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Self-Control and Aggression Amongst Mixed Martial Arts Practitioners

Trajectories and Mitigating Mechanisms

Abstract

Mixed Martial Arts (MMA) is a popular, yet controversial, martial art which have amassed plenty of practitioners and fans in recent years. MMA-gyms frequently conveys the message that the sport of MMA facilitates sociopsychological development; however, the evidence for this claim is weak. Instead, Blomqvist Mickelsson (2019) have reported that young and novel MMA practitioners may increase in aggression. However, the same practitioners also exhibited increased self-control. This finding is peculiar, as the psychological core of these characteristics are opposite to one another. This would suggest that the increased self-control did not mitigate aggression levels. Thus, a series of moderation analyses were performed with the same MMA practitioners (n = 63) who underwent a 5-month training intervention. The results indicated that initial levels of either trait both predicted and interacted with each other. These results suggest that, despite the parallel increase in both characteristics, high levels in one of aforementioned traits may mitigate the other. Finally, further inquiry revealed that, some items in the Self-Control Scale may draw from different dimensions related, and non-related, to aggression; thus, allowing practitioners to increase in both self-control and aggression simultaneously. These findings may have practical implications. Whereas MMA-training may be harmless when practiced by individuals with high self-control and low aggression, the combination of these traits is not common amongst youths at risk.

Keywords

Martial Arts, Self-Control, Aggression, Mixed Martial Arts

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Introduction

The practice of martial arts and its sociopsychological harm or benefit have been debated for quite some time, where no empirical consensus has been achieved. Alas, the current literature around the sociopsychological outcomes due to practicing martial arts have been split by the paradoxical findings of either elevated aggression or increased self-control.

Indeed, whereas a substantial amount of research indicates increased aggression amongst martial artists (e.g., Endresen & Olweus, 2005; Kreager, 2007; Mutz, 2012; Sofia & Cruz, 2017), other scholars report positive effects, such as increased self-control (e.g., Lakes & Hoyt, 2004, Zivin et al., 2001, Twemlow et al., 2008). Verthongen and Theeboom (2010) reviewed over two decades of martial arts research and found that, while the majority of the data seemed to indicate positive effects due to the practice, there still remained occasional negative reports. The authors concluded that the results are inconsequential, and that the literature was limited due to methodological issues such as an overwhelming use of cross-sectional designs. Furthermore, a recent metanalysis reported that no link between externalizing behavior and martial arts could be established; however, the authors imply that their results may not reflect the true externalizing behavior amongst martial artists, due to a detected publication bias (Gubbels, van der Stouwe, Spruit & Stams, 2016). In what may be the most recent metanalysis on the topic, Harwood, Lavidor and Rassovsky (2017) found methodological improvements and positive results from longitudinal studies that indicated that martial arts do decrease aggression and externalizing behavior.

The relationship between self-control and aggression is a peculiar one; Denson, DeWall and Finkel (2012) points out that, even though criminology and sociology have acknowledged the relationship between these two characteristics, it has remained somewhat unexplored in the domain of (general) psychology. However, recent research has investigated interactions between self-control and aggression in both non-athletic (Keatley, Allom & Mullan, 2017) and athletic populations, including martial artists (Manuel Sofia & Cruz, 2015). The authors reported that self-control seems to mitigate aggression. However, due to the cross-sectional nature of both studies, we do not know if self-control mitigated *trajectories* related to aggressive levels, only that participants high in self-control seemed to have less aggression levels.

While the sociopsychological research around martial arts include sports such as boxing, wrestling, karate, judo etc., the literature is scarce on a fairly new discipline, which have amassed great popularity in contemporary time: MMA. MMA have experienced a strong commercialization through the Ultimate Fighting Championship (UFC), and may have surpassed the popularity of boxing (Spencer, 2009; Tainsky, Salaga & Santos, 2013), which have been the martial art with the biggest revenues up until now. Furthermore, MMA have frequently been referred to as the 'fastest growing sport in the world' (Blue 2012, p.161). Following the rise of MMA, there are now MMA-facilities all over the world. These gyms frequently convey the message that MMA-training facilitates sociopsychological youth development; however, Beesley

and Frasier-Thomas (2019) found that MMA-gyms in Toronto refers to anecdotal evidence and popular media when promoting the sport and its sociopsychological developmental effects. The authors conclude that this practice is misleading for parents that may enroll children in MMA-programs, and that the sports true effect is unclear. Additionally, MMA have been argued to be de-civilizing and sensation-seeking (e.g., Van Bottenburg & Heilbron, 2006). As MMA is under explored, we know little of how the training affects youth sociopsychologically, or how MMA coaches and related agents conduct themselves in the context of MMA. In contrast, what may be the sole intervention that specifically utilized MMA-training, it was found that MMA in combination with psychotherapy generated positive effects amongst youth's-at-risk (Bird, McCarthy & O´Sullivan, 2019). However, Bird et al. (2019) noted that the masculine practice of MMA may have compensated the stigma surrounding mental therapy, thus, making participants more inclined to properly handle their mental issues with a professional. As such, the sports exclusive effect on sociopsychological characteristics may have been clouded.

In contrast to Bird et al. (2019), Blomqvist Mickelsson (2019) followed 'common' youths over the course of five months and found that the participants became increasingly aggressive. There is a noteworthy difference between Bird et al. (2019) and Blomqvist Mickelsson (2019); in the latter study, the youths enrolled in common commercial MMA-programs at local gyms, whereas Bird et al. (2019) utilized a focused intervention with a clear agenda. This indicates that youths who do not partake in a focused intervention, but instead enrolls in commercial gyms, may not reap the same sociopsychological benefits as in Bird et al. (2019). There was yet another finding of interest in Blomqvist Mickelsson (2019); the literature on martial arts revolves around increased aggression *or* self-control, however, this time both characteristics seemed to increase amongst the MMA practitioners (Blomqvist Mickelsson, 2019). Following this finding, the interaction between self-control and aggression in Blomqvist Mickelsson (2019) sample may need further investigation in the current context of MMA-training. While the literature refers to self-control as a mitigator for aggression (Manuel Sofia & Cruz, 2015) and self-control failure to facilitate aggression (Denson, DeWall & Finkel (2012), these results suggest that these MMA practitioners may not have mitigated their aggression levels, even though their self-control increased due to the training. Thus, there may be a need to explore how, and if, different trajectories of self-control and aggression may mitigate one another amongst these MMA-practitioners.

Following questions of issue were formulated: (1) can baseline levels of self-control predict aggression, (2) can baseline levels of aggression predict self-control and (3) can baseline levels of aggression interact with baseline levels of self-control when predicting aggression, and vice versa?

Method

Procedure

The current study is a follow-up study on Blomqvist Mickelsson (2019). The multiple use of this data is due to several reasons. First, MMA are an under researched area; thus, the first study needed to address the basic questions of 'how' participants are affected and who may be attracted to the sport. In short, data were collected at several Swedish gyms, where participants were approached before or after training sessions. For a full account on the data collection and procedure, see Blomqvist Mickelsson (2019).

Participants

All participants consented to their participation and were aware of their opportunity to quit at any given time without stating any reasons, should they do so. Furthermore, participants were informed of study purpose and allowed to take part of the study results when possible. The sample consisted of 63 participants (58 males, 5 females), with a mean age of 20.13 (*SD* = 2.44). Participants (1) had limited or none experience from martial arts and (2) intended to complete an average of 3.23 (*SD* = 1.2) training sessions per week during the course of five months. The majority were high school educated (*n* = 47), while a subset were university graduates (*n* = 9) or had finished elementary school (*n* = 3).

Measurements

Aggression. Aggression was measured with the Buss-Perry Aggression Questionnaire (BPAQ; Buss & Perry, 1992). The scale deploys 29 items with four subscales. These are physical aggression (e.g., "If somebody hits me, I hit back"), verbal aggression (e.g., "I often find myself disagreeing with people"), hostility (e.g., "I am sometimes eaten up with jealousy") and anger (e.g., "When frustrated, I let my irritation show"). The items are rated on a Likert scale, ranging from 1 (*extremely uncharacteristic of me*) to 5 (*extremely characteristic of me*). These subscales were analyzed as a total score. The scores range from a minimum of 29 to a maximum of 145.

Self-control. Self-control was measured with the Self-Control Scale (SCS; Alvarez-Rivera & Kathleen, 2010). The scale deploys 31 items. Items to be rated include "When situations become scary or complicated, I quit", "I sometimes talk without thinking" and "It is okay to have unprotected sex with a person you barely know." SCS utilizes a Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The score ranges from 31 to 155. High scores indicate good self-control and vice versa.

Statistical Analysis

The current study sought to investigate predictions and interactions between self-control and aggression over time. As such, a series of moderation analysis were performed. All analysis was performed in IBM SPSS. 23, with the PROCESS v3.3 macro for SPSS (Hayes, 2012). In addition, a power calculation was performed in G*Power 3.1 (Faul, Erdfelder, Lang & Buchner, 2007).

The following settings provided the basis of the calculation: an effect size of Cohen's *d* = .25, *alpha level*= .05 and a power of .9. Finally, it was stated that three predictors (i.e., baseline levels of self-control and aggression as well as the interaction between these baseline characteristics) would be utilized. G*Power stated that the desirable sample size was a total of 61 (*n*) participants.

Results

Descriptive Statistics and Correlations

On an average, the practitioners completed 2.56 (*SD* =.41) training sessions per week.

The participants reported baseline values of self-control to be *M* = 73.08, (*SD* = 16.7) and posttest values of self-control to be *M* = 77.71 (*SD* = 16.36). Additionally, baseline aggression levels were *M* = 83.4 (*SD*= 12.49) and posttest aggression levels were *M* = 84.32 (*SD*= 14.44). A correlational matrix is displayed in Table 1.

Table 1. Correlational matrix for pre- and posttest aggression and self-control

Variable	**Baseline aggression**	**Posttest aggression**	**Baseline self-control**	**Posttest self-control**
Baseline aggression	1			
Posttest aggression	.9**	1		
Baseline self-control	-.17	-.26*	1	
Posttest self-control	-.06	-.17	.96**	1

Note. *p <.05, **p < .001.

Moderation analysis

In order to explore how aggression and self-control predicted and interacted with one another, a series of moderation analysis were performed. Predictors were baseline levels of self-control and aggression as well as the interaction between these two characteristics. The outcome variable was either posttest self-control or posttest aggression. Two moderation analysis were performed. All variables were mean centered prior to analysis and bootstrapped with a 95 % confidence interval.

Predicting Aggression with Self-Control

Baseline self-control significantly predicted posttest aggression. Additionally, an interaction effect was found. Finally, the total model was significant. The interaction is visualized in Figure 1.

Table 2. Self-control as predictor and moderator for aggression levels

	b	SE B	t	p-value
Constant	83.75 [82.23, 85.27]	.76	110.03	p <.001
Baseline aggression	.96 [.82, 1.1]	.07	14.15	p <.001
Baseline self-control	-.11 [-.21, -.02]	.05	-2.34	p = .02
Interaction	-.01 [-.02, 0.00*]	0.00	-1.97	p =. 05

*Note. * Full confidence-intervall = -.001; R^2 = .91, p <.001*

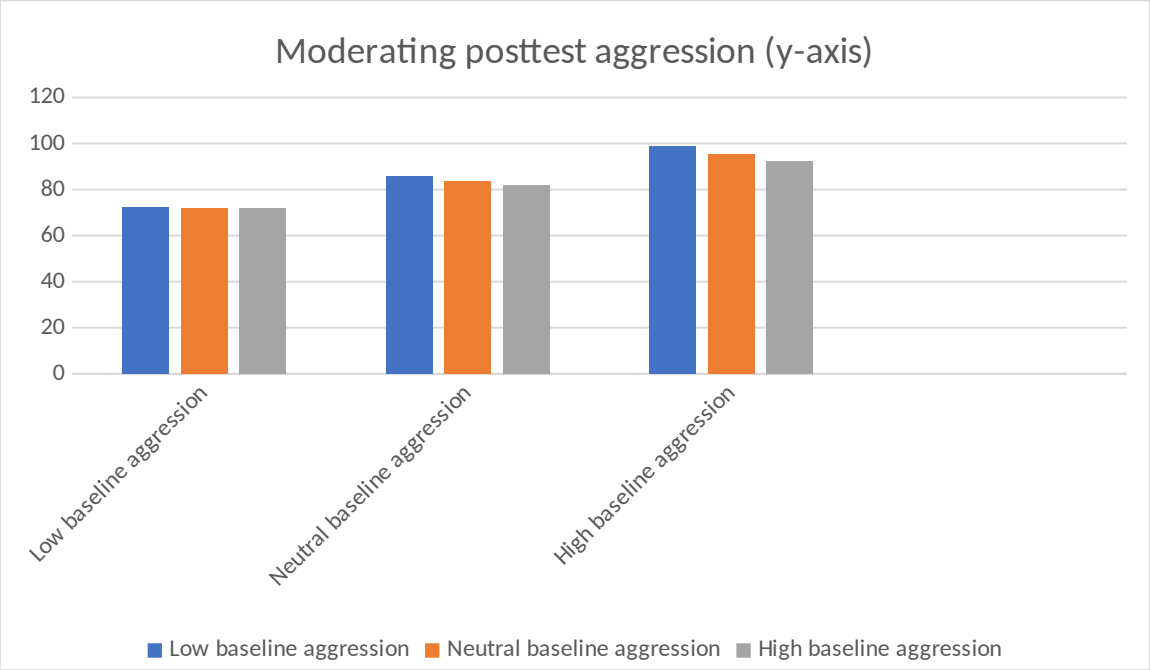

Figure 1. Self-control as a moderator for aggression

Predicting Self-Control with Aggression

Baseline aggression was a significant predictor. Additionally, an interaction effect between baseline self-control and baseline aggression significantly predicted posttest self-control. Finally, the total model was significant. The interaction is visualized in Figure 2.

Table 3. Aggression as a moderator and predictor of self-control

	b	SE B	t	p
Constant	76.57 [75.44, 77.7]	.57	135.34	p <.001
Baseline self-control	.96 [.89, 1.03]	.04	27.21	p <.001
Baseline aggression	.12 [.01, .22]	.05	2.3	p = .03
Interaction	-.01 [-.01, -.00*]	0.00	-2.32	p =. 02

*Note. * Full confidence-intervall = -.001; R^2= .96, p <.001*

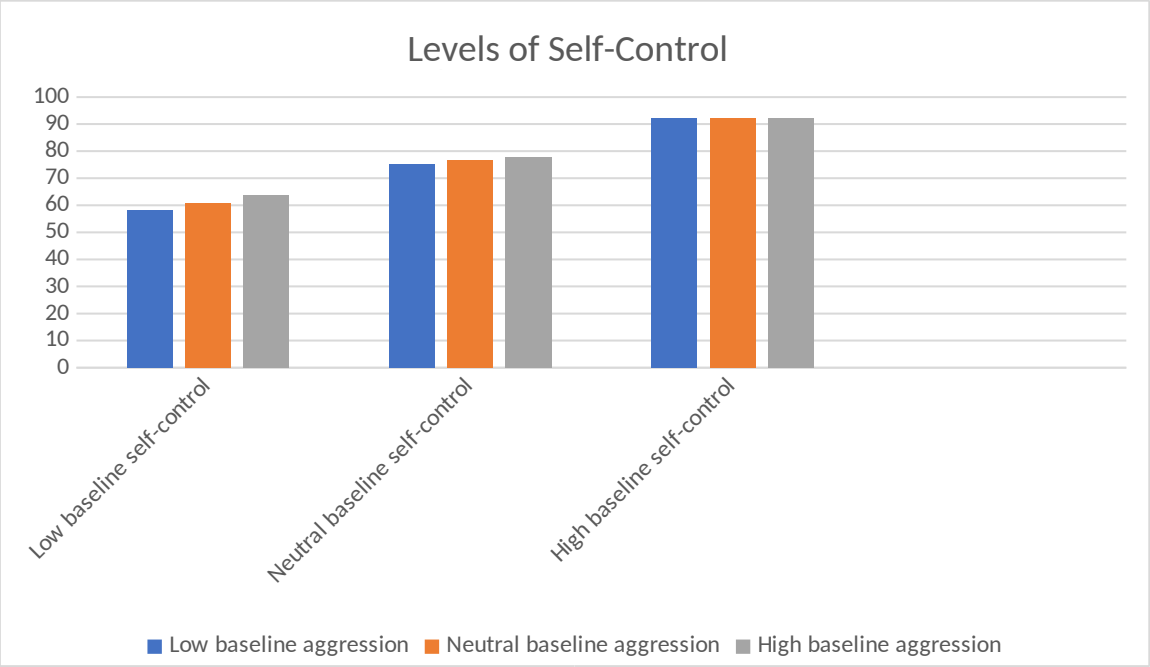

Figure 2. Interaction between baseline self-control and aggression when predicting posttest self-control

Discussion

The current study investigated whether self-control respectively aggression levels could predict post-aggression/self-control in a longitudinal study and if there were any interaction effects. The rationale for this purpose were primarily prior research that reported both elevated aggression and self-control amongst MMA practitioners (Blomqvist Mickelsson, 2019) despite other research that report how self-control may control aggression in athletic populations (Manuel Sofia & Cruz, 2015). Due to the increase in both self-control and aggression for MMA

practitioners in the current sample, a plausible assumption would have been that these practitioners were not affected by any mitigating effects from either self-control or aggression. However, further inquiry revealed that this was not the case.

The primary finding was that both traits both moderated and predicted one another. However, while low self-control combined with high aggression seemed to generate more aggression, high baseline levels of aggression seemed to generate *more* posttest self-control. Drawing from these results, MMA practitioners may increase both in aggression and self-control, but their increase in self-control or aggression may depend on their initial levels of the opposite trait. This finding indicate that, overall mental resilience and socially desirable behavior (i.e., low aggression levels and high self-control) is optimal when trying to further improve self-control.

The concepts of self-control and aggression are opposite to one another, and it is peculiar that these traits seemed to, in symbiosis, increase up until a certain point. However, a closer examination of the frequencies in the specific items revealed other indications. While BPAQ measures overt aggression, there are several items in SCS that may draw from different dimensions of self-control (i.e., self-control related to both aggressive and non-aggressive traits). While participants with increasing aggression seemed to score high on items in the SCS, such as "I prefer to hit people than to talk to them when I am angry", or "I prefer engaging in physical over mental activities", the same participants also scored lower on items such as "I try to avoid complicated tasks" and "I quit when things become complicated or scary", thus, indicating that they still had an inclination towards overt aggression, but not lazy (mental) behavior. This would rather indicate that participants increased their self-control, but not self-control that would plausibly mitigate overt aggression effectively, if such aggression were to be high. Instead, self-control non-related to overt aggression but other impulsive or non-desirable behavior seemed to decline as a result of the MMA-training. This would explain why the study's participants exhibited increased aggression and self-control simultaneously.

Furthermore, Bird et al. (2019) did show that MMA may function in a beneficial way; however, they combined it with psychotherapy in a focused intervention. Thus, the intensity and the specific focus on sociopsychological improvement may have rendered a better effect, than in Blomqvist Mickelsson (2019) study, where young and novel MMA practitioners enrolled in a commercial gym without the supervision that was present in Bird et al.'s (2019) study. Due to the nature of their study, Bird et al. (2019) may have provided the pacifistic message, which is associated with traditional martial arts, and perhaps absent in common commercial MMA-gyms. This may indicate that MMA as a sport simply needs to address *how* the sport is taught to at-risk youth. As MMA is a sport where commercial interests have been incorporated, this may reflect the attitude and practice of MMA-gyms. In the current sample, young and novel practitioners enter the gym for the first time; as such, there may be expectations originating from expensive events with big audiences', productions etc. Thus, there may be a commercial need to satisfy these expectations. As such, the pragmatic and violent nature of the sport may be more promoted, at the expense of fostering positive attitudes, which could facilitate aggressive

attitudes. As MMA is a fairly young sport in comparison to our more traditional well-explored sports, we know little of how practitioners are being coached and if there really is any evidence-based effort to stimulate sociopsychological development. Drawing from Bird et al. (2019), Blomqvist Mickelsson (2019) and the current follow-up study, both supervision and preexisting characteristics seems to play a factor in how a youth may develop in the context of MMA-training. However, the literature on aggression in this context have reached no consensus. While Harwood et al.'s (2017) metanalysis reported lowered aggression levels, other recent research points to elevated aggression in martial artists (e.g., Sofia & Cruz, 2017) and even neuropsychological differences when presented with anger-inducing stimuli compared to non-athletes (Xia, Zhang & Wang, 2018). Martial arts research may need to address moderating factors, such as specific sports and their associated values, as this may be the underlying cause of the currently split literature, in terms of aggression.

In conjunction with the initial study (Blomqvist Mickelsson, 2019), the following findings may have practical implications. In Blomqvist Mickelsson (2019) it was revealed that MMA may (partially) cause heightened aggression and self-control; thus, concluding that it should be questioned whether MMA is suitable as for youth's at risk, who are novel to the sport. This same preliminary conclusion may still be true, despite the current results. An individual with low levels of aggression and high levels of self-control may not experience elevated aggression due to the practice of MMA at all, however, youth's at risk generally do not have low aggressive levels and high self-control. Thus, these preliminary results suggest that MMA training may be suitable, or at least harmless, for individuals with already adequate pro-social behavior and high mental resilience. However, as MMA training seems to, overall, facilitate aggressive behavior amongst youth (Blomqvist Mickelsson, 2019), it may not be suitable for at-risk youths who may already possess socially undesirable characteristics. However, as indicated by Bird et al. (2019), the role of coaches and supervision may influence this trajectory.

In conclusion, the current study provided preliminary evidence that, despite the increase in both self-control and aggression due to practicing MMA, the characteristics seemed to influence each other to different extents. Furthermore, the interaction effect indicated that, in order to effectively develop high self-control, the individual may already require adequate levels of self-control in the current context where elevated aggression is present. The simultaneous increase in self-control and aggression may be due to the different types of self-control displayed in SCS; individuals increased their overt aggression but may have improved self-control that was not related to overt aggression.

Limitations

A few limitations must be mentioned. The interaction effect was also small; the pre- and posttest variables were highly correlated as they measured the same construct. As such, it is harder for a predictor or a moderator to influence the relationship between these two, as little variance is left to explain.

Secondly, the study did not measure instrumental aggression. This was a salient limitation, as it could explain the relationship between higher self-control as a result of the second interaction.

There was also a lack of control of other demographic and environmentally relevant factors that may have played a factor in the current context. In the current context, there may be a wide variety of moderating- and mediating factors (Ennigkeit & Beek, 2019). Thus, participation alone cannot account for all variance related to developmental trajectories.

Finally, due to limited space, the initial control group (Blomqvist Mickelson, 2019) was removed from the study, in order to thoroughly discuss the MMA-practitioners peculiar results.

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Declaration of Interest Statement

No potential conflict of interest has been reported by the author.

References

Alvarez-Rivera, Lorna L., & Fox, Kathleen A. (2010). Institutional attachments and self-control: Understanding deviance among Hispanic adolescents. Journal of Criminal Justice, Vol 38(4), 666-674. doi: 10.1016/j.jcrimjus.2010.04.040.

Beesley, T., & Fraser-Thomas, J. (2019) Claims of positive youth development: a content analysis of mixed martial arts gyms' websites, Leisure/Loisir, 43:1, 1-25, DOI: 10.1080/14927713.2019.1582356.

Bird, N., McCarthy, G., & O'Sullivan, K. (2019). Exploring the Effectiveness of an Integrated Mixed Martial Arts and Psychotherapy Intervention for Young Men's Mental Health. American Journal of Men's Health, 13(1). doi:10.1177/1557988319832121.

Blomqvist Mickelsson, T. (2019) Modern unexplored martial arts – what can mixed martial arts and Brazilian Jiu-Jiutsu do for youth development?, European Journal of Sport Science, doi: 10.1080/17461391.2019.1629180.

Blue, S. (2012). Ongoing Change in the Rhythms of Mixed Martial Arts Practice. International Journal of Sport & Society, 3(3).

Denson, T. F., DeWall, C. N., & Finkel, E. J. (2012). Self-control and aggression. Current Directions in Psychological Science, 21(1), 20-25. doi: 10.1177/0963721411429451.

Endresen, I. M., & Olweus, D. (2005). Participation in power sports and antisocial involvement in preadolescent and adolescent boys. Journal of Child Psychology and Psychiatry, 46(5), 468-478. doi:10.1111/j.1469-7610.2005.00414.x.

Ennigkeit, F., & Beek, F. L. (2019). The effect of judo on social behavior with special consideration of periods of reflection. Journal of Martial Arts Research, 2(2), 7-7.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. Behavior Research Methods, 39(2), 175-191. doi:10.3758/BF03193146.

Gubbels, J., van der Stouwe, T., Spruit, A., & Stams, G. J. J. M. (2016). Martial arts participation and externalizing behavior in juveniles: A meta-analytic review. Aggression and Violent Behavior, 28(May-June), 73-81. doi:10.1016/j.avb.2016.03.011.

Harwood, A., Lavidor, M., & Rassovsky, Y. (2017). Reducing aggression with martial arts: A meta-analysis of child and youth studies. Aggression and Violent Behavior, 34, 96-101. doi: http://dx.doi.org/10.1016/j.avb.2017.03.001.

Hayes, A. F. (2012). PROCESS: A versatile computational tool for observed variable mediation, moderation, and condi-tional process modeling [White paper]. Retrieved from http://www.afhayes.com/ public/process2012.pdf.

Keatley, D. A., Allom, V., & Mullan, B. (2017). The effects of implicit and explicit self-control on self-reported aggression. Personality and Individual Differences, 107, 154-158. doi:10.1016/j.paid.2016.11.046.

Kreager, D. A. (2007). Unnecessary roughness? School sports, peer networks, and male adolescent violence. American Sociological Review, 72(5), 705-724. doi:10.1177/000312240707200503.

Lakes, K. D., & Hoyt, W. T. (2004). Promoting self-regulation through school-based martial arts training. Journal of Applied Developmental Psychology, 25(3), 283-302. doi:10.1016/j.appdev.2004.04.002.

Manuel Sofia, R., & Cruz, J. F. A. (2015). Self-control as a mechanism for controlling aggression: A study in the context of sport competition. Personality and Individual Differences, 87, 302-306. doi:10.1016/j.paid.2015.08.025.

Mutz, M. (2012). Athletic participation and the approval and use of violence: a comparison of adolescent males in different sports disciplines. European Journal for Sport and Society, 9(3), 177-201. doi:10.1080/16138171.2012.11687896.

Sofia, R., & José Fernando A. Cruz. (2017). Unveiling anger and aggression in sports: The effects of type of sport, competitive category and success level. Revista De Psicología Del Deporte, 26(2), 21-28.

Spencer, D. C. (2009). Habit(us), body techniques and body callusing: An ethnography of mixed martial arts. Body & Society, 15(4), 119-143. doi:10.1177/1357034X09347224.

Spencer, D. C. (2012). Narratives of despair and loss: Pain, injury and masculinity in the sport of mixed martial arts. Qualitative Research in Sport, Exercise and Health, 4(1), 117-137. doi:10.1080/2159676X.2011.65349.

Tainsky, S., Salaga, S., & Santos, C. A. (2013). Determinants of pay-per-view broadcast viewership in sports: The case of the Ultimate Fighting Championship. Journal of Sport Management, 27(1), 43-58.

Twemlow, S. W., Biggs, B. K., Nelson, T. D., Vernberg, E. M., Fonagy, P., & Twemlow, S. W. (2008). Effects of participation in a martial arts–based antibullying program in elementary schools. Psychology in the Schools, 45(10), 947-959. doi:10.1002/pits.20344.

Van Bottenburg, M., & Heilbron, J. (2006). De-sportization of fighting contests: The origins and dynamics of no holds barred events and the theory of sportization. International Review for the Sociology of Sport, 41(3-4), 259-282. doi:10.1177/1012690207078043.

Vertonghen, J., & Theeboom, M. (2010). The social-psychological outcomes of martial arts practise among youth: A review. Journal of Sports Science & Medicine, 9(4), 528.

Xia, X., Zhang, G., & Wang, X. (2018). Anger weakens behavioral inhibition selectively in contact athletes. Frontiers in Human Neuroscience, 12, 463-463. doi:10.3389/fnhum.2018.00463.

Zivin, G., Hassan, N. R., DePaula, G. F., Monti, D. A., Harlan, C., Hossain, K. D., & Patterson, K. (2001). An effective approach to violence prevention: Traditional martial arts in middle school. Adolescence, 36(143), 443-460.