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## Brazilian jiu-jitsu as social and psychological therapy: a systematic review

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### Abstract:

The results surrounding the socio-psychological contribution of the martial arts are contested. One analytical distinction that has been made is that traditional, as opposed to modern martial arts, are more well-suited to such ends. Yet, this distinction is not always made, rendering shallow the analytical depth of this topic. Brazilian jiu-jitsu (BJJ) is an emerging martial art that has been highly touted as a social and psychological form of therapy. However, this claim derives from anecdotal reports and narratives. BJJ's potentially therapeutic properties have been understudied because of the sport's recent emergence. It has not been systematically assessed to date. Considering BJJ's late emergence and direct connection to other modern martial arts, it is unclear whether BJJ is considered a modern- or traditional martial art; something that has implications for a martial art's potential to contribute towards developmental outcomes. This systematic review identified 12 articles of BJJ's potential social- and psychological properties. In summary, the research on BJJ is focused on two salient themes: the psychosocial outcomes and the social meanings of BJJ. The former tended to focus on the relationship with aggression, with little theoretical consideration for how BJJ functioned as an agent of social change. However, the latter offered a glimpse into such mechanisms through sociological inquiries that effectively highlighted how BJJ entails developing resilience. While the literature uniformly indicated that BJJ holds promise as a form of therapy, research also points to BJJ's complex social nature. This characteristic entailed social rituals that BJJ-practitioners go through, which are socially- and morally debatable. The review thus suggests further theoretical considerations to the emerging field of BJJ research. In summary, BJJ training may be an appropriate public health intervention considering its social climate and emphasis on developing resilience and its mitigating effect on aggression. However, more research is needed to explore unhealthy traditions that seem to exist in BJJ.

**Key Words:** martial arts, combat sports, socio-psychological, aggression, resilience, intervention

### Introduction

The martial arts hold the potential to promote a host of developmental outcomes, extensively researched in the literature. Yet, there appear to be contrasting results that cast doubt on the potential of martial arts to contribute towards socio-psychological outcomes. This lack of clarity can effectively be illustrated with several recent reviews concerning martial arts and aggression. For example, Harwood et al. (2017) reviewed 12 studies. They found stable evidence for martial art's mitigating effect on aggression, whereas Gubbels et al. (2016) and Moore et al. (2020) found no association at all. More concerningly, Gubbels et al. (2016) noted a publication bias in favor of studies that detect positive socio-psychological effects. In their seminal review of martial arts and socio-psychological outcomes, Vertonghen and Theeboom (2010) declared that it indeed is contested and that we lack robust evidence. Over a decade later, in the most recent review, Lafuente et al. (2021) concluded that this problem is still the case but that there seems to be a significant but weak mitigating effect on aggression. How are we to understand these contradictions? One of the issues may lie in the definition of martial arts and the heterogeneity between martial arts disciplines. Martial arts is an umbrella term spanning across a multitude of disciplines, ranging from non-contact martial arts (e.g., tai-chi) to full-contact competitive disciplines (e.g., Thaiboxing).

These disciplines not only differ in features and norms, but their practitioners also differ in characteristics, such as levels of aggressiveness (cf. Vertonghen et al., 2014). As Lafuente et al. (2021) point out, a decisive factor in whether martial arts may promote socio-psychological development seems to be contingent on whether the practiced martial art is considered traditional or modern. While modern martial arts lack a clear foundation or belief system with clear ethics and norms for practitioners to rely on, traditional martial arts are deeply seated in a pacifistic belief with an immense cultural legacy that emphasizes self-control, discipline, and humbleness (Zivin et al., 2001). In returning to the fragmented findings of reviews on aggression and martial arts, it is thus not surprising to note that Harwood et al. (2017) found the strongest positive effects, also almost exclusively included martial arts considered traditional. Clearly, this point makes problematic the analysis of the aggregation of a wide range of martial arts as a single study. One might even argue that this approach plays a zero-sum game, considering that modern martial arts seem to promote aggression. In contrast, traditional martial arts seem to mitigate it (Nosanchuk & MacNeil, 1989). Consequently, by failing to make this distinction, studies

fall into traps that do not consider the varying character and associated outcomes of various martial arts, at times without accounting for such an important moderator. This point brings us to this paper's paradoxical martial art: BJJ.

BJJ is a martial art originating from Brazil and Japan. Specifically, it is a grappling sport that utilizes chokeholds and joint locks. Participants are dressed in traditional kimonos and are ranked according to experience and skill, ranging from white belts to black belts. The sport was primarily noticed through its embodied appearance by the Gracie clan in the early days of the Ultimate Fighting Championship's (UFC) event in the mid-'90s. Within this mixed martial art (MMA) event, a physically smaller, kimono-dressed man neutralized and defeated opponents far more muscular. This attention sparked an intense interest in the art of BJJ. Quickly acquiring BJJ skills became a necessity in order to be competitive within MMA. Since its appearance in the UFC, BJJ has accompanied MMA on its explosive rise and emerging popularity (Blue, 2013). For example, this popularity can be characterized through the growing numbers of BJJ- and MMA clubs in the UK, going from 12 in 2009 to a stunning number of 320 in 2020 (Sugden, 2021). In stark contrast to MMA, which is surrounded by discourses on gross violence, commercialization, glorification of violence, and ambiguous reputation (García & Malcolm, 2010), BJJ is founded on a traditional philosophy and has been attributed social, and even spiritual, meaning (Pope, 2019). Pope (2019, p.306) states that BJJ has the capacity to "...shape human nature in a positive way, that is both for the practitioner in terms of internally directed virtue development and achieving a calm inner state..".

Furthermore, known as 'the gentle art', BJJ emphasizes concepts such as playfulness and flow (Pope, 2019) and resembles a game of human chess and problem-solving (Hogeveen, 2013). This proposed nature of BJJ has led scholars to examine whether BJJ can contribute towards subjective well-being (Fogarty, 2020) and if it has therapeutic properties, for example, in military populations (Collura, 2018), or if the sport can be useful in educational programs for youth (Bueno & Saavedra, 2016). Reusing (2014) explored the lives of five prominent BJJ practitioners in-depth. He found that the salient themes which emerged were how BJJ was intertwined in discourses on social values and teamwork and how BJJ clubs functioned as safe spaces, sometimes with clinical meaning. Although the cited works have shown great promise for BJJ's potential to contribute towards developmental outcomes, there is still a palpable dearth of research on this topic. The evidence for this fact includes that the above references are mostly grey literature, with scattered scopes and research questions. Furthermore, these anecdotal reports and accounts of BJJ connect such practices to spirituality (Jennings et al., 2010), mindfulness (Miyata et al., 2020), discipline (Lakes & Hoyt, 2004), and pacifistic values (Zivin et al., 2001) and resembles the literature on more traditional martial arts.

This background introduces a peculiar paradox. BJJ is a modern martial art in terms of temporality; however, its indicated philosophy and its associated features and norms seem to point towards a more traditional understanding of martial arts. This paradox is further spurred because BJJ made its most remarkable and noticed appearance in MMA competition, which is today's benchmark for how modern martial arts look. Yet, MMA and BJJ are sports that go well together, as evidenced by the fact that most MMA gyms also house BJJ classes. Utilizing martial arts in general as a social intervention is frequently done by social workers; however, they often do so without the empirical evidence behind it (Theeboom et al., 2008). This practice is peculiar, given that different martial arts indeed seem to be associated with different levels of anti-social behavior (e.g., Theeboom et al., 2014). Consequently, it is imperative to assess the evidence behind an intervention's potential capacity; it now stands clear that BJJ has attracted attention for its possibility to contribute towards psychosocial outcomes, often mentioned in a therapeutic sense. Additionally, despite a dearth of reviews on martial arts socio-psychological contributions, BJJ has yet to be included and studied (Moore et al., 2020; van der Kooi, 2020; Vertonghen & Theeboom, 2010). Tentatively, the recent origin of BJJ compared to the long existence of other martial arts has contributed to BJJ's absence within the literature. Given the anecdotal narratives on how BJJ can change lives (Dzabirski, 2018), BJJ surely is an addition to the sociological- and psychological literature on martial arts. Considering the positive narratives surrounding BJJ combined with an overall increasing rise in BJJ practitioners, it is now high time to compile- and assess the evidence behind these claims. Contemporarily, research on BJJ is heavily dominated by topics such as injury prevalence or performance aspects (e.g., Detanico et al., 2017; Jones & Ledford, 2012, Øvretveit et al., 2019). To date, no research has systematically assessed the social- and psychological meanings and effects of BJJ practice, despite its emerging popularity and potential value as a social intervention. The current study sought to assess socio-psychological effects due to BJJ practice systematically. The following research question was posed: how does BJJ affect- or associate to social- and psychological factors? The current paper is structured as follows: 1) method, 2) results, and 3) a discussion that ties together the findings, evaluates BJJ's potential as a social intervention, and proposes further directions.

### **Material & methods**

The current study sought to conduct the systematic review with rigor, following Khan et al.'s (2003) guidelines. These include 1) framing the research question, 2) identifying relevant work, 3) assessing the quality of the studies, 4) summarizing the findings, and 5) interpreting the findings.

#### *Inclusion and exclusion*

The articles had to be 1) peer-reviewed, 2) written in English, 3) include empirical material, and 4) include a

social- or psychological aspect or outcome. The latter was shaped more broadly given the review’s sport-specific scope but still needed to be central to the study scope. Both qualitative- and quantitative work was included. Articles that compared BJJ populations to other sporting populations were included; however, articles that exclusively aggregated the results of the BJJ population with other sport populations were excluded. Furthermore, grey literature was not included in the current review.

In order to preserve the scope of the study and avoid covering performance-related findings, the study excluded all personality traits that were discussed regarding performance (e.g., mood-states in competition, perceived competence, self-confidence, etc.). Furthermore, the study excluded literature that only concerned physical aspects, including weight loss and factors associated with it (e.g., disordered eating), historical accounts of how the sport had developed, and organizational inquires (e.g., leadership quality, etc.). In short, the review was not concerned with sport-specific, historical, organizational, or competitive aspects but instead concerned with social- and psychological aspects that could indicate BJJ’s potential effect outside of the sport itself.

*Search strategy*

Four major databases were searched: Google Scholar, PsycINFO, Scopus, and SportDISCUS. Before conducting the main searches, a preliminary investigation was undertaken to acquire a pre-understanding of the literature's breadth and depth. Based on this pre-understanding, the searches were conducted in January 2021, with a single search word: “Brazilian jiu-jitsu”. At all search engines but google scholar, the keyword Brazilian jiu-jitsu was used without any search restrictions. In google scholar, it was stated that the keyword had to be found within the title of the study to make a reasonable limitation for the specific database. Initially, 576 articles were identified. After the removal of duplicates, 454 remained. All these article’s abstracts and titles were screened to assess their preliminary eligibility. If the articles made no mention of any social- or psychological aspects of martial arts training, they were excluded. In total, 387 articles were excluded, leaving 67 for a final full-text review. Out of these, 12 articles were deemed fit for final inclusion.

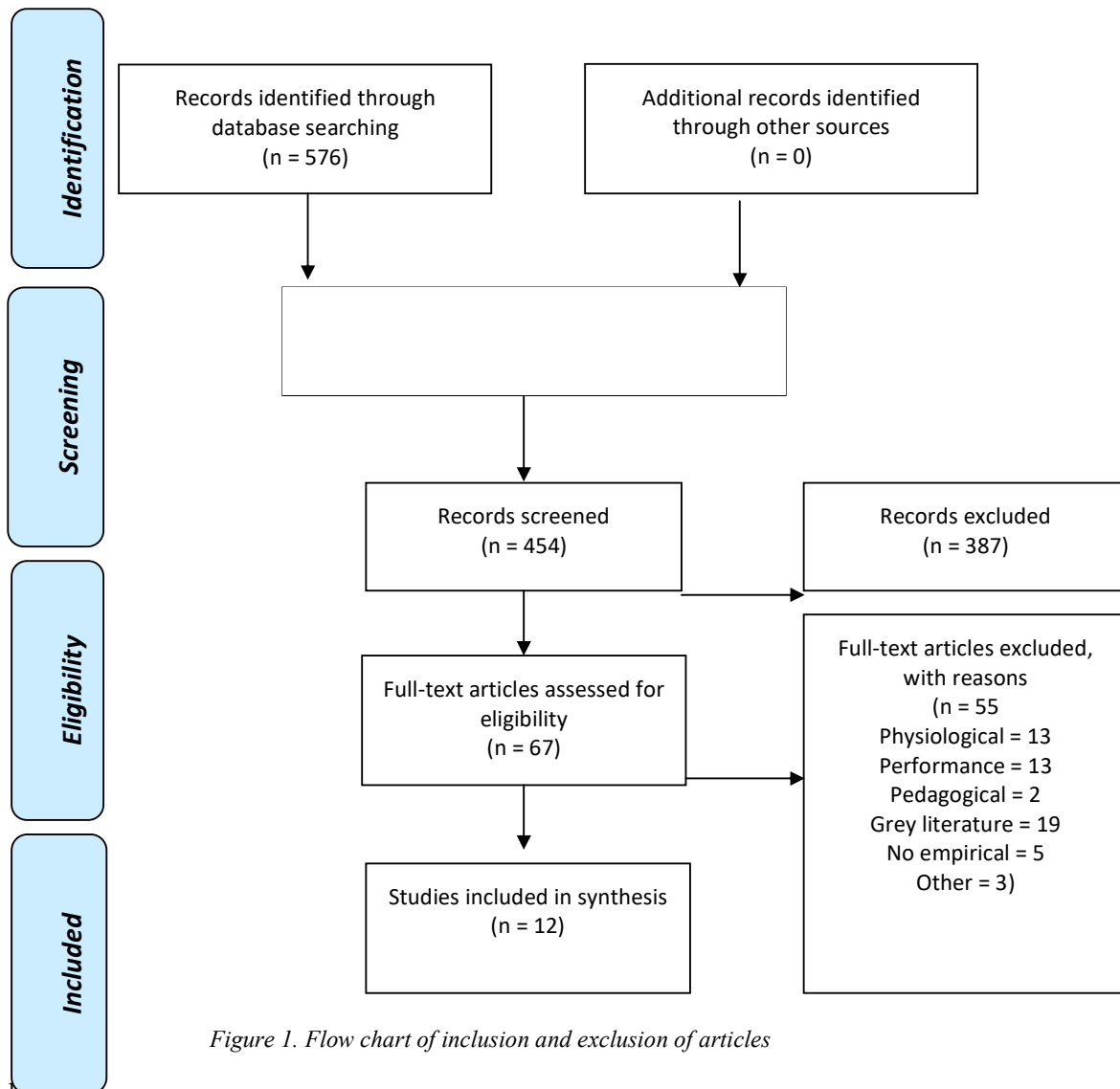


Figure 1. Flow chart of inclusion and exclusion of articles

## Results

Within the results section, the descriptive characteristics of the studies will be accounted for at first, followed by two emerging themes: 1) psychosocial outcomes and 2) social meanings of BJJ practice.

### *Descriptive characteristics*

The earliest studies within the set-out inclusion criteria were published as late as 2016 (Chinkov & Holt, 2016), which gives a clear picture of the novelty of socio-psychological research in BJJ. Nine of the studies deployed a quantitative design, consisting mainly of cross-sectional designs ( $n = 6$ ), followed by (quasi)experimental designs ( $n = 2$ ) and social network designs ( $n = 1$ ). Out of the three qualitative studies, two ( $n$ ) deployed an ethnographic approach, and one ( $n$ ) used semi-structured interviews.

There was a clear notion of BJJ's potentially therapeutic properties, characterized by the fact that half of the studies explicitly linked or discussed the practice of BJJ as a form of psychosocial therapy. Additionally, one study (Willing et al., 2018) used BJJ as an actual clinical intervention. Furthermore, there was a geographical diversity of the studies, where most studies were conducted in Central Europe ( $n = 5$ ), followed by the UK ( $n = 2$ ), Sweden ( $n = 1$ ), Canada ( $n = 1$ ), Guam ( $n = 1$ ), the US ( $n = 1$ ) and Brazil ( $n = 1$ ). The conceptualizations differed to some extent between the included studies. Seven ( $n$ ) studies examined psychosocial markers and their association to BJJ-practice; two ( $n$ ) studies spanned across several themes, including both mental health and social bonding within BJJ-clubs; one ( $n$ ) study examined social identity concerning positioning within a social network, and one ( $n$ ) study examined a social ritual within BJJ-clubs and how this related to perceptions of this ritual and associations to in-group ties and identity.

### *Psychosocial outcomes*

A bulk of the included articles assessed aggression levels in BJJ practitioners (Blomqvist Mickelsson, 2020; Janowska et al., 2018; Pujszo et al., 2018; Vit et al., 2019; Wojdat & Ossowski, 2019). The assessment of aggression levels was mainly examined in comparison to other sports such as MMA (Blomqvist Mickelsson, 2020), baseball players (Vit et al., 2019), hip-hop dancers (Pujszo et al., 2018), and judo (Janowska et al., 2018) with one study examining gender differences within a BJJ-sample with a control group (Wojdat & Ossowski, 2019). Notably, all studies mentioned above used the Buss and Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992), further consolidating the BPAQ as the gold standard aggression inventory. Notably, few elaborate accounts of any theoretical mechanisms underlying the relationship between BJJ and aggression are to be found. Generally, distinctions are made between instrumental aggression and sport-specific aggression, where it, for example, is concluded that aggression is a neurobiological human trait (Wojdat & Ossowski, 2019) needed to survive, but that sport can fulfill educational aims, and therefore indirectly reduce aggressive levels (e.g., Pujszo et al., 2018, p.768). Wojdat and Ossowski (2019) argue that BJJ-practice will facilitate emotional processing more adequately, therefore being able to resolve conflict more easily. Still, such an hypothesis remains untested, since emotional processing was never examined.

Overall, the results point to a negative correlation between training experience and aggression; in other words, more experienced BJJ practitioners report lower levels of aggression (Blomqvist Mickelsson, 2020; Janowska et al., 2019; Wojdat & Ossowski, 2019). Additionally, the studies that examine aggression also generally agree that BJJ practitioners exhibit low aggression levels compared to other populations. Whereas no findings between BJJ practitioners and baseball players were found (Vit et al., 2019), BJJ practitioners reported lower aggression compared to hip-hop dancers (Pujszo et al., 2018), control-groups (Janowska et al., 2019; Wojdat & Ossowski, 2019), MMA practitioners (Blomqvist Mickelsson, 2020) and judokas (Janowska et al., 2019).

Other psychological constructs that were examined included life satisfaction (Wojdat et al., 2017), pro-social behavior, self-control, crime frequency (Blomqvist Mickelsson, 2020), PTSD markers, anxiety, depression, and alcohol intake (Willing et al., 2019). Overall, life satisfaction was significantly higher in BJJ-practitioners than control groups (Wojdat et al., 2017), and BJJ-practitioners significantly increased levels of pro-social behavior and self-control, while reported crime frequency dropped (Blomqvist Mickelsson, 2020). Of note is the populations studied. Whereas the bulk of the studies examined 'regular' practitioners, Willing et al. (2019) utilized BJJ as a complementary therapeutic element for military veterans, with the primary aim of examining changes in PTSD scores. Consequently, in light of the discussions surrounding BJJ's potentially therapeutic properties, Willing et al. (2019) are the only authors that explicitly use BJJ as what could be perceived as a clinical intervention. Within their study, Willing et al. (2019) found clinically meaningful improvements in PTSD-markers, along with improvements in anxiety, depression, and reduced alcohol intake; however, it was a pilot study, and the results ought to be interpreted accordingly due to sample size issues, as accounted for below.

However, in general, these (quantitative) studies were conducted with low sample sizes with BJJ-practitioners such as, for example, 30 ( $n$ ) (Janowska et al., 2019; Vit et al., 2019), 33 ( $n$ ) (Pujszo et al., 2018), 50 ( $n$ ) (Blomqvist Mickelsson, 2020), 63 ( $n$ ) (Wojdat et al., 2017) with the biggest sample size being 81 ( $n$ ) (Wojdat & Ossowski, 2019). Although using BJJ as a clinical intervention, only 9 ( $n$ ) participants fulfilled the whole intervention in Willing et al.'s (2019) study. Despite these low sample sizes, there are numerous statistically significant findings (except for Vit et al., 2019); this further spurred the notion that there is something inherent in BJJ that promotes psychosocial development.

Additionally, although many studies discuss causality in some form regarding how sporting experience allegedly affects aggression levels, most of the studies only deploy a cross-sectional design except Blomqvist Mickelsson (2020) and Willing et al. (2019). However, even the latter articles lack randomization (Blomqvist Mickelsson, 2020) or control groups (Willing et al., 2018). Despite this design, the latter two studies offer a glimpse into the causal effect of BJJ practice, although this should be carefully interpreted.

In short, there is a palpable absence of theoretical accounts of how BJJ functions as an agent of (psychosocial) change. In the aforementioned studies, the theoretical basis is often grounded in prior research that posits whether combat sports are either psychosocially beneficial or not. These contrast the philosophies of traditional martial arts versus modern martial arts but are rarely analyzed with any comprehensive theoretical framework. In short, this presents a methodological caveat in the quantitative socio-psychological BJJ research, where most design and sample sizes prevent a thorough discussion of causality. At the same time, the absence of theoretical explanations retains the ‘black box’ status of such studies.

#### *Social meanings*

In the ethnographical studies, Sugden (2021) immersed himself within the local BJJ-gym for three years trained in where he “...socialized, fought and competed with members of an urban MMA gym” (p.2). Drawing from his three-year ethnography and inspired by the salutogenic health model Sugden (2021) uncovers many themes but primarily about mental health. Specifically, the author frequently encounters sentiments that discuss the link between mind and body and how BJJ facilitates personal development and the construct of mindfulness. In auto ethnographical fashion, Sugden (2021) also notes how he, to his surprise, experiences the BJJ gym and local BJJ competitions as extremely friendly and kind spaces which he positions against the mainstream discourse on combat sports gyms with connotations to gross- and barbaric violence. This experience is corroborated elsewhere, where coaches- and peers facilitate the acquisition of life skills (Chinkov & Holt, 2016) and where peer interactions predict stronger in-group ties and continuous engagement within the BJJ club (Rodrigues et al., 2018). In short, the social climate within BJJ clubs functions as a powerful mediator for other social experiences, where peers and coaches have a central function. However, a social function is also found within the actual physical practice. Consider the following excerpt from an informant from Sugden (2021, p.24):

*“Nowhere else can you spend an hour on the mat with someone, knock 10 bells out of [beat] each other or choke each other 10/15 times and then come off and chat about what you did right or what you did wrong, and develop this kind of bond and this friendship”*

Subsequently, Sugden (2021, p.24) concurs with the informants’ notion of BJJ-practice, and the core of this social bonding practice can thus be traced to the sparring itself.

Relating more directly to mental health is the coping mechanisms that practitioners experience. Sugden (2021) notes that coping with anxiety and depression often surfaces in discussion with the practitioners and relates to the nature of BJJ. The content of the interview material indicates that participants learn to cope with stress and anxiety – a life-skill they transfer to the outside world by surviving the physical and stressful encounters on the mat. Consequently, drawing from Sugden’s (2021) ethnography, BJJ indeed resembles therapy. In his work, Farrer (2019, p.407) responds to this exact parallel by posing the question: “*How does therapy arise from techniques to incapacitate, injure, and kill? What could be the malady? Who requires treatment?*” Farrer (2019) himself engaged in the local BJJ scene at the militarized Island of Guam for 18 months.

On the contrary to Sugden’s (2021) health-oriented model, Farrer (2019) takes a theoretically different approach and attempts to view the BJJ-as-therapy parallel as ‘shifting subjectivities’. That is, BJJ can take many forms, including the re-enactment of death, eroticism, and health (Farrer, 2019). Consequently, BJJ, along with all its properties, are contingent upon these subjectivities and how they shift. The author presents slightly more critical results- and analysis compared to Sugden (2021), in which he claims that positioning BJJ as a form of therapy is possible for some. However, for others, it could be considered an ironic joke. Regarding the latter, Farrer (2019, p.426) argues that some may adhere to the notion of BJJ as a therapy on the grounds of hyper masculinity; that real therapy is for “...*the mentally ill, wimps, failures, or deviants...*”. However, Farrer (2019) also highlights elements of BJJ in a positive light. Relating to Sugden’s (2021) coping mechanisms is Farrer’s (2019) exploration of survival as a concept in BJJ. Again, the nature of BJJ practice entails being physically dominated (or dominating) another human being – a highly stressful scenario, something that Chinkov and Holt’s (2016) participants also stress. In Chinkov and Holt’s (2016) study, participants frame this as ‘perseverance’, and as one coach put it:

*“...persevere under pressure, no matter where you are. ... When your opponent’s crushing you down, you don’t give up just because it’s uncomfortable. You persevere, you have heart, you carry on. These are values that also take place out into the workplace, and take place out into your social interactions”* (Chinkov & Holt, 2016 p.146)

Consequently, BJJ gives participants abilities that extend beyond the sport sphere and could be transferable into the workplace. These sentiments of ‘coping’ and ‘surviving’ in BJJ practice were framed in a more clinically oriented manner, in which Willing et al. (2019) argued that BJJ resembles exposure therapy. In one out of the two quantitative articles on a social phenomenon at the group level, Kavanagh et al. (2019) examined how social cohesion and pro-group behavior were affected by a very specific tradition within BJJ,

namely 'belt whipping' in a sample of 605 (*n*) BJJ-practitioners. Belt whipping refers to a ritual where a practitioner is awarded a new rank (i.e., belt). Subsequently, the practitioner must walk "...past a line of their training partners, who stand shoulder-to-shoulder and use their untied belts to whip the individual being promoted, which often results in severe welts and bruising" (Kavanaugh et al., 2019, p.464). Kavanaugh et al. (2019) found that if the promotion was experienced as an overall positive experience, it was significantly linked to stronger identity fusion group bonds and group identification; however, no statistically significant link could be established if the promotion had been perceived as a negative experience.

Furthermore, the authors established a mediating pathway where identity fusion mediated the relationship between positive experiences of the promotion and costly pro-group sacrifices, operationalized as donating money, risking life, and donating time. Identity fusion proved to be a consistently reliable mediator across all relationships. Kavanaugh et al. (2019) advance the socio-psychological research on BJJ by moving beyond merely measuring personality traits and linking a much-debated ritual to phenomena at a group level. The concept of identity fusion can also be linked to Sugden's (2021) experiences within the MMA-gym. Sugden (2021, p.19) posited that:

*"It is the confronting nature of the training along with the commitment, sacrifice, and time required to train and improve which is significant engendering dropout. Yet the consequences of overcoming these difficulties are profound."*

By enduring and overcoming the difficulties of BJJ practice, BJJ-practitioners may be more inclined to partake in promotions that include belt-whipping. Tentatively, such rituals consolidate the suffering and the perseverance that BJJ practice entails, as displayed by the above excerpt. In so far, the study on BJJ that extends beyond the psychosocial, cross-sectional realm seem to be both methodologically- and theoretically more informed.

## Discussion

The review sought to assess social- and psychological effects and associations tied to BJJ practice. Evidently, the research on BJJ is clearly still in its infancy, although not surprising, as BJJ as a sport only surfaced in the mid-'90s in conjunction with the UFC. Comparing this research to the traditional socio-psychological research on martial arts, it becomes clear that other traditional martial arts have been around longer and received much (more) scholarly attention. Considering the seminal review from Vertonghen and Theeboom (2010), karate and taekwondo dominates while there is no mention of BJJ. This point still holds because the most recent review on martial arts and mental health still does not include BJJ (Moore et al., 2020; van der Kooi, 2020) In so far, the current review is the first to summarize what we currently know about BJJ's potentially social- and psychological contribution. The main findings of this review consist of descriptively mapping the field and its methodological- and theoretical caveats and challenges. However, the review also links different concepts to each other, ultimately pointing to how the nature of BJJ contributes towards resilience and how this relates to a strong social culture within BJJ-gyms.

One of the first salient findings is the extreme focus on psychosocial outcomes, but specifically aggression, evidenced by many quantitative studies. This finding generally reflects the field's tendency to focus on this particular trait with combat sports (Vertonghen & Theeboom, 2010). Furthermore, these studies were most often carried out in a cross-sectional fashion, with low sample sizes. Additional concerns consider the lack of theoretical explanatory power – few, if any, theoretical accounts were given in most of these quantitative studies concerned with aggression. This point is also reflective of a broader debate on whether combat sports, in general, are associated with higher- or lower levels of anti-social behavior (Endresen & Olweus, 2005). This research question has been engaging scholars for decades (Nosanchuk & MacNeil, 1989) and seems to proliferate every time a new combat sport emerges. Although these methodological and theoretical shortcomings limit the inference, we can draw from these studies. The studies consistently show that BJJ practitioners, in most cases, report lower levels of aggression compared to other groups. Yet, when compared against, for example, Vertonghen, Theeboom, and Pieter's (2014) work, BJJ-practitioners (Wojdat & Ossowski, 2018) are less (physically) aggressive than Thai boxers but reports higher scores on the BPAQ-scale than aikido-, judo- and karate practitioners.

Secondly, many studies discussed the nature of BJJ practice and how it entailed 'coping' (Sugden, 2021), 'survival' (Farrer, 2019), and 'perseverance' (Chinkov & Holt, 2016). Willing et al. (2019) conceptualized BJJ as a promising sort of exposure therapy in a more clinical spirit. These concepts are closely aligned to one another in their psychological construct and refer to how they develop resilience due to BJJ practice. Also important to this phenomenon is the social context in which it is embedded. Evidently, a strong social and pleasant atmosphere mediated these experiences, in which peers took a central role.

Consequently, despite battling each other, the BJJ practitioners stimulate one another's personal development through the challenging practice. Relatedly, Andreasson and Johansson (2019) noted how MMA-practitioners forged a strong social community through long (common) preparations before bouts. Additionally, on the benefits of how sport relates to social relationships, Jones (2001) highlights how boxers tend to hug after bouts, showing respect and appreciation for the opponent. The grueling practice of combat sports in general thus seems to stimulate personal development and social bonds as practitioners collectively overcome the practice.

Drawing from a plethora of quotes from the qualitative studies, a therapeutic property lies in the actual physical encounter that BJJ-practitioners engage in, as we keep returning to how sparring constitutes the foundation for such development and social bonding.

It should be emphasized how BJJ not only contributes towards physical health; physical health may be the first detectable sign when one engages in BJJ practice, but it may also have the capacity to stimulate both resilience and access to a social networking relation to the appropriateness of BJJ as a social intervention. Considering the palpable lack of theoretical frameworks that intend to explain how personal development occurs from this specific practice, there is a need to formulate and advance the theory applied to this phenomenon. This application entails a broader exploration of the psychological literature; however, given the results here on social bonding, such a theoretical framework could effectively be merged with sociological theories. We need to re-organize our idea of violence in general and conceive sparring in martial arts as a collaborative activity, where training partners push each other towards physical and psychological development through the embodied practice. Drawing from specifically Sugden's (2021) thick descriptions, both his own and his informant's experiences align with such a view. The physicality of combat sports sparring and the challenges BJJ-practitioners oppose for one another can be perceived as a collective emotional experience, which provides a breeding ground for social relationships.

Finally, the social climate and the group dynamics play an important role in BJJ gyms. BJ-gyms engage in physically- and mentally challenging practices, but the social atmosphere that these practices are embedded in is social- and comforting (e.g., Chinkov & Holt, 2016; Sugden, 2021). Notwithstanding the friendly and socializing atmosphere, it is, however, also intertwined with social rituals (i.e., belt whipping) that have been morally disputed. Considering Chinkov and Holt's (2016, p.141) justification for choosing BJJ in their study: "The sport has an underlying philosophy that may be particularly suited for the acquisition of life skills based on the values of efficiency, patience, and control", such rituals seem peculiar and contradictory, given the alleged underlying philosophy in BJJ. On the other hand, by enduring the belt whipping, it may also be argued that practitioners display discipline, patience, and control. However, the social meaning of this ritual is still not explored in the academic literature but is constrained to popular media and anecdotal statements by renowned BJJ practitioners. As a future research proposal, research ought to combine sociological lenses with social psychology to collaboratively explore why this ritual occurs, who is inclined to partake on what grounds, particularly considering the strong social culture within BJJ clubs.

## Conclusions

This study is the first to assess the therapeutic properties of BJJ systematically. The field currently suffers from a lack of theoretical consideration and methodological caveats. Consequently, it is imperative to further explore and emphasize the mechanisms at play that make BJJ a suitable form of therapy and look to alternative theoretical explanations and more rigorous designs. Nevertheless, the review also shows that BJJ holds great promise as a sociopsychological intervention; it is consistently associated with low levels of aggression, development of resilience, and the possibility of extending one's social network. In other words, BJJ may constitute a community that can buffer against mental illness and promotes well-being. This goal has direct implications for social workers, psychologists, and physical therapists that seek to combat public health issues. Additionally, considering the current pandemic and the mental illness it has brought with it, along with decreases in physical activity, practitioners and policy-makers will need to address how to go from here to re-establishing a healthy baseline of physical and psychological standards. BJJ seems appropriate to achieve these outcomes.

**Conflicts of interest** -the authors have no conflicts of interest.

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