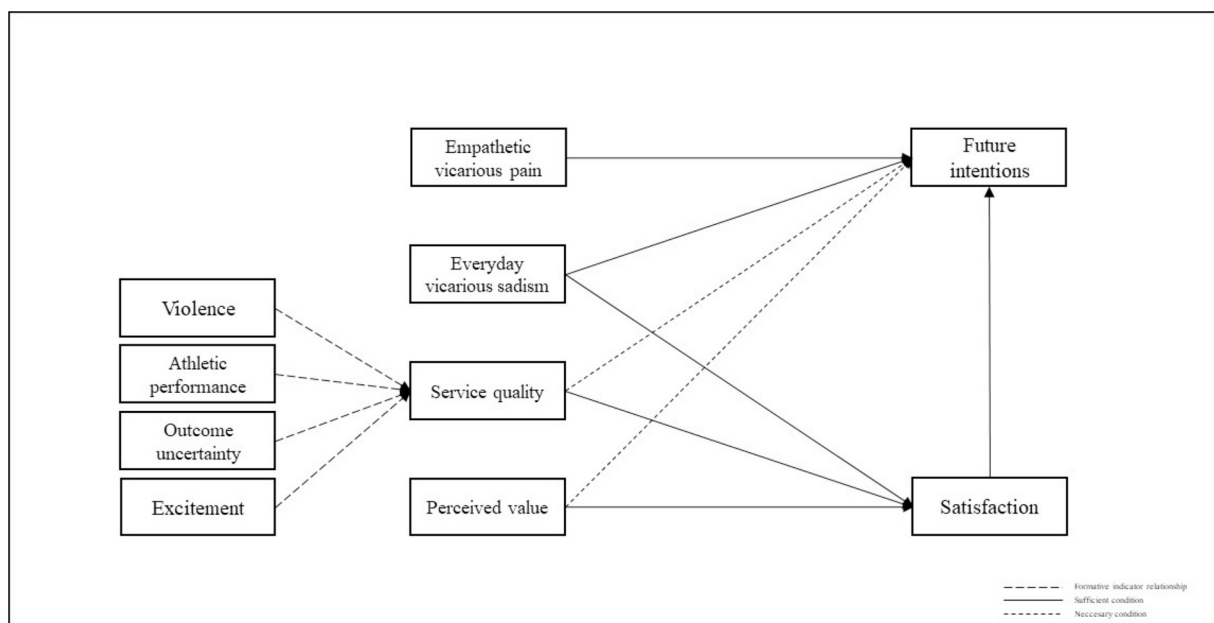


Fig. 1. Conceptual Model.

unnecessary harm. Empirical findings on the appeal of violence are mixed. Paul (2003), for example, found that fighting in ice hockey games positively correlates with attendance, suggesting that some fans are drawn to physical confrontation. In contrast, Coates et al. (2012) reported no consistent relationship between penalty minutes and attendance across seasons. These findings indicate that the effect of violence on viewer interest may vary across context and audience.

Outcome uncertainty distinguishes sports from scripted entertainment, as it offers real-time drama and engagement that cannot be replicated through replays or predictable outcomes. According to Rotenberg's (1956) uncertainty-of-outcome hypothesis, competitive balance and unpredictability are key drivers of sports consumption. Outcome uncertainty amplifies suspense and increases the emotional payoff of live viewing (Frick et al., 2023; Pawlowski & Nalbantis, 2019).

In sports, the athletes' performance and the event's ability to deliver excitement and uncertainty shape the level of resulting satisfaction (Cronin & Taylor, 1992; Murray & Howat, 2002). High service quality increases both satisfaction and behavioral intentions, including repeat viewing and event loyalty (Cronin & Taylor, 1994; Wakefield & Blodgett, 1999). Given these considerations, we propose:

Hypothesis 1: Core service quality, which comprises athletic performance, outcome uncertainty, excitement, and controlled violence, directly and positively predicts viewer satisfaction with violent sports.

Hypothesis 2: Providing a high core service quality is a necessary condition for attracting viewers to future events (high future viewing intentions).

2.3. Effects of empathetic vicarious pain and everyday vicarious sadism

Violence and pain are inextricably linked (Tinley, 2019), especially in sports like MMA, where intense physical contact frequently results in visible injury. While pain serves as a protective biological function (Kastanakis et al., 2022), in the context of combat sports it becomes part of the spectacle (Dubreuil et al., 2023). Audiences respond to this pain in different ways. Some are disturbed, while others seem to overlook or even enjoy the perceived pain of athletes (Cornwell et al., 2023).

Empathetic vicarious pain refers to the discomfort observers feel when witnessing another person in pain, even though they are not physically harmed themselves (Cheng et al., 2007). Psychological and neuroscientific research shows that such vicarious experiences can activate affective empathy and brain regions associated with pain processing (de Vignemont & Jacob, 2012; Singer & Lamm, 2009). In the context of spectator sports, these reactions may lead to deeper emotional involvement, such as admiration for athletes' toughness, moral concern for their well-being, or a heightened sense of ethical engagement.

While intense empathy could discourage viewing due to emotional discomfort, it may also foster a meaningful connection with the sport. Spectators who feel vicarious pain might perceive the event as more real, more serious, or more admirable – especially when athletes persist through visible suffering. Such reactions can deepen moral investment and create a personal sense of relevance, which may enhance continued interest in violent sports content (Bartsch et al., 2014; Oliver & Bartsch, 2010). Based on this rationale, a positive relationship between empathetic vicarious pain and intentions to watch violent sports can be hypothesized:

Hypothesis 3: Empathetic vicarious pain positively impacts intentions to watch future violent sports events.

In contrast, everyday vicarious sadism reflects the tendency to enjoy others' suffering in settings deemed socially acceptable, such as violent entertainment or combat sports (Paulhus & Jones, 2015). Individuals higher in this trait may find pleasure in watching violent scenes not despite the athletes' suffering, but because of the suffering. In the context of MMA, consumers may experience satisfaction when the intensity of

the contest meets their psychological expectations. Unlike empathy, sadism can have a dual benefit in this context: it may increase both satisfaction and the desire to continue watching. For these viewers, violence and pain are essential features of entertainment, not moral challenges to overcome. As such, everyday vicarious sadism is not only expected to drive both satisfaction and future intentions but may also function as a necessary condition. That is, deriving enjoyment from the athletes' suffering is an essential part of some viewers' interest in violent sports that drives them to watch events. Without a substantial level of violence and pain, sustained interest in violent sports may be unlikely for some audience segments. Based on these theoretical perspectives, we propose the following hypotheses:

Hypothesis 4: Everyday vicarious sadism positively relates to viewer satisfaction.

Hypothesis 5: Everyday vicarious sadism positively influences intentions to watch future violent sports events.

Hypothesis 6: Everyday vicarious sadism is a necessary condition for intentions to watch violent sports events.

2.4 The effects of perceived value and satisfaction

Perceived value is a consumer's assessment of a product's worth. In line with equity theory, perceived value is customers' assessment of whether the benefits they receive (e.g., entertainment, emotional fulfillment) are a fair return for the costs (money, time, effort) incurred (Yang et al., 2011; Yang & Peterson, 2004; Zeithaml, 1988, p. 14). Although functional and practical value often dominate discussions of consumer perceptions, perceived value also includes emotional, social, and knowledge-related dimensions (Sheth et al., 1991), and these dimensions are particularly relevant in the context of spectator sports.

Empirical evidence suggests a strong positive relationship between perceived value and satisfaction (Cronin et al., 2000; Kuo et al., 2009; Lai et al., 2009), a consumer's positive response to a product or service, shaped by the extent to which their experiences align with their expectations (Oliver et al., 1997). In sports settings, perceived value is also significantly linked to satisfaction (Calabuig Moreno et al., 2014; Howat & Assaker, 2013; Jeong, 2020).

Hypothesis 7: Perceived value directly and positively predicts viewer satisfaction with violent sports events.

Empirical evidence also suggests that perceived value is an essential factor in predicting future purchase intentions, with consumers who perceive high value being more likely to return (Lee et al., 2007; Quansah et al., 2023; Shapiro et al., 2019; Yang et al., 2011). One could suppose that consumers will not intend to further view a kind of sports event when they do not expect to get a fair return for the cost incurred. Thus, despite the fact that there is no information available in literature concerning the potential necessity of perceived value for consumer intentions to repeat viewing sports events, the following hypothesis can be proposed:

Hypothesis 8: Perceived value is a necessary condition for intentions to watch violent sports events.

The well-established link between satisfaction and purchase intentions (Cronin et al., 2000; Jones et al., 2000; Martin et al., 2008) shows that satisfaction enhances a customer's attitude and likelihood of future purchases (Carlson & O'Cass, 2010; Martin et al., 2008). This relationship extends to sports viewers, for whom satisfaction is not only a key driver of loyalty and repeat viewing (Bodet & Bernache-Assollant, 2011; Calabuig Moreno et al., 2015, 2016; Stathopoulou et al., 2022; Yoshida & James, 2010) but can also be a necessary condition for watching sports events. Consequently, we hypothesize that:

Hypothesis 9: Viewer satisfaction directly and positively impacts intentions to watch violent sports events.

2.5 Research context

MMA is a full-contact combat sport that differs from traditional martial arts and combat sports in that it allows fighters to use a wide variety of techniques, including striking and grappling, and to combine disciplines such as karate, kickboxing, wrestling, and Brazilian Jiu-Jitsu. The outcome of an MMA fight is decided by knockout, submission, or judges' decision (Lystad et al., 2014; Thomas & Thomas, 2018).

When MMA first emerged in the early 1990 s, it was widely criticized as barbaric and devoid of rules and ethics (Andreasson & Johansson, 2019; Veit & Browning, 2021), with both the media and scholars arguing that it was too violent and too intrinsically immoral to be a legitimate sport (Andreasson & Johansson, 2019; Dixon, 2015). Indeed, MMA fighters often suffer facial fractures and brain trauma (Buse, 2006; Rainey, 2009), as well as the types of muscle and ligament injuries seen in other sports, and injuries can be severe enough to cause death – 29 MMA fighters had died in sanctioned and unsanctioned contests by 2023 (Buse, 2006; Rainey, 2009; Watts, 2023; Wikipedia Contributors, 2024). In the United States, the medical community and legislators became so concerned about MMA's repercussions for society that they called for the sport to be banned (Greenwell et al., 2015; Hishinuma et al., 2012; Murray, 2008). These calls were successful in all but three states (Jewell et al., 2012), pushing MMA underground (Andreasson & Johansson, 2019), which may have had the unintended consequence of increasing MMA's popularity (Kim, 2010).

MMA organizations responded to their critics by making strenuous efforts to legitimize the sport. For example, the Ultimate Fighting Championship (UFC), currently the world's most influential MMA organization (Watanabe et al., 2023), changed its rules to protect fighters (Stenius & Dziwenka, 2015), introduced innovative marketing initiatives, and entered strategic partnerships (McClearen, 2017). These efforts have borne fruit, and MMA has now become a mainstream sport that captivates audiences worldwide, particularly in the United States (where it is no longer banned), Japan, and South Korea. It is also building a solid fan base in many other territories, including Brazil, Russia, and the Middle East, largely thanks to the promotional efforts of organizations such as Pride FC and K-1 (Sánchez García & Malcolm, 2010).

Investigations of the factors that impact live attendance and pay-per-view purchases of MMA events enabled Tainsky et al. (2012) and Watanabe (2012; 2015) to identify venue size, pricing, and star power as determinants of demand. Pricing, event timing, and athlete weight classes are also significant factors, as is the UFC's strategic control over event frequency, which it has used to create scarcity and sustain consumer interest and demand for its events (Watanabe et al., 2023). The UFC's success has inspired other bodies to invest in MMA, notably Saudi Arabia's sovereign wealth fund, which bought a US\$100 million stake in the Professional Fighters League in 2023, intending to emulate the UFC's success in Saudi Arabia and North Africa and challenge it in its home market (Al-Atrush, 2023).

3. Method

3.1. Sample and procedure

We recruited participants through a well-established online participation platform frequently used in academic research to source diverse and reliable respondents. This platform has been extensively validated for its ability to source participants across a wide range of demographic categories (Goodman & Paolacci, 2017; Peer et al., 2017). Although concerns remain about the quality of data obtained from online panels (Chmielewski & Kucker, 2020), they are an effective way of collecting data from large samples that cover a wide range of demographic categories (Callegaro et al., 2014). The careful use of screening questions, attention checks, and time limits mitigates the risks associated with inattentive or careless responses (Meade & Craig, 2012).

Respondents in the current study were North American residents who had watched MMA fights or who were aware of the sport. We focused on the United States because it is a crucial part of the global combat sports market (Sánchez García, 2021). Respondents were compensated for their time, ensuring a reliable data source.

A total of 1139 respondents completed the questionnaire. However, 342 respondents had to be excluded from our analysis because they did not meet quality control criteria. They either did not pass attention filter questions, completed the survey in an unrealistically short time (Smith et al., 2016), or responded “no” to the self-assessment question, “In your honest opinion, should we use your data?” Thus, our final sample consisted of 797 respondents, 53 % of whom were male and 47 % of whom were female. Ages ranged from 18 to 65 years, with a mean age of 36.9 years. Educational attainment ranged from not graduating high school (0.9 % of respondents) to undergraduate or postgraduate degree (53 % of respondents). Table 1 summarizes the respondents' demographic characteristics.

3.2. Measures

To ensure the data obtained were robust, established scales served to measure the considered constructs. Table 2 shows the reliability and convergent validity of each scale.

- Outcome uncertainty: Measured using five items adapted from Che et al. (2015) (e.g., “The outcome of an MMA fight is uncertain”), evaluated on a 7-point Likert scale.
- Excitement: Measured using five bipolar pairs adapted from Jayawardhena and Tiu Wright (2009) (e.g., “Exciting vs. Unexciting” and “Boring vs. Stimulating”), evaluated on a 7-point Likert scale.
- Perceived Athletic Performance: Measured using four items adapted from Yoshida and James (2011) (e.g., “The athletes in MMA competitions perform at a high level”), evaluated on a 7-point Likert scale.
- Perceived Value: Measured using three items adapted from Kwon et al. (2007) (e.g., “Watching MMA is worth the price”), evaluated on a 7-point Likert scale.
- Satisfaction: Measured using four bipolar items adapted from Stathopoulou et al. (2022) (e.g., “Satisfied vs. Unsatisfied”), evaluated on a 7-point Likert scale.
- Violence (perceived level of violence in MMA fights): Measured using six items drawn from Cottingham et al. (2014) (e.g., I enjoy the rough and physical nature of MMA), evaluated on a 7-point Likert scale.
- Everyday vicarious sadism: Measured using six items adapted from the VAST subscale (Paulhus & Jones, 2015) (e.g., “People enjoy seeing MMA fighters getting hurt”), evaluated on a 7-point Likert scale.
- Empathetic vicarious pain: Measured using three items adapted from Giummarra et al. (2015) and de Vignemont and Jacob (2012) (e.g., “I feel pain when one of the fighters gets hurt”), evaluated on a 7-point Likert scale.
- Future intentions (to watch MMA events): Measured using four items drawn from Jones et al. (2000) (e.g., “How likely is it that you will watch an MMA fight again in the future?”) evaluated on a bipolar scale.

Table 1
Demographic Information.

Number of respondents	797	
Mean age (SD)	36.9	(±9.6)
Men	419	(52.6 %)
Women	378	(47.4 %)
Did not graduate high school	7	(0.9 %)
High school diploma	118	(14.8 %)
Some college education	232	(29.1 %)
Undergraduate or postgraduate degree	440	(55.2 %)

Table 2
Assessment of Reliability and Convergent Validity.

Variable	Item	DBL	CA	CR	AVE
Athletic performance	Aper1	0.799	0.874	0.913	0.725
	Aper2	0.868			
	Aper3	0.867			
	Aper4	0.871			
Excitement	Exci1	0.695	0.871	0.908	0.664
	Exci2	0.823			
	Exci3	0.877			
	Exci4	0.852			
Future intentions	Fint1	0.936	0.945	0.961	0.859
	Fint2	0.948			
	Fint3	0.889			
	Fint4	0.934			
Everyday vicarious sadism	Evsa1	0.859	0.906	0.931	0.729
	Evsa2	0.769			
	Evsa3*				
	Evsa4	0.890			
Satisfaction	Evsa5	0.896	0.934	0.953	0.834
	Evsa6	0.850			
	Sati1	0.901			
	Sati2	0.919			
Outcome uncertainty	Sati3	0.928	0.878	0.916	0.733
	Sati4	0.904			
	Unpr1	0.813			
	Unpr2	0.867			
Perceived value	Unpr3	0.890	0.922	0.950	0.864
	Unpr4	0.852			
	Pval1	0.937			
	Pval2	0.932			
Empathetic vicarious pain	Pval3	0.920	0.716	0.821	0.705
	Evpa1*				
	Evpa2	0.651			
	Evpa3	0.931			
Violence	Viol1	0.766	0.890	0.916	0.647
	Viol2	0.839			
	Viol3	0.762			
	Viol4	0.727			
	Viol5	0.889			
	Viol6	0.833			

*items removed.

3.3. Data analysis

We tested our hypotheses by submitting the data to a structured, multi-step analysis.

3.3.1. Measurement model

As a first step, we evaluated our measurement model's convergent validity, discriminant validity, and reliability by calculating, respectively, average variance extracted (AVE), heterotrait-monotrait (HTMT) ratios of correlations, and, as recommended by Hair et al. (2020), Cronbach's alpha, rho_A, and composite reliability for each construct.

3.3.2. Structural equation modeling (SEM)

The second step was to carry out partial least squares structural equation modeling (PLS-SEM) using SmartPLS 4 software. PLS-SEM is particularly well-suited to evaluating complex predictive models, especially in exploratory studies where data structure or sample characteristics may challenge traditional covariance-based SEM (CB-SEM) methods (Hair et al., 2019). Unlike CB-SEM, which uses variance-covariance analysis to assess model fit, PLS-SEM prioritizes predictive accuracy and explained variance. Additionally, PLS-SEM is resilient to collinearity, does not require normally distributed data, and is more effective with small sample sizes. These characteristics make PLS-SEM highly applicable to business and marketing research (Henseler & Schuberth, 2020; Sarstedt et al., 2023).

PLS-SEM served to estimate path coefficients (β) and to assess

explained variance (R^2) within the hypothesized model. The use of a nonparametric bootstrapping method with 5,000 resamples generated confidence intervals for path estimates and ensured robust parameter accuracy.

3.3.3. Necessary condition analysis (NCA)

As a complement to traditional SEM, which identifies relationships based on sufficiency logic (a combination of antecedents contributes to the outcome), we conducted necessary condition analyses (NCA) to identify conditions that are essential for an outcome to occur without necessarily being sufficient by themselves (Dul, 2016). Recent research has highlighted the value of combining SEM with NCA when trying to understand complex behaviors (Greckhamer et al., 2018; Richter & Hauff, 2022), as it allows investigators to obtain a more nuanced view of behaviors. Being able to capture both sufficient and necessary relationships between variables is particularly important when studying phenomena such as sports consumption, where specific conditions may need to reach minimum levels for a specific outcome to occur but may not be enough for the outcome on their own.

NCA evaluates an antecedent condition's effect size (d) by analyzing the empty area in the upper-left corner of a scatter plot of the antecedent and the outcome. Larger empty areas indicate a stronger necessity relationship (Vis & Dul, 2018). NCA also helps identify thresholds at which antecedents start influencing an outcome and from which level upwards they become inefficient for increasing the outcome. A necessary condition becomes inefficient if an outcome reaches its potential maximum before the antecedent condition reaches its highest possible value.

To calculate the average net effects (the potential impact) of all antecedent variables, we first performed regression imputation using SEM constructs. Then multiple NCA helped detect whether specific factors (e.g., empathetic vicarious pain, excitement, athletic performance) are necessary for people's future viewing intentions. We used ceiling envelopment-free disposal hull (CE-FDH) analysis with 10,000 permutations to estimate effect sizes and p-values and to ensure the robustness of the findings. As recommended by Dul et al. (2020), we categorized effect sizes as small ($d = 0.10$ — 0.30), medium ($d = 0.30$ — 0.50), or large ($d > 0.50$). Conditions with an effect size greater than 0.10 and a p-value below 0.05 are considered statistically significant. One outlier had to be removed to avoid distorting the analysis. Identifying both the necessary conditions and their limits of efficiency provided a deeper understanding of how factors such as violence perception and vicarious pain impact future intentions (Vis & Dul, 2018).

4. Results

4.1. Measurement model

The measurement model had strong reliability and validity. Item loadings were above the recommended threshold of 0.5 (Hair et al., 2020) for all but two of the items, which we removed from subsequent analyses. All the constructs had satisfactory reliabilities, with Cronbach alpha, rho_A, and composite reliability values above 0.7, indicating good internal consistency (Cheah et al., 2023; Hair et al., 2020). Additionally, AVE values for all the constructs were above the recommended threshold of 0.5, further supporting convergent validity. Table 2 provides detailed results for all these tests.

Discriminant validity, assessed via HTMT ratios, confirmed that each construct was distinct from the others. All HTMT values were below the conservative threshold of 0.85 (Henseler et al., 2015), showing no issues with discriminant validity (see Table 3).

Table 3

Assessment of Discriminant Validity (Heterotrait-Monotrait Ratios).

Variable	Athletic performance	Excitement	Future intentions	Everyday vicarious sadism	Satisfaction	Service quality	Outcome uncertainty	Perceived value	Empathetic vicarious pain	Violence
Athletic performance										
Excitement	0.438									
Future intentions	0.282	0.44								
Everyday vicarious sadism	0.183	0.162	0.361							
Satisfaction	0.472	0.806	0.603	0.295						
Service quality	0.791	0.837	0.522	0.459	0.776					
Outcome uncertainty	0.37	0.252	0.157	0.179	0.272	0.658				
Perceived value	0.45	0.455	0.642	0.421	0.598	0.647	0.234			
Empathetic vicarious pain	0.486	0.357	0.057	0.187	0.27	0.426	0.309	0.097		
Violence	0.38	0.472	0.517	0.659	0.579	0.852	0.233	0.619	0.118	

4.2. Structural model evaluation

4.2.1. PLS-SEM

Results showed a robust fit for the structural model and satisfactory amounts of variance explained for key dependent variables, notably explaining 56.7 % of the variance for Satisfaction ($R^2 = 0.572$, adjusted $R^2 = 0.570$) and 36.9 % of the variance for Future Intentions ($R^2 = 0.369$, adjusted $R^2 = 0.367$). Hence, the model had a substantial level of predictive accuracy (Hair et al., 2019).

Service Quality showed a significant positive impact on Satisfaction ($\beta = 0.636$, $p < 0.001$), as predicted by H1. Thus, perceived service quality is a major driver of viewer satisfaction in the case of violent sports events. However, contrary to our expectation that empathetic vicarious pain would foster loyalty and engagement (H3), it seems to reduce future viewing intentions, as the link between Empathetic Vicarious Pain and Future Intentions was negative and only just significant ($\beta = -0.121$, $p < 0.05$).

Everyday Vicarious Sadism had two noteworthy effects. Results supported H5, as Everyday Vicarious Sadism was positively linked to Future Intentions ($\beta = 0.168$, $p < 0.001$), but did not support H4, as Everyday Vicarious Sadism had a small negative effect on Satisfaction (β

$= -0.075$, $p < 0.01$). This dual impact underscores the complexity of the role played by everyday vicarious sadism, as it suggests that deriving pleasure from seeing others' pain may motivate people to watch MMA fights but not necessarily enhance their overall enjoyment of MMA.

Perceived Value had a significant positive impact on Satisfaction ($\beta = 0.174$, $p < 0.001$) and a significant indirect effect on Future Intentions through Satisfaction ($\beta = 0.089$, $p < 0.001$). Satisfaction related positively with Future Intentions ($\beta = 0.512$, $p < 0.001$). These results support H7 and H9, respectively, and highlight the importance of Satisfaction and Perceived Value as drivers of future behavioral intentions.

Service Quality had a significant indirect effect on Future Intentions through Satisfaction ($\beta = 0.326$, $p < 0.001$). These results further emphasize the importance of Satisfaction as a mediator of Future Intentions. Thus, Satisfaction is a central mediating construct in the model.

Violence ($\beta = 0.456$) and Excitement ($\beta = 0.444$) made the largest contributions to perceived Service Quality, with Athletic Performance ($\beta = 0.288$) and Outcome Uncertainty ($\beta = 0.197$) acting as supporting factors. Violence and Excitement reflect the intensity and competitiveness of combat sports (See Fig. 2 and Table 4).

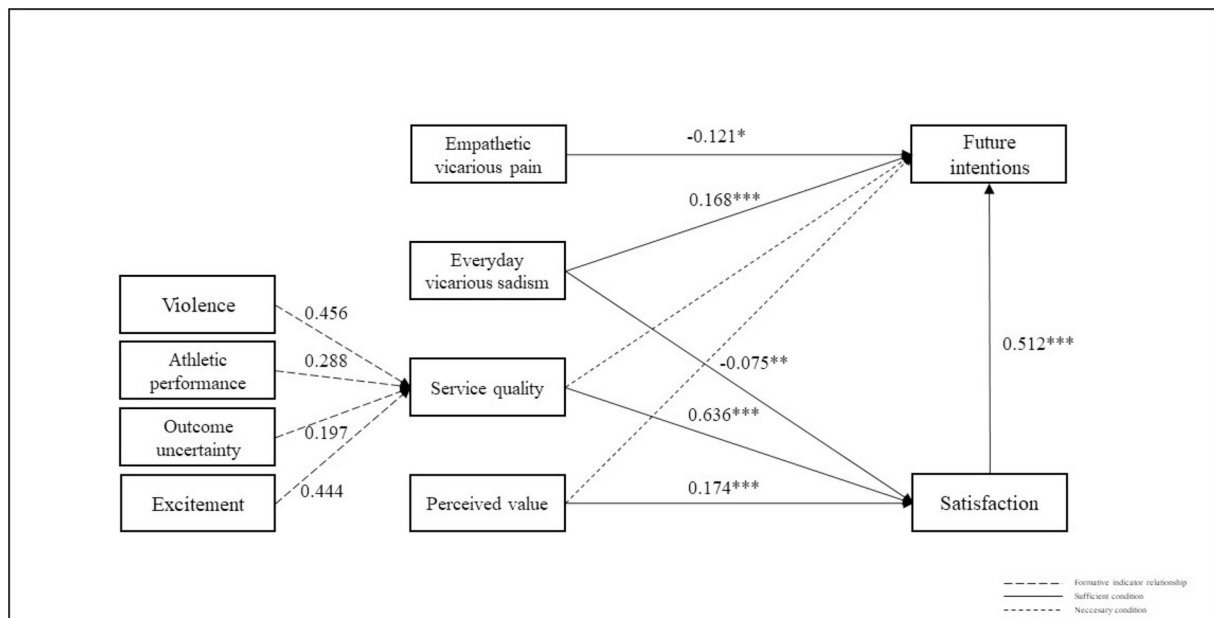
**Fig. 2.** Structural Modeling Results.

Table 4

Assessment of the Structural Model.

Relationships	β
(H1) Service quality \rightarrow Satisfaction	0.636***
(H3) Empathetic vicarious pain \rightarrow Future intentions	-0.121*
(H4) Everyday vicarious sadism \rightarrow Satisfaction	-0.075**
(H5) Everyday vicarious sadism \rightarrow Future intentions	0.168***
(H7) Perceived value \rightarrow Satisfaction	0.174***
(H9) Satisfaction \rightarrow Future intentions	0.512***
Indirect effects	
Service quality \rightarrow Future intentions	0.326***
Perceived value \rightarrow Future intentions	0.089***
Formative indicator relationship	
Violence \rightarrow Service quality	0.456
Athletic performance \rightarrow Service quality	0.288
Outcome uncertainty \rightarrow Service quality	0.197
Excitement \rightarrow Service quality	0.444
R-squared/adjusted R-squared (Satisfaction)	0.572/0.570
R-squared/adjusted R-squared (Future intentions)	0.369/0.367

4.2.2. NCA

Tables 5 and 6 report the results of NCA.

Of all the variables we assessed, Service Quality was the only necessary condition for future intentions. Service Quality's medium to large effect size ($d = 0.339$, $p < 0.001$) shows that perceiving service quality as satisfactory is essential for drawing viewers to future sports events. All four formative indicators of Service Quality—athletic performance, outcome uncertainty, excitement, and controlled violence—appear to play a crucial role in shaping viewer intentions. Consequently, H2 that posited core service quality as necessary for fostering future viewing intentions, was supported. This outcome underscores the importance of high service quality in sustaining viewers' interest in and engagement with violent sports events.

Contrary to H6 and H8, which posited that everyday vicarious sadism and perceived value would be critical for future viewing intentions, NCA results showed that neither met the required threshold (effect size $d \geq 0.10$). Everyday vicarious sadism had an effect size of $d = 0.000$ ($p < 0.001$), and perceived value had a negligible effect size of $d = 0.029$ ($p < 0.001$). These findings indicate that while these factors may influence intentions in other ways, they are not essential prerequisites.

Table 5

NCA Effect Sizes for Future Intentions.

Factor	CE-FDH	p-value
(H2) Service quality	0.339	0.000
(H6) Everyday vicarious sadism	0.000	0.000
(H8) Perceived value	0.029	0.000

Table 6

NCA Bottleneck Table for Future Intentions.

Future intentions (percent range)	Service quality ($d = 0.339$, $p = 0.000$)
10	NN
20	2.253
30	2.253
40	2.253
50	2.253
60	3.782
70	3.782
75	3.782
80	3.840
90	3.840
100	3.840

5. Discussion and conclusion

In the current study we used the example of MMA to investigate violent sports viewers' complex motivations, testing possible links between future viewing intentions and four components of service quality (athletic performance, excitement, outcome uncertainty, and violence), perceived value, and two psychological factors relating to pain and aggression: empathetic vicarious pain and everyday vicarious sadism. Our findings offer new insights into the unique consumption motivations driving violent sports viewership, highlighting the emotional appeal of aggression, alongside traditional aspects of service quality elements such as excitement and outcome uncertainty.

In non-combat sports, competitive balance and suspense – driven by outcome uncertainty – are often crucial for drawing in viewers (Frick et al., 2023; Pawlowski & Nalbantis, 2019). However, our results suggest that in combat sports such as MMA, viewer satisfaction is more strongly influenced by the visibility and intensity of violence than by the uncertainty of the outcome. This may be because MMA presents violence in a raw, unambiguous way – unlike non-combat sports where conflict is often incidental. As a result, the visceral intensity of violence may replace the suspense traditionally generated by uncertainty of outcome. While outcome uncertainty slightly improves perceived service quality, it does not play a strong role in shaping viewer satisfaction or intentions. In MMA, fans appear to be more drawn to the sport's intensity and physical spectacle than to suspense about who will win.

The link found between future viewing intentions and everyday vicarious sadism in MMA is consistent with studies of other sports featuring violence (e.g., ice hockey and football), where viewers see physicality as part of the entertainment (Cornwell et al., 2023; Paul, 2003).

Although previous research has linked empathy to deeper engagement and moral alignment in media (Oliver & Bartsch, 2010), empathetic vicarious pain was found to negatively predict future viewing intentions. Our findings suggest that in violent sports, higher empathy of spectators may trigger discomfort or moral dissonance – ultimately reducing the desire to rewatch. This result aligns with recent work suggesting that empathy can have adverse effects on further service consumption in morally complex entertainment contexts where suffering is central to the appeal (Kang et al., 2025).

The study's results indicate that certain aspects of core service quality, particularly athletic performance, are essential prerequisites for maintaining viewer interest in MMA events. This finding supports Kelley and Turley's (2001) assertion that athletic skill and commitment are key factors in shaping viewers' judgments of service quality. However, this finding challenges earlier assumptions by showing that although violence and thrill-seeking drive initial attraction, technical performance is indispensable for building viewer loyalty. In contrast, even though outcome uncertainty is generally crucial for viewer engagement (Frick et al., 2023), it is not a significant predictor of viewer interest in MMA. The intrinsic excitement generated by the aggression within MMA may satisfy audiences and replace the need for an uncertain outcome.

5.1. Theoretical contribution

The current study makes several contributions to the literature. First, by offering empirical evidence that vicarious enjoyment of pain (everyday sadism) can drive engagement, it challenges the traditional emphasis on empathy-driven viewer motivations (Jewell et al., 2012). Whereas sports marketing research has tended to focus on positive viewing emotions, such as excitement and enjoyment (Krokosz & Lipowski, 2022), our findings support an emerging view that morally ambivalent responses – such as deriving pleasure from others' suffering – can also sustain audience engagement in violent sports. Vicarious enjoyment of pain increased viewing intentions even though it had a slight negative impact on satisfaction, highlighting that satisfaction is not the only factor influencing engagement with a sport. These results

suggest that morally ambivalent emotional responses – often overlooked in existing models – may play a role in shaping demand for violent sports. The inclusion of everyday sadism expands the understanding of consumer behavior in sports by extending theories of cathartic release and thrill-seeking.

Second, by combining SEM and NCA, the current study advances understanding consumer motivation in contexts shaped by dual influences, such as hedonic gratification versus functional necessity (Vis & Dul, 2018). Although SEM revealed that everyday sadism has a significant impact on MMA viewing intentions, NCA suggested that service quality, particularly elements such as athletic performance, is a necessary condition for future viewing intentions. That is, factors driving immediate intentions, such as violent thrills, will not necessarily create sustained interest unless a sport/event meets viewers' demands for service quality. Necessary conditions for sustained behavior can be distinct from motivators sufficient for inducing more spontaneous behavior. What draws consumers initially (e.g., violent thrill) may differ from what retains them over time.

H6 and H8 were not supported: neither everyday vicarious sadism nor perceived value emerged as necessary conditions. This underscores the distinction between factors that can motivate interest and those that are truly indispensable for continued engagement.

Finally, the research findings contribute to emerging theorization on the empathy–sadism continuum in morally complex consumption. Existing literature relates empathy with positive consumer experiences, intentions to consume similar events in the future, and is often associated with pro-social responses (Bartsch et al., 2018). The current study shows that this relationship is inverted in violent sports, as empathy for athletes' pain reduces future viewing intentions. This might explain previously observed differences in viewer loyalty between sports types (Andrew, Koo, et al., 2009; Cornwell et al., 2023) where engagement appears to depend not only on service quality but also on the emotional framing of violence. Empathetic consumer responses traditionally framed as prosocial may not always align with sustained consumer engagement, particularly in domains like violent sports, where pain and suffering are integral to the experience.

5.2. Managerial implications

The present findings provide pointers practitioners can use to craft more nuanced marketing strategies that respond to the complex motivations of audiences of violent sports. Given the key role that aspects of service quality such as athletic performance, excitement, and violence play in viewer satisfaction, managers should emphasize these elements when promoting events. For example, pre-event promotion should highlight the athletes' technical prowess, as well as the event's intensity, thereby balancing the thrill of controlled aggression with appreciation for athletic discipline and performance. In contrast, while outcome uncertainty impacts perceived service quality to some extent, it plays a relatively minor role in shaping satisfaction and future intentions. Managers may therefore focus on promoting performance and the controlled intensity of combat, rather than emphasizing outcome unpredictability. Highlighting the skill and competitive drive of athletes can capture the excitement viewers seek, without glorifying harm or excessive violence.

The finding that high service quality is a necessary condition for future viewing intentions highlights the need for combat sports to meet viewers' expectations concerning service quality. Event organizers should invest in athlete training, event quality, and consumers' perceptions of value, as these are foundational to sustaining viewer loyalty. Because excitement enhances satisfaction, promoters could ensure that viewers feel they have received good value for their investment by using in-event strategies such as audience participation or pre-fight narratives to build suspense and engagement (Calabuig Moreno et al., 2014).

The effects of everyday sadism versus empathy suggest the need for adapted communication strategies for different target audiences. Our

findings show that while some viewers are motivated by the intense excitement and physicality of violent sports, others find enjoyment in witnessing others' pain. This highlights the value of psychographic segmentation in sports marketing: marketers can appeal to specific emotional profiles rather than treating violent sports audiences as a uniform group. For example, general media materials could capitalize on the controlled violence aspect of MMA, without glamorizing harm, by showcasing moments of intensity or physical resilience (Greenwell et al., 2015). Balanced content could avoid overly graphic imagery while retaining the thrill that appeals to viewers' everyday sadism. Empathy-driven engagement could be addressed to improve the image of violent sports, which many people view very negatively. Although empathy might slightly decrease future viewing intentions, marketers could appeal to more traditional audiences, and expand the fan base by leveraging empathetic narratives, e.g., by highlighting athletes' resilience and rigorous training to counter negative perceptions. In contrast, social media channels addressing potential spectators who enjoy witnessing the pain of others could be used for transmitting more violent message contents.

5.3. Limitations and further research

The current study has several limitations. The first limitation arises from the fact that our sample was restricted to consumers living in North America. Cultural contexts and fan behaviors can vary significantly between countries and ethnicities, so our respondents' perceptions and beliefs may differ from those of viewers in other regions. Consequently, our findings may not be generalizable to regions outside North America. To gain broader insights, future studies should include respondents from a variety of countries with different cultures, and which have embraced combat sports to different degrees. Focusing on MMA also limits the generalizability of our findings to other sports. Future studies could assess our model's broader applicability by examining similar dynamics in other potentially violent spectator sports, including emerging extreme sports.

Another limitation relates to the use of self-report measures, which can lead to respondents underreporting certain motivations (e.g., enjoying violence) due to concerns about their social desirability. Future research could overcome these potential biases by using experimental approaches or physiological measures.

Future research should explore the continuum between empathetic pain and vicarious sadism within sport consumer behavior frameworks. Given the contrasting roles played by empathetic pain and vicarious sadism, it would be interesting to investigate differences in motivations between different subgroups of viewers. Qualitative research on why violence attracts some viewers but repels others could provide insights into different audience segments across various violent sports.

Finally, although combining a regression-based approach such as SEM with multiple NCA provides valuable insights, it does not overcome the fact that intentions do not always translate into actual behavior. Intention may be a necessary precursor for watching MMA, but it is not a sufficient condition. Future studies could measure actual viewing behavior, such as TV viewing data, internet clicks, and viewing time.

CRedit authorship contribution statement

Tommy Kweku Quansah: Writing – original draft, Visualization, Software, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Markus Lang:** Writing – review & editing, Supervision, Software, Investigation, Conceptualization. **Hans Mühlbacher:** Writing – review & editing, Validation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence

the work reported in this paper.

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