

# The effects of implicit and explicit self-control on self-reported aggression<sup>☆</sup>

D.A. Keatley<sup>†, \*</sup>

DKeatley@lincoln.ac.uk

V. Allom<sup>b</sup>

B. Mullan<sup>b</sup>

<sup>a</sup>Researchers in Behaviour Sequence Analysis (ReBSA), School of Psychology, University of Lincoln, United Kingdom

<sup>b</sup>Health Psychology and Behavioural Medicine Research Group, School of Psychology and Speech Pathology, Curtin University, Australia

\*Corresponding author at: Forensic and Clinical Psychology Research Group Researchers in Behaviour Sequence Analysis (ReBSA), School of Psychology, University of Lincoln, Lincolnshire LN67TS, United Kingdom.

<sup>☆</sup>Authors contributed equally to the manuscript.

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## Abstract

Aggression and violence have a large impact on society. Researchers have highlighted the need to incorporate impulsive processes into models of aggression. The current research is the first to investigate the role of self-control, measured by both explicit questionnaires and an implicit association test, on trait aggression. Results indicated that higher levels of implicit and explicit self-control were associated with lower levels of aggressive tendencies of anger, and physical and verbal aggression, but not hostility while higher levels of explicit self-control were related to lower levels of all types of aggression. We also investigated the role of sex gender in the current study and showed that while sex gender was associated with aggressive tendencies overall, such that males had higher levels of trait aggression on three out of four outcomes, and the relationship between explicit self-control and physical aggression did not differ according to sex gender whereby the relationship between these variables was stronger among males. The current findings provide the first indication that both implicit and explicit self-control have roles in aggressive tendencies.

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**Keywords:** iImplicit; IAT; eAggression; sSelf-control; dDual-process

## 1.1 Introduction

Aggressive tendencies have been reported in a range of contexts, including in schools (Robers, Zhang, & Truman, 2012), at sporting events and among athletes (Reza, 2012), and towards hospital staff (Mullan & Badger, 2007), and other areas. Research into aggression has focused on a range of aetiological factors or predictors of aggression (Hawkins et al., 2000). This research is typically split between studies that take a behavioural approach to measurement of aggression studies (See Eagly & Steffen, 1986 for review) and those which use self-report measures studies (Garcia-Forero, Gallardo-Pujol, Maydeu-Olivares, & Andres-Pueyo, 2009). Self-report measures may report reflect more trait-type aggression (Denson, DeWall, & Finkel, 2012). Focusing on the trait-type approach to aggression, longitudinal studies have indicated several predictors of aggression (Farrington, 1989, 1991; Moffitt, 1993).

Self-control, the ability to control emotions or impulses in order to attain goals (Baumeister, Vohs, & Tice, 2007), has been highlighted as a possible variable that is related to an individual's tendency to act aggressively (Bluemke, Friedrich, & Zumbach, 2010; Bluemke & Teige-Mocigemba, 2014; Denson et al., 2012; Garcia-Forero et al., 2009; Schmidt, Zimmerman, Banse, & Imhoff, 2015; Sofia & Cruz, 2015). The capability to exert self-control is fundamental to adaptive functioning and goal attainment (Tangney, Baumeister, & Boone, 2004). Deficits or breakdowns in self-control are central to maladaptive behaviours and psychopathology, such as antisocial personality disorder (Krueger & South, 2009). Furthermore, situations in which self-control is diminished or depleted typically lead to more overt and extreme aggressive behaviours (Matthias, Monika, & Joerg, 2010; Richetin, Richardson, & Mason, 2015; Rothbart & Sheese, 2007; Schmidt et al., 2015; Simons, Wills, Emery, & Spelman, 2015). Additionally, there has been a recent increase in the integration of self-control in theoretical models of aggression (Denson et al., 2012). The I<sup>3</sup> theory (Finkel et al., 2012) outlines inhibition, which involves self-control, a facet of the broader construct of self-control as one of the three processes that underpin aggression. The current study develops these trends in the literature by focusing on self-reported, trait-like aggression, similar to Garcia-Forero et al. (2009), rather than experimental behavioural approaches (e.g., Eagly & Steffen, 1986).

It is unclear why some individuals are better able to control their aggression than others. Recent conceptualisations of [the role of self-control and behavioural-in](#) outcomes [such as aggression](#) that take a dual process approach ([Hofmann, Friese, & Strack, 2009](#); [Strack & Deutsch, 2004](#)) may offer some explanation. Dual process approaches highlight the role of both reflective (e.g., conscious action towards a goal) and impulsive (e.g., non-conscious automatic tendencies) processes. For example, in [Strack and Deutsch's \(2004\) Reflective-Impulsive Model](#), the reflective system is typified as effortful control, goal-oriented planning, and conscious deliberations. The impulsive system is closely linked to emotion-based action tendencies, associative processes, and is relatively fast acting or automatic. In terms of self-control and aggression, people may feel an impulse to behave aggressively at the cost of a long-term goal (e.g., avoiding punishment). In order to resist temptation and choose the long-term goal, self-control is needed ([Hofmann et al., 2009](#); [Strack & Deutsch, 2004](#)). Therefore, higher levels of self-control are likely to allow people to curb aggressive tendencies. While the necessity to incorporate impulsive processes into models and theories of aggression has been outlined, there remains a lack of research in this area ([Bluemke & Teige-Mocigemba, 2014](#); [Bluemke et al., 2010](#)). The studies that have incorporated impulsive processes, have focused on developing an implicit association test (IAT; [Greenwald & McGhee, 1998](#)) to measure aggression ([Banse, Messer, & Fischer, 2014](#); [Richetin et al., 2015](#)), rather than attempting to determine how these processes interact to influence aggressive tendencies.

Assessing self-control using both explicit and implicit measures may capture the reflective and impulsive processes associated with aggression ([Perugini, Richetin, & Zogmaister, 2010](#)). A multitude of self-report measures that tap explicit self-control exist and have been shown to relate to behavioural outcomes (For review, see: [de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012](#)). The Tangney brief self-control scale ([BSCS](#)) has shown the most validity in terms of predicting a variety of self-control outcomes and behaviours ([Maloney, Grawitch, & Barber, 2012](#); [Tangney et al., 2004](#)). In terms of impulsive processes, the [implicit association test IAT](#) ([Greenwald & McGhee, 1998](#)) has been repeatedly used as a proxy measure of the impulsive system ([Keatley, Clarke, & Hagger, 2012](#)). In this task, participants are required to [quickly](#) pair target and category exemplars. Faster target-category pairings are said to reflect greater impulsive tendencies towards the concepts represented by these associations ([Keatley et al., 2012](#)). For example, pairing of aggression with 'good' faster than with 'bad' may suggest an implicit tendency towards aggression. While the IAT has been modified; previously; to measure [individual's](#) aggression, the task has not been modified to implicitly measure self-control in the context of aggression. Given that impulsive processes are likely to determine aggressive tendencies, an implicit measure of self-control, which captures impulsive processes, may elucidate why some individuals tend to be more aggressive than others. Further, there is evidence to suggest that explicit measures of self-control and other measures of this construct do not necessarily overlap, and may capture unique variance in self-control outcomes ([Allom, Panetta, Mullan, & Hagger, 2016](#)).

The aim of the current research was to investigate the role of impulsive and reflective self-control processes, as assessed by implicit and explicit measures respectively, in self-reported aggression. This is the first study, to the authors' knowledge, to develop an implicit measure of self-control and test it in the domain of aggression. Based on previous research in the area ([Bluemke & Teige-Mocigemba, 2014](#); [Bluemke et al., 2010](#); [Hofmann et al., 2009](#)), a series of hypotheses were developed. The first hypothesis was that individuals with higher implicit self-control would have lower aggressive tendencies, based on research showing the role of self-control in inhibiting aggression ([Schmidt et al., 2015](#); [Simons et al., 2015](#)). Similarly, a second hypothesis was that individuals self-reporting higher levels of explicit self-control would have lower aggressive tendencies. Given that males and females typically show different forms of aggression ([Archer, 2004](#); [Eagly & Steffen, 1986](#); [Strüber, Lück, & Roth, 2008](#)) and levels of self-control ([Chapple, Vaske, & Hope, 2010](#)) we investigated the effects of [sex/gender](#) in the current study.

## **2.2 Materials and Methods**

### **2.1.2.1 Participants**

An online sample ( $N = 320$ , females = 206;  $M_{age} = 31.11$ ,  $SD = 10.88$ , Range: 18-71) participated in the current study. Participants were part of an international online pool recruited through SocialSci (73% Caucasian/White; 12% Asian/Pacific Island; 6% Black; 4% Hispanic; 5% others). A 2USD inconvenience allowance was administered in return for participation in the study. There were no restrictions on who could take part, aside from fluency in English. The study protocol was approved by the University HREC.

### **2.2.2.2 Materials**

#### **2.2.1.2.2.1 Implicit Association Test - Self-control (IAT-SC)**

Implicit self-control was measured using the IAT ([Greenwald & McGhee, 1998](#)). Words representing 'self-control' (controlled, cautious, planned, disciplined, consider) and 'impulsivity' (impulsive, free, careless, spontaneous, hasty) were taken from explicit self-report measures of self-control and impulsivity ([Maloney et al., 2012](#); [Tangney et al., 2004](#)). Once several explicit scales had been sourced, a group of four experts in the area independently reviewed the chosen words and agreed on their use as being appropriate to represent the two constructs. Words pertaining to 'self' (I, me, my, mine, self) and 'others' (others, they, them, their, theirs) were adopted from previous research in the literature ([Keatley, Clarke, & Hagger, 2013a, 2013b](#); [Keatley et al., 2012](#)). The label 'others' was adopted as it has been shown to be easier to distinguish from 'self' than 'not-self', and was clearly defined to participants as being 'not-

self', rather than a more generalised social comparison category. The standard five-step IAT was used, in which blocks 1, 2, and 4 were practice blocks consisting of 20 trials, and test blocks 3 and 5 comprised 20 practice trials and 40 test trials. Test blocks were counterbalanced. The IAT score was calculated in accordance with the improved *D*-score algorithm (Greenwald & Nosek, 2003). Implicit association test (IAT) scores were calculated such that higher scores indicated higher levels of implicit self-control.

### 2.2.2.2.2 Brief self-control scale (BSCS)

The BSCS brief self-control scale (Maloney et al., 2012; Tangney et al., 2004) is a measure of dispositional self-control. The scale comprises 13 items, rated on a 5-point Likert type scale (1 = *not at all like me* to 5 = *very much like me*). Example: "People would say I have iron self-discipline". The scale demonstrate good reliability in the current sample,  $\alpha = 0.70$ .

### 2.2.3.2.2.3 Aggression

Participants completed the Buss-Perry Aggression Questionnaire (Anderson & Dill, 2000; Buss & Perry, 1992), which is a 29 item measure of an individual's physical aggression, and verbal aggression, anger, and hostility. Items such as "if someone hits me, I hit back" (physical aggression,  $\alpha = 0.81$ ); "I often find myself disagreeing with people" (verbal aggression,  $\alpha = 0.83$ ); "When frustrated, I let my irritation show" (anger,  $\alpha = 0.78$ ); "At times I feel I have gotten a raw deal out of life" (hostility,  $\alpha = 0.89$ ) were measured on a 7 point Likert-type scale (1 = *extremely uncharacteristic of me* to 7 = *extremely characteristic of me*).

## 2.3.2.3 Procedure

Participants were recruited online, where they were provided with study information and indicated their consent to participate by clicking the 'I agree' option. The order of presentation was randomised, such that the IAT appeared either before or after the self-report measures, which were also randomised. Participants progressed through the study at their own pace, typically lasting approximately 15 minutes. Completion of the IAT took approximately 5 minutes. While the IAT was administered online, it was set-up to download and run itself using participants' own operating systems; therefore, there were no issues relating to internet speed or lag.

## 3.3 Results

### 3.1.3.1 Preliminary Analyses

All participants were included in the analysis as none met exclusion criteria specified in the improved scoring algorithm of the IAT. Initial data screening for skewness and kurtosis indicated that all data could be considered normally distributed. Analyses indicated that there was a difference in self-reported aggression between males and females such that males reported higher scores for physical aggression,  $t(318) = 4.667, p < 0.001$ , verbal aggression,  $t(318) = 2.653, p = 0.008$ , and anger,  $t(318) = 2.228, p = 0.027$ ; however, hostility showed no differences,  $t(318) = -0.994, p = 0.321$ . We therefore controlled for gender sex in correlations and the regression analyses. Zero-order correlations were computed between the implicit and explicit self-control measures and self-reported aggression. The implicit measure was significantly correlated with physical aggression,  $r = -0.219, p < 0.001$ ; verbal aggression,  $r = -0.130, p = 0.023$ ; anger,  $r = -0.146, p = 0.010$ , and hostility,  $r = -0.136, p = 0.017$ . The implicit measure also correlated with the explicit measure of self-control,  $r = -0.149, p = 0.009$ . The explicit measure was correlated with all measures of aggression. See Table 1 for descriptive statistics presented separately for males and females, and correlations between all variables presented separately for men and women.

**Table 1** Summary of descriptive statistics and inter-correlations, controlling separately for males and females sex, and inter-correlations of for study variables.

alt-text: Table 1

	Mean (SD)		1	2	3	4	5	6	7
	Males	Females							
1. IATD	0.17 (0.48)	0.19 (0.48)							
2. BSCS	2.98 (0.48)	3.01 (0.62)	0.149*						
3. Physical	27.77 (10.44)	22.33 (9.73)	-0.219**	-0.185**					
4. Verbal	18.11 (6.92)	16.09 (6.25)	-0.130*	-0.229**	0.524**				
5. Anger	22.84 (8.68)	20.71 (7.90)	-0.146*	-0.287**	0.668**	0.708**			

6. Hostility	23.96 (11.16)	25.30 (11.64)	-0.136*	-0.316**	0.531**	0.402**	0.624**	-	-
7. SexGender	-	-	-0.026	-0.024	0.253**	0.147**	0.124*	-0.056	-

Note. IATD = implicit association test *D*-score representing implicit self-control; BSCS = brief self-control scale representing explicit self-control; physical = self-reported physical aggression; verbal = self-reported verbal aggression; anger = self-reported anger; hostility = self-reported hostility.

\*  $p < 0.05$ .

\*\*  $p < 0.01$ .

### 3.2.3.2 Predicting a Correlates of aggression

Based on correlational results, regressions were conducted with interaction terms for sexgender and self-control variables. Hierarchical regression analyses were conducted to measure the relationship between implicitly and explicitly measured self-control, sexgender, and aggression. Standardised regression coefficients and  $R^2$  values from the regression analyses are shown in Table 2.

**Table 2** Multiple regression analyses predicting different forms of aggression for males and females.

alt-text: Table 2

	Aggression											
	Physical			Verbal			Anger			Hostility		
	$R^2$	$\beta$	$p$	$R^2$	$\beta$	$p$	$R^2$	$\beta$	$p$	$R^2$	$\beta$	$p$
Step 1	0.064**			0.018*			0.018*			0.003		
(Please delete 'Sex')SexGender		0.254	0.001		0.136	0.017		0.134	0.019		-0.054	0.348
Step 2	0.146**			0.090**			0.123**			0.112**		
(Please delete 'Sex')SexGender		0.247	0.001		0.129	0.019		0.126	0.020		-0.061	0.258
IATD		-0.189	0.001		-0.155	0.025		-0.176	0.010		-0.070	0.305
BSCS		-0.151	0.006		-0.165	0.010		-0.217	0.001		-0.288	0.001
(Please delete 'Sex')SexGender * IATD		0.022	0.743		0.094	0.172		0.115	0.087		-0.038	0.578
Sex(Please delete 'Sex')Gender * BSCS		-0.141	0.023		-0.088	0.169		-0.094	0.134		-0.030	0.630

Note. IATD = implicit association test *D*-score representing implicit self-control; BSCS = brief self-control scale representing explicit self-control; physical = self-reported physical aggression; verbal = self-reported verbal aggression; anger = self-reported anger; hostility = self-reported hostility. \*  $p < 0.05$ . \*\*  $p < 0.01$ .

#### 3.2.1.3.2.1 Physical Aggression

The effect of sexgender on physical aggression resulted in a significant model in step 1,  $R^2 = 0.06$ ;  $F(1, 307) = 21.08$ ,  $p < 0.001$ , indicating males have greater physical aggressive tendencies. In step 2, self-control variables and interactions between sexgender and these variables were entered, resulting in a significant model and change in  $\Delta R^2 = 0.82$ ,  $F(3, 307) = 10.351$ ,  $p < 0.001$ . GenderSex remained significantly associated with aggression,  $\beta = 0.25$ ,  $p < 0.001$ ; the effect of the implicit measure (IAT score) on physical aggression was significant,  $\beta = -0.19$ ,  $p = 0.001$ . The BSCS was also significantly associated with physical aggression,  $\beta = -0.15$ ,  $p = 0.006$ . There was not a significant interaction between sexgender and the IAT,  $\beta = -0.02$ ,  $p = 0.743$ ; however, there was a significant interaction between sexgender and BSCS,  $\beta = -0.14$ ,  $p = 0.023$ , such that the relationship between explicit self-control and trait aggression was stronger for males.

#### 3.2.2.3.2.2 Verbal aggression

The effect of **sexgender** on verbal aggression resulted in a significant model in step 1,  $R^2 = .02$ ;  $F(1, 307) = 5.76, p = .017$ , indicating males had higher self-reported levels of verbal aggression. In step 2, self-control variables and interactions between **sexgender** and these variables were entered, resulting in a significant model and change in  $\Delta R^2 = .07, F(3, 307) = 5.95, p < .001$ . **GenderSex** remained significantly associated,  $\beta = -.13, p = .0219$ ; the effect of the implicit measure (IAT score) on verbal aggression was significant,  $\beta = -.16, p = .02$ . The BSCS was a significant associated with verbal aggression,  $\beta = -.17, p = .010$ . There was not a significant interaction between **sexgender** and the IAT,  $\beta = -.09, p = .172$ ; neither was there a significant interaction between **sexgender** and BSCS,  $\beta = -.09, p = .1697$ .

### 3.2.3.3.2.3 Anger

The effect of **sexgender** on anger resulted in a significant model in step 1,  $R^2 = .02$ ;  $F(1, 307) = 5.55, p = .019$ . In step 2, the other variables were entered, resulting in a significant model and change in  $\Delta R^2 = .11, F(3, 307) = 8.49, p < .001$ . **SexGender** remained a significant variable,  $\beta = -.13, p = .002$ ; the effect of the implicit measure (IAT score) on anger was significant,  $\beta = -.18, p = .010$ . The BSCS was significant associated with anger,  $\beta = -.227, p < .001$ . There was not a significant interaction between **sexgender** and the IAT,  $\beta = -.12, p = .0879$ ; neither was there a significant interaction between **gendersex** and BSCS,  $\beta = -.09, p = .134$ .

### 3.2.4.3.2.4 Hostility

The effect of **sexgender** on hostility resulted in a non-significant model in step 1,  $R^2 = .03$ ;  $F(1, 307) = 0.89, p = .3485$ . In step 2, the other variables were entered, resulting in a significant model and change in  $\Delta R^2 = .11, F(3, 307) = 7.63, p < .001$ . **SexGender** remained a non-significant variable,  $\beta = -.06, p = .2586$ ; the effect of the implicit measure (IAT score) on hostility was not significant,  $\beta = -.29, p = .3054$ . The BSCS was not significant,  $\beta = -.2904, p = .00158$ . There was not a significant interaction between **sexgender** and the IAT,  $\beta = -.04, p = .578$ ; neither was there a significant interaction between **sexgender** and BSCS,  $\beta = -.030, p = .630$ .

## 4.4 Discussion

The aim of the current study was to investigate the role of self-control, using both implicit and explicit measures, in trait aggression. This approach was based on dual-process models (Strack & Deutsch, 2004) and was developed to provide understanding of the role of impulsive and reflective processes in aggression. The current research adds to previous research by showing the independent roles of implicit self-control and explicit self-control in relation to different types of aggressive tendencies. The first hypothesis was partially supported as **all facets of aggression were physical aggression was the only aggressive tendency** significantly associated with implicit self-control, **with the exception of hostility. Physical aggression demonstrated the greatest association** perhaps owing to the overlap between impulsive processes and physical responses, also captured in the motor/physical IAT task. Furthermore, **sexgender** did not significantly interact with the implicit measure for any of the types of trait aggression indicating that the relationship between implicit self-control and aggression was the same for males and females. Secondly, the hypothesis that explicit measures of self-control would be related to aggressive tendencies was supported more consistently such that a higher level of self-reported self-control was associated with lower self-reported tendencies for aggression across all types of aggression. For physical aggression, **sexgender** interacted with explicit self-control scores, qualifying the relationship between self-control and physical aggression. Specifically, the relationship between self-control and aggression is stronger for females. **This means indicating** that increasing **a man's** self-control **among males** may **not have as much impact on curb** their tendency to be physically aggressive. **In general, gender was related to all aggression outcomes with the exception of hostility such that males tended to have higher levels of trait aggression compared to females.** This supports previous research showing females typically report fewer physically aggressive behaviours (Archer, 2004; Eagly & Steffen, 1986; Strüber et al., 2008) and have higher self-control (Chapple et al., 2010).

According to dual process models of behaviour, both reflective and impulsive processes direct behaviour. **In the current study, both explicit and implicit self-control were related to aggressive tendencies. The brief self-control scale represents a generalised tendency to consciously exert effort towards goal pursuit, while the IAT represents more impulsive forms of self control.** The current results **support a dual-process explanation of aggression suggesting that reflective and impulsive forms of self-control suggest that self control measured explicitly, representing reflective goal pursuit, and implicitly, representing impulsive processes,** impact differently upon aggressive tendencies. Impulsive processes seem particularly important for physical aggression **and less so for hostility**, while reflective processes are more important for understanding physical aggression in females. **Explicit and implicit self-control both predicted aggressive tendencies. The brief self-control scale represents a trait, or generalised, measure of self-control, while implicit association task represents more impulsive forms of self-control. (Please remove this break to form one paragraph)**

**GenderSex** was also significantly related to aggressive tendencies **with the exception of hostility. Sex d**Differences in aggression **between males and females** are well researched (Archer, 2004; Hyde, 1984; Strüber et al., 2008); however, the current research underlines the importance of taking **both gender and** self-control into account when researching aggression. **More research is required in this area and these results suggest that it is important for future research to separate males and females implicit responses in terms of self-control and aggression.**

**While T**he implicit measure and the explicit measure of self-control **did not were** correlated, **the magnitude of this correlation was quite small suggesting that these measures do not precisely map on to the same construct, and may in fact assess** **The current results suggest that the two measures of self control are not related, which indicates that they are measuring** distinct processes. This is in line with our conceptualisation of these

measures as impulsive and reflective processes, and supports previous research that suggests self-control is a multifaceted construct (Allom et al., 2016). Research has also shown a dissociation whereby implicit measures may better predict unplanned, spontaneous behaviours, whereas explicit measures better predict planned, [controlled self-report](#) behaviours (Jens, Rainer, & Daniel, 2002; Keatley et al., 2013a; Perugini & Conner, 2011; Perugini et al., 2010). Future research could investigate the predictive validity of implicit self-control on planned and spontaneous aggression and violence.

#### 4.1.4.1 Limitations

Displays of aggression are typically frowned upon in modern culture; therefore, social desirability may [have influenced](#) participants' responses (Uziel, 2010). ~~The current results may reflect the fact that those individuals with higher levels of both implicit and explicit self-control are also more likely to show interpersonal self-control and reduce their reported aggression.~~ Furthermore, scale correspondence- the phenomenon that variables measured using similar methods are more likely to correlate (Keatley, Chan, Caudwell, Chatzisarantis, & Hagger, 2014; Spector, 2006), may have been a factor in the current study as the aggression measures and explicit self-control measure are all self-report scales, compared to the IAT, which uses reaction times. Thus, scale correspondence may partially explain why trait self-control appears more strongly related to aggression than implicit self-control. A further limitation was the use of self-report measures of aggression, rather than behavioural or experimental approaches. Future research should investigate whether implicit self-control predicts actual aggressive behaviours, as well as self-reported behaviours.

#### 4.2.4.2 Conclusions

Overall, the current findings highlight the importance of self-control in trait aggression. Furthermore, impulsive processes, measured by an [implicit association test IAT](#), and reflective processes, measured by trait self-control, predict different aspects of aggressive tendencies. This research is an important first step towards understanding the role of self-control at both a reflective and impulsive level, in aggression. Future research should apply these findings to more objective measures of aggression and violence.

## References

- Allom V., Panetta G., Mullan B. and Hagger [M.S.M.S.](#), Self-report and behavioural approaches to the measurement of self-control: Are we assessing the same construct?, *Personality and Individual Differences* **90**, 2016, 137-142.
- Anderson [G.A.C.A.](#) and Dill [K.E.K.E.](#), Video games and aggressive thoughts, feelings, and behavior in the laboratory and in life, *Journal of Personality and Social Psychology* **78**, 2000, 772-790.
- Archer J., Sex differences in aggression in real-world settings: [a](#) meta-analytic review, *Review of General Psychology* **8**, 2004, 291-322.
- Banase R., Messer M. and Fischer I., Predicting aggressive behavior with the aggressiveness-IAT, *Aggressive Behavior* **41**, 2014, 65-83.
- Baumeister [R.F.R.F.](#), Vohs [K.D.K.D.](#) and Tice [D.M.D.M.](#), The strength model of self-control, *Current Directions in Psychological Science* **16**, 2007, 351-355.
- Bluemke M. and Teige-Mocigemba S., Automatic processes in aggression: Conceptual and assessment issues, *Aggressive Behavior* **41**, 2014, 44-50.
- Bluemke M., Friedrich M. and Zumbach J., The influence of violent and nonviolent computer games on implicit measures of aggressiveness, [Aggressive behavior](#)[Aggressive Behavior](#) **36**, 2010, 1-13.
- Buss [A.H.A.H.](#) and Perry M., The aggression questionnaire, *Journal of Personality and Social Psychology* **63**, 1992, 452-459.
- Chapple [C.L.C.L.](#), Vaske J. and Hope [F.L.T.L.](#), Sex differences in the causes of self-control: An examination of mediation, moderation, and gendered etiologies, *Journal of Criminal Justice* **38**, 2010, 1122-1131.
- de Ridder [D.T.D.T.](#), Lensvelt-Mulders G., Finkenauer C., Stok [F.M.F.M.](#) and Baumeister [R.F.R.F.](#), Taking stock of self-control: [a](#) meta-analysis of how trait self-control relates to a wide range of behaviors, [Pers Soc Psychol](#)  
[Rev Personality and Social Psychology Review](#) **16**, 2012, 76-99.
- Denson [T.F.T.F.](#), DeWall [C.N.C.N.](#) and Finkel [E.J.E.J.](#), Self-control and aggression, *Current Directions in Psychological Science* **21**, 2012, 20-25.
- Eagly [A.H.A.H.](#) and Steffen [V.J.V.J.](#), Gender and aggressive behaviour: [a](#) meta-analytic review of the social psychological literature, *Psychological Bulletin* **100**, 1986, 309-330.
- Farrington [D.P.D.P.](#), Early predictors of adolescent aggression and adult violence, *Violence and Victims* **4**, 1989, 79-100.
- Farrington [D.P.D.P.](#), Childhood aggression and adult violence: Early precursors and later-life outcomes, In: Pepler J. and Rubin [K.H.K.H.](#), (Eds.), *The ~~D~~development and ~~T~~treatment of ~~C~~childhood ~~A~~aggression*, 1991,

Lawrence Erlbaum; Hillsdale, NJ.

- Finkel [E.-J.E.I.](#), DeWall [C.-N.C.N.](#), Slotter [E.-B.E.B.](#), McNulty [J.-K.I.K.](#), Pond [R.-S.R.S.](#), Jr., and Atkins [D.-C.D.C.](#), Using I<sup>3</sup> theory to clarify when dispositional aggressiveness predicts intimate partner violence perpetration, *Journal of Personality and Social Psychology* **102**, 2012, 533-549.
- Garcia-Forero C., Gallardo-Pujol D., Maydeu-Olivares A. and Andres-Pueyo A., Disentangling impulsiveness, aggressiveness and impulsive aggression: An empirical approach using self-report measures, *Psychiatry Research* **168**, 2009, 40-49.
- Greenwald [A.-G.A.G.](#) and McGhee [D.-E.D.E.](#), Measuring individual differences in implicit cognition: The implicit association test, *Journal of Personality and Social Psychology* **74**, 1998, 1464-1480.
- Greenwald [A.-G.A.G.](#) and Nosek [B.-A.B.A.](#), Understanding and using the implicit association test: I. An improved scoring algorithm, *Journal of Personality and Social Psychology* **85**, 2003, 197-216.
- Hawkins [J.-D.I.D.](#), Herrenkohl [T.-I.T.I.](#), Farrington [D.-P.D.P.](#), Brewer D., Catalano [R.-F.R.F.](#), Harachi [F.-W.T.W.](#) and Cothorn L., Predictors of Youth Violence, *Juvenile Justice Bulletin* **1**, 2000, 1-11.
- Hofmann W., Friese M. and Strack F., Impulse and Self-control from a Dual-Systems Perspective, *Perspect Psychol Sci/Perspectives on Psychological Science* **4**, 2009, 162-176.
- Hyde [J.-S.J.S.](#), How large are gender differences in aggression? A developmental meta-analysis, *Developmental Psychology* **20**, 1984, 722-736.
- Jens [B.-A.B.A.](#), Rainer B. and Daniel M., Double dissociation between implicit and explicit personality self-concept: The case of shy behavior, *Journal of Personality and Social Psychology* **83**, 2002, 380-393.
- Keatley [D.-A.D.A.](#), Clarke [D.-D.D.D.](#) and Hagger [M.-S.M.S.](#), Investigating the predictive validity of implicit and explicit measures of motivation on condom use, physical activity and healthy eating, *Psychology & Health* **27**, 2012, 550-569.
- Keatley [D.-A.D.A.](#), Clarke [D.-D.D.D.](#) and Hagger [M.-S.M.S.](#), Investigating the predictive validity of implicit and explicit measures of motivation in problem-solving behavioural tasks, *British Journal of Social Psychology* **52**, 2013a, 510-524.
- Keatley [D.-A.D.A.](#), Clarke [D.-D.D.D.](#) and Hagger [M.-S.M.S.](#), The predictive validity of implicit measures of self-determined motivation across health-related behaviours, *British Journal of Health Psychology* **18**, 2013b, 2-17.
- Keatley [D.-A.D.A.](#), Chan [D.-K.D.K.](#), Caudwell K., Chatzisarantis [N.-L.N.L.](#) and Hagger [M.-S.M.S.](#), A consideration of what is meant by automaticity and better ways to measure it, *Frontiers in psychology* *Frontiers in Psychology* **5**, 2014, 1537.
- Krueger [R.-F.R.F.](#) and South [S.-G.S.C.](#), Externalizing disorders: eCluster 5 of the proposed meta-structure for DSM-V and ICD-11, *Psychological Medicine* **39**, 2009, 2061-2070.
- Maloney [P.-W.P.W.](#), Grawitch [M.-J.M.J.](#) and Barber [L.-K.L.K.](#), The multi-factor structure of the Brief Self-Control Scale: Discriminant validity of restraint and impulsivity, *Journal of Research in Personality* **46**, 2012, 111-115.
- Matthias B., Monika F. and Joerg Z., The influence of violent and nonviolent computer games on implicit measures of aggressiveness, *Aggressive Behavior* **36**, 2010, 1-13.
- Moffitt [T.-E.T.E.](#), Adolescence-limited and life-course-persistent antisocial behavior: a developmental taxonomy, *Psychological Review* **100**, 1993, 674-701.
- Mullan B. and Badger F., Aggression and violence towards staff working with older patients, *Nursing Standard* **21**, 2007, 35-38.
- Perugini M. and Conner M., Automatic activation of individual differences: A test of the gatekeeper model in the domain of spontaneous helping, *European Journal of Personality* **25**, 2011, 465-476.
- Perugini M., Richetin J. and Zogmaister C., Prediction of behaviour, In: Gawronski B. and Payne K., (Eds.), *Social Cognition: Measurement, Theory, and applications*, **10**, 2010, The Guilford Press; London.
- Reza [A.-B.A.B.](#), Comparing the incidence of Aggression Among Student Athletes in Various Sports Disciplines at the University of Tiran, *Procedia - Social and Behavioral Sciences* **47**, 2012, 1869-1873.
- Richetin J., Richardson [D.-S.D.S.](#) and Mason [G.-D.G.D.](#), Predictive validity of IAT aggressiveness in the context of provocation, *Social Psychology* **41**, 2015, 27-34.
- Roberts S., Zhang J. and Truman J., Indicators of School Crime and Safety, 2012, National Centre for Education Statistics. U.S. Department of Education and Bureau of Justice Statistics.
- Rothbart [M.-K.M.K.](#) and Sheese B.E., Temperament and emotion regulation, In: Gross [J.I.](#) (Ed), *Handbook of emotion regulation*, 2007, Guilford Press; New York, NY.
- Schmidt [A.-F.A.F.](#), Zimmerman [P.-S.P.S.](#), Banse R. and Imhoff R., Ego Depletion Moderates the Influence of Automatic and Controlled Precursors of Reactive Aggression, *Social Psychology* **46**, 2015, 132-141.

Simons [J.S.J.S.](#), Wills [T.A.T.A.](#), Emery [N.N.N.N.](#) and Spelman [P.J.P.J.](#), Keep calm and carry on: Maintaining self-control when intoxicated, upset, or depleted, *Cognition & Emotion* **11**, 2015, 1-15.

Sofia [R.M.R.M.](#) and Cruz [J.F.A.J.F.A.](#), Self-control as a mechanism for controlling aggression: A study in the context of sport competition, *Personality and Individual Differences* **87**, 2015, 302-306.

Spector [P.E.P.E.](#), Method variance in organizational research truth or urban legend?, *Organizational Research Methods* **9**, 2006, 221-232.

Strack F. and Deutsch R., Reflective and impulsive determinants of social behavior, *Personality and Social Psychology Review* **8**, 2004, 220-247.

Strüber D., Lück M. and Roth G., Sex, aggression and impulse control: [a](#)An integrative account, *Neurocase* **14**, 2008, 93-121.

Tangney [J.P.J.P.](#), Baumeister [R.F.R.F.](#) and Boone [A.L.A.L.](#), High self-control predicts good adjustment, less pathology, better grades, and interpersonal success, *Journal of Personality* **72**, 2004, 271-324.

Uziel L., Rethinking [S](#)Social [D](#)esirability [S](#)scales: From [I](#)mpression [M](#)anagement to [I](#)nterpersonally [O](#)riented [S](#)elf-[C](#)ontrol, *Perspectives on Psychological Science* **5**, 2010, 243-262.

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### Highlights

- An implicit measure of self-control was developed to predict [aggressive tendencies](#) [violence and aggression](#).
- Higher implicit and explicit self-control predicted lower levels of aggression [and violence](#).
- [Gender also had a role in prediction of behaviours, but did not interact with self-control measures.](#) [Males demonstrated a stronger relationship between explicit self-control and physical aggression.](#)

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