Varieties of Self-Control and Their Personality Correlates

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Hoyle, R. H., & Davisson, E. K. (2016). Varieties of self-control and their personality correlates. In K. D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and applications* (3rd ed., pp. 396-413). New York: Guilford Press.

Although the ability to exercise self-control does not guarantee good health, fulfilling relationships, and professional success, achieving those desiderata is virtually impossible without it. For some people, self-control seems to come naturally; they readily recognize threats to desired behavior and outcomes and strategically avoid or manage them. For others, self-control is often difficult to muster and, as a result, behavior and outcomes are unduly, and frequently adversely, influenced by counterproductive urges and insufficient motivation or attention. This variability across people in the ability to exert self-control when needed and its covariation with personality is the focus of this chapter.

There is no widely accepted, well-articulated model of trait self-control; however, insight into the principal features of the construct can be gleaned from the different instruments routinely used to measure it. As such, we preface our review of research on self-control and personality with a brief review of prominent measures of self-control, including our own recently developed measure. This measure is unique in its basis in a multidimensional model of self-control, which it captures explicitly. We then review research on the association between self-control and personality, beginning with broad domains of personality then turning to narrower personality traits. We cover research on traits that are conceptually similar to (and sometimes confused with) self-control, capturing individual differences in specific features or consequences

of it, as well as traits that, like self-control, reflect components of and approaches to self-regulation.

MEASURES AND DEFINITIONS OF TRAIT SELF-CONTROL

Measures of self-control are of two general types. One, to which we devote relatively little attention in this chapter, includes performance and other behavioral indicators of self-control. Examples are the stop-signal task (e.g., Tabibnia et al., 2011), the go/no-go task (e.g., Somerville, Hare, & Casey, 2011), delay discounting tasks (e.g., Waegeman, Declerck, Boone, Van Hecke, & Parizel, 2014), and the marshmallow test (Mischel, Shoda, & Peake, 1988). The other, on which we draw for the sketch of the construct and its measurement in this section of the chapter, includes self-report and informant measures. A meta-analysis focused on the convergent validity of measures of self-control from both categories identified more than 100 self-report and informant measures (Duckworth & Kern, 2011). Nearly all of those measures were developed for specific research studies and therefore have not been widely disseminated or used. Many reflect specific variants or correlates of self-control but do not capture the full breadth of the construct.

Two self-report measures of trait self-control have been used in studies of a wide range of self-control processes and behaviors. We briefly describe those measures, focusing primarily on the conceptualization of trait self-control they imply or purport to measure. We then describe a new conceptual model of the construct and a measure that captures individual differences in the different capacities for self-control it specifies. These descriptions provide a conceptual context for interpreting associations with personality, especially when they vary in magnitude as a function of how self-control is measured.

Low Self-Control Scale

The oldest widely used measure of self-control is the Low Self-Control Scale, developed by Grasmick, Tittle, Bursik, and Arneklev (1993) for the purpose of evaluating key tenets of the general theory of crime (Gottfredson & Hirschi, 1990). According to the theory, a primary cause of crime is the combination of poor self-control and opportunities to commit crime (Rocque, Posick, & Piquero, Chapter 28, this volume). The prominent position of a trait in the theory was motivated by the observations that the propensity to engage in criminal behavior is a stable individual difference and that individuals prone to such behavior often engage in different types of crime. The theory views self-control as “the differential tendency of people to avoid criminal acts whatever the circumstances in which they find themselves” (Gottfredson & Hirschi, 1990, p. 87). The focus of the theory is poor or underdeveloped self-control, evidenced in poorly socialized individuals who are “unusually sensitive to immediate pleasure and insensitive to long-term consequences” (pp. 1-2). Despite the potential application of this definition to a broad range of behavior, the theory focuses exclusively on self-control in the context of criminal behavior, characterizing self-control as the trait that accounts for “variation in the likelihood of engaging in such acts” (Gottfredson & Hirschi, 1990, p. 2; see also Akers, 1991).

Given the exclusive focus of the conceptual model on criminal behavior, it is not surprising that the measure inspired by the theory focuses primarily on proximal causes of those behaviors. Specifically, the Low Self-Control Scale assesses impulsivity, preference for simple vs. complex tasks, risk seeking, preference for physical rather than mental activities, self-centeredness, and a volatile temper (Grasmick et al., 1993). Although scores corresponding to these components of the construct can be derived from the measure (Williams, Fletcher, & Ronan, 2007), typically a single score presumed to reflect underdeveloped self-control is derived (Piquero, MacIntosh, & Hickman, 2000). Whether these scores reflect self-control proper or an

amalgamation of related constructs is a concern (Piquero & Bouffard, 2007). For example, impulsivity and self-centeredness are sometimes cast as aspects of (low) self-control, but as we argue with specific reference to impulsivity later in the chapter, they do not reflect all, or even most, of the breadth of the construct. Risk-taking, volatile temper, and the preference for simple tasks and physical activities are better viewed as consequences of self-control and other factors rather than components of the construct (cf. Hirschi & Gottfredson, 1993). These concerns about the validity of the measure coupled with the criminality-focused conceptualization should be taken into account when interpreting correlations with personality.

Self-Control Scale

In psychological research on self-control and self-regulation, the most widely used measure of trait self-control is the Self-Control Scale (Tangney, Baumeister, & Boone, 2004). Noting that measures of self-control available at the time their research was conducted did not reflect the latest conceptual models and empirical findings relevant to the construct, Tangney and colleagues (2004) developed a new measure for research on the range of outcomes associated with individual differences in the capacity for self-control. They defined self-control as “the ability to override or change one’s inner responses, as well as to interrupt undesired behavioral tendencies and refrain from acting on them” (p. 275). They described this basic capacity as “powerfully adaptive,” providing an array of benefits that should result in a happier, healthier, and more productive life.

The basis for the measure and the definition it implies were results of a comprehensive review of published research on self-control, with a particular focus on self-control failures (Baumeister, Heatherton, & Tice, 1994). That review organized self-control failures in five categories, suggesting that, for a measure to fully capture the construct, it would need to touch on

aspects of self-control relevant for every category of failure. Specifically, the review identified self-control failures that reflect insufficient capacity to control thoughts, emotions, and impulses; to regulate performance; and to overcome maladaptive habits. Analyses of candidate items written to reflect these capacities resulted in the Self-Control Scale, of which a subset of items constitutes the Brief Self-Control Scale (Tangney et al., 2004). The scale is nearly always used to generate a single score, which is assumed to reflect the general capacity to exert self-control when it is required. Although the items were not written with the intent of assessing different forms of self-control, such as those outlined in the next section, conceptual (de Ridder, de Boer, Lugtig, Bakker, & van Hooft, 2011) and empirical (Maloney, Grawitch, & Barber, 2012) sorting of the items hint at two forms of self-control. On balance, these analyses suggest that scores on the brief form of the Self-Control Scale primarily reflect control over impulses with an underdeveloped secondary capacity to initiate desired behaviors.

Capacity for Self-Control Scale

The Low Self-Control Scale and the (Brief) Self-Control Scale, and the conceptual models they represent, have contributed to significant advances in the understanding of the correlates and consequences of individual differences in the capacity for self-control; however, neither captures the full breadth of the construct without reference to specific behaviors or outcomes. As a more general and complete complement to these measures and the conceptual models they represent, we have developed a new model of individual differences in self-control capacity and a corresponding measure.

Our model posits two binary dimensions along which instances of self-control vary—type and duration. Crossing these dimensions yields four forms of self-control. An assumption of the model, reflected in our multifactor Capacity for Self-Control Scale, is that there is predictive and

explanatory benefit to be gained from measuring capacity for each form of self-control. Although we would expect capacity for one form of self-control to covary with capacity for the other forms, we do not assume that they represent a single, undifferentiated capacity. For that reason, we expect capacity for the different forms of self-control to be differentially associated with certain aspects of personality, particularly narrowly-defined traits.

The most basic distinction between forms of self-control is type. Formalizing the distinction highlighted in item-level analyses of the Brief Self-Control Scale (de Ridder et al., 2011), we posit two types of self-control: self-control by inhibition and self-control by initiation. These are formally defined with reference to a general definition of *self-control*: a conscious decision by the individual to move, or to continue moving, in a direction that differs from that dictated by opposing forces in the person (e.g., impulses, habits, desires) or situation (e.g., norms, requests/demands by others). Building on this basic definition, *self-control by inhibition* is required when those forces pull for thoughts, feelings, or behaviors that are inconsistent with one or more active goals—consciously overriding a pull toward goal-inconsistent behavior. *Self-control by initiation* is required when those forces pull for inaction when pursuit of an active goal requires action—consciously producing goal-consistent action despite a pull toward inaction.

Whether the type of self-control required for productive goal pursuit is inhibition or initiation, its duration might be short lived or sustained over a period of time. Typical treatments of the construct focus almost exclusively on single, short-lived acts of self-control; for example, making a healthy meal choice at a restaurant or restraining an emotional display when cut off in traffic. These treatments may not adequately account for instances of self-control that require ongoing inhibition or initiation (Vohs & Schmeichel, 2003). For example, inhibiting the desire to check e-mail while at work on a computer requires self-control by inhibition throughout the

course of a workday. Completing an exercise routine begun through an act of self-control by initiation requires staying the course when heart rate quickens and muscles ache. In our model, these are acts of *self-control by continuation*, consciously deciding to persist at inhibition or to continue following initiation despite the pull to stop when a self-control challenge is ongoing.

Our initial attempt at capturing these distinctions followed the example of extant measures by focusing on single, short-lived acts of self-control. Drawing on narrative accounts of self-control successes and failures by adults of all ages, we developed self-report items to capture individual differences in the capacity for self-control by inhibition or initiation. Because our measure is new and to facilitate interpretation of correlations we report later in the chapter, we have included the items in Table 22.1. Consistent with our definition, the self-control by inhibition items focus on inhibiting the desire to act on temptations, cravings, impulses, wants, and bad habits. In contrast, the self-control by initiation items focus on initiating behavior rather than delaying or wasting time when motivation or desire for the behavior is low. In several adult samples, the correlation between the two types of self-control range from .50 to .60. This magnitude is strong enough to suggest that we have captured two types of the same capacity but not so strong as to suggest conceptual redundancy.

We next turned to the development of items to capture the capacity for continuing inhibition and initiation when self-control challenges require it. Again, we drew on narrative accounts provided by adults asked to describe situations in which they had succeeded or failed at sustaining self-control by inhibition or initiation. Those accounts made clear that the continuation of self-control that begins with initiation is a common demand and distinct from simply initiating behavior when motivation or desire are lacking. For example, getting to the gym for a cardio workout requires initiation (often preceded by inhibition), but staying with a

challenging workout that feels as if it is taking longer than it should requires continuation (Vohs & Schmeichel, 2003). Surprisingly the distinction between individual acts of self-control by inhibition and the continuation of self-control when the relevant temptation or urge is not transitory was not as clear. In circumstances involving prolonged exposure to a temptation or experience of an urge, individuals reported engaging in repeated discrete acts of inhibition rather than sustaining inhibition over time. For instance, the temptation to visit social media sites while working on a computer is not sustained over time in the same way as the urge to stop a challenging activity as motivation wanes or difficulty increases. Rather, the temptation waxes and wanes in concert with attention to work. We nonetheless wrote items corresponding to the continuation of each type of self-control. Factor analyses confirmed the pattern evident in the narrative accounts, with items reflecting the capacity for individual acts of inhibition and those reflecting ongoing inhibition clustering on a single factor.

As a result, and as evident in Table 22.1, the final version of our Capacity for Self-Control Scale comprises subscales corresponding to the capacity for individual acts of self-control by inhibition and initiation and the capacity for sustaining self-control that begins with initiation. As would be expected, the correlation between initiation and continuation is strong—around .70 in young adult samples. Despite the substantial empirical overlap, as we report later in the chapter, there is separation between the two in terms of association with personality traits. Somewhat unexpected is the correlation of about .60 between inhibition and continuation following initiation, which are conceptually distinct. Findings not covered in our review suggest that this relation can be attributed in part to the necessity of inhibiting the urge to quit in order to sustain self-control involving initiation. In fact, our findings to date suggest that all acts of initiation involve some degree of inhibition; that is to say, inhibition is necessary but not

sufficient to account for acts of self-control by initiation (de Ridder, Lensvelt-Mulders, Finkenauer, Stok, & Baumeister, 2012).

Summary: Measures and Definitions

The empirical literature on trait self-control has relied heavily on two self-report measures, each reflecting a discipline-specific view of the construct. The Low Self-Control Scale derives from the general theory of crime, in which self-control is posited to result from socialization within the family and to manifest as the propensity toward criminal behavior when afforded an opportunity. More abstractly, the theory proposes that opportunistic crime is an instance of behavior driven by immediate benefits without consideration for potential long-term consequences of the behavior (cf. Hirschi, 2004). The measure used to operationally define key features of this conceptualization focuses on the implications and consequences of self-control defined in this way and, as such, conflates the propensity toward criminal behavior with poor self-control. The widely used Self-Control Scale derives from an extensive review of failures of self-control (of which opportunistic crime is but one), resulting in a more general measure and characterization of the construct. Despite its basis in a relatively nonselective review of self-control challenges, the measure does not capture the full range of self-control behaviors. With but a few exceptions, the items tap self-control by inhibition. To these measures, we have added the Capacity for Self-Control Scale, which reflects a two dimensional model of the construct. One binary dimension distinguishes type of self-control—inhibition or initiation. The other distinguishes duration of self-control—short-lived or sustained over time. The accompanying measure produces three scores, two corresponding to short-lived inhibition and initiation, and a third to continuation following initiation. Acts of inhibition, even when they are in response to an

ongoing temptation or persistent urge, are always short-lived. As a result, there is no need for a separate score for sustained inhibition.

Having sketched prominent perspectives on trait self-control and approaches to its measurement, we now turn to a review of research on self-control and personality. We begin with a focus on higher-order dimensions of personality, then move to specific personality traits that contribute to or share features with trait self-control.

SELF-CONTROL AND BROAD DOMAINS OF PERSONALITY

Personality can be profitably studied at different levels of generality and abstractness. Our focus in this section of the chapter is on the relations between self-control and a small number of personality domains that, collectively, are posited to account for nearly all of the covariation between personality traits. The most prominent of these higher-order models posit five general sources of commonality that, together, constitute the Big Five (John, 1990) and the parallel five-factor model (Costa & McCrae, 1992; cf. John & Robins, 1993). Although the bases of these models differs, resulting in minor differences in the content of the domains, those differences are generally inconsequential for understanding the associations between self-control and broad domains of personality. We generically refer to the set of five domains as the Big Five in the remainder of this section.

Conceptual integration of the Big Five and general models of self-regulation suggest that themes relevant to self-control should be evident in each of the domains. Cybernetic Big Five theory offers the most detailed integration, casting personality as a cybernetic system that guides the pursuit of goals using specific cognitive and behavioral strategies in response to interpretations of current states given memories of past states and expectations regarding future states (DeYoung, 2015). Although self-control might be evident at any phase of the cybernetic

cycle, it is most clearly evident in cognitive and behavioral activity aimed at reducing perceived discrepancies between the current states and desired states as reflected in goals (Van Egeren, 2009). For example, individuals high in extraversion would be expected to characteristically employ approach strategies (e.g., self-control by initiation) and find motivation in positive affect stemming from goal pursuit. Individuals high in conscientiousness should excel at inhibiting distractions during goal pursuit (e.g., self-control by inhibition). These and other points of integration between broad domains of personality and cybernetic models of self-regulation suggest that variability in the capacity for self-control should be reflected in scores on measures of the Big Five domains.

Another, related, conceptual analysis of the Big Five provides additional reasons to expect associations between broad domains of personality and self-control. Returning to the origins of the Big Five in factor analysis, this analysis finds evidence for two independent meta-traits that account for the covariation between the Big Five domains (DeYoung, 2006, 2010). Specifically, the covariation between (low) neuroticism, agreeableness, and conscientiousness is attributed to a factor labeled *stability*, and the covariation between extraversion and openness is attributed to a factor labeled *plasticity*. Consistent with Cybernetic Big Five Theory, these meta-traits are cast in self-regulatory terms. Stability reflects a tendency toward resisting temptations that would disrupt progress toward currently active goals. Plasticity reflects a tendency toward the pursuit of new goals and a willingness to entertain new perspectives on currently active goals and strategies for pursuing. Given the conceptual similarity of stability with self-control by inhibition and plasticity with self-control by initiation, we would expect stronger correlations of inhibition with neuroticism, agreeableness, and conscientiousness and stronger correlations of initiation with extraversion and openness.

Domains that Reflect Stability

Neuroticism reflects individual differences in the tendency to experience emotional instability, anxiety, moodiness, irritability, and sadness. Although some evidence suggests an association between neuroticism and a tendency to procrastinate, which would correspond to low self-control by initiation (Steel, 2007), in general and consistent with the meta-trait of stability we would expect moderate negative correlations with self-control by inhibition. Here we rely exclusively on our own data given the lack of published research that includes measures of self-control and measures of neuroticism. At the domain level, we find robust negative correlations between neuroticism and both types of self-control, with a particularly strong association with self-control by inhibition (r s about $-.60$). The five-factor model specifies facets, lower-order manifestations of the Big Five. We find that for each facet the correlation is stronger for self-control by inhibition. This is particularly true for the angry hostility and impulsiveness facets, for which the correlations for inhibition fall between $-.50$ and $-.60$ and the correlations for initiation fall between $-.20$ and $-.30$. Returning to the domain level, the associations between neuroticism and self-control as assessed by the Low Self-Control Scale and the Self-Control Scale fall between those for inhibition and initiation (de Vries & van Gelder, 2013; Tangney et al., 2004). The propensity to experience unstable and often negative emotions appears to be especially problematic for the capacity for self-control by inhibition.

Agreeableness concerns individual differences in preferences and tendencies related to social life. Higher scores correspond to a preference for compassionate versus tough-minded interpersonal relations. Although there is no reason to predict strong associations with self-control, the maintenance of positive interactions often requires inhibition and, when difficult interactions are anticipated, initiation. In the lone published study that includes the Low Self-

Control Scale and a measure of the Big Five, self-control is moderately correlated with agreeableness and more strongly so than self-control as assessed by the Self-Control Scale (de Vries & van Gelder, 2013). In fact, when the latter correlation is estimated controlling for social desirability, it approaches zero (Tangney et al., 2004). In our analyses of both domain- and facet-level data we find, at the domain level a small correlation with self-control by inhibition but no correlation with self-control by initiation. Moving to the facet level, we find modest correlations between inhibition and the straightforwardness and compliance facets, and a modest correlation between initiation and modesty. Consistent with the cybernetic models of personality and the meta-trait conceptualization, agreeableness is correlated with self-control in a manner that reflects self-regulation in the service of stability.

Conscientiousness, with its focus on the tendency toward responsibility, orderliness, and dependability, is the personality domain with the most explicit connections to self-control. In our own work mapping the connections between conscientiousness and self-control we have been particularly interested in differences between self-control by inhibition and self-control by initiation in their associations with conscientiousness. The meta-traits conceptualization of personality suggests that we should find the strongest associations with self-control by inhibition. Strong correlations between scores on the Self-Control Scale, which disproportionately taps inhibition, and conscientiousness are consistent with this expectation (r of about .50 reported by Tangney et al., 2004; see also de Vries & van Gelder, 2013). Correlations between conscientiousness and Low Self-Control Scale scores are surprisingly weak, perhaps owing to the focus of that measure on multiply-determined consequences of low self-control (O’Gorman & Baxter, 2002). Our work with the Capacity for Self-Control Scale and facet-level measurement of personality offers a more nuanced picture of the association between self-control

and conscientiousness. The correlations of the two types of self-control with the order facet (personal organization) are modest and equivalent. The correlations with the self-discipline facet are high. Given the emphasis on starting tasks despite boredom and distractions, it is not surprising that the correlation between this facet and our self-control by initiation subscale is high (r s of about .75) and significantly higher than the correlation with self-control by inhibition (r s closer to .60). Otherwise, the correlations are moderate in magnitude and vary for the two types of self-control capacity. Inhibition is more strongly correlated with the competence and deliberation facets, whereas, in addition to self-discipline, initiation is more strongly correlated with achievement striving. This pattern partially corresponds to the stability-plasticity distinction offered by the meta-traits conceptualization, which positions conscientiousness as an indicator of stability, although some facets of conscientiousness appear to be more reflective of plasticity than stability.

The moderate-to-strong correlations between measures of self-control and measures of conscientiousness and its facets raise the question of how the two constructs differ. In the absence of longitudinal data on each construct beginning during childhood, we cannot draw a distinction based on rigorous empirical evaluation. Instead we rely on theory and knowledge of the content of measures typically used to operationally define each construct. In terms of theory, we find the arguments in five-factor theory to be persuasive. Conscientiousness is the more fundamental of the two characteristics, underpinning self-control capacity and other self-regulatory processes and skills. Importantly, conscientiousness does not alone account for individual differences in self-control capacity. Rather, it is the interaction of conscientiousness with culture and life experiences that shapes those individual differences (McCrae & Costa, 1996). In terms of measurement, we suspect that the high correlations between certain facets of

conscientiousness and self-control can be attributed to significant overlap in item content. For instance, an item from the NEO Personality Inventory-Revised (NEO-PI-R) measure of the self-discipline facet of conscientiousness that reads “I have trouble making myself do what I should” is conceptually similar to the Capacity for Self-Control Scale item that reads “I just can’t seem to get going, even when I have much to do.” Although self-control is associated with other personality domains, there is substantial and understandable overlap with conscientiousness and its facets.

Domains that Reflect Plasticity

Extraversion, with its emphasis on sociability and approach orientation, should be associated with self-control by initiation; selected facets might also be associated with self-control by inhibition. Estimates of association involving the Low Self-Control Scale and the Self-Control Scale are positive but weak, peaking at $r = .16$ for the Self-Control Scale (de Vries & van Gelder, 2013). The domain-level correlations for our measure are consistent with those involving the other self-control measures but, as might be expected given the prominent role of approach, are stronger for self-control by initiation. Moving to the facet level, we find moderate correlations of self-control by initiation and the assertiveness and activity facets. The only nonzero correlation involving self-control by inhibition is for activity; that correlation is significantly weaker than the corresponding correlation for initiation. In summary, certain features of extraversion are associated with self-control; the magnitude of those associations is modest and, consistent with the meta-traits conceptualization, primarily involve self-control by initiation.

Estimates of the association between self-control and the openness domain are sparse. The meta-traits conceptualization suggests that, primarily, any relation between the two should

be attributable to self-control by initiation. In a study that gathered data on both the Low Self-Control Scale and the Self-Control Scale along with the Big Five, scores on neither measure correlated with openness. In our scale development work, we assessed self-control by inhibition, self-control by initiation, and openness at the domain and facet levels. None of the domain-level correlations was significant. Among the 12 facet-level correlations, two attained significance at a magnitude of about .30. Self-control by initiation was correlated with actions, openness to new experiences on a practical level, and fantasy, receptivity to the inner world of imagination. As suggested by the meta-traits conceptualization of personality, only self-control by initiation is associated with openness to experience, and the association is modest and specific to two of six facets.

Summary: Self-Control and Domain-Level Personality

Our review highlighted findings from a small corpus of research in which broad domains of personality were assessed along with one or more measures of self-control. To these findings, we added results from our own work focused at both the domain and facet levels of personality and distinguishing between self-control by inhibition and self-control by initiation. Collectively, these findings are consistent with the stability-plasticity distinction in the meta-traits conceptualization of personality (DeYoung, 2006, 2010). Neuroticism, agreeableness, and conscientiousness, which primarily reflect the tendency toward resisting temptations that would disrupt progress toward currently active goals, were primarily correlated with self-control by inhibition. Extraversion and openness, which primarily reflect a tendency toward the pursuit of new goals, and a willingness to entertain new perspectives on currently active goals and strategies for pursuing them, were primarily correlated with extraversion and openness (though only weakly and for selected facets of openness). This pattern of associations validates the meta-

traits conceptualization as well as our inhibition-initiation distinction, about which we offer further insight in the next section.

SELF-CONTROL AND NARROW PERSONALITY TRAITS

Findings from research on the relations between domain-level personality and self-control are informative because they reveal connections between self-control and personality across the full range of personality content. Yet, as our review of that research revealed, moving the focus to the facet-level sometimes provided a clearer, more detailed account of those connections. In this section, we further narrow the focus, considering traits that, like self-control, are more proximal to behavior than domains, or even facets, of personality. Unlike facets, which can be grouped neatly under domains, most of these traits crosscut personality domains and facets as a result of their origins in models of specific personality processes as opposed to comprehensive models of personality structure. Although a consideration of the association between self-control and almost any trait might prove informative, we limit our review to traits that help or hinder self-control or influence how self-control is enacted.

Impulsivity

As with self-control, impulsivity as a trait has been characterized in the research literature by many different—often inconsistent—definitions (DeYoung, 2011). Despite these inconsistencies, most operationalizations of impulsivity reflect the tendency to act without thought or planning (Eysenck & Eysenck, 1977; Patton, Stanford, & Barratt, 1995; Whiteside & Lynam, 2001). This feature of impulsivity is prominent in the most widely-used measures of the trait (e.g., Eysenck, Pearson, Easting, & Allsopp's, 1985, 16 Impulsiveness Scale narrow impulsiveness subscale; Urgency, Premeditation, Perseverance, Sensation Seeking [UPPS] lack of premeditation; Barratt Impulsiveness Scale, Version 11 [BIS-11] nonplanning impulsiveness).

Yet, research on strategies routinely used by individuals high in self-control suggests that the conceptualization of impulsivity as acting without thought is problematic for understanding the impulsivity-self-control link. A meta-analysis of research on self-control and behavior revealed that the strongest relations involved automatic behaviors (i.e., addictive and habitual behaviors; de Ridder et al., 2012). A set of studies focused specifically on self-control and habitual behavior showed that the relation between self-control and multiple beneficial behaviors (e.g., academic engagement, effective meditation) was mediated by automatic behavior reflecting relevant habits (Galla & Duckworth, 2015). Nonetheless, we find acting without thought or planning as assessed by common measures of impulsivity to be moderately negatively correlated with self-control by inhibition scores and scores on the Self-Control Scale (cf. Frieze & Hofmann, 2009). This core feature of impulsivity is only modestly associated with the capacity for self-control by initiation and the continuation of self-control over time.

Also common to these conceptualizations is the multidimensional nature of impulsivity, with some facets tapping deficits in inhibitory or impulse control (as described earlier) and others reflecting features of suboptimal conscientiousness (e.g., the UPPS model's lack of perseverance facet; Whiteside & Lynam, 2001). Facets of impulsivity reflecting a lack of conscientiousness, not surprisingly, are robustly associated with self-control by initiation and self-control by continuation. Common to the capacities to initiate and sustain behaviors when motivation or desire is low and to low-conscientiousness aspects of impulsivity is an ability to restrain impulses that may interfere with the pursuit of active goals from start to finish. Thus, it is not surprising that we also observe an association between those aspects of impulsivity and the capacity for self-control by inhibition.

Approach-Avoidance

We noted in our review of the association between extraversion and self-control that one explanation for that association—and a reason to expect a stronger association for self-control by initiation than self-control by inhibition—is that extraversion reflects, in part, an approach tendency (Quilty, DeYoung, Oakman, & Bagby, 2014). With our focus now on narrower, more specific personality traits, we can examine more closely the relation between traits that reflect a general tendency toward approach as well as those that reflect a general tendency toward avoidance. The most basic of these are behavioral inhibition and behavioral approach as outlined in Gray's (1987) neuropsychological model of personality and emotion. Although all normally functioning individuals are motivated by both the behavioral inhibition (BIS) and behavioral approach (BAS) systems, they vary in the sensitivity of those systems (Carver & White, 1994). The more sensitive the BIS, the more prone the individual is to anxiety and avoidance. The more sensitive the BAS, the more prone the individual is to impulsivity and novelty seeking and the more responsive he or she is to reward. One of our data sets includes a measure of individual differences in these sensitivities, the BIS/BAS Scales, as well as the Self-Control Scale and our Capacity for Self-Control Scale. Scores on the measure of behavioral inhibition are modestly correlated with scores on both measures, equivalently for self-control by inhibition and initiation. Surprisingly, we observe only weak correlations of selected self-control measures with behavioral activation; specifically self-control by initiation is correlated with reward responsiveness and self-control by inhibition and self-control, as measured by the Self-Control Scale, are correlated with fun seeking. The capacity for self-control is only weakly associated with individual differences in the sensitivity of the behavioral inhibition and activation systems.

Two additional traits assumed to involve approach and avoidance are sensation seeking and harm avoidance. *Sensation seeking* reflects individual differences in preferences for and a

willingness to seek out (i.e., approach) novel and intense stimuli despite risks that might be associated with doing so (Zuckerman, 1994). We would expect a negative correlation with self-control by initiation and, at most, a weak negative correlation with self-control by inhibition. Our data generally confirm these expectations, showing a small but significant negative correlation between sensation seeking and initiation and no correlation between sensation seeking and inhibition. *Harm avoidance*, as typically measured, reflects concern that bad things will happen, tension in unfamiliar situations, and difficulty adapting to change (Cloninger, 1987). Because we have not included a measure of harm avoidance in our studies of the Capacity for Self-Control Scale, we cannot evaluate our expectation of a moderate negative correlation with self-control by inhibition and little or no correlation with self-control by initiation. Evidence consistent with this expectation is provided in a study showing a moderate correlation of harm avoidance with poor self-control (a composite of impulsiveness, poor anger control, and impatience) but no correlation with good self-control (a composite of dependability, attentional control, and behavioral coping; Wills, Sandy, & Shinar, 1999). Across several relevant traits, we find a robust correlation between avoidance and self-control by inhibition but a negligible relation between approach and self-control by initiation.

Delay of Gratification

Though conceptually similar to self-control and related traits, delay of gratification diverges from self-control and many of its personality correlates with respect to its measurement. Delay of gratification is commonly assessed using a behavioral paradigm developed by Mischel, Ebbsen, and Zeiss (1972) in which participants, typically children, are presented with two items or sets of objects of varying appeal. In the classic version of this task, the “marshmallow test” (Mischel et al., 1972), children can elect to receive one marshmallow immediately, or two

marshmallows upon waiting; other versions involve two toys (Funder, Block, & Block, 1983) or foods varying in appeal (Duckworth, Tsukayama, & Kirby, 2013). The focus on children, for whom self-report is not a viable approach to measurement, necessitates the use of performance measures. That focus also implies that the ability to delay gratification is one of the earliest forms of self-control capacity to emerge, serving as a foundation for the development of the more elaborate and adaptive capacities required later in life. Early delay ability predicts an array of outcomes indicative of good self-control later in life, including better social competence in adolescence (Mischel et al., 1988), higher SAT scores (Shoda, Mischel, & Peake, 1990), fewer instances of substance use (Romer, Duckworth, Sznitman, & Park, 2010), and lower rates of obesity in both adolescence and adulthood (Schlam, Wilson, Shoda, Mischel, & Ayduk, 2013; Seeyave et al., 2009).

The ability to delay gratification, though required for many forms of self-control (Duckworth et al., 2013), is most clearly relevant for resisting the temptation of an immediate reward when it would work against currently active goals. As such, we would expect a moderate-to-strong correlation between scores reflecting the ability to delay gratification and self-control by inhibition and moderate correlations with self-control by initiation and continuation, each of which might require deferring a current desire in order to begin and/or continue goal pursuit. Indeed, we find strong associations between self-reported delay of gratification (Hoerger, Quirk, & Weed, 2011) and all forms of self-control capacity, but a significantly stronger correlation between the ability to delay gratification and the capacity for self-control by inhibition.

Grit

Despite its relatively recent appearance in the literature (Duckworth, Peterson, Matthews, & Kelly, 2007), grit has joined well-worn traits such as impulsivity and delay of gratification in

discussions of individual differences relevant to goal pursuit. *Grit* captures individual differences in the ability to pursue challenging long-term goals and maintain commitment and progress toward them, even in the face of failure or adversity. Grit predicts academic success and achievement outcomes such as performance in the Scripps National Spelling Bee, retention rates of cadets at West Point, and superior college grade point averages (Duckworth et al., 2007). Although grit assumes self-control, it is a broader trait than self-control capacity and captures the need to exercise self-control and other self-regulatory strategies many times over the course of months or years (Duckworth & Gross, 2014; Eskreis-Winkler, Gross, & Duckworth, Chapter 21, this volume). We have included a measure of grit in multiple studies that also included the Self-Control Scale and the Capacity for Self-Control Scale. Correlations are moderate to high, bounded on the lower end at around $r = .60$ with the Self-Control Scale and our self-control by inhibition subscale and on the upper end at about $r = .75$ with self-control by initiation and self-control by continuation. These forms of self-control are strong contributors to grit.

Characteristic Approaches to Self-Regulation

Self-control is a self-regulatory strategy. As such, we might expect associations between self-control capacity and traits related to self-regulation more generally. An influential general model of self-regulation posits three primary phases of that psychological process—self-monitoring, self-evaluation, and self-reinforcement (Kanfer, 1970). During the self-monitoring phase, the individual takes stock of a target behavior. The status of that behavior is then compared to an internalized standard for the behavior through self-evaluation. That comparison results in self-reinforcement, which may take the form of reward or punishment. Successful execution of each phase of this iterative process is vital for successful self-regulation. We have collected data on skill at executing each of these phases of self-regulation (Mezo, 2009) and self-

control capacity, allowing us to examine how self-control might contribute to self-regulation. For both the Self-Control Scale and our Capacity for Self-Control Scale, we find a similar pattern of correlations in two large samples. Self-control is strongly correlated with self-monitoring and self-evaluation (r s between .50 and .65) but only weakly correlated with self-reinforcement. When we consider separately the three forms of self-control captured by our measure, we find slightly higher correlations for self-control by continuation than for self-control by initiation, for which the correlations are slightly higher than for self-control by inhibition. Self-control, especially the capacity to continue exerting self-control over time, is implicated at every phase of self-regulation, especially the self-monitoring and self-evaluation phases.

Although the basic processes outlined earlier are implicated in all acts of self-regulation, how they are initiated and unfold may vary between people and for the same person as a function of situational constraints and affordances (Hoyle & Gallagher, 2015). Three traits have received sufficient attention to warrant consideration from the perspective of self-control capacity. Regulatory focus theory proposes two general approaches to self-regulation—promotion and prevention. Although every individual is capable of either approach, and circumstances may favor one or the other, individuals vary in their typical or preferred approach to self-regulation. Those who favor promotion are more oriented toward obtaining positive outcomes, whereas those who favor prevention are more oriented toward avoiding negative outcomes (Higgins, 1997). Either approach can result in successful regulation of goal pursuit (Scholer & Higgins, 2010) and both require self-control. Our data suggests that the capacity for self-control by inhibition and initiation are moderately and equivalently associated with promotion orientation. Self-control by inhibition is also moderately correlated with prevention orientation, but self-control by initiation is only weakly associated with this orientation. Regulatory mode

distinguishes between two fundamental aspects of self-regulation: assessment and locomotion (Kruglanski et al., 2000). *Assessment* concerns processes associated with comparison in self-regulation; *locomotion* refers to processes in self-regulation that involve moving from the current state toward another state. We have assessed locomotion in one study, predicting and finding that it correlates with both inhibition and initiation but more strongly with initiation. One final distinction in how self-regulation is characteristically approached and for which self-control likely is relevant is that between action and state orientation (Kuhl, 1994). *Action orientation* is characterized by initiative and decisiveness, whereas *state orientation* is characterized by preservation of the current state. Although we have yet to examine the relations between these action control constructs and self-control, we would expect a moderate-to-strong correlation between action orientation and self-control by initiation and the capacity to sustain that self-control as required. Consistent with this expectation, individuals high on action orientation show no evidence of a decline in self-control capacity following an initial self-control demand (Gröpel, Baumeister, & Beckmann, 2014). These relations between regulatory focus, regulatory mode, and action control highlight the importance of distinguishing among forms of self-control when considering the role of self-control in self-regulatory preferences.

Summary: Self-Control and Narrow Personality Traits

Self-control is associated in predicted ways with a host of narrow personality traits relevant to the self-regulation of behavior. A subset of the traits we considered are sometimes treated as variants of self-control (Duckworth & Kern, 2011). Our review highlights not only the empirical associations between self-control and traits such as impulsivity, grit, and sensation seeking but also their conceptual distinctiveness. The remainder of the traits we reviewed refer to processes and preferences related to self-regulation. In terms of processes, we highlighted the

broad relevance of self-control, particularly the capacity to sustain self-control over time, for self-regulatory processes. With respect to preferences, we find differential associations between capacity for the different types of self-control and particular approaches to self-regulation. These findings establish self-control as distinct from but related to an array of narrow personality traits implicated in self-regulation and related processes.

CONCLUSIONS

Individual differences in the capacity for self-control are implicated in a wide range of personality models and traits, ranging from comprehensive models focused on broad personality domains to narrow traits that capture individual differences in specific preferences, propensities, and orientations related to the general activity of self-regulating behavior. In the absence of a widely accepted, well-articulated model of individual differences in the capacity for self-control, research on self-control and personality makes use of different measures and conceptual models that emphasize different forms and features of the construct. Our two-dimensional model offers a comprehensive account of self-control capacity, distinguishing between self-control by inhibition and self-control by initiation and, within those types, one-off versus sustained forms of self-control. For some personality domains and traits, the correlations with individual differences in the different self-control capacities are equivalent, suggesting a common set of personality assets and liabilities for all self-control capacities. For other domains and traits, the correlations differ, sometimes substantially, suggesting unique or varied contributions of personality to the different self-control capacities. Given the informative results from these studies focused primarily on personality and self-control structure, a profitable direction for future research is the dynamic interplay of online personality and self-control processes.

ACKNOWLEDGMENT

The preparation of this chapter was supported in part by grant P30DA023026 from the National Institute on Drug Abuse.

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TABLE 22.1. Items from the Capacity for Self-Control Scale Arrayed by Form of Self-Control

Self-Control by Inhibition
1. I am able to resist temptations.* 3. I have trouble resisting my cravings. (R) 6. I can deny myself something I want but don't need. 9. My bad habits cause problems for me. (R) 12. When I want something that is bad for me, I go after it anyway. (R) 15. I am able to control how I react to impulses.* 18. If I want to do something I know I shouldn't, I won't do it.*
Self-Control by Initiation
2. I waste a lot of time before getting down to work. (R)* 4. I delay as long as possible before starting something I expect to be unpleasant. (R) 7. I waste time on things that don't really matter, rather than working on things that do. (R)* 10. I just can't seem to get going, even when I have much to do. (R) 13. Even when the list of things to do is long, it is easy for me to get started. 16. I get started on new projects right away.* 19. I do nothing despite having plenty to do. (R)
Self-Control by Continuation
5. I am able to keep doing what I think I should do, even when other people would stop. 8. When I commit to doing something difficult, I see it through to the end.* 11. Not much can stop me from honoring a commitment to better myself. 14. I find it hard to continue doing something I don't want to do. (R)* 17. After I have started a challenging task, I find it easy to stick with it.* 20. I find it easy to keep with good behavior.

Note. Numbers correspond to recommended order of items when scale is administered. Items followed by (R) are reverse-scored. Responses are indicated on five-point scales anchored by *hardly ever* and *nearly always*. Subscale scores are computed as a mean of scores on individual items.

*Indicates items that form an abbreviated measure.