The Predictive Validity of Self-Control for Different Forms of Recidivism

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Abstract

Purpose: This prospective study investigated the predictive validity of Self-Control (SC) for several forms of criminal recidivism (general, property, violence, sexual).

Design: N = 1838 male prisoners were interviewed while serving a prison sentence. Personality traits known to be related to SC served as operationalization of SC. Cluster analyses identified three clusters of SC-related traits: Emotion Regulation, Self-Assertion, and Effortful Control. Survival-analyses predicted recidivism, which was assessed using official data. The follow up period amounted to 72 months.

Findings: The SC-related trait clusters significantly predicted general and violent reoffending, after controlling for established risk factors for recidivism (age, age at first offense, social status, previous youth detention, out-of-home placements, and length of imprisonment). However, trait clusters did not predict reoffending with a property offense. Offenders with violent or sex offenses in their criminal history showed different profiles on the trait clusters.

Originality: SC is an important risk factor for violent recidivism. SC-related trait clusters should not be combined to form a single score, because essential information for risk profiles would be lost.

The Predictive Validity of Self-Control for Different Forms of Recidivism

The construct Self-Control (SC) has received major attention in criminological research (DeLisi, 2011). There is substantial evidence for a strong relationship between SC and crime (Pratt and Cullen, 2000), and an antisocial personality pattern closely related to Gottfredson and Hirschi's (1990) conceptualization of SC has been established as one of the "big four" risk factors for recidivism (Andrews and Bonta, 2010). However, the number of empirical studies testing the relationship between SC and recidivism is relatively small. Therefore, we address this issue in our prospective study, using a large sample of young adult, first-time prisoners. The average follow-up period in our sample is about three times longer than the average for other studies of young adult offenders (Olver *et al.*, 2009). We use official records for the operationalization of recidivism. Furthermore, we investigate different forms of recidivism separately, and we include psychological processes posited to moderate SC (Duckworth and Kern, 2011).

SC and Crime

According to the general theory of crime (Gottfredson and Hirschi, 1990), low SC in combination with opportunity is considered to be the only cause of crime, and the level of SC is presumed to correspond to the mean number of crimes. Being considered as one of the most influential theories in criminology (DeLisi, 2011), the general theory of crime has triggered extended research investigating whether low SC predicts criminal behavior (e.g., Moffitt *et al.*, 2011; Tittle *et al.* 2003a; Vazsonyi *et al.*, 2001; Ward *et al.*, 2010). Even though many studies found results contradicting minor hypotheses (e.g., that SC predicts all forms of crime equally well; Cretacci, 2007), most of the studies corroborate the main hypothesis that SC predicts crime. A meta-analysis by Pratt and Cullen (2000) summarized that, across different measures and types of samples, low SC is an important predictor but

not the only predictor of crime. Underpinning the practical relevance of this branch of research, another meta-analysis found that training programs designed to promote SC among children and adolescents improve SC and reduce delinquency (Piquero *et al.*, 2010).

SC and Recidivism

Most of previous studies of SC and crime examine the relationship between the two factors using community samples. However, the fact that SC can be considered as a predictor of crime does not necessarily imply that it also predicts criminal recidivism (Grieger and Hosser, 2012). The few studies explicitly investigating the relationship between SC and recidivism (e.g., Benda, 2003), indicate that SC predicts recidivism. Moreover, SC and its facets have been shown to be useful predictors of a number of subtypes of crime and recidivism. Low SC operationalized using official behavioral data was found to predict violent recidivism over a five-year follow up period in a large sample (N = 3995) of two cohorts of parolees (Piquero *et al.*, 2005). SC is also discussed as one major factor influencing sexual recidivism (Beech and Ward, 2004). General self-regulation problems were identified as a risk factor for sexual recidivism in the meta-analysis by Hanson and Morton-Bourgon (2005). Finally, low SC assessed through attitudinal and behavioral measures was found to be related to property offenses (Benda, 2005; Cretacci, 2007). Nonetheless, to our best knowledge, there is as of yet no study investigating the predictive validity of SC for reoffending with property crimes.

Regarding offender types, it has been shown that offenders who had never committed a violent offense in their criminal history (according to self-report data) differed in personality traits related to SC from offenders who had offended violently at least once (Lynam *et al.,* 2004). This difference between individuals who have committed violent and non-violent crimes underscores that it could also be informative to distinguish between offender types.

Operationalizational Problems

SC is conceptualized in a multitude of ways (e.g., Gottfredson and Hirschi, 1990; Moffitt *et al*., 2011). However, "effortful regulation of the self by the self" (Duckworth, 2011, p. 2639) emerges as the common thread running through diverse conceptualizations. SC is typically measured using questionnaires assessing SC either through attitudes or behavioral acts analogous to criminal behavior. However, elements of the behaviors that are analogous to crime (and used as operationalizations of low SC) and actual criminal behaviors strongly overlap, leading to the tautology of predicting criminal activities through the assessment of illegal behavior (Akers, 1991; Geis, 2008). Furthermore, the imprudent behaviors used in behavioral assessment of SC intercorrelate only weakly (Tittle *et al.*, 2003b), resulting in internally inconsistent behavioral SC scales.

Several researchers have pointed out that facets of SC as differentiated by Gottfredson and Hirschi (1990; temper, impulsivity, self-centeredness, risk taking, preference for simple tasks, preference for physical as opposed to mental activities) correspond to separate scales within models of personality (cf. Marcus, 2003; *Romero et al.*, 2003). These separate personality scales assess independent personality traits that, taken together, may be viewed as the actual core of "low self-control". Consistent with this idea, DeLisi et al. (2010) suggested that SC may have convergent validity with personality constructs in several studies in which SC has been conceptualized according to Gottfredson and Hirschi's (1990) model. Thus it could be fruitful to break down the meta-construct of SC into the already established and validated constructs in the (psychological) literature, such as personality traits related to SC.

Present Study

Following this idea and keeping with the results of previous studies (DeLisi et al., 2010; Wiebe, 2006b), we operationalized SC as several personality traits expected to be

related to various facets of SC (Table 1). This approach also allowed us to take into account processes that moderate impulse control in the assessment of SC (Duckworth and Kern, 2011). The first moderating process we considered in this study was coping, since different coping strategies, e.g., cognitive reappraisal/finding meaning in negative events and problem-directed action, are considered to play an important role in affect regulation (Larsen and Prizmic, 2004). The other process accounted for in our study was perceived self-efficacy, which is strongly correlated with SC (Luszczynska *et al.,* 2005) and influences people's acceptance of challenges, their persistence in pursuing tasks , their execution of complex cognitive strategies, and their emotional response in face of threat, promoting self-regulation and achievement (Bandura, 1997).

In line with previous research results and theoretical assumptions, we expected that lower scores on personality traits related to SC should predict all forms of recidivism assessed in this study (i.e., general, violent, sex, and property reoffenses). Since SC was found to be differentially related to different forms of offending (e.g., Cretacci, 2007), we hypothesized that the different forms of recidivism would have distinct patterns of hazard ratios. We expected the highest predictive validity for violent recidivism (Piquero et al., 2005). Furthermore, following an approach taken by Lynam et al. (2004), we postulated that offenders without a violent or sex offense in their criminal history would differ from those who committed such a crime in the clusters of SC-related traits.

Method

Participants

This study was part of an extensive research project (2004-2011) examining the effects of prison sentences on young adult offenders with a cohort-sequence-design (c.f. Hosser *et al.*, 2008). Participants (N = 2405) were recruited from six youth correction facilities in Northern Germany. The prisons were located in several German counties and

varied in terms of security level. All male, German prisoners who served a custodial sentence for the first time and were referred to one of the participating youth correction facilities between 1998 and 2001 were approached and asked if they wanted to participate in the study. The only exclusion criteria were insufficient German language skills and a non-German passport.

At three times during incarceration, trained interviewers conducted standardized interviews with the participants. The data for this study was collected during the second interview, which took place, on average, four months after imprisonment (M = 4.1, SD = 3.1). The subsample for this study consisted of N = 1838 male, young adult, first-time offenders. The original sample size was reduced for several reasons. First, 299 prisoners were part of the cross-sectional portion of the study. Therefore, they were interviewed only once in prison and information on crimes after release from prison was not gathered. Second, we excluded prisoners from the sample if they had a previous incarceration documented in their official files (n = 41) in order to have a sample that is more homogenous and specific. Finally, about 9% of the participants dropped out of the study after the first interview for a variety of reasons, such as transfer to another correctional facility, to a hospital, or to a forensic mental institution. Other participants were suicidal and could therefore not be interviewed, and yet others had already been released from prison before all three interviews were completed. A small number of participants refused to take part in the second interview.

The participants' age at incarceration ranged from 14.5 to 25.4 years (M = 19.6, SD = 2.0). This range in age is consistent with German legislation, which allows offenders to be committed to youth correction facilities between the ages of 14 and 24 years, although the actual average age at which young adult offenders are imprisoned is 20 years (Dünkel and Geng, 2007). On average, the participants were incarcerated for 19.8 months (SD = 13.6, *range*: 2.2 - 113.9 months) because they had committed the following crimes (*index crimes*):

property offenses (36.0%), bodily injury (32.3%), grievous bodily harm (14.4%), drug offences (4.8%), homicide and manslaughter (2.7%), sex offences (1.6%), and other crimes (8.2%).

Participation in the study was voluntary, and confidentiality was assured according to the criteria of informed consent. Participants received ten Euros (approximately 14 US dollars) as compensation. The study was approved by the review boards of the prison administrations, the Ministries of Justice of the involved federal states, and the National Data Protection Authorities. The advisory board of the Criminological Research Institute of Lower Saxony provided ethics review and approval of this study.

Measures

An overview of the scales applied to assess SC-related traits and their reliabilities is provided in Table 1. Reliabilities ranged from minimally acceptable to satisfactory values.

< Table 1 >

Multidimensional Personality Questionnaire (MPQ).

The *MPQ* (Tellegen, 1982) is a self-report personality inventory. It consists of 11 scales that can be subsumed under the three higher order factors, *Positive Emotionality*, *Negative Emotionality,* and *Constraint*. We used 6 of the 11 scales because they conceptually overlap with Gottfredson and Hirschi's (1990) dimensions of (low) SC (cf. Table 1). Tellegen and Waller (2008) describe the scale construction of the MPQ and the congruence with other self-report personality inventories. Consistent with the *Dunedin Multidisciplinary Health and Development Study* (Caspi et al., 1997; Krueger et al., 1994), we used a short, 144-item version of the German MPQ (Spinath and Angleiter, personal communication). The internal consistencies of the scales we chose range from $\alpha = .69$ to $\alpha = .80$ for the English short version (Caspi et al., 1994). Each item of the 144-item MPQ

contains a statement that is either affirmed or denied (0 = *I agree,* 1 = *I disagree*). We used the *Social Potency* scale in order to assess forceful, decisive, and dominant personality traits which overlap with the self-centeredness facet of Gottfredson and Hirschi's (1990) conceptualization. However, the short version contained three items that are more related to the gregariousness aspect of extraversion than to social power ("I enjoy being in the spotlight," "I perform for an audience whenever I can," and "I often stir up a dull party."). Since gregariousness was found to correlate negatively with self-centeredness (Romero et al., 2006) we deleted these three items from the scale. Likewise, the scale *Control* included three items that were more related to harm avoidance than to reflective, level-headed and planning behavior ("I almost never do something reckless," "I am not as cautious as I should be," and "I am a cautious person."). As we also assessed the Harm Avoidance scale, these three items were redundant and thus we thus excluded them from the Control scale.

Delay of Gratification.

Delay of gratification is the process of postponing immediate gratification for the sake of higher deliberate goals in the long run. Three items from the *Delayed Gratification Questionnaire* (Utz, 1979), modified by Blass (1983), were chosen because they exhibited the most ideal relationships between item-selectivity and item-difficulty in a forensic sample (Blass, 1983). The questions were (translated from the original German), "I think it's better to live hand-to-mouth than to save money for the long run.", "If you don't try to fulfill your wishes immediately, you might miss out on something in life.", and "If I really want something, I can't go on long living without it." The items were rated on a four-point Likert rating scale ("How accurate is the following statement?": 0 = *not at all*, 1 = *somewhat*, 2 = *highly*, 3 = *extremely*).

Coping.

Coping is defined as the process of responding to a perceived threat (Lazarus, 1984). Brandstädter and Renner (1990) describe two separate types of coping strategies that promote adaptive competence in dealing with goal discrepancies. In the *assimilative mode*, the person actively tries to resolve the situation while sticking to his/her goals, standards, and orientation. Following the *accommodative mode*, the individual resolves the situation by adjusting his/her goals to constraints, reappraising the situation, and finding new feasible goals. We used the *TEN-FLEX* questionnaire by Brandstädter and Renner (1990), which consists of the two 15-item scales, *Tenacious Goal Pursuit (Assimilation)* and *Flexible Goal Adjustment (Accommodation)*, to assess assimilative and accommodative tendencies. Each item is scored on a four-point Likert rating scale ("How correct is the following statement?": 0 = *not at all*, 1 = *somewhat*, 2 = *highly*, 3 = *extremely*). Satisfactory internal consistencies and content validity were reported for the original German version (accommodation: $\alpha = .83$; assimilation: $\alpha = .80$; Brandtstädter and Renner, 1990).

Self-Efficacy.

We chose the German, short version of the *Scale of General Self-Efficacy* (Schwarzer and Jerusalem, 1989) to assess self-efficacy. It consists of ten items that are rated on a four-point Likert rating scale ("How correct is the following statement?"; 1 = *not at all*, 2 = *somewhat,* 3 = *highly*, 4 = *extremely*). The internal consistency of the short version reported by the authors amounts to $\alpha = 82$ (Jerusalem and Schwarzer, 1986; see also for content validity analyses).

Recidivism.

Information on recidivism was gathered at the German Federal Central Register (Bundeszentralregister), an institution operated by the German Federal Office of Justice (Bundesamt für Justiz), which administers a database with all legal decisions in Germany.

According to section 4 of the Federal Central Criminal Register Act from 1971, all final rulings considering a) offenses committed in Germany or b) by German citizens or residents abroad, have to be entered in the Central Criminal Register (Bundesamt für Justiz, 2011).

General recidivism was defined as any reincarceration after release from prison regardless of the form of recidivism and thus the category of general recidivism includes individuals who were imprisoned for recidivating with any type of crime. The categories *violent recidivism* (bodily harm, grievous bodily harm, robbery, and homicide), *sexual recidivism* (rape, child abuse, and possession of illegal pornography), and recidivism with a *property offense* (theft, burglary, and embezzlement) cover all reincarcerations due to these offenses. The specific forms of recidivism do not exclude one another. For example, if a person reoffended with a violent offense as well as with a property offense and was reincarcerated, he was scored as a recidivist for both types of offenses. These crime categories were all included in the general recidivism category which additionally includes other crimes of the German penal code that do not fall into the categories mentioned above. The date of the offense was set to the date of recidivism for each criterion. For each individual, the follow-up period (time at risk) was defined as number of months between date of release from prison and the date when the criminal files were requested (31.12.2007). Across the sample, the time at risk averaged 79.4 (SD = 17.5) months in duration.

Self-reported criminal behavior.

In order to assess additional and potentially undetected criminal activities before incarceration, the interview included questions on incidents of robbery ("*Did you ever rob someone, i.e., take something from someone by force or with threat of violence?*"), bodily injury ("*Did you ever intentionally beat or hurt someone, without using a weapon?*"), grievous bodily harm ("*Did you ever hurt someone intentionally with a gun, knife, a cane or*

similar objects?") and sex offenses ("*Did you ever force someone to have sexual contact with you against their will?*").

Offender types.

We classified offender types according to information on the index offenses and on reoffenses during the follow up interval. Both types of information are captured in the official criminal file. Each person was assigned to only one category. Individuals who reoffended with a sex offense or had committed a sex offense as their index crime were classified as sex offenders, regardless of whether they had also committed a violent reoffense (n = 56). Participants who had committed a violent crime or had a violent offense as their index crime were classified as violent offenders (n = 1,066), and the rest of the offenders received were classified as general (i.e., non-violent and non-sexual) offenders (n = 702).

As Lynam et al. (2004) noted that a classification of offender types according to self-report data yielded better results than a classification using only official data, we created a second classification of offender types, based on official as well as on self-report data (read above). Participants were classified as sex offenders (n = 64) if they either 1) admitted that they had offended with a sex offense or 2) had committed a sex offense as index crime or 3) if they had reoffended with a sex offense, regardless of any (self-reported) violent crimes in their criminal history. Accordingly, participants who admitted that they had committed a violent offense, or who had a violent crime as index crime, or who had reoffended with a violent crime, were classified as violent offenders (n = 1538). All other offenders were scored as non-violent/non-sexual offenders (n = 225).

Control variables.

We assessed the following established risk factors for recidivism in young adult offenders (Cottle *et al.*, 2001) as control variables: *current age*, *age at first entry in the*

criminal file, and *previous youth detention* (0 = *no*, 1 = *yes*); this information was derived from the offenders' official criminal files. Prison files provided information on *out-of-home placements* (0 = *no*, 1 = *yes*). The variable *duration of current imprisonment* was also measured, tapping into three different issues relevant to recidivism: 1) the duration of the first imprisonment (since all participants were first-time offenders when incarcerated), 2) the severity of the index crime, and 3) the length of the observation period after release. In addition, we assessed the *social status* of the parents (measured according to the socio-economic index; Ganzeboom *et al.*,1992) as a control variable.

Statistical analysis

We conducted all statistical analyses with the *IBM SPSS 19* software. *Cluster analyses* across all scales were calculated in order to reduce the amount of data and degrees of freedom for further analyses. All scales were *z*-standardized. A preliminary single-linkage clustering procedure – an algorithm that is particularly sensitive to statistical outliers – using the city-block distance measure was employed to identify outliers on construct level. As no presumptions were made concerning the initial linkage of the scales, an agglomerative hierarchical procedure was chosen for the crucial second cluster analysis (Ward's linking method with squared Euclidian distances as similarity measure that mathematically tends to produce internally consistent clusters that are very well separated from each other).

In the first step evaluating recidivism, Pearson's correlation coefficients were used to estimate the effect size of the trait clusters corresponding to Andrews and Bonta's (2010) approach. However, in order to examine the predictive validities of the trait clusters for recidivism more closely and accurately, Cox regression analyses were calculated for each form of recidivism. Compared to conventional procedures (including logistic regressions, correlation coefficients), this method has major advantages (Allison, 2010); it takes into account the time at risk until the event occurred (in this case, the time until the reoffense),

and it can deal with censored data (in this case, participants who did not reoffend during the time at risk). Due to the variation in the participants' length of imprisonment (which is partially due to differences in the sentences), the times at risk largely differed among participants, ranging from 0.2 to 117.4 months (M = 79.4, SD = 17.5). Since Cox regression analyses utilize the longest time at risk existing in a sample for the calculation, all participants with shorter times at risk drop out of the analyses (random censoring). In order to reduce random censoring, which causes problems for the interpretation of the results (Allison, 2010), the time at risk was made comparable for all offenders. Therefore, we chose a cut-off of 72 months for the observation period. Thus any reoffense that occurred after 72 months after release was not examined in this study. In the first step, we investigated the predictive validity of the trait clusters for all forms of recidivism using three separate models. In the second step, we calculated hierarchical models in order to partial out shared variance with the control variables.

Results

Clusters of SC-related personality traits

The preliminary single-linkage cluster analysis identified Harm Avoidance of the MPQ as a conceptual outlier among SC-related personality traits. This is consistent with theoretical presumptions and empirical evidence reported by previous studies (Marcus, 2004). Therefore, the Harm Avoidance scale was excluded from further analysis. The second cluster analysis using the Ward's linking method revealed a three-cluster solution (see Figure 1).

< Figure 1 >

Scores on the scales belonging to one cluster were summed to form unweighted sum scores of the three clusters. The scales Stress Reactivity, Delay of Gratification, and Aggressivity were subsumed under the cluster we named *Emotion Regulation*. Individuals

with high scores on this cluster described themselves as non-violent, lenient, not exploiting others, not feeling vulnerable, able to cope with negative emotions, and able to postpone immediate gratification. The second cluster summons the scales Social Potency and Assimilation as *Self-Assertion*. High scores on this cluster indicate that the individuals describe themselves as forceful, decisive, dominant, and persistently and actively striving for the achievement of their goals. The third cluster, *Effortful Control*, consists of the scales Achievement, Control, Accommodation, and Self-Efficacy. High scores on this trait cluster indicate that the individuals think of themselves as hard-working, persistent, ambitious, reflective, rational, self-reliant, and able to adjust their goals when a former goal is not feasible. The intercorrelations of the clusters and the correlations with the control variables are indicated in Table 2.

<Table 2>

Predicting recidivism from SC-related personality traits

During the observation period approximately half of the sample was reincarcerated (51.5%), 38.9% recidivated with a property offense, 29.3% with a violent offense, and 1.8% with a sex offense. The effect sizes of the three trait clusters for the types of recidivism were calculated using Pearson correlation coefficients (see Table 2). Emotion Regulation correlated significantly and negatively with the three types of recidivism. Self-Assertion showed positive correlation with violent reoffending. The cluster Effortful Control correlated significantly and negatively with sexual reoffending, indicating a relationship between Effortful Control and sex reoffending that is of comparable strength to the relationship between previous youth detention and sex reoffending, and stronger than the relationship of sex reoffending with any other control variable. All bivariate main effects were small in magnitude.

Cox regression analyses provided for a more accurate estimation of the predictive validity of the trait clusters for reoffending. When all trait clusters were entered simultaneously, violent recidivism could be significantly predicted ($\Delta\chi^2 = 12.56$, $df = 3$, $\Delta R^2 = .01$, $p < .01$). General recidivism and sexual recidivism could be marginally significantly predicted by the trait clusters (general: $\Delta\chi^2 = 7.62$, $df = 3$, $\Delta R^2 = .00$, $p = .06$; sexual: $\Delta\chi^2 = 7.15$, $df = 3$, $\Delta R^2 = .00$, $p = .07$). However, the trait clusters did not predict reoffending with a property offense ($\Delta\chi^2 = 5.06$, $df = 3$, $\Delta R^2 = .00$, $p = .13$).

In order to control for established risk factors, hierarchical Cox Regression analyses were calculated. In the first step of the analysis, the control variables were entered simultaneously into the model, resulting in a significant model fit for all forms of recidivism. For general and violent recidivism, the model fit significantly improved after the second step, when the trait clusters were entered, indicating an incremental effect of the SC-related trait clusters. In the case of sexual recidivism and reoffending with a property offense, the improvement in model fit was only marginally significant. The results of the hierarchical Cox regression analyses are displayed in Table 3.

< Table 3>

Examining the relative contribution of the different trait clusters to the improvement in model fit revealed that lower values in Emotion Regulation showed at least a trend to a higher risk of recidivism for all forms of recidivism (except for reoffending with a property crime), since all hazards ratios were < 1. The cluster Self-Assertion showed a different pattern depending on the form of recidivism; although the hazards ratio was < 1 for sexual reoffending, the hazards ratios were > 1 for all other forms of recidivism. Since the hazards ratios for Effortful Control were very close to 1 for all forms of recidivism except for sexual recidivism (Table 3), the cluster of Effortful Control showed almost no effect on reoffending. However, Effortful Control was one of the two strongest correlates of sexual

recidivism (Table 2). Taken together, the form of recidivism that was best predicted by our trait clusters was violent recidivism.

We assumed that the effect in the case of general recidivism may have been caused by the fact that this criterion includes violent reoffenses. Therefore, we tested this assumption by including violent reoffenses as a control variable (0 = *no*, 1 = *yes*) in hierarchical Cox regression analysis analogous to the analyses presented in Table 2. The Cox regression analyses did not reach significance after the second step ($\Delta\chi^2 = 2.65$, $df = 3$, $\Delta R^2 < .01$, $p = .45$). This is consistent with our assumption that the predictive validity of SC-related trait clusters (and in particular of Emotion Regulation) for the prediction of general recidivism may be caused to a large extent by the fact that this criterion also includes reincarceration due to violent reoffenses.

SC-related personality traits and offender type

For both classifications of offender types (cf. p. 12), we calculated one-way ANOVAs with a priori contrasts using the offender type as independent and the trait clusters as dependent variables. The results are displayed in Table 4. In both classifications, the profiles of the offender types were similar: while general offenders showed uniquely high values on Emotion Regulation and Effortful Control, violent offenders were characterized by high levels of Self-Assertion. Finally, sex offenders showed low values on all trait clusters. However, using additional self-report data, these patterns were in line with the results by Lynam et al. (2004) more pronounced, as indicated by the significant results.

< Table 4 >

Discussion

This prospective study investigated the incremental predictive validity of SC – one of the most discussed constructs in criminology (DeLisi, 2011) – for the prediction of different forms of criminal recidivism in a large sample of young adult offenders after they were

released from having been incarcerated for the first time. Following Duckworth and Kern's (2011) suggestion, we expanded the conceptualization of SC by additionally including personality traits that are theoretically and empirically related to SC, such as self-efficacy and coping. In order to reduce degrees of freedom, we clustered the scales to higher order clusters (Emotion Regulation, Self-Assertion, and Effortful Control) and predicted four forms of recidivism with Cox-regression analyses using official data.

SC-related personality traits and recidivism

The results of the Cox regression analyses on the one hand (cf. Table 3), and the comparison of the different offender types on the SC-related trait clusters on the other hand (cf. Table 4), revealed that different profiles on the SC-related trait clusters predict different offenses. Consistent with theoretical presumptions, this suggests that the approach of analyzing facets of SC separately may be more appropriate than using only overall sum-scores (Marcus, 2003).

As in other studies (e.g., DeLisi and Vaughn, 2008; Grasmick *et al.*, 1993; Moffitt et al., 2011; Vazsonyi et al., 2001), the effect sizes of SC were rather small (R^2 = .01; assessed according to Allison, 2010). DeLisi and Vaughn (2008) suggest that the effect of SC should be compared to the effect of established risk factors. In the case of our study, the effect sizes for the well-established risk factors were not considerably larger (R^2 = .05; see Table 3). These small effect sizes may in general be due to the calculation of R^2 according to Allison (2010), which includes the sample size (N = 1,838) in the denominator. The fact that e.g., the probability of violent reoffending for two groups which are one unit apart on the Self-Assertion cluster differs by 18% (and respectively, on Emotion Regulation by 14%), indicates that SC-related trait clusters may provide substantial incremental information to the prediction of violent reoffending.

SC-related personality traits and violent (re-)offending.

We hypothesized in contrast to Gottfredson and Hirschi (1990), that the predictive validity of SC should be stronger for violent recidivism than for general recidivism. The results of the Cox regression analyses affirm this assumption. Furthermore, we found that higher scores on the Self-Assertion cluster were characteristic for violent offenders (cf. Table 4) and they were significantly associated with an increased likelihood of violent reoffending (cf. Table 3). This implies that individuals who characterized themselves as forceful, decisive, dominant, and persistently and actively striving for the achievement of their goals were at a higher risk of reoffending with a violent crime. Considering that these attributes were based on self-report, these items should not be interpreted to be factually accurate, but rather to indicate the specific respondent's self-perception and image cultivation. For example, Lilienfeld and Fowler (2006) argue that in self-report measures of psychopathy, an item like "I can read people like a book" may be a valid indicator of narcissism but may not necessarily be factually correct (p. 111-112). Correspondingly, we hypothesize that our cluster Self-Assertion may be a proxy for the interpersonal facet of psychopathy (Hare and Neumann, 2008), reflecting grandiosity, narcissism, and self-centeredness. Empirically, self-reported Social Potency has been found to correlate positively with psychopathy yielding a weighted effect size of .27 in a meta-analysis (Lynam and Derefinko, 2006), and Benning et al. (2003) found that in particular the affective-interpersonal factor of psychopathy was strongly correlated with Social Potency (r = .49). Wiebe (2006a) pointed out the commonalities of the interpersonal elements of psychopathy and low SC, particularly with the facet self-centeredness. Another meta-analysis showed that psychopathic traits in juveniles predicted violent recidivism with a moderate effect size (r = .22, $p < .001$; Asscher *et al.*, 2011). Hence the interpretation of Self-Assertion as a proxy for the interpersonal facet of psychopathy would be in line with our finding that high scores on

Self-Assertion were more characteristic of violent offenders (see Table 4) and predicted violent recidivism better than they predicted any other form of recidivism (see Table 3).

The finding that offenders who were never incarcerated for a violent offense showed a different trait pattern than individuals who did have violent crimes in their criminal history is consistent with previous results (Lynam et al., 2004). The other significant predictor for violent reoffending was Emotion Regulation[1], which was in line with results reported by Baron et al. (2007).

SC-related personality traits and (re-)offending with a property offense.

The clusters of SC neither predicted reoffending with a property crime in a simple, nor in a hierarchical Cox regression analysis after controlling for established risk factors. Correspondingly, none of the SC clusters correlated significantly with reoffending with a property crime. We share Swatt and Meier's (2008) view that property offenses are a very broad category, with different levels of planning required for different offense types within this category (e.g., shoplifting versus burglary). Therefore, SC may be not a good predictor of reoffending with a property crime. This presumption needs further empirical testing.

SC-related personality traits and sexual (re-)offending.

The sex offenders in our sample showed a pattern on the SC clusters that was different from the other two offender types; they exhibited low values on all of the SC-related trait clusters (Table 4), and in particular, they were characterized by low levels of Effortful Control, a cluster that showed no effect in the Cox regression analyses for general

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[1] In another hierarchical Cox regression analysis (analogous to Table 3), we tested if Emotion Regulation and Self-Assertion showed a joint effect on the probability of violent reoffending. However, the inclusion of the interaction effect in the third step did not significantly improve the model fit.

and violent recidivism (Table 3). The fact that the SC-related trait clusters showed only a marginally significant predictive validity for sexual recidivism may be due to the small number of events in this sample (n = 30). However, the incremental change in model fit after entering the trait clusters amounted to about 50% (compared to the model fit of only control variables, cf. Table 3). This may hint at the importance of SC for the prediction of sexual reoffending.

SC-related personality traits and general (re-)offending.

The SC-related trait clusters significantly and incrementally predicted general recidivism after controlling for established risk factors (Table 3). However, this effect vanished when we controlled for violent reoffending in the first step of the hierarchical Cox-Regression analysis. Therefore, we assume that the significant effect in the Cox regression analysis (Table 3), especially of low Emotion Regulation, is mainly caused by the fact that the criterion "general recidivism" includes violent reoffenses. The fact that offenders without a violent or sexual offense in their offense history showed uniquely high levels of Emotion Regulation and Effortful Control (Table 4) corroborates this assumption. In line with current research results (Hilton *et al.*, 2010; Singh et al., 2011), these results stress the need for risk assessment measures that are tailored to the form of recidivism.

Limitations and Strengths

There are several limitations to our study that need to be pointed out. First of all, our measures of SC were based on self-report and should therefore not be interpreted as factual information but rather as indicators of the offender's self-perception and image cultivation as mentioned above. However, our measures provided incremental predictive information beyond the well-established risk factors for recidivism and could thus serve a practical purpose – especially in the case of Self-Assertion that yielded counterintuitive results from

the perspective of social desirability. A second limitation concerns the conclusions that may be drawn about our SC-related trait clusters as predictors of recidivism. In order to establish patterns of SC-related trait clusters as a causal dynamic risk factor, future studies would have to demonstrate that these pattern changes spontaneously through intervention and that a change in SC scores predicts changes in the likelihood of reoffending (Douglas and Skeem, 2005). If this were the case, treatment programs tailored to change this pattern of SC-related trait clusters should theoretically be able to influence recidivism rates (Andrews *et al.*,1990). So far, results from studies on intervention programs addressing low SC are promising, showing that SC can increase over time with practice (Bauer and Baumeister, 2011; Piquero *et al.*, 2010).

Furthermore, even though we examined the type of offense, we did not have any detailed information on the offense or the circumstances surrounding the offense. Especially in the prediction of violent recidivism, knowledge about the circumstances of the offense and the offense itself (e.g., reactive versus proactive violence) may shed light on the risk factors for violent recidivism (Grieger and Hosser, 2012). Analogously, due to the small number of sex offenders in our sample, we did not distinguish between different forms of sex offending (i.e., rape, child sex abuse). Future research should take the potentially meaningful differentiations between types of sex offending into account.

Despite of these limitations, our study also has certain strengths. In contrast to previous studies that employed measures of SC that were subject to severe criticism, we chose a new approach to the operationalization of SC (DeLisi et al., 2010; Wiebe, 2006b), which could also be easily used for risk assessment. Furthermore, by using official data as criterion for recidivism, we did not have any missing values on the dependent variable, and the use of survival analysis helped us to overcome some of the shortcomings of conventional methods (Allison, 2010).

Conclusions

Our study showed that SC-related trait clusters incrementally predict violent recidivism after controlling for established risk factors. It appears to be necessary to predict different forms of recidivism separately because personality profiles are differentially associated with and predictive of the varying types of offending and recidivism. We also conclude that the subgroups of SC-related traits should not be combined to form a single score, because the predictive validities of each of the different SC-related trait clusters may contain valuable information that characterizes different forms of (re-)offending. Future studies should test the robustness of our results by using multi-trait, multi-method designs in order to clarify whether SC-related trait clusters can be considered as causal dynamic risk factors.

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