



Does choice of measure matter? Assessing the similarities and differences among self-control scales



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ABSTRACT

Purpose: To assess the extent to which three well-validated measures of self-control are assessing the same construct.

Methods: Two student samples ($n_s = 315$ and 172) completed multiple self-control scales (the Grasmick et al. scale, Weinberger Adjustment Inventory-Restraint, and the Tangney et al. scale), as well as other personality traits, aggression, and offending scales.

Results: The three scales correlated highly with one another (r_s ranged from 0.65 – 0.69) and rank-order differences were uncommon (approximately 80% were within 1 standard deviation). However, each scale demonstrated somewhat different patterns in terms of their relationships with other personality indices, aggression, and offending.

Conclusions: The Grasmick scale and Weinberger Adjustment Inventory were similar to one another in many (but not all) instances, and both were distinct from the Tangney scale. The three self-control scales used in this analysis have much in common, but they are not identical. Moreover, with the exception of the Tangney scale, the constructs assessed by the self-control scales are not synonymous with Conscientiousness or impulsivity. Care should be exercised in including these different self-control scales and similar constructs (e.g., impulsivity) within meta-analytic studies as effect sizes risk being misspecified.

1. Introduction

Self-control is a widely-studied transdisciplinary construct (DeLisi, 2013) that is associated with antisocial behavior (De Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012; Hay & Meldrum, 2016; Pratt & Cullen, 2000) and other important life outcomes (Moffitt et al., 2011; Moffitt, Poulton, & Caspi, 2013).¹ While some have argued that different measures of self-control are essentially interchangeable (De Ridder et al., 2012; Hay & Meldrum, 2016), limited research suggests this is not necessarily the case (De Vries & Van Gelder, 2013; De Ridder et al., 2012; Walters, 2016). To the extent that different measures are not tapping into the same construct, scientific advancement is compromised (Block, 1995; Carlson & Herdman, 2012; Duckworth & Kern, 2011; Whiteside & Lyman, 2001).

There are various estimates for the convergence of self-control measures. Across different methods of assessment (e.g., delay of gratification tasks, self-report questionnaires) convergence is low ($r = 0.20$; Duckworth & Kern, 2011). This is true of attitudinal and behavioral indices of self-control as well ($r = 0.24$, Walters, 2016). Others have found higher estimates when exploring self-report attitudinal measures. For example, a meta-analysis of convergence among self-report self-control scales found moderate convergence ($r = 0.50$; Duckworth & Kern, 2011).² Similar findings exist for how well the Grasmick scale is related to other self-control scales including: the Tangney scale ($r = 0.50$, De Vries & Van Gelder, 2013), the Retrospective Behavioral Self-control scale ($r = 0.42$), the self-control scale from the California Psychological Inventory ($r = 0.67$) and the Sixteen Personality Factor Questionnaire Perfectionism scale ($r = 0.58$) (the

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¹ Self-control, broadly defined, refers to the tendency to inhibit a desired behavior because there are possible negative outcomes. There are a variety of terms (e.g., self-regulation, effortful control) and conceptualizations stemming from various disciplines and researchers, and despite this, many researchers use the term as though it has the same (or a similar) meaning (Duckworth & Kern, 2011). However, this debate and the surrounding issues of conceptualization are beyond the scope of this analysis. Instead, the focus here is solely on the convergence of different measures of self-control.

² This meta-analysis included > 100 distinct self-report self-control scales based on a variety of conceptualizations. Importantly, there was significant heterogeneity among the self-report measures, indicating that some measures were more convergent than others. Due to the large numbers of different measures, an analysis of which specific measures were more convergent was not possible.

latter of which is similar to self-control, despite the different label; Marcus, 2003).

Some have suggested that similar constructs, such as Conscientiousness or impulsivity, are related to self-control, and therefore might be reasonable proxies for the construct (Duckworth & Kern, 2011; Hay & Meldrum, 2016). Empirical evidence offers some support for this. Conscientiousness was related to the Grasmick scale ($r = 0.36$, De Vries & Van Gelder, 2013; $r = 0.58$, Marcus, 2003), the Tangney scale ($r = 0.55$, De Vries & Van Gelder, 2013), and the Gibbs, Giever, and Martin (1998) (low) self-control scale ($r = -0.60$, O'Gorman & Baxter, 2002).

It is challenging to conclude whether the evidence supports the notion that different measures of self-control, or related constructs such as Conscientiousness, are related enough to consider them reasonably equivalent because there is no standard for what constitutes acceptable convergence. Some have argued that two reasonably equivalent measures should correlate very similarly to an outcome variable if they are measuring the same thing (Carlson & Herdman, 2012). Based on their analysis, Carlson and Herdman offered the following recommendations. Measures with convergent validity less than $r = 0.50$ cannot be used interchangeably, as they are too distinct and lead to nearly half of cases being differentially related to a given outcome at values greater than 0.10. They further suggested that convergent validity as high $r = 0.85$ be used to minimize differences in the magnitude of an effect of a construct on some outcome. The convergence between many self-control measures reported above fall at or near the lower bound, and none approach the upper limit they recommend. Even at the relatively high levels of convergence, varying estimates on the relationship between self-control and a given outcome are likely. This in turn can increase the variability of effect sizes included in a meta-analysis, which might bias meta-analytic estimates (Carlson & Herdman, 2012).

Limited research speaks to how well different measures of self-control are related to antisocial outcomes. Some research indicates that attitudinal and behavioral measures of self-control exert similar effects on antisocial outcomes (Pratt & Cullen, 2000; Walters, 2016). However, De Ridder et al. (2012) found non-overlapping confidence intervals in effect sizes between some self-control measures. Moreover, they found the full version of the Tangney scale exerted significantly stronger effects on undesired behavior compared to the brief version. In addition, self-report measures of self-control exert weaker effects than different reporting methods (although it was not reported what those other methods were; Vazsonyi, Mikuška, & Kelley, 2017).

Only one study has examined whether different self-control scales are similarly related to a wide variety of personality traits. As discussed above, both the Grasmick and Tangney scales were related to Conscientiousness. However, the Grasmick scale demonstrated notable relationships with Honesty-Humility and Agreeableness, while the Tangney scale was somewhat related to Emotionality (De Vries & Van Gelder, 2013). This differential pattern of relationships suggests the two scales are not measuring the same construct.

Currently, there is insufficient empirical knowledge that speaks to the convergent validity of self-control measures commonly used in criminology. Similarly, there has been little focus on how different measures of self-control are related to other personality traits. To the extent that self-control measures are not capturing the same construct, meta-analytic estimates might be biased (Carlson & Herdman, 2012). Moreover, if different measures of self-control are assessing related, but distinct constructs, this can impede the successful accumulation of scientific knowledge around this important construct. The current study extends this small literature by examining multiple well-validated self-report measures of self-control by focusing on relative and absolute agreement among them, and how they are uniquely related to other traits and antisocial outcomes.³

2. Method

2.1.1. Participants and procedure

Two separate undergraduate samples were drawn from a large research university. In sample 1, there were 315 participants (58.41% women; 41.59% men), with an average age of 21.73 ($SD = 3.33$). The majority self-identified as Caucasian (66.88%), followed by African-American (12.10%), Latino (11.78%), and Other (9.24%). Sample 2 consisted of 172 participants (66.28% women; 33.72% men). The average age was 21.44 ($SD = 3.56$). The majority self-identified their race as Caucasian (60.47%), followed by Latino (16.28%), African-American (12.21%), and Other (11.05%). Data from sample 1 were collected via confidential surveys. Individuals were given the survey in an envelope and asked to return it in one week. Data from sample 2 were collected via a confidential online survey. All participants were given extra credit in their course for completing the surveys. Both studies were approved by the university's institutional review board.

2.1.2. Measures

2.1.2.1. Self-control. The Grasmick scale (Grasmick, Tittle, Bursik, & Arneklev, 1993). This scale consists of 24 items with six facets: Impulsivity, Risk Taking, Simple Tasks, Physical Activities, Self-centeredness, and Temper. Each item is scored from 1 (*Agree strongly*) to 4 (*Disagree strongly*). Items were reverse scored and summed so that higher scores reflect greater self-control (Sample 1, $\alpha = 0.84$; Sample 2, $\alpha = 0.80$). The means were 66.92 ($SD = 10.20$) and 67.68 ($SD = 8.58$) for samples 1 and 2, respectively.

Weinberger Adjustment Inventory-Restraint (WAI-R; Weinberger & Schwartz, 1990). Restraint has four facets: Impulse Control, Suppression of Aggression, Consideration of Others, and Responsibility. Items are scored from 1 (*False*) to 5 (*True*), with higher scores indicative of more Restraint. The first three facets were summed to form a modified Restraint scale (22 items). The fourth facet (Responsibility) has several items that gauge attitudes and behaviors about violating rules and the law. By not including this facet, there are no concerns about predictor-criterion overlap with antisocial measures. The modified Restraint scales had a mean of 79.34 ($SD = 12.92$; $\alpha = 0.85$) and 81.90 ($SD = 12.91$; $\alpha = 0.88$) in samples 1 and 2, respectively.

The Tangney Scale (Tangney, Baumeister, & Boone, 2004). This scale has 36 items ($M = 123.62$; $SD = 19.69$; $\alpha = 0.90$) measured from 1 (*Not at all*) to 5 (*Very much*). Items were summed and higher scores on this measure are indicative of greater levels of self-control. This scale was used in Sample 2 only.

2.1.2.2. Personality scales. UPPS Impulsive Behavior Scale (Whiteside & Lynam, 2001). This scale, used only in Sample 1, contains 4 traits underlying impulsive behavior: Urgency ($M = 28.22$; $SD = 6.55$; 12 items; $\alpha = 0.84$), Premeditation ($M = 21.09$; $SD = 5.38$; 11 items; $\alpha = 0.83$), Perseverance ($M = 19.25$; $SD = 5.20$; 12 items; $\alpha = 0.81$), and Sensation Seeking ($M = 32.98$; $SD = 7.26$; 12 items; $\alpha = 0.84$). Items were scored from 1 (*Agree Strongly*) to 4 (*Disagree Strongly*) and summed to represent greater

³ The three measures are: the scale developed by Grasmick and colleagues (Grasmick et al., 1993; hereafter referred to as the Grasmick scale), a revised version of the Weinberger Adjustment Inventory Restraint scale (Weinberger & Schwartz, 1990; WAI-R), and the Self-Control Scale (Tangney et al., 2004; hereafter referred to as the Tangney scale). The reasons for including these self-control scales are twofold. First, each has undergone psychometric analyses that in some manner speak their construct validity (e.g., factorial validity, convergent and discriminant validity). Second, all have been used in previous studies that examined offending behavior. The Grasmick scale is arguably the most widely used in criminology (Pratt & Cullen, 2000). The WAI has been used previously in criminology outlets (Coffman, Steinberg, & Piquero, 2005; Jones, Coffman, & Piquero, 2007) and will likely be used extensively given it is included in the Pathways to Desistance dataset (<http://www.pathwaysstudy.pitt.edu/>). The Tangney scale has also been used in several criminological studies to assess antisocial outcomes (e.g., Holtfreter, Reiss, Piquero, & Piquero, 2010; Reiss, Wolfe, & Holtfreter, 2011).

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