Overriding "Doing Wrong" and "Not Doing Right": Validation of the Dispositional Self-Control Scale (DSC)

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We present the Dispositional Self-Control (DSC) Scale, which reflects individuals' tendency to override 2 types of temptations, termed doing wrong and not doing right. We report a series of 5 studies designed to test the reliability and validity of the scale. As hypothesized, high DSC predicts distant future orientation and low DSC predicts deviant behaviors such as aggression, alcohol misuse, and aberrant driving. DSC also predicts task performance among resource-depleted participants. Taken together, these findings suggest that the DSC Scale could be a useful tool toward further understanding the role of personality in overcoming self-control challenges.

We are all frequently faced with situations in which we must exercise self-control, whether deciding not to eat an extra piece of cake or working over the weekend instead of going out with friends. Self-control has been recognized as a prominent component of well-adjusted behavior and a contributing factor toward the attainment of long-term goals. Therefore, it is not surprising that self-control has been the focus of research in many fields.

Despite the vast literature on self-control, there is a lack of well-validated measures of dispositional self-control (Maloney, Grawitch, & Barber, 2012). This article presents and tests a theory-driven measure—the Dispositional Self-Control (DSC) Scale. The DSC Scale builds on the premise that self-control overrides two temptations that capture the basic human motivations of approaching pleasure and avoiding pain (Higgins, 1997). We term these temptations *doing wrong* (DW) and *not doing right* (NDR). We suggest that when individuals are faced with a temptation they might yield to the temptation either because of the motivation to approach pleasure, or because of the motivation to avoid pain. Overriding these temptations is manifested as self-control. We begin by discussing our theoretical framework for conceptualizing the self-control scale. We then describe the process of constructing the scale. Finally, we present a set of studies that serve to validate the scale as a measure of self-control.

SELF-CONTROL AS OVERRIDING "DOING WRONG" OR "NOT DOING RIGHT"

Researchers vary in their conceptualizations of self-control, defining it as the ability to delay gratification (Metcalfe & Mischel, 1999; Mischel, Shoda, & Rodriguez, 1989), resist temptations (Fudenberg & Levine, 2006), overcome impulses (Hofmann, Friese, & Strack, 2009), avoid procrastination (Ariely & Wertenbroch, 2002), or override short-term goals that block long-term goals (Fishbach & Shah, 2006; Hofmann et al., 2009; Muraven & Baumeister, 2000).

We reason that these conceptualizations all tap into one inner conflict: a conflict that arises when the hedonic principle stands in the way of one's future goals and well-being. The hedonic principle, according to which people are motivated to approach pleasure and avoid pain (Higgins, 1997), leads individuals to seek immediate gratification, to yield impulsively to self-indulgent urges, and to postpone necessary yet unpleasant tasks. The process of self-control is evoked when individuals recognize the undesired consequences of acting on the hedonic principle and the need to invest effort to override it and to behave in a long-term-oriented and goal-driven manner. We thus suggest that self-control is a process in which individuals overcome two types of temptations that reflect the hedonic principle, portrayed as the urge to do wrong and the urge to not do right.

Doing Wrong

DW means acting in a way that provides an immediate benefit. Not considering the negative long-term consequences of a DW action typically implies acting in an impulsive, self-indulgent manner. Past literature has addressed the negative consequences of DW actions. For instance, the psychological literature shows that individuals who self-report impulsive behavior are more likely to report health problems (e.g., Verplanken, Herabadi, Perry, & Silvera, 2005) and risky behaviors (e.g., smoking; Friese & Hofmann, 2009). Similarly, management research shows that self-reported impulsive consumer behaviors are associated with negative emotional and financial consequences (e.g., Hoch & Loewenstein, 1991; Ramanathan & Williams, 2007).

Not Doing Right

NDR means delaying a necessary task while disregarding the negative long-term consequences of this delay. It typically implies procrastinating or not persisting in a task. There are consequences to postponing or not persisting in a necessary task: Individuals experience the relief and benefit of not engaging in the effortful task, yet risk a greater future goal or benefit (Anderson, 2003; Steel, 2007). Researchers point to the drawbacks of NDR and view it as something that people find regrettable and wish to prevent. For example, Milgram (1991) added

to the definition of procrastination the negative emotional result of feeling upset.

The concepts of "right" and "wrong" in our definition of DW and NDR temptations are subjective, dependent on the individual goals of the person who is faced with temptation. Specifically, right behavior is behavior that is consistent with the goals that are important to a person, and wrong behavior is inconsistent with those goals. For example, eating cake while on diet might be a DW behavior, reflecting low self-control, because it is harmful for the long-term goal of the dieter. A person who is not on a diet who eats the same cake would not be considered to be doing wrong. Thus, the terms DW and NDR are not intended to carry a moral overtone. They reflect personal failure vis-à-vis one's own goals.

We suggest that DW and NDR are positively interrelated. Past studies have shown that DW actions and NDR actions similarly predict constructs such as poor attention management (NDR: Lay, 1986; DW: Barratt, 1985). Both are also negatively related to the conscientiousness trait (NDR: Lay, 1997; Steel, 2007; DW: Carver, 2005). Furthermore, many complex behaviors and decisions in life involve DW and NDR temptations simultaneously. For example, a person attempting to lose weight might have to avoid the temptation of eating a cake (i.e., to DW) as well as overcome the desire to skip a workout (i.e., to NDR). In addition, the temptation to postpone a necessary yet unpleasant task (i.e., to NDR) can become stronger when a more enjoyable alternative is present, which triggers an impulsive reaction (i.e., to DW). The two constructs are highly related yet do not always mirror each other; individuals might be able to resist NDR temptations, yet at the same time find themselves giving in to DW temptations. Thus, the two constructs are interdependent yet complementary. Fully exercising self-control usually requires overriding both DW and NDR actions.

We propose that to better understand and measure self-control, it is necessary to merge DW and NDR together under one roof. A scale that combines the two is likely to capture dispositional self-control better than scales that focus mainly on one type of temptation. The studies included in this research are designed to explore this reasoning.

SELF-CONTROL VERSUS OTHER MANIFESTATIONS OF THE HEDONIC PRINCIPLE

Ample research has explored the two aspects of the hedonic principle: avoiding pain and approaching pleasure. The distinction between pain avoidance and pleasure approach has some neurobiological expression: Research in monkeys found that pain avoidance is linked to activity in the anterior cingulate cortex and the caudate nucleus (e.g., Koyama, Kato, Tanaka, & Mikami, 2001). A study in humans found that making decisions involving immediate rewards—that is, decisions that are likely to relate to pleasure approach—activates the limbic system associated with the midbrain dopamine system (McClure, Laibson, Loewenstein, & Cohen, 2004). However, approach and avoidance reactions were also found to activate similar regions in the brain. For example, Schlund and Cataldo (2010) found that within the amygdala, bilateral activation occurs in response to both avoidance and approach cues.

Research on the hedonic principle has yielded models that distinguish between activation and inhibition systems. Two prominent examples are the BIS-BAS model (Carver & White, 1994) and the sensitivity to punishment (SP) and sensitivity to reward (SR) model (Torrubia, Avila, Molto, & Caseras, 2001), which distinguish between a behavioral inhibition system (BIS) that is driven by the motivation to avoid pain (BIS, SP), and a behavioral activation system (BAS) that is driven by the motivation to seek pleasure (BAS, SR).

The hedonic principle underlies the process of self-control as well. Yet, the distinction between DW and NDR is not parallel to the distinction between activation and inhibition. Rather, the struggle between yielding to and overcoming temptations combines both inhibition and activation processes. For example, individuals might employ the activation system when yielding to temptations—moving toward immediate pleasure—and also when overcoming temptations—moving toward the desired long-term consequences of goal attainment. Similarly, individuals might employ the inhibition system to either resist or yield to temptations: In resisting temptations they might move away from the negative consequences of DW or NDR; and in yielding to temptations they might move away from the pain or cost of missing out on an immediate reward (for DW temptations) or the pain or cost of performing an undesirable yet necessary task (for NDR temptations). Hence, the distinction between DW and NDR is inherently different from the distinctions between activation and inhibition.

MEASURING DISPOSITIONAL SELF-CONTROL

Existing self-control scales include either scales that have been developed in specific domains or contexts, such as deviant behavior (e.g., Gibbs & Giever, 1995; Gibbs, Giever, & Martin, 1998) or context-free scales. As self-control is a trans-situational trait-like characteristic (see Baumeister, Heatherton, & Tice, 1994; Baumeister & Vohs, 2004), we focus on the development of a context-free scale that might be applicable across various situations that demand self-control.

Most context-free scales focus on one of the two types of temptations. The Brief Self Control Scale (BSCS; Tangney, Baumeister, & Boone, 2004), for example, has been shown to consist of two factors: Impulsivity, which refers to the tendency to be impulsive and spontaneous, and Restraint, which refers to the ability to engage in effortful and restrained behavior (Maloney et al. 2012). We suggest that both factors reflect DW temptations, where Impulsivity refers to yielding to DW and Restraint to overcoming it. Similarly, the Sensation Seeking scale (Zuckerman, Eysenck, & Eysenck, 1978) focuses mainly on the DW component and captures little if any of the NDR component. The Ego-Control scale (Letzring, Block, & Funder, 2005) also focuses mainly on DW actions (16 items measure DW and only 3 items measure NDR). As discussed earlier, individuals exercise self-control when they are faced with either type of temptation and in many cases these temptations are faced simultaneously. As such, a scale that captures resistance to both temptations captures a broader aspect of self-control and in doing so might provide more insight on this trait and the behaviors it influences. Thus, the DSC Scale was designed as a context-free scale that reflects both DW and NDR temptations.

STUDY 1: CONSTRUCTION OF THE DSC SCALE

In developing the DSC Scale we followed the recommended procedures for developing measures (e.g., Clark & Watson, 1995; Netemeyer, Bearden, & Sharma, 2003). After

reviewing the literature and developing our conceptualization of the self-control construct, we developed the item pool and tested the initial version of the scale.

Study 1a: Initial Stage of Scale Construction

We started by constructing items that measure yielding to versus overcoming DW or NDR. Twenty-two items were generated for a preliminary version of the scale. Three independent judges reviewed the items and commented on them. Ten items were rated as too general, redundant, or ambiguous and were omitted. Two items were added for measuring overcoming DW temptations, and one was added to measure yielding to DW temptations. One item measuring yielding to NDR was removed because it was too specific. One item measuring overcoming NDR was rephrased, and another such item was added. These changes were made in accordance with agreements among the three judges. Study 1a was conducted to test the structure and psychometric properties of the resultant version (the "initial version") of the scale.

Method.

Participants and Procedure: The DSC Scale was administered to 373 adults (71% female; age range = 19–75, $M = 53.73$, $SD = 27.74$) who registered on an online site that conducts surveys. The site posts the surveys online and participants complete them voluntarily. Participants sign in with a password and a user name to ensure their anonymity. They completed the online survey, and in return were included in a raffle for 24 gift certificates of $15 each.

Instruments: The participants completed the DSC Scale and other personality inventories, as part of a larger project (see Ein-Gar, Goldenberg, & Sagiv, 2008, Study 2, Sample 2).

Dispositional Self-Control: The initial version of the DSC Scale included 15 items, measuring yielding to NDR temptations (3 items; e.g., "I tend to postpone completing unpleasant tasks"), overcoming NDR temptations (5 items; e.g., "I am able to work effectively toward long-term goals while resisting temptations along the way"), yielding to DW temptations (4 items; e.g., "I do many things on the spur of the moment"), and overcoming DW temptations (3 items; e.g., "I seldom get carried away by my feelings"). Participants reported their agreement with each statement on a 5-point Likert scale ranging from 1 (*do not agree at all*) to 5 (*agree very much*).

Results and discussion. We conducted an item-to-scale analysis to verify that each item was positively correlated with the full DSC Scale. All corrected correlations were positive, ranging from .36 to .61, except for one item with a correlation of .15. To explore the structure of the DSC Scale we used a multidimensional scaling technique named similarity structure analysis (SSA; Guttman, 1968; Shye, Elizur, & Hoffman, 1994). The SSA provides a graphic representation of the relationships among all items of the scale. Each item is represented by a dot. The stronger the positive correlation between two items, the closer the two dots representing the two items appear on the SSA map. Thus, items with similar meanings emerge in distinct regions that can subsequently be identified as representing distinct components of the measure.
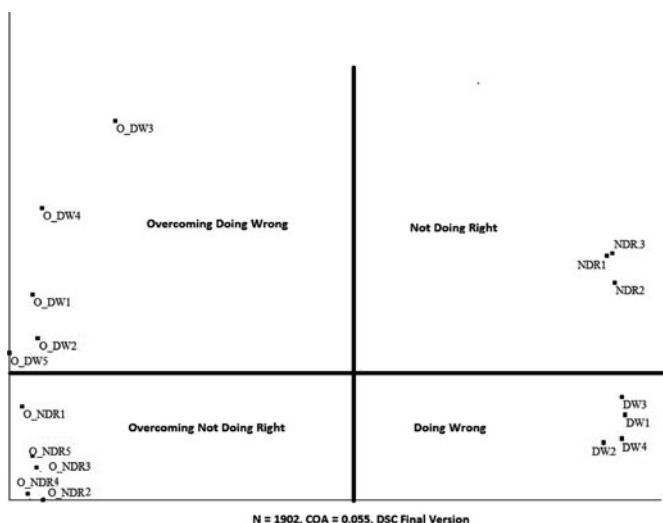

FIGURE 1.—Similarity structure analysis map of the Dispositional Self-Control Scale, final version (Study 1b).

The SSA is suitable for testing the structure of the DSC model for several reasons: First, it provides a spatial representation of the items from which clusters can be identified without being imposed. In addition, the SSA does not assume that each item relates to only one dimension, and hence enables more complex models to be tested. Finally, the SSA is a confirmatory technique in the sense that it enables a comparison between an observed mapping of items and a hypothesized mapping derived from theory (Shye et al., 1994).

We expected the structure of the SSA map to capture both the type of temptation (DW or NDR) and the self-control-related response (overcoming vs. yielding to temptation) that each item reflects. Thus, we hypothesized that the SSA map could be partitioned in a way that distinguishes temptation items and self-control-related response items, resulting in four distinct regions (yielding to DW, yielding to NDR, overcoming DW, and overcoming NDR). The SSA analysis yielded a coefficient of alienation (COA) of .069. The COA reflects the extent to which the spatial map adequately represents the matrix of intercorrelations. It ranges from 0 to 1; the smaller the COA the better the fit. A COA of .15 or less is considered satisfactory (see Guttman, 1968). The SSA map was consistent with our hypothesized four-region structure (see Figure 1). First, all items representing yielding to temptation emerged on the right side of the map, whereas all items representing overcoming temptation emerged on the left side. Second, the items emerged along two diagonals, one including all DW items, and one including all NDR items.

We computed mean scores of four indexes according to the four regions of the map: yielding to DW (4 items), yielding to NDR (3 items), overcoming DW (3 items), and overcoming NDR (5 items). Correlations among the indexes were consistent with the hypothesized structure (see Table 1). The two indexes of yielding to temptations were positively correlated ($r = .34$, $p < .01$). The two indexes of overcoming temptations were also positively correlated ($r = .35$, $p < .01$). The index representing yielding to NDR temptations was negatively correlated with the index representing overcoming NDR ($r = -.63$, $p < .01$), and

TABLE 1.—Correlations between the Dispositional Self-Control Scale indexes (Studies 1a and 1b).

Measures	1	2	3	4	5	6	M	SD	Cronbach's α
1. General index DW	—	.39**	−.90**	−.35**	.79**	.36**	3.26	0.79	.75
2. General index NDR	.51**	—	−.33**	−.87**	.34**	.93**	3.25	0.76	.82
3. Yielding DW	−.88**	−.44**	—	.34**	−.47**	−.27**	2.69	0.94	.75
4. Yielding NDR	−.41**	−.88**	.43**	—	−.25**	−.63**	2.99	1.04	.74
5. Overcoming DW	.88**	.46**	−.55**	−.29**	—	.35**	3.18	0.79	.36
6. Overcoming NDR	.51**	.93**	−.36**	−.64**	.52**	—	3.40	0.78	.71
M	3.23	3.17	2.72	3.11	3.17	3.34			
SD	0.66	0.82	0.85	1.07	0.74	0.80			
Cronbach's α	.82	.88	.80	.86	.70	.81			

Note. Intercorrelations for Study 1a ($N = 373$) are presented above the diagonal, and intercorrelations for Study 1b ($N = 1,902$) are presented below the diagonal. Means, standard deviations, and internal reliability (Cronbach's α) for Study 1a are presented in the vertical columns, and means, standard deviations, and internal reliability (Cronbach's α) for Study 1b are presented in the horizontal rows. DW = items reflecting doing wrong temptations; NDR = items reflecting not doing right temptations.
**$p < .01$.

the index representing yielding to DW was negatively correlated with the index representing overcoming DW ($r = -.47$, $p < .01$). We then computed two general indexes of DW and NDR (all items reflecting yielding to temptations were reversed). As expected, the indexes were positively correlated ($r = .39$, $p < .01$). Internal reliabilities were $\alpha = .75$ for DW, $\alpha = .82$ for NDR, and $\alpha = .83$ for the full scale. The SSA map provides support to the hypothesized structure of the DSC Scale. Yet, findings indicated that some elements of the scale (e.g., items, reliabilities) needed further refinement.

Study 1b: Final Stage of Scale Construction

In the final stage of scale construction we devoted particular attention to the aspect of overcoming temptation. To better represent the effort of exercising self-control, we aimed to ensure that the items measuring overcoming temptations reflected the inner struggle that takes place when individuals are faced with temptations and need to enforce control to overcome them. Thus, for example, the item "People can count on me to stay on schedule," which measured overcoming NDR, was changed to "People can trust me to stay on schedule even if I am overloaded and under a lot of pressure." Similarly, the overcoming DW item "Most of the decisions I make are very considered" was changed to "Even when I am stressed, most of the decisions I make are considered and calculated." In addition, two new items measuring overcoming DW were added. Study 1b replicated Study 1a with the revised DSC Scale.

Method.

Participants and Procedure: The participants were 1,902 adults (70% female; age range = 17–75, $M = 28.91$, $SD = 10.49$; 35% were high school graduates, 53% were university or college graduates). They voluntarily registered on a website that provides information about personality and individual differences. The website offered participants an opportunity to complete individual-attribute scales and receive constructive feedback. Participants signed an agreement that assured them that their reports would be used anonymously, and for academic purposes only. Data for this study were collected over a period of 24 months.

Measures: The final version of the DSC Scale included 17 items measuring yielding to DW temptations (4 items), overcoming DW temptations (5 items), yielding to NDR tempta-

tions (3 items), and overcoming NDR temptations (5 items). The participants reported their agreement with each statement on a 5-point Likert scale ranging from 1 (*do not agree at all*) to 5 (*agree very much*). For the full list of items, see the Appendix. The participants also completed 6 items measuring the tendency to use control mechanisms to overcome temptations. These items were not included in the analysis of this research.

Results and discussion. We conducted an item-to-scale analysis to verify that each item was positively correlated with the full DSC Scale. All corrected items produced correlations ranging between .45 and .63, except for one item with a correlation of .31. The item with a correlation of .15 in Study 1a now yielded a correlation of .46. Thus, the item-to-scale correlations improved in comparison to Study 1a. To assess the structure of the DSC Scale we again conducted an SSA (see Figure 1). The coefficient of alienation was .055, indicating good representation of the matrix of intercorrelations (see Guttman, 1968). Again, all items representing yielding to temptation emerged on the right side of the map, whereas all items representing overcoming temptation emerged on the left side. In addition, the items emerged along two diagonals, one including all DW items, and one including all NDR items. Thus, the map partitioned into four regions, reflecting the distinction between DW and NDR and the distinction between overcoming versus yielding to temptation.

As in Study 1a, we computed mean scores of the four theorized indexes: yielding to DW, yielding to NDR, overcoming DW, and overcoming NDR. The correlations among the indexes were again consistent with the hypothesized and observed structure (see Table 1). The two indexes of yielding to temptations were positively correlated ($r = .43$, $p < .01$), as were the two indexes of overcoming temptations ($r = .52$, $p < .01$). The two indexes associated with NDR temptations were negatively correlated ($r = -.64$, $p < .01$), as were the two indexes associated with DW temptations ($r = -.55$, $p < .01$). We computed two broad indexes of DW and NDR (items reflecting yielding to temptations were reversed). The two indexes were positively correlated ($r = .51$, $p < .01$). Internal reliabilities were $\alpha = .82$ for DW, $\alpha = .88$ for NDR, and $\alpha = .89$ for the full scale. These reliabilities are an improvement from the previous version, although they are still not ideal (below .90) and could potentially impact the utility of the measure.

Once construction of the scale was complete, we combined the four indexes into a single factor score. We reason that the four components of the DSC Scale reflect one higher order latent construct of dispositional self-control. To test this reasoning, a second-order confirmatory factor analysis (CFA) was performed. In the model, the four latent factors found in the SSA served as the first-order latent factors and were modeled as emanating from a single, higher order latent factor of self-control. CFA was performed with EQS software, version 6 (Bentler, 2002). The analyses were performed on variance-covariance matrices. The variables in the data were multivariately nonnormally distributed, with a normalized Mardia's estimate of multivariate kurtosis of 68.60; therefore, we employed a maximum-likelihood estimation method with robust standard errors together with the Satorra-Bentler rescaled χ^2 statistic (Satorra & Bentler, 1994), which compensates for nonnormality of variables. To achieve model identification, the loading of each first item of a factor was fixed to a value of 1, and the variance of the second-order factor was also fixed to 1. We allowed the disturbances of DW and overcoming DW and the disturbances of overcoming DW and NDR to covary freely (cf. the correlated traits-correlated uniquenesses method; Marsh, 1989). The results of the second-order CFA model were $\chi^2(113, N = 1,902) = 941.78$, $p < .001$, Nonnormed Fit Index = .91, Comparative Fit Index = .92, standardized root mean square residual = .05, and root mean squared error of approximation = .06, suggesting a single second-order factor of self-control.

The next set of studies was designed to test the validity of the DSC Scale.

STUDY 2: RELIABILITY OVER TIME, CONVERGENT AND DISCRIMINANT VALIDITY

Study 2 had two main goals. First, we tested the reliability of the DSC measure over time, aiming to show stability over a period of 1 year. In addition, we tested the convergent and discriminant validity of the DSC Scale by investigating its relationships with conceptually related constructs. We next explain these constructs and derive our hypotheses regarding the relationship of each construct to DSC.

Ego-control (Letzring et al., 2005) refers to the broad tendency for expression of motivational, emotional, and behavioral impulses. High levels of ego-control produce the tendency to delay gratification and restrain impulses, even when this level of restraint is unnecessary (i.e., overcontrol). Low levels of ego-control produce the tendency to seek immediate gratification and express impulses freely, even when these impulses are inappropriate or counterproductive (i.e., under control). This construct partly overlaps with both DW and NDR aspects of self-control and is therefore hypothesized to be positively correlated with DSC, which would provide support to the scale's convergent validity. Ego-control differs from self-control, conceptually. Ego-control theory suggests that human action is driven by affect, and specifically by anxiety avoidance (Block, 2002). Self-control theory, in contrast, suggests that human action is goal-driven (for a similar claim see DeYoung, 2010). Accordingly, the ego-control scale captures aspects of behavior that distinguish it from self-control per se (e.g., social anxiety).

Ego-resiliency (Letzring et al., 2005) reflects individuals' ability to modify behavior in response to situational demands. A person with high ego-resiliency can match her actions to the requirements of a given situation, whereas a person with low ego-resiliency is more restricted to one set of responses (either impulsive or controlled). We reason that an individual might act in an unvarying manner regardless of whether he or she has low or high self-control (i.e., the person might always yield to temptations or always overcome them). Thus, we do not expect ego-resilience to be substantially correlated with self-control.

The Behavioral Inhibition System and Behavioral Activation System (BIS–BAS; Carver & White, 1994) is based on Gray's (1981) theory, which suggests that individuals have two motivational systems for behavior: a BIS and a BAS. The BIS regulates aversive motivation: It captures the individual's movement away from punishment, undesired outcomes, and negative emotions (Carver & White, 1994). As an inhibiting motivation system, directed at avoiding mistakes, the BIS might block actions that reflect low self-control, such as yielding to temptations to DW or NDR. At the same time, however, the BIS might block actions that reflect high self-control. To prevent unpleasant events the BIS might block actions directed at attaining long-term goals (e.g., going to the dentist, exercising). Thus, we reason that the BIS is equally compatible with low and high self-control. We therefore do not expect substantial relationships between the two constructs.

The BAS controls appetitive motivation and is sensitive to rewards (as opposed to punishment). Individuals who are motivated by the BAS move toward positive emotions and outcomes (Carver & White, 1994). They are therefore able to express high self-control, by moving toward actions focusing on attaining long-term goals. At the same time, however, they can direct themselves toward short-term pleasant outcomes, thus expressing low self-control by yielding to DW or NDR temptations. Carver and White (1994) distinguished three factors of BAS: Reward Responsiveness, Drive, and Fun Seeking. The Drive factor captures the motivation to persistently act to attain desired goals. We reason that this is consistent with overcoming temptations to achieve long-term goals. We therefore expect the Drive factor to be positively related to self-control. The Fun Seeking factor captures the motivation to engage in hedonic and impulsive behavior. It is linked to seeking immediate pleasure, gratification, and self-indulgence. We therefore hypothesize that this factor will be negatively correlated with self-control. Finally, the Reward Responsiveness factor captures the emotional excitement associated with attaining positive outcomes. This could be gratified by yielding to temptations (and hence could be negatively correlated with self-control). However, it could also be gratified by the satisfaction of overcoming temptation and attaining long-term goals (and hence could be positively correlated with self-control). Thus, we expect no substantial relationships between this factor and self-control.

Like the BIS–BAS model, the Sensitivity to Punishment and Sensitivity to Reward model (SPSRQ; Torrubia et al., 2001) is based on Gray's (1981) theory. It builds on the premise that the inhibition system is motivated by sensitivity to punishment, whereas the activation system is motivated by sensitivity to reward. SP reflects individuals' tendency to avoid situations and refrain from actions that potentially involve negative consequences. This construct hence conceptually overlaps with the BIS (Cogswell, Alloy, van Dulmen, & Fresco, 2006). Yielding to DW and NDR temptations (i.e., expressing low self-control)

could lead to long-term negative outcomes and punishment and hence might be related to SP. At the same time, however, overcoming temptations (i.e., expressing high self-control) involves unpleasant experience in the short term and thus might also be related to SP. Thus, in line with our hypothesis for BIS, we expect no substantial relationships between DSC and SP.

SR (Torrubia et al., 2001) reflects individuals' tendency to engage in situations with potentially positive consequences. This tendency is reflected in several aspects of life, including money, sex, social events, power, and sensation-seeking. This component conceptually overlaps with the BAS (Cogswell et al., 2006). We reason that it especially resembles the Fun Seeking component of BAS, which focuses on the tendency to engage in positive experiences, even if in the long run they might yield negative consequences. We therefore hypothesize that DSC and SR will be negatively correlated.

Sensation Seeking (Zuckerman et al., 1978; Zuckerman & Neeb, 1980) refers to the extent to which individuals respond positively to exciting and novel experiences. The Sensation Seeking scale is composed of four factors: Thrill and Adventure Seeking, which expresses desire for exciting behaviors; Experience Seeking, which reflects openness to new things; Disinhibition, which represents social and sexual disinhibition, and Boredom Susceptibility, which reflects avoiding routine and repetition. All four factors refer to seeking exciting and pleasurable experiences, even at the expense of following social norms or attaining future goals. Thus, we hypothesize that Sensation Seeking will be negatively correlated with DSC.

Study 2a

Method.

Participants and Procedure: The participants were 114 working adults (57% female; age range $= 23-49$, $M = 34.57$, $SD = 9.13$; 22% were high school graduates, 76% were university or college graduates). They were registered for an online survey pool, and were informed by e-mail about upcoming surveys. They voluntarily entered the online survey and completed it in return for monetary compensation (about $5 for each session). The participants completed the DSC Scale twice, as part of two unrelated online studies (T1 and T2), separated by an interval of 1 year. In T1 the participants completed the DSC Scale and then answered questions about a hypothetical cellular service provider. In T2 they completed the following individual-differences scales.

Measures: The DSC Scale was described in Study 1b. Internal reliability of the DSC Scale was $\alpha = .83$ in T1 and $\alpha = .88$ in T2.

The Ego-Control scale (EC; Letzring et al., 2005) measures individuals' response to impulse of action and affect. The scale consists of 37 items, which measure controlled responses and delay of gratification. The participants reported their agreement with each statement on a 5-point Likert scale ranging from 1 (*do not agree at all*) to 5 (*agree very much*). Thus, higher scores on the EC scale reflected tendencies toward overcontrolled behavior. Internal reliability has previously been reported as somewhat low (Letzring et al., 2005; $\alpha = .63$). In this study it was satisfactory ($\alpha = .84$).

The Ego-Resiliency scale (ER; Letzring et al., 2005) measures individuals' ability to adapt their behavior to situational

contexts. The scale consists of 14 items measuring individuals' control-adjustment ability. The participants reported their agreement with each statement on a 5-point Likert scale ranging from 1 (*do not agree at all*) to 5 (*agree very much*). Higher scores indicated higher levels of ego-resilience. In a previous study, internal reliability of the ER was evaluated as $\alpha = .87$ (Letzring et al., 2005); in this study it was $\alpha = .87$.

We also used the BIS–BAS (Carver & White, 1994). The BIS is measured by 8 items that capture an individual's movement away from punishment, undesired outcomes, and emotions. The BAS is measured by three scales: Reward Responsiveness (5 items), Drive (4 items), and Fun Seeking (4 items). For all scales, the participants reported their agreement with each statement on a 5-point Likert scale ranging from 1 (*do not agree at all*) to 5 (*agree very much*). Internal reliabilities were as follows: BIS: $\alpha = .83$; Reward Responsiveness: $\alpha = .85$; Drive: $\alpha = .90$; and Fun Seeking: $\alpha = .71$. These reliabilities are higher than those reported in Carver and White (1994; BIS: $\alpha = .74$; Reward Responsiveness: $\alpha = .73$; Drive: $\alpha = .76$; and Fun Seeking: $\alpha = .66$).

We also administered the SPSRQ (Torrubia et al., 2001). The SP scale is a 24-item scale that measures individuals' tendency to avoid potentially negative consequences. The SR scale includes 24 items measuring individuals' tendency to promote potentially positive consequences. For the two scales, the participants reported their agreement with each statement on a 5-point Likert scale ranging from 1 (*do not agree at all*) to 5 (*agree very much*). Higher scores on the SP and SR scales indicated higher levels of sensitivity to punishment and to reward, respectively. Previous studies computed the following internal reliabilities for the two scales: SP: $\alpha = .83$ and $\alpha = .82$; SR: $\alpha = .78$ and $\alpha = .75$ (Torrubia et al., 2001). In this study we obtained $\alpha = .92$ and $\alpha = .82$ for SP and SR, respectively.

Results.

Test-Retest Reliability: We first tested the reliability of the DSC measure over time. To account for missing data, listwise deletion was used in this study (and in all studies hereafter). The Pearson's r correlation between the DSC scores in T1 and T2 was .73 ($p < .01$), indicating the scale's reliability as a measure of self-control over a period of a full year.

Relations With Related Constructs: Table 2 presents the means and standard deviations of the variables studied and the intercorrelations among them. The Bonferroni alpha correction procedure for multiple comparisons was set to $p < .006$ ($\alpha = .05/8$). Of most interest are the two first rows, presenting the correlations between DSC and each of the other constructs. As expected, participants' scores on the various scales correlate similarly with the DSC scores in T1 and with those in T2. We next describe the correlations between DSC (measured at T1) and all other constructs.

As hypothesized, the DSC scale was positively correlated with the EC scale ($r = .53$, $p < .01$), indicating convergent validity. We did not expect ER to substantially correlate with DSC. Surprisingly, the correlation between the two was significant, albeit moderate to weak ($r = .21$, $p < .01$.), but it did not pass the Bonferroni adjusted alpha correction test.

The findings regarding the BAS scale confirmed our hypotheses: The BAS Fun Seeking scale was negatively correlated with

TABLE 2.—Correlations Between Dispositional Self-Control and other constructs (Study 2a).

	DSCt1	DSCt2	EC	ER	BIS	BAS_RR	BAS_D	BAS_FUN	SP	SR
M (SD)	3.3 (.57)	3.3 (.62)	3.22(.43)	3.65(.61)	3.5(.69)	4.23(.60)	3.65(.82)	3.45(.66)	2.85(.69)	2.86(.47)
DSC $_{t1}$	.83	.73**	.53***	.21**	−.16	.06	.23*	−.21*	−.11	−.21*
DSC $_{t2}$		.88	.62***	.29***	−.23*	.11	.26***	−.26***	−.16	−.29***
EC			.84	−.07	−.04	−.07	−.09	.41***	−.15	.44***
ER				.87	−.34***	.18*	.39***	.23**	−.45***	.01
BIS					.83	.30***	−.09	−.12	.60***	.25**
BAS_RR						.85	.29***	.29***	.11	.19*
BAS_D							.90	.20*	−.19*	.15
BAS_FUN								.71	0	.35***
SP									.92	.28***
SR										.82

Note. DSC$_{t1}$ = Dispositional Self-Control Scale administered at Time 1; DSC$_{t2}$ = Dispositional Self-Control Scale administered at Time 2, a year after Time 1; EC = Ego-Control scale; ER = Ego-Resiliency scale (Letzring et al., 2005); BIS = Behavioral Inhibition System scale; BAS_RR = Behavioral Activation System Reward Responsiveness scale; Behavioral Activation System BAS_D = Drive scale; BAS_FUN = Behavioral Activation System Fun Seeking scale (Carver & White 1994); SP = Sensitivity to Punishment scale; SR = Sensitivity to Rewards scale (Torrubia et al., 2001). The first row presents each scale's mean score and standard deviation. Other rows present correlations between scales. The diagonal presents internal reliability (Cronbach's α).

*p < .05. **p < .01. ***p < .006 (Bonferroni alpha correction).

the DSC Scale ($r = −.21$, $p < .05$), the BAS Drive scale was positively correlated ($r = .23$, $p < .05$), and the BAS Reward Responsiveness scale was unrelated ($r = .06$, *ns*). Also, as hypothesized, SR was negatively correlated with DSC ($r = −.21$, $p < .01$). These correlations were all moderate to weak; they did not pass the Bonferroni adjusted alpha correction test at Time 1 (yet did pass them at Time 2). These findings are consistent with our reasoning that DSC is related to, yet distinguishable from, these constructs.

Finally, we did not expect the BIS and SP scales, both of which measure avoidance of negative experiences, to correlate with the DSC Scale. As expected, the BIS scale and the SP scale were unrelated to the DSC measurements taken at T1 ($r = −.16$, *ns* for BIS; $r = −.11$, *ns* for SP). Notably, however, there was a significant—albeit weak—negative correlation between the BIS scale and the DSC measurements taken at T2 ($r = −.23$, $p < .05$). The result, however, did not pass the Bonferroni adjusted alpha correction test.

Study 2b

Method.

Participants and Procedure: Participants were 100 students (50% female; $M = 22.08$, $SD = 3.29$) who had registered to a pool, wherein university students are offered opportunities to participate in studies in return for monetary compensation. The participants are informed about new studies via e-mail and can enter online studies with a user name and a password to ensure anonymity. The participants volunteered to complete an online survey and in return entered a raffle with the prize of two VIP cinema tickets (about $50 each).

Measures: See Study 1b for a description of the DSC Scale. The reliability of the DSC Scale in this study was $\alpha = .90$.

We used Form V from the Sensation Seeking Scale (SSK; Zuckerman et al., 1978; Zuckerman & Neeb, 1980). This scale consists of 40 forced-choice items yielding four factors: Thrill and Adventure Seeking (TAS) includes 10 items measuring exciting behaviors such as engagement in extreme sports; Experience Seeking (ES) includes 9 items measuring openness to new experiences; Disinhibition (DIS) includes 8 items measuring social and sexual disinhibition; and Boredom Susceptibility (BS)

consists of 10 items that measure avoidance of routine and of repetition. Items indicating high sensation seeking were coded as 1, and items indicating low sensation seeking were coded as 0. For each factor, we summed the item scores. Thus, higher scores indicated higher sensation seeking. The scales' internal reliability levels were TAS: $\alpha = .79$; ES: $\alpha = .63$; DIS: $\alpha = .63$; BS: $\alpha = .50$.

Results and discussion: We hypothesized that DSC would be negatively correlated with each of the four aspects of Sensation Seeking. The correlations were in the negative direction for all four factors, significant for each scale except the BS scale (TAS: $r = −.22$; ES: $r = −.39$; DIS: $r = −.33$, all $p < .01$; BS: $r = −.14$, *ns*). Again, the significant correlations were weak to moderate, indicating that DSC is related to, yet distinct from, Sensation Seeking.

Taken together, the patterns and magnitudes of correlations observed in Studies 2a and 2b show that DSC is correlated with, yet distinct from, other relevant constructs. We next investigate the prediction power of the scale.

STUDY 3: DSC, BSCS, AND TIME FOCUS

The goal of Study 3 was to demonstrate the strength of the DSC Scale in predicting general, abstract tendencies and behaviors, and to investigate its predictive power above and beyond that of another established self-control measure (the BSCS; Tangney et al., 2004). Self-control is the intentional overriding of DW and NDR temptations to attain future goals and well-being (see also Fishbach & Shah, 2006; Hofmann et al., 2009; Muraven & Baumeister, 2000). This suggests that to exercise self-control, people must think about their future goals and aspirations, and consider the consequences of their current actions with respect to attaining those goals and aspirations. Thus, self-control is associated with one's engagement with thoughts about the future. We therefore propose that the higher a person's self-control, the more likely she or he is to be future-oriented—to consider the future consequences of her or his actions and to be driven by long-term outcomes.

In Study 3 we investigated this assertion. We studied the tendency to consider possible future outcomes of one's actions (consideration of future consequences [COFC]; Strathman,

Gleicher, Boninger, & Edwards, 1994) and the tendency to engage in thoughts about future outcomes, whether positive or negative (elaboration on potential outcomes [EPO]; Nenkov, Inman, & Hulland, 2007). We hypothesized that self-control would positively predict COFC and EPO. We further studied general time perspective (TP; Zimbardo & Boyd, 1999), which is composed of five perspective facets: future, present hedonic, present fatalistic, past positive, and past negative. We hypothesized that DSC would positively predict future perspective and negatively predict present-hedonic perspective. We did not expect relationships with the other perspectives, which are irrelevant to the need to overcome temptations.

Method

Participants and procedure. The participants were 134 students and working adults (58% female; age range $= 18$–33; $M = 24.56$, $SD = 1.92$), who were recruited via snowballing. We first addressed students and working adults in a university subject pool. Following their participation we asked them to recruit additional participants among their acquaintances. Participants volunteered to complete an online survey and in return entered a raffle with a prize of two VIP cinema tickets (about \$50 each). The participants completed a questionnaire with several scales in a counterbalanced order.

Measures. The participants completed five self-report measures.

DSC: See Study 1b for details of this measure. Internal reliability of the scale was $\alpha = .89$.

Brief Self-Control Scale: The BSCS (Tangney et al., 2004) measures the ability to override one's impulsive responses, which includes regulating one's thoughts, moods, emotions, and actions. The scale includes 13 items measuring self-control processes and failures. The participants reported the extent to which each statement describes them, using a 5-point Likert scale ranging from 1 (*does not describe me at all*) to 5 (*describes me a lot*). Higher scores reflected higher levels of self-control. Internal reliability in this study was $\alpha = .88$, which is consistent with past findings ($\alpha = .83$ and $\alpha = .85$; Tangney et al., 2004).

Elaboration on Potential Outcome: The EPO scale (Nenkov et al., 2007) measures thoughts about potential outcomes. It consists of three subscales. The general generation subscale includes six items measuring generation of thoughts about potential outcomes. The other two subscales focus on either positive or negative outcomes and are irrelevant to this study. The participants reported agreement with each statement using a 7-point Likert scale ranging from 1 (*does not describe me at all*) to 7 (*describes me a lot*). Higher scores reflected greater elaboration on potential outcomes. Internal reliability of the generation index was $\alpha = .90$, which is consistent with past findings (internal reliabilities ranging from .82–.94; Nenkov et al., 2007).

Time Perspective: The TP scale (Zimbardo & Boyd, 1999) measures five factors: Future time perspective (TP–F, 10 items) measures a general future orientation. Present hedonistic time perspective (TP–PrH, 18 items) assesses a hedonistic, risk-taking attitude toward time and life. Present fatalistic time per-

spective (TP–PrF, 10 items) measures a helpless and hopeless attitude toward the future and life. Past positive time perspective (TP–PsP, 7 items) measures a warm, sentimental attitude toward the past. Past negative time perspective (TP–PsN, 11 items) measures a negative, aversive view of the past. The participants reported the extent to which each item describes them using a 5-point Likert scale ranging from 1 (*does not describe me at all*) to 5 (*describes me a lot*). Past studies found test-retest correlations ranging from .70 to .80, and internal reliabilities ranging from .74 to .82 (Zimbardo & Boyd, 1999). In this study, internal reliabilities were TP–F: $\alpha = .74$; TP–PrH: $\alpha = .85$; TP–PrF: $\alpha = .72$; TP–PsP: $\alpha = .80$; TP–PsN: $\alpha = .87$.

Consideration of Future Consequences: The COFC scale (Strathman et al., 1994) consists of 12 items measuring reflection on future consequences of one's actions. The participants reported the extent to which each item describes them, using a 7-point Likert scale ranging from 1 (*does not describe me at all*) to 7 (*describes me a lot*). Higher scores reflected a greater tendency to consider future consequences of one's actions. Past studies found test-retest correlations ranging from .72 to .76, and internal reliabilities ranging from .80 to .86 (Strathman et al., 1994). In this study, internal reliability was $\alpha = .81$.

Results and Discussion

The correlations among the three measures of time focus ranged from .17 to .49, suggesting that the three constructs share a common aspect of time focus, yet measure distinct aspects of this construct (see Table 3; Bonferroni alpha correction procedure for multiple comparisons was set to $p < .0055$ [$\alpha = .05/9$]). To examine whether the DSC Scale predicts time focus above and beyond the prediction of the BSCS, we conducted a series of hierarchical regressions. For each measure of time perspective, we conducted two regressions: one in which DSC was entered in the first step and BSCS in the second, and one with this order reversed (see Table 4).

EPO. When entered at the first step, DSC explained 14% of the variance, $F(1, 133) = 22.12$, $p < .001$. The BSCS did not add significantly to the explained variance, $F_{change} = 0.25$ (*ns*). In contrast, when entered at the second step, DSC added 6% to the variance explained by the BSCS, $F_{change} = 9.75$ ($p < .005$).

TP. Similarly, when entered at the first step, DSC explained 43% of the variance in future time perspective, $F(1, 133) = 99.45$, $p < .001$, and the BSCS did not add significantly, $F_{change} = 0.24$ (*ns*). In contrast, when entered at the second step, DSC added 13% to the variance explained by the BSCS, $F_{change} = 28.89$ ($p < .001$). Also as hypothesized, when entered at the first step, DSC explained 32% of the variance in the present-hedonic perspective, $F(1, 133) = 61.33$, $p < .001$, and the BSCS did not add significantly, $F_{change} = 0.01$ (*ns*). When entered at the second step, DSC added 11% to the variance explained by the BSCS, $F_{change} = 21.28$ ($p < .001$).

COFC. Both BSCS and DSC positively predicted this aspect of time orientation. Together, the two scales explained 31% of the variance, $F(1, 133) = 29.26$, $p < .001$. When entered

TABLE 3.—Correlations among self-control and time-focus scales (Study 3).

	DSC	BSCS	EPO	TP–F	TP–PrH	TP–PrF	TP–PsP	TP–PsN	COFC
M (SD)	3.38(.65)	3.13(.62)	5.29(.86)	3.55(.55)	2.99(.56)	2.31(.54)	3.46(.76)	2.55(.75)	3.64(.49)
DSC	.89	.78***	.38***	.66***	−.57***	−.24***	−.10	−.42***	.53***
BSCS		.88	.29***	.57***	−.46***	−.34***	−.09	−.44***	.54***
EPO			.90	.48***	−.17	−.05	.17	−.16	.36***
TP–F				.74	−.38***	−.15	.06	−.15	.53***
TP–PrH					.85	.37***	.36***	.26***	−.49***
TP–PrF						.72	.21*	.46***	−.42***
TP–PsP							.80	−.02	−.05
TP–PsN								.87	−.20*
COFC									.81

Note. DSC = Dispositional Self-Control Scale; BSCS: Brief Self-Control Scale (Tangney et al., 2004); EPO = Elaboration on Potential Outcomes (Nenkov et al., 2007); TP–F = Future time perspective; TP–PrH = Present-hedonic time perspective; TP–PrF = Present-fatalistic time perspective; TP–PsP = Past-positive time perspective; TP–PsN = Past-negative time perspective (Zimbardo & Boyd, 1999); COFC = Consideration of future consequences (Strathman et al., 1994). The first row presents participants' mean scores and standard deviations for each scale. The other rows present correlations between scales. The diagonal presents internal reliability (Cronbach's α).

*$p < .05$. **$p < .01$. ***$p < .006$ (Bonferroni alpha correction).

at the second step, each of the scales significantly added to the variance explained by the other, $F_{change} = 6.16$ and $F_{change} = 4.73$ for DSC and BSCS, respectively (both $p < .05$).

To sum, for two out of the three measures of time focus (i.e., EPO and TP) the DSC demonstrated predictive power above and beyond the BSCS.

STUDY 4: DSC AND DEVIANT BEHAVIOR

Study 4 investigated the concurrent predictive validity of the DSC Scale by examining the relationships between DSC and three types of deviant behavior: aggression (Study 4a), alcohol misuse (Study 4b), and aberrant driving (Study 4c). These behaviors are all expressions of self-control failure. We therefore hypothesized that low scores on DSC would predict all three. Past research has investigated the role of gender in such deviant behaviors (e.g., for a meta-analysis exploring the relationship between gender and aggression, see Hyde, 2005). In this study we therefore controlled for gender.

Study 4a: DSC and Aggressive Behavior

In Study 4a, we investigated aggressive behavior, defined as the intentional infliction of harm on another person (Bandura, 2006). In a situation of conflict with another person, an individual has to resist the temptation to harm the other person and to persist in remaining calm and finding ways of responding nonviolently, even when such responses are effortful. Aggressive behavior has been found to be associated with poor self-control (Archer, Fernandez-Fuertes, & Thanzami, 2010; Restubog, Garcia, Wang, & Cheng, 2010). We hypothesized that DSC would negatively predict aggressive behavior.

Method.

Participants and Procedure: The participants were 205 adults (80% female; age range = 17–74, $M = 29.29$, $SD = 11.41$; 36% high school graduates, 49% college or university graduates) who volunteered to complete an online survey in return for personal feedback (see Study 1b). Participants anonymously completed the questionnaires in a counterbalanced order.

Measures: The DSC Scale was described in Study 1b. Here, internal reliability was $\alpha = .89$ ($M = 3.15$, $SD = 0.65$).

To measure aggressive behavior, we administered the short Expagg scale (Campbell, Muncer, McManus, & Woodhouse, 1999; Driscoll, Campbell, & Muncer, 2005). This scale consists of 16 items measuring social representations of two types of aggression: expressive and instrumental. Participants reported their agreement with each statement on a 5-point Likert scale ranging from 1 (*do not agree at all*) to 5 (*agree very much*). Higher scores indicated a higher tendency to act aggressively ($M_{score} = 2.87$, $SD = 0.61$). Internal reliability of the total scale was $\alpha = .83$, which is consistent with past studies ($\alpha = .83$, Campbell et al., 1999; $\alpha = .81$, Driscoll et al., 2005).

Results and discussion. To examine the impact of DSC on behavior while taking gender into account we conducted regression in which DSC served as a predictor of aggressive behavior and gender was a control variable.

Gender explained 2% of the variance in aggression, $F(1, 204) = 4.14$, $p < .05$, indicating that women reported less aggressive behavior than men ($\beta = .14$, $p < .05$). As hypothesized, DSC negatively predicted aggressive behavior, adding 9% to the variance explained ($\beta = -.28$, $p < .01$, $F_{change} = 16.72$, $p < .001$).

Study 4b: DSC and Alcohol Misuse

Past research has related alcohol consumption to self-control failure (Keane, Maxim, & Teevan, 1993), as well as to risky or criminal behavior (Conigrave, Saunders, & Reznik, 1995; Hull & Bond, 1986; Murdoch, Pihl, & Ross, 1990). Tools developed to evaluate alcohol-related behaviors have distinguished among alcohol consumption, drinking behavior, and alcohol-related problems (Saunders, Aasland, Babor, De La Fuente, & Grant, 1993). However, these distinctions were made mainly to test the effectiveness of different interventions. From a self-control perspective, all three alcohol-related behaviors are indicators of the ability to control and supervise one's actions. We therefore combined all three behaviors into a single index of alcohol misuse and hypothesized that this index would be negatively associated with DSC.

Method.

Participants and Procedure: The participants were 348 adults (67% female; age range = 17–74, $M = 28.82$,

TABLE 4.—Self-control and time focus.

Variable	Model 1			Model 2		
	B	$SE\ B$	β	B	$SE\ B$	β
DSC, BSCS Predicting Elaboration on Potential Outcomes						
First Regression						
DSC	.50	.10	.38**	.52	.17	.40**
BSCS				−.03	.18	−.02
R^2 (F change)		.14 (22.12**)			.14 (.03)	
Second regression						
BSCS	.40	.11	.29**	−.03	.18	−.02
DSC				.52	.17	.40**
R^2 (F change)		.08 (12**)			.14 (9.24**)	
DSC, BSCS Predicting Future Time Orientation						
First regression						
DSC	.56	.06	.66**	.47	.09	.55**
BSCS				.12	.09	.13
R^2 (F change)		.43 (99.45**)			.44 (1.52)	
Second regression						
BSCS	.51	.06	.57**	.12	.09	.13
DSC				.47	.09	.55**
R^2 (F change)		.32 (61.56**)			.44 (27.32**)	
DSC, BSCS Predicting Present-Hedonic Time Orientation						
First regression						
DSC	−.48	.06	−.57**	−.45	.10	−.53**
BSCS				−.04	.11	−.05
R^2 (F change)		.32 (61.33**)			.32 (.17)	
Second regression						
BSCS	−.42	.07	−.46**	−.04	.11	−.05
DSC				−.45	.10	−.53**
R^2 (F change)		.21 (35.42**)			.32 (20.40**)	
DSC, BSCS Predicting Consideration of Future Consequences						
First regression						
DSC	.40	.06	.53**	.21	.09	.28*
BSCS				.26	.09	.33**
R^2 (F change)		.28 (52.29**)			.33 (7.93**)	
Second regression						
BSCS	.44	.06	.45**	.26	.09	.33**
DSC				.21	.09	.28*
R^2 (F change)		.30 (55.29**)			.33 (5.70*)	

Note. DSC = Dispositional Self-Control Scale; BSCS: Brief Self-Control Scale (Tangney et al., 2004).
*$p < .05$. **$p < .01$.

$SD = 10.65$; 39% were high school graduates; 51% were college or university graduates) who volunteered to complete an online survey in return for personal feedback (see Study 1b). Each participant completed two scales.

Measures: Participants completed the DSC Scale, described in Study 1b. Here, internal reliability was $\alpha = .88$ ($M = 3.11$, $SD = 0.63$).

The participants also completed the Alcohol Use Disorders Identification Test (Bradley et al., 1998; Saunders et al., 1993). This scale consists of 10 items assessing consumption of alcohol, drinking behavior, and alcohol-related problems. The participants reported their agreement with each statement on a 5-point Likert scale ranging from 1 (*do not agree at all*) to 5 (*agree very much*; $M = 0.58$, $SD = 0.57$). Higher scores indicated higher alcohol consumption and alcohol-related problems. Internal reliability of the full scale was $\alpha = .86$, which is consistent with past findings (e.g., $\alpha = .81$; Saunders et al., 1993).

Results and discussion. We conducted a regression in which DSC predicted alcohol misuse, and gender was a control variable. Gender had no effect on alcohol misuse ($\beta = -.01$, *ns*), $F(1, 347) = 0.04$, *ns*. As hypothesized, DSC negatively predicted alcohol misuse, explaining 8% of the variance ($\beta = -.28$, $p < .01$), $F_{change} = 28.37$ ($p < .001$).

Study 4c: DSC and Aberrant Driving

Aberrant driving refers to errors and violations of driving rules that impose risk on oneself or others (Parker, Reason, Manstead, & Stradling, 1995). Driving according to legal regulations requires overcoming impulses to drive recklessly as well as applying safe driving practices. Past research has related aberrant driving to self-control failure (Keane et al., 1993). We therefore hypothesized that self-control would negatively predict aberrant driving.

Method.

Participants and Procedure: The participants were 139 working adults (63% female; age range = 17–74, $M = 31.99$,

Sd = 11.80; 37% were high school graduates; 56% were college or university graduates) who volunteered to complete an online survey in return for personal feedback (see Study 1b). Participants completed two scales.

Measures: Participants completed the DSC Scale, described in Study 1b. Here, internal reliability was $\alpha = .87$ ($M = 3.22$, $SD = 0.59$).

The participants also completed a joint measure adopted from Westerman and Haigney (2000), which combines items from the Driver Behavior Inventory (Glendon et al., 1993) and the Driver Behavior Questionnaire (Parker et al., 1995). The scale consists of 24 items measuring three facets: violations (e.g., "Disregard the speed late at night or very early in the morning"), errors (e.g., "Brake too hard on a slippery road"), and lapses (e.g., "Hit something when reversing that you had not previously seen"). Participants rated their agreement on a 5-point Likert scale ranging from 1 (*do not agree at all*) to 5 (*agree very much*; $M = 1.86$, $SD = 0.47$). Higher scores indicated greater frequency of driving violations, errors, and lapses. In past studies, internal reliability of the three factors ranged from .74 to .76 (Westerman & Haigney, 2000). In this study the internal reliability of the full scale was $\alpha = .88$.

Results and discussion. We conducted a regression in which DSC predicted aberrant driving, and gender was a control variable. Gender had no significant effect ($\beta = -.01$, *ns*), $F(1, 138) = 1.71$, *ns*. As hypothesized, DSC negatively predicted aberrant driving, explaining 4% of the variance ($\beta = -.20$, $p < .02$), $F_{change} = 5.64$ ($p < .05$).

Taken together, the findings of Studies 4a, 4b, and 4c indicate that DSC is associated with three aspects of dangerous behavior (aggression, alcohol misuse, and aberrant driving). The DSC explained 4% to 9% of the variance in the behavior.

Studies 2 through 4 examined self-reported behaviors and examined the concurrent predictive validity of the scale. In Study 5 we tested the predictive validity of the DSC for overt behavior.

STUDY 5: DSC AND TASK PERFORMANCE

We suggest that individuals with high (as opposed to low) self-control can be distinguished by their ability to perform in a self-managed, self-restrained manner, even when circumstances make such behaviors difficult. Past studies have shown the impact of the interaction between individual attributes and situational factors on controlled behavior. For example, exposure to desirable temptations (e.g., Friese & Hofmann, 2009) or demands of a given task (e.g., Ein-Gar & Steinhart, 2011) have been shown to affect the behavior of low-self-control individuals differently from that of high-self-control individuals.

An individual's state of depletion is a situational factor that could temporarily block controlled behavior (for a meta-analysis see Hagger, Wood, Stiff, & Chatzisarantis, 2010). According to the self-regulation resource theory, people have a limited pool of resources that they use when regulating their behavior, emotions, and thoughts (Baumeister & Vohs, 2004). An individual who exerts resources in a given task becomes depleted, and is left with fewer available resources for completing subsequent tasks (Muraven & Baumeister, 2000). Because self-control is a stable individual attribute that influences behavior across situations, we reason that even among individuals who are in a state of depletion, higher levels of DSC are associated with better

performance in a situation calling for controlled behavior. Prior evidence has suggested that a depletion state can have different influences on individuals' behavior, depending on the personal attributes of these individuals. Thus, for example, Vohs and Faber (2007, Experiment 2) found that among depleted individuals, impulsive participants were more prone than less impulsive participants to make unplanned purchases.

In this study, all participants performed a self-control demanding task (identifying jumbled brand names) while in a depleted state (i.e., after completing a depleting task). We hypothesized that DSC would predict task performance.

Method

Participants and procedure. The participants were recruited through a subject pool as in Study 1a. The sample consisted of 36 volunteers (70% female; age range = 18–62, $M = 37.65$, $SD = 11.96$). In this study, participants were compensated by being entered into a raffle for an Amazon.com gift certificate worth $25. They completed the DSC Scale and then performed a resource-depleting task (the resource-depletion version of the e-task; see later). Finally, they completed the anagram task, a self-control-demanding task.

Instruments. The participants completed one scale and two tasks.

DSC: Participants completed the DSC Scale, as described in Study 1b. Internal reliability in this study was $\alpha = .81$.

Resource-Depletion Manipulation: The e-task is a two-part task adopted from earlier work on resource depletion (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Ein-Gar & Steinhart, 2011; Wheeler, Brinol, & Hermann, 2007). In the first part of the task, the participants were asked to follow a rule—to count the number of times the letter "e" appeared in each of four paragraphs. In the second part of the task, they were asked to perform a similar task for three additional paragraphs. This time, however, they were asked to count the letter "e" only when another vowel followed it in the same word or when the vowel was one letter removed from the letter "e" in either direction in the same word. Thus, to follow the rule in the second part of the task, the participants had to override their initial inclination to act according to the rule they had learned in the first part of the task. Past research has found that overriding this inclination exhausts participants' resources. In one study, for example, participants who completed the e-task (i.e., experienced depletion) and then watched a boring movie took more time to quit the movie when quitting required an active response ($M = 125$) than when it required a passive response ($M = 71$, $p < .01$; Baumeister et al., 1998). In another study, the participants who undertook the e-task were more likely to be persuaded by weak arguments ($M = 4.32$) than were nondepleted participants ($M = 2.69$, $p < .01$; Wheeler et al., 2007).

Anagram Task: In this task, adopted from previous work (Higgins, Roney, Crowe, & Hymes, 1994), the participants were asked to identify as many brand names as they could among 15 jumbled, known brand names (e.g., tofsomcir = Microsoft). Recognizing as many brand names as one possibly can demands persistence and stamina and might therefore be frustrating. The participants have to resist the temptation to give up on the task,

thereby ending their frustration, and instead to persist in identifying as many brands as possible.

Results and Discussion

Manipulation check. We reasoned that when applying the new rule in the second part of the e-task, participants would be depleted. To test the resource-depletion manipulation, at the end of the task we asked the participants to report on a scale of 1 (*not at all*) to 5 (*very much*) how hard it had been to follow the second rule (see Baumeister et al., 1998, Experiment 4; Ein-Gar & Steinhart, 2011, Study 2). If participants were depleted, we would expect their rating of the difficulty in applying the second rule to be greater than the scale's midpoint of 3. To test this, we conducted a t test against the scale midpoint, revealing that overriding the first rule when applying the second was difficult ($M = 3.53$), $t(35) = 2.79$, $p < .01$.

Task performance. We conducted a regression in which DSC predicted the number of brands identified; gender was entered as a control variable. Gender did not predict task performance ($\beta = .11$, *ns*), $F(1, 34) = 0.42$, *ns*). As hypothesized, DSC positively predicted task performance, explaining 14% of the variance ($\beta = .39$, $p < .05$), $F_{change} = 5.08$ ($p < .05$). Thus, the higher a participant's self-control, the greater the persistence he or she was able to exert in performing the task when depleted.

GENERAL DISCUSSION

Self-control reflects two fundamental human struggles: doing wrong and not doing right. This research introduces the DSC Scale as a measure of self-control. Whereas most existing scales reflect one type of temptation, the DSC Scale reflects both types and as such might be suitable for providing insight into a wider range of self-control-related behaviors.

We first tested the scale's inner structure using multidimensional scaling (i.e., SSA, Studies 1a and 1b) and CFA (Study 1b). We then studied its associations with other constructs, to investigate convergent and discriminant validity (Study 2). The observed pattern of relationships supported most of our hypotheses, showing the commonalities and differences between DSC and other related constructs. As hypothesized, the DSC Scale was positively correlated with other scales that assess yielding versus overcoming temptation (e.g., ego-control). Consistent with our reasoning, the findings suggest that the DSC Scale is distinct from other classifications based on the hedonic principle. For example, we did not observe substantial correlations between DSC and BIS measures, whereas DSC was negatively correlated with the Fun Seeking BAS measure and positively correlated with the Drive BAS measure. The results did not pass the Bonferroni adjusted alpha correction test at Time 1; however, they did pass them at Time 2, suggesting the need for further inquiry of these relationships in future studies. In sum, the overall findings suggest that DSC is related to, yet distinguishable from, these constructs.

Finally, we investigated the predictive validity of the DSC. We found that self-control predicted individuals' focus on future consequences (Study 3), and that its prediction power was above and beyond that of another measure of self-control (the BSCS). Furthermore, DSC negatively predicted deviant behavior: aggressive behavior, alcohol misuse, and aberrant driving (Study 4). Last, depleted individuals who scored high on the

DSC scale performed better in a task requiring persistence than did depleted individuals who scored low on the scale (Study 5).

Limitations and Directions for Future Research

The DSC Scale was developed and tested using samples of adults. It would be worthwhile to conduct a longitudinal study exploring the extent to which the DSC Scale captures individuals' stable personal tendencies to yield to versus overcome temptations from childhood to adulthood, as well as the changes in these tendencies throughout life. Furthermore, this research did not explore possible cultural differences in dispositional self-control. Future research could compare the manifestation of self-control in different cultural orientations.

In Studies 3 and 4 we relied on self-reported measures of behavior, which are susceptible to self-report biases such as limited self-awareness or social desirability biases. This might account for the modest relationships observed between DSC and the behavioral measures in these studies.

For example, in the findings of Studies 4a, 4b, and 4c the DSC explained 4% to 9% of the variance in the behavior (aggression, alcohol misuse, and aberrant driving). Although these effects are modest, they could be critical in predicting destructive and dangerous behaviors.

Interestingly, however, when DSC predicted performance (i.e., overt behavior, Study 5) it accounted for 14% of the variance. Thus, future studies exploring self-control should consider employing additional measures of overt behavior. We studied the relationship of DSC to several behaviors, including time focus, deviant behavior, and task performance. In future studies, it would be important to study the association between DSC and ongoing self-control-demanding behaviors, such as sticking to a diet or monitoring expenses. The DSC might provide insight into such behaviors, which are likely to reflect struggles with both DW and NDR temptations. Moreover, exploring the role of personality in such behaviors could shed light on the ways in which self-control failure can affect society as a whole (e.g., by causing obesity epidemics, financial crises, etc.).

Our findings revealed that the DSC predicted behavior above and beyond the BSCS (Tangney et al., 2004) measure of self-control (Study 3). Future studies should investigate the predictive power of DSC above and beyond other measures of self-control. Furthermore, it could be beneficial to study the unique contribution of each aspect of self-control (i.e., DW and NDR) to behaviors that are likely to be especially related to each aspect. For example, NDR might be especially related to individuals' struggles to keep up their routine medical check-ups, whereas DW might be especially relevant to the struggle to resist watching TV or playing computer games.

Conclusions

In recent years, self-control has become a prominent subject of interest for educators, marketers, psychologists, and policymakers. The ability to maintain self-control has been associated with a wide range of behaviors that influence well-being at the individual level as well as at the societal level. Developing better methods for measurement that can identify self-control behaviors might allow for more effective interventions in cases of self-control failure. Taken together, our findings suggest that the DSC Scale could be a useful tool toward further understanding the role of personality in overcoming self-control challenges.

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APPENDIX A. THE DISPOSITIONAL SELF-CONTROL SCALE ITEMS.

Yielding to NDR temptations	• I tend to postpone completing unpleasant tasks.
	• I sometimes postpone tasks that I must do until it's almost too late.
	• When I need to run errands, I usually put them off until the last minute.
Overcoming NDR temptations	• People can trust me to stay on schedule even if I am overloaded and under a lot of pressure.
	• I never delay work that needs to be done, even if I am busy.
	• I tend to finish assignments right away, even if they are annoying.
	• I am able to work effectively toward long-term goals while resisting temptations along the way.
	• It is important for me to finish all of my tasks on time, even if I don't feel like doing them.
Yielding to DW temptations	• People say I often make up my mind without thinking things through.
	• I do many things on the spur of the moment.
	• I often act without thinking through all of the alternatives.
	• I often make spontaneous and slightly hasty decisions.
Overcoming DW temptations	• Even when something exciting happens to me, I do not get carried away by my feelings or act without thinking.
	• Even when I am stressed, most of the decisions I make are considered and calculated.
	• I rarely act impulsively.
	• Usually, when something tempts me, I manage to hold out.
	• I usually succeed in overcoming temptations.

Note. NDR = not doing right; DW = doing wrong.