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# The interaction between self-control and morality in crime causation among older adults

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## Abstract

Situational Action Theory (SAT), a recently developed explanation of criminal conduct, is becoming increasingly studied. Hitherto, however, nearly all tests of the theory and its hypotheses have been based on samples of adolescents or young adults. Studies drawing on the older population have been missing so far. This work addresses the interplay of moral beliefs and the ability to exercise self-control in crime causation among respondents aged 50 years and over. In line with SAT and the results obtained previously for young people, our analyses show that self-control ability affects offending among older adults too, particularly when personal morality is weak.

## Keywords

Late-life offending, morality, self-control, Situational Action Theory

Late-life offending is a topic that will increasingly gain significance. In most European countries, the absolute number as well as the proportion of older people in the population is growing. People not only live longer; they also stay healthy, fit and mobile until old age, a fact that is suited to raise senior citizens' criminal activity. Increasing poverty in late life arising from economic crises and the dismantling of the welfare state, as well as a general erosion of the moral foundation of late-modern societies, may contribute to

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heightened criminal inclinations of older people. These developments suggest that the levels of crime committed in late adulthood can be expected to rise in most European countries (Fattah and Sacco, 1989; Feldmeyer and Steffensmeier, 2007; Kunz, 2014), although crime certainly will not stop peaking in adolescence.

Within criminology, there is a paucity of research on older offenders. Although US criminologists are increasingly studying offending and victimization in late life (Holtfreter et al., 2015a,b; Reisig and Holtfreter, 2014; Wolfe, 2015), both theory and research continue to concentrate on juvenile delinquency and neglect the consequences of the demographic change for societies' crime structures. Evidence-based knowledge on the causes of older people's criminal involvement has remained very limited.

One prominent theoretical development aimed at explaining rule-breaking behaviour in all age groups is Per-Olof Wikström's (2004, 2006, 2010, 2014) Situational Action Theory (SAT). SAT maintains that acts of crime are an outcome of how individuals perceive their action alternatives and make their choices. The interaction of people's criminal propensity and their exposure to criminogenic settings initiates a perception–choice process that immediately guides action. The theory has already received its share of empirical scrutiny (and this with promising results), but mostly among samples of adolescents and young adults (for example, Svensson and Pauwels, 2008; Wikström and Butterworth, 2006; Wikström et al., 2010, 2012). Studies drawing explicitly on older people have been absent so far, which is a remarkable deficiency given SAT's focus on the perception–choice processes of people of all ages.

This article will focus on one specific aspect of SAT, namely the postulated interplay of personal morality and ability to exercise self-control in crime causation. SAT states that self-control is a relevant factor in the aetiology of criminal behaviour only when moral forces do not prevent criminal conduct from being seen as a viable action alternative. This is tantamount to positing an interaction between morals and self-control, with self-control ability influencing behavioural decisions only when morality is weak. So the hypothesis guiding this research can be formulated with Wikström and Svensson (2010: 400): 'Self-control is assumed to have an effect on offending only when the level of morality is low and therefore practically no effect on offending when the level of morality is high.'

Previous research has been largely supportive of this hypothesis. However, most of the available evidence comes from samples of adolescents and young adults, only in exceptional cases from studies drawing on the general population (De Li, 2004; Hirtenlehner, 2015; Pauwels, 2015; Schoepfer and Piquero, 2006; Svensson et al., 2010; Tittle et al., 2010; Wikström and Svensson, 2010). To our knowledge, the morality–self-control interaction has not yet been tested among senior citizens specifically.

This work adds to the literature by scrutinizing the interplay of personal morality and ability to exercise self-control in the older population. Based on a large German survey among people aged 50 years and over, we investigate whether the findings obtained for younger populations generalize to older adults. Older people's lower criminality (as compared with younger people) (Hirschi and Gottfredson, 1983), their reduced physical and sometimes also cognitive capabilities and their specific life situation (characterized, for example, by isolation and excessive leisure time) may challenge the explanatory power of mechanisms emphasized in general action theories. This article is the first to

examine the tenability of the morality–self-control interaction hypothesis in late adulthood.

## Theory and previous research

SAT (Wikström, 2004, 2005, 2006, 2010, 2014) seeks to explain why people comply with or breach rules of conduct. According to the theory, acts of crime are acts that break moral rules defined in law. The basic assumption of SAT is that criminal acts are an outcome of a perception–choice process initiated by the interaction between a person’s criminal propensity and his or her exposure to criminogenic settings. An individual’s criminal propensity comprises his or her personal sense of morality (internalized rules of conduct that materialize as moral beliefs, values and emotions) and his or her ability to exercise self-control (the ability to resist current temptations and provocations towards rule-breaking behaviour). The criminogenicity of a setting is determined by its moral context (the moral rules that apply to it) and its deterrent character (the enforcement of these rules). Criminogenic exposure is expected to lead to criminal behaviour especially when it is experienced by individuals with high levels of criminal propensity.

The perception–choice process is the crucial situational mechanism that links person and environment to action. This process encompasses two stages: the perception of basically thinkable behavioural alternatives to act upon a particular motivation and the choice from the host of the considered alternatives. The so-called moral filter, which is composed of the person’s individual morality and the moral norms of the setting, governs which action alternatives are taken into consideration in relation to a certain motivation. Internal and external controls (self-control and deterrence) affect the process of choice among the pondered alternatives, but they only come into play when the moral filter has failed to exclude crime from the catalogue of perceived action alternatives. It is only when people see crime as a viable behavioural option that the weighing of the pros and cons of criminal alternatives for action – and with that the exertion of control – becomes a relevant factor in crime causation. So action is not conceptualized as the outcome of pure rational choices; greater significance is accorded to personal moral values and the moral make-up of the surroundings. Perception, a fundamentally moral endeavour, is more important for explaining offending than choice. For most people in most circumstances, self-control ability is irrelevant for their course of action, simply because they either act habitually or, owing to a functioning moral filter, do not see crime as an alternative (Wikström and Treiber, 2007).

Apart from the primacy of morals, rationality is further restricted in SAT by acknowledging that decision-making can take two forms: habitual (in familiar situations the actor perceives only one action alternative and quasi-automatically forms an intention to carry it out) and rational (in unfamiliar situations the actor considers several response options, weighs their potential consequences and selects the one that appears best). Only when individuals deliberate over behaviours and their consequences can control have an effect on action.

Whereas SAT’s understanding of personal morals (an individual’s values and beliefs about what is right or wrong to do and the associated moral emotions) is rather

straightforward, SAT's notion of self-control deserves more attention because it differs somewhat from that proposed in Gottfredson and Hirschi's (1990) General Theory of Crime.

According to Gottfredson and Hirschi (1990), self-control is a multi-faceted trait that centres on the ability to defer easy, immediate gratification of desires when such gratification results in long-term negative consequences. Aside from an inability to take the long-term consequences of behaviour into consideration when making behavioural choices (and consequently to avoid acts whose long-term costs exceed their momentary benefits), the constitutive elements of low self-control include impulsivity, risk-taking, bad temper, self-centredness and a preference for physical activity and simple problem solutions (Grasmick et al., 1993).

For SAT, self-control is both something that people have (an enduring capability) and something that people do (a situational activity). The execution of self-control as a situational process is defined in SAT as 'the successful inhibition of perceived action alternatives . . . that conflict with an individual's morality' (Wikström and Treiber, 2007: 252). From this perspective, self-control is always the management of the seductions and pressures to act against one's personal morals that an individual experiences in a particular setting. A moral management of temptations and provocations, in the sense of a repression of action alternatives that collide with one's moral values, nevertheless comes into play as a crime-reducing process only when criminal action alternatives have entered the range of the perceived response options and acts of crime are seen as a real alternative, which is the case more frequently when weak morals allow this to happen. In other words, the actual execution of self-control represents a second appeal to one's law-relevant morality, which does not become relevant in crime causation until a weakness of the moral compass has permitted the actor to regard a particular act of crime as an alternative.

Self-control ability is defined in SAT as 'the executive function based capability to exercise moral management of the temptations and provocations the individual encounters in a setting' (Wikström, 2005: 217) or the ability to adhere to one's morals when confronted with situational inducements to breach rules of conduct. An individual's general ability to exercise self-control – a rather enduring capacity that is not fully developed until early adulthood (Wikström and Treiber, 2007) – is seen as the result of his or her executive capabilities (his or her capacity for self-regulation, which basically rests on a range of cognitive faculties, such as abstract reasoning, self-monitoring or anticipation of future consequences). It clearly has to do with the ability to resist current inducements to offend and is expected to interact with situational influences such as the degree of intoxication or stress in governing the execution of self-control in concrete circumstances.<sup>1</sup>

In line with this definitional attempt, the theory also argues that an individual's ability to exercise self-control is significant for law abidance 'to the extent that there is a conflict between his or her desires . . . and his or her moral values' (Wikström and Svensson, 2010: 397). If this ability is weak, a person is more likely to follow his or her desires; if this ability is strong, a person is more likely to follow his or her moral values. From this perspective, a strong ability to exercise self-control can prevent crime (that is, exert a negative influence on offending) only when an individual's personal moral rules are consistent with the rules of criminal law (that is, when the individual's level of morality is high).

On the other hand, the outlined workings of the moral filter – with personal morality forming one of its constituent elements – give way to the assumption that a strong ability to exercise self-control can prevent crime (that is, have a negative impact on offending) only when personal morals do not impede crime from crossing the individual's mind as a 'real' action alternative (that is, when the individual's level of morality is low). The notion that self-control becomes relevant only when a person considers acting upon a temptation or provocation in criminal ways suggests that self-control ability becomes crucial as a cause of crime especially when the individual's morality does not exclude crime from being seen as a viable alternative. Morality affects perception, self-control influences choice. Wikström (2005: 217) himself highlights that 'an individual's judgments . . . influence what alternatives for action the individual perceives (whether an act of crime is seen as an alternative)'. This implies that a malfunctioning of the moral filter can be due to weak personal morals. Hence, self-control ability can be expected to affect crime involvement most notably when an individual's morality is low. Put differently, a second appeal to one's morals becomes necessary predominantly when a deficient moral compass has previously failed to prevent crime from being taken into consideration.

To recap. At first sight SAT's definition of self-control and the presumed workings of the moral filter might look somewhat contradictory, especially with regard to the interplay of morality and self-control. When asking how self-control affects crime involvement for people with different levels of law-relevant morality, both lines of argument can lead to different hypotheses concerning the direction of the interaction. From the employed definition of self-control it follows that the concrete execution of self-control can only cause compliance with the law when personal morals are congruent with penal law, which implies that self-control can only be influential when an individual's level of morality is high. From the conceptualization of the perception–choice process it follows that 'the main relevance of self-control . . . is for those whose morals (values, commitment, emotions) "permit" them to see a particular act of crime as an alternative' (Wikström, 2004: 17), which suggests that self-control ability exerts an influence especially when an individual's level of morality is low. Key to reconciling the seeming contradiction is the temporal ordering of the perception–choice process. At stage 1, a weak law-relevant morality facilitates that crime is perceived as a viable action alternative, thereby bringing *self-control ability* into play as a factor affecting choice (individual-level interaction between morality and capability for self-control). At stage 2, after crime has overcome all moral barriers, the *execution of self-control* serves as a second (last) appeal to one's moral values, which at least to some extent in each jurisdiction reflect the existing legal rules (situation-level interaction between morality and execution of self-control).

In this work, which draws on individual-level survey data collected among older people, our focus is on the interplay of personal morals and an individual's general ability to exercise self-control. Consequently, we assume that self-control ability is more important in predicting offending for people with weaker moral beliefs.

Previous research has established that both morality (Kroneberg et al., 2010; Tittle et al., 2010; Svensson et al., 2013; Wikström and Butterworth, 2006) and self-control ability (Grasmick et al., 1993; Marshall and Enzmann, 2012; Pratt and Cullen, 2000; Rebellon et al., 2008) are robust predictors of criminal involvement. Individuals with

low morality and low self-control are more likely to offend, and morality has been shown to be more influential than capacity for self-control (Antonaccio and Tittle, 2008).

The majority of the few studies that empirically tackle the interplay of these two factors have found that the relationship between ability to exercise self-control and offending is stronger for individuals with low levels of morality (De Li, 2004; Hirtenlehner, 2015; Pauwels, 2015; Schoepfer and Piquero, 2006; Svensson et al., 2010; Tittle et al., 2010; Wikström and Svensson, 2010), although not all of these works can demonstrate this interaction for all employed measures of criminal behaviour. With that, the scant available research mainly corroborates the nature of the morality–self-control interaction that can be derived from the presumed operation of the moral filter. Only one study found no evidence of interaction at all, although in this case the response variable was restricted to drug use (Gallupe and Baron, 2014). Antonaccio and Tittle's (2008) findings are inconsistent: whereas most of their analyses provide no support for interaction, in one instance they observed that self-control ability has a greater impact on criminal activity among respondents with strong moral beliefs – a result that is consistent with SAT's substantive definition of self-control.

However, the available evidence is challenged by the fact that it almost exclusively stems from samples of adolescents and young adults. Hitherto, only two studies (Antonaccio and Tittle, 2008; Tittle et al., 2010) have examined the interaction between morality and capability for self-control in the general population, and with contradictory findings. Research on this issue among people in the later years of life has been missing so far.

## **Methods**

### *Sample*

The data for this study come from a mail survey of people between 50 and 80 years of age living in the federal state of Baden-Württemberg located in south-western Germany. This age group was chosen because the study intends to examine one of SAT's core hypotheses among adults of advanced age (and not to explain elderly crime, which would have suggested focusing on people aged 65 and over). The upper limit of 80 years acknowledges the fact that a higher age may be associated with cognitive and physical deficits reducing the ability to participate in written surveys.

The sampling frame encompasses all German citizens (aged 50–80 years) living in private households in the governmental district of Freiburg im Breisgau, a region that comprises both urban and rural municipalities in the south-western part of Germany.<sup>2</sup> A stratified, clustered, two-stage random sample was employed. At stage 1, 12 out of 302 municipalities in the district were randomly drawn, stratified proportionately on the basis of community size. At stage 2, a total of 3555 people within municipalities were randomly selected, again proportionately to community size.

Data were gathered in summer 2009 through a mail survey that in many aspects followed the advice given by Dillman (2000).<sup>3</sup> The 3555 sampled individuals were sent a reminder letter three weeks after the initial questionnaire mailing and another copy of the questionnaire again three weeks later. To improve both the willingness to participate in the

**Table 1.** Composition of the sample and the population (percent).

Characteristic	Sample	Population
<i>Age</i>		
< 60 years	38	39
60–70 years	39	37
> 70 years	23	24
<i>Sex</i>		
Male	49	47
Female	51	53
<i>Education</i>		
Below A-level	74	84
A-level and above	26	16
<i>Size of domicile</i>		
Large or medium city	38	37
Small town	39	39
Countryside	23	24

study and the quality of the answers, the first mailing included a €5 banknote as an incentive. To ensure full anonymity, the questionnaires did not include any identification numbers. For controlling responses and being able to remind people effectively, we used the separate postcard return technique instead. For various reasons (for example, death, change of address), 132 questionnaires could not be delivered. Of the 3423 people actually contacted, 1997 returned a completed questionnaire – a net response rate of 58percent.

All in all, the 1997 respondents represent the population from which they were drawn rather well. Table 1 shows the socio-demographic composition of both the population (official census data for the region) and the sample. A comparison reveals that the respondents are representative of the local population in terms of age, sex and size of domicile, but not with regard to educational attainment. As is often the case in mail surveys, people with higher education are slightly overrepresented in the final sample.<sup>4</sup>

## Measurement

*Offending.* Self-reported offending was measured in terms of a variety score. Variety scales depict the number of different types of crime an individual has committed in the year before the survey. A scale capturing the versatility of offending is preferred here, because it has been shown that variety scales outperform frequency scales in several ways (Bendixen et al., 2003; Sweeten, 2012). Variety scores exhibit a higher reliability than frequency scales, are less skewed and show higher correlations with other measures of criminal conduct. Furthermore, they are not biased by a ‘guessing’ of the frequency of personal involvement in a certain crime and are less dominated by the least serious offences.<sup>5</sup> With regard to testing interaction relationships, the fact that crime variety scores are normally less skewed than crime frequency scores is of particular significance (see the next section). Information was collected on 14 different offences. Approximately



**Table 2.** Correlation matrix (product-moment correlation coefficients).

	1.	2.	3.	4.	5.	6.
1. Offending	1.00					
2. Weak morality	.28***	1.00				
3. Low self-control	.16***	.23***	1.00			
4. Age	-.21***	-.18***	.02	1.00		
5. Sex	.16***	.17***	.22***	.01	1.00	
6. Education	.13***	.17***	.01	-.10**	.10***	1.00
Arithmetic mean / Standard deviation	0.39 / 0.78	12.36 / 6.59	24.90 / 3.85	63.39 / 8.24	0.49 / 0.50	0.26 / 0.44

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

a quarter (26 percent) of the respondents reported having committed at least one of these crimes in the previous 12 months. The most frequently committed crimes were driving under the influence of alcohol and tax fraud, with 1-year prevalence rates of 12 percent and 10 percent, respectively. Detailed information on this measure, as well as on the following ones, is provided in Appendix A.

*Morality.* Moral values were measured by asking subjects how wrong they think it is to commit seven specific misdeeds, ranging in seriousness from 'fraudulently obtaining social benefits for which one is not eligible' to 'beating and physically injuring other persons'. For each type of misconduct, a 10-category response scale between 'not at all wrong' (1) and 'very wrong' (10) was presented. Responses were summed to form a composite score ( $\alpha = .80$ ), which was coded in such a way that high scores indicate weak moral beliefs.

*Self-control.* The ability to exercise self-control was measured by a modified and abridged version of the self-control scale developed by Grasmick and colleagues (1993), whereby the refinements were inspired by Wikström's suggestions (Wikström et al., 2012) and the age of the target group. The respondents were provided with 12 statements such as 'Sometimes I will take a risk just for the fun of it' and asked to assess them on a four-category response scale ranging from 'strongly agree' (1) to 'strongly disagree' (4). Responses were summed ( $\alpha = .60$ ) and coded so that high scores on the scale indicate a low capability for self-control.

*Control variables.* Age (in years), sex (0 = female; 1 = male) and educational attainment (A-levels: 0 = no; 1 = yes) serve as control variables in some analyses.

Table 2 provides descriptive statistics and correlations for all measures included in the analyses.

## Analysis

Offending is measured with a variety scale here. Usually count data models (mostly negative binomial regression analyses) are considered to be the appropriate analytical

procedure for this kind of data (Hilbe, 2011). But, although a negative binomial regression best matches the skewed and discrete nature of the employed response variable, our focus on interaction effects suggests refraining from this analytical technique. Recent methodological works have found that the established practice of testing interaction effects by adding product terms to the model, which works well in the context of ordinary least squares (OLS) regression, cannot be applied to non-linear models (Ai and Norton, 2003; Bowen, 2012; Berry et al., 2010; Karaca-Mandic et al., 2012; Svensson and Oberwittler, 2010).<sup>6</sup> The problems, which arise particularly from the functional form and the multiplicative nature of the models, boil down to difficulties in detecting interaction effects. In non-linear models, product terms depict only a part of the interaction of two explanatory variables. Here the effect of an individual predictor variable can – and often will – vary with the value of another predictor variable even if the model does not include a product term. Coefficient variation resulting from the inherent nonlinearity of the model, and interaction captured by a product variable, can also cancel each other out. So a statistically significant product term coefficient is neither necessary nor sufficient for claiming interaction in logit or negative binomial models (Ai and Norton, 2003; Berry et al., 2010; Bowen, 2012; Greene, 2010; Karaca-Mandic et al., 2012).

Given the problems outlined above, we decided to base our examination of the morality–self-control interaction on linear regression analyses, but with adjustments for the non-normality of the response variable.

The objection that the very skewed distribution of self-reported offending violates key assumptions (multivariate normal distribution and homoscedasticity) of linear regression analyses can be countered by pointing out that OLS regression is fairly robust in this regard and that the main effect of a passably powerful predictor should appear in all types of regression models (Fox, 1991). More detrimental, however, is the critique that, when dealing with a limited and highly skewed response variable, OLS regression may establish spurious interaction effects that arise from the specific distribution of the dependent variable (Osgood et al., 2002). To control for spurious interaction, we rely on a modelling strategy proposed by Lubinski and Humphreys (1990). These authors suggest introducing the quadratic terms of the predictor variables involved in the interaction into the model equations – in addition to the product variable and the individual predictors. The quadratic terms soak up the non-linear parts of the relationship of the predictors to the target variable, and thus enable an estimation of the interaction effect that is not obscured by artefacts related to the non-normality of the response variable (see also Svensson and Oberwittler, 2010).

All OLS models were fitted with STATA 12's regression procedure (StataCorp, 2011). Predictor variables were *z*-standardized before computing the multiplicative interaction terms (Aiken and West, 1991). Owing to the non-normal distribution of the response variable, robust standard errors were employed (Hannon and Knapp, 2003).<sup>7</sup>

## Findings

Table 3 presents the findings from the various OLS regression analyses. Model 1 tests for independent effects of moral beliefs and self-control ability on late-life offending. The results indicate that both low morality and low ability to exercise self-control increase offending, but the criminogenic effect of the former exceeds that of the latter. This

**Table 3.** OLS regression models predicting offending.

	Model 1		Model 2		Model 3		Model 4	
	<i>b</i>	SE	<i>b</i>	SE	<i>b</i>	SE	<i>b</i>	SE
Weak morality	0.20***	0.027	0.18***	0.024	0.26***	0.028	0.15***	0.024
Low self-control	0.08***	0.019	0.09***	0.018	0.08***	0.019	0.08***	0.019
Morality*Self-control			0.06*	0.026	0.07**	0.024	0.06*	0.025
Weak morality (squared)					-0.04**	0.012		
Low self-control (squared)					0.02	0.014		
Age							-0.01***	0.002
Sex							0.14***	0.036
Education							0.12**	0.044
Model fit	$R^2 = .091$ ; $p = .000$		$R^2 = .098$ ; $p = .000$		$R^2 = .109$ ; $p = .000$		$R^2 = .132$ ; $p = .000$	

Notes: The predictors 'weak morality' and 'low self-control' were converted into z-scores.

*b*: unstandardized regression coefficient; SE: robust standard error.

\* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ .

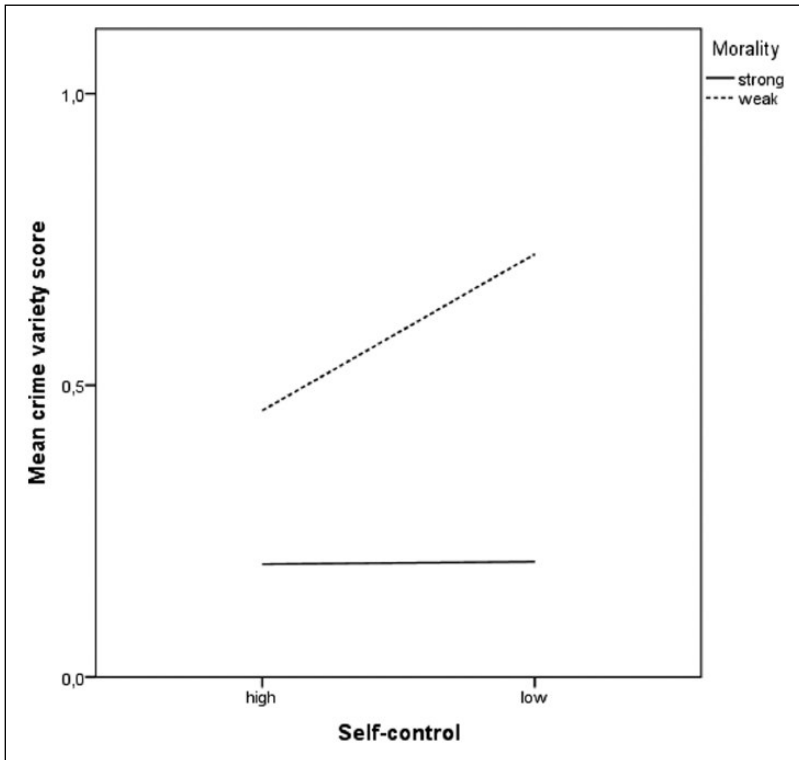
accords well with SAT's assumption that people's personal morals are more fundamental in the explanation of criminal conduct than their capability for self-control.

In Model 2, the product term capturing the interaction between personal morality and the ability to exercise self-control is introduced. The interaction is significant and points in the expected direction. This indicates that the influence of self-control ability on offending is dependent on the strength of one's moral values, with a strong capacity for self-control preventing offending particularly when personal morality is porous. Put differently, the criminogenic effect of low self-control ability increases as the level of morality decreases. It must be noted, however, that the addition of the multiplicative term raises the explained variance by only 0.7 percent, which suggests that the interaction effect is very weak. On the other hand, in view of the well-known difficulties of detecting interaction effects in non-experimental studies, it has been recommended 'that even those explaining as little as 1% of the total variance should be considered important' (McClelland and Judd, 1993: 377).

Figure 1 gives the corresponding interaction diagram for the median-dichotomized predictor variables, which clearly illustrates that the ability to exercise self-control makes a difference most notably when personal morality is weak. However, when older people's personal morals are well developed, self-control ability is irrelevant for their criminal involvement. This is perfectly in line with SAT's proposition that self-control plays a role in crime causation only when moral forces are weak.

Subgroup-specific OLS models – morality was again dichotomized at the median – confirm this picture (Table 4): although self-control ability does not have an impact on offending in the high morality group, it has a significant effect in the low morality group. A test for the equality of the regression coefficients (Paternoster et al., 1998: 862) indicates a significant effect difference, with the capacity for self-control being more influential among respondents with lower levels of morality ( $Z = 4.245$ ;  $p = .000$ ).

The remaining models are dedicated to the examination of the robustness of the detected interaction effect.



**Figure 1.** Interaction between morality and self-control ability in predicting offending.

**Table 4.** Effect of low self-control on offending at different levels of morality.

	Weak morality		Strong morality	
	<i>b</i>	SE	<i>b</i>	SE
Low self-control	0.18***	0.035	0.02	0.016

Note: *b*: unstandardized regression coefficient; SE: robust standard error.

\**p* < .05; \*\**p* < .01; \*\*\**p* < .001

In Model 3, Lubinski and Humphreys’ (1990) approach to correcting for the non-normality of the response variable is implemented. After adjustment for the squared terms of the predictors ‘low morality’ and ‘low self-control’, the multiplicative term retains significance and sign. The fact that the significance of the product term survives the introduction of the quadratic predictor terms speaks against the assumption that the interaction reflects solely a methodological artefact arising from the skewness of the target variable.<sup>8</sup>

In the fourth model, several socio-demographic characteristics are added as covariates. Despite controlling for age, sex and education, a significant interaction can still be

observed according to which people with weak moral beliefs are more likely to be restrained by high self-control. The socio-demographic predictors themselves all relate significantly to criminal involvement: as one would expect, males report more crimes than females, criminal activity declines with increasing age, and respondents with A-level education report more offending than people from lower educational ranks (which makes sense considering the dominant types of offences – see Appendix A).

Drawing on respondents aged 50 years and over in an analysis seeking to make statements on older adults may be seen critically. To check whether the observed pattern of interaction is true for senior citizens specifically, people below 65 years were excluded from the analysis and then Model 2 was re-estimated for the reduced sample ( $n = 902$ ). Among people aged 65 years and over, a statistically significant product term of limited size once more emerged, which indicates that the capacity for self-control has a greater effect on offending when morals are weak ( $B = .08$ ;  $p_{\text{normal}} = .003$ ;  $p_{\text{robust}} = .051$ ).<sup>9</sup> Here the interaction term accounts for exactly 1 percent of the variance of the response variable. In all, the results of this stability analysis underscore that the findings really apply to senior citizens.

## Conclusions

The present article seeks to contribute to the empirical foundation of SAT (Wikström, 2010, 2014) by for the first time examining one of the theory's core propositions in a population of older citizens. Based on a large probability sample of German respondents aged 50 years and over, we investigated whether the effect of the ability to exercise self-control on offending is conditional on the strength of one's personal morals. SAT claims, among other things, that controls only come into play when the moral filter fails to exclude crime from the catalogue of perceived action alternatives. From this it follows that self-control becomes relevant in crime causation particularly when personal morality is weak. Although this interaction hypothesis has been tested repeatedly among samples of adolescents or young adults and also a few times among the general population – with most studies providing at least partial support for the postulated interplay – research on its tenability in late life has been missing so far.

The results of this enquiry show that the hypothesized interplay of morality and self-control ability can also be found among older adults. Although very weak in terms of magnitude, a statistically significant interaction effect indicates that a low capacity for self-control leads to criminal activity, especially when the inner moral compass is attenuated. This is tantamount to stating that people with weaker moral beliefs are more likely to be restrained from offending by high self-control than people with stronger moral beliefs. Such an observation is highly compatible with SAT's argument that 'people's ability to exercise self-control becomes relevant . . . only when their (law-relevant) morality allows them to see an act of crime as an action alternative' (Wikström and Svensson, 2010: 404).

The findings also demonstrate that personal morality is a better predictor of law abidance than self-control ability among older adults. Such an observation has been made repeatedly for younger populations (Antonaccio and Tittle, 2008; Hirtenlehner, 2015; Wikström and Svensson, 2010) and is perfectly in line with SAT's proposition that

morals are more fundamental than controls in explaining offending (Wikström and Treiber, 2007). The lower explanatory power of self-control ability may be rooted in the fact that people with strong moral beliefs do not see crime as a viable action alternative; hence the ability to exercise self-control cannot influence the decision process. In any case, this result challenges Gottfredson and Hirschi's (1990) assumption that low self-control is the main cause of criminal behaviour.

Finally, some methodological limitations of our work must be addressed. The first one concerns the cross-sectional nature of the study, which is known to challenge inferences about causality. Problems arise especially when the outcome variable dates before the explanatory variables, which is the case here. However, both the ability to exercise self-control and older people's moral values can be understood as rather stable dispositions that change only slowly over time. Besides, on theoretical grounds there is little reason to assume that prior offending brings about a specific interplay of morality and self-control ability.

Next, the low explanatory power of the interaction term must be mentioned. The fact that the introduction of the multiplicative term increases the explained variance by less than 1 percent suggests that the interaction effect is very weak in terms of size. Given that offending is a rare event in late adulthood and the employed crime variety measure thus has limited variance, it is not surprising that the product variable depicting the morality–self-control interplay fails to gain a greater explanatory value.

Another methodological concern relates to the parsimonious employment of control variables. The decision to forgo the inclusion of numerous covariates is justified by the fact that testing interactive relationships with non-experimental survey data is generally plagued by the problem of low power to detect interaction effects. This is why the methodological literature warns against over-controlling in the sense of introducing covariates that are not absolutely necessary (McClelland and Judd, 1993). With each additional predictor variable, the power to establish interaction erodes further.

Taking this into account, we refrained from including measures of opportunity as third variables. Although both SAT (Wikström, 2004) and self-control theory (Gottfredson and Hirschi, 1990) emphasize the interplay of self-control and criminal opportunities, it may be argued that older adults, owing to a variety of age-related changes in physical capabilities and lifestyle, have fewer opportunities to offend.<sup>10</sup> This does not, however, imply that senior citizens never face circumstances favourable to crime. Hence, future research may be well advised to examine three-way interactions between individual morality, self-control ability and opportunities for crime.

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## Notes

1. SAT's notion of self-control is consistent with Roy Baumeister's conceptualization of the construct (Muraven and Baumeister, 2000; Tangney et al., 2004). According to the latter, self-control involves the deliberate overriding of current impulses and the inhibition of immediate

- desires in favour of the long-term best interests of the actor. This process may include following moral rules when situational inducements suggest breaching them, all for the sake of providing a better fit between the individual and the environment.
2. People without German citizenship and people living in retirement or nursing homes were excluded.
  3. The survey was financed by the Max Planck Institute for Foreign and International Criminal Law in Freiburg (Germany). For more information and methodological details see Kunz (2014).
  4. According to a binomial test, the proportion of people with A-levels is significantly higher in the sample than in the population ( $p=.000$ ). For the other characteristics, no significant sample–population differences could be found.
  5. Dichotomous prevalence measures waste most available information.
  6. The same applies to the comparison of subgroup-specific effect parameters with tests for the equality of regression coefficients. These tests cannot be used in a non-linear framework either (Mood, 2010).
  7. Robust standard errors correct for heteroscedasticity by providing wider confidence intervals.
  8. The quadratic terms should not be interpreted substantively. They just serve to adjust the models to the non-normality of the response variable and, thus, correct for spurious interaction effects (Lubinski and Humphreys, 1990).
  9. Given survey studies' generally low power for detecting interaction effects, McClelland and Judd (1993) recommend reducing the significance threshold. This is why we consider a robust type-I error of .051 as still indicative of a systematic interplay of morality and capability for self-control.
  10. Gottfredson and Hirschi (2003) are actually equivocal regarding the role of opportunities in crime causation.

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## Appendix A: Measures

**Table 5**

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Offending	<p>Crime variety scale based on the perpetration of 14 distinct crimes in the last 12 months [crime (prevalence)]:</p> <ul style="list-style-type: none"> <li>- fare dodging (4.8%)</li> <li>- insurance fraud (0.6%)</li> <li>- vandalism (0.3%)</li> <li>- shoplifting (0.9%)</li> <li>- theft from a person (0.3%)</li> <li>- physical assault (0.2%)</li> <li>- threat / extortion (0.1%)</li> <li>- illegal drug use (0.7%)</li> <li>- driving under the influence (11.8%)</li> <li>- social security fraud (0.3%)</li> <li>- tax fraud (10.3%)</li> <li>- illicit work (3.1%)</li> <li>- theft from workplace (4.5%)</li> <li>- unlawful change keeping (3.4%)</li> </ul>
Morality	<p>Assessment of the wrongfulness of seven behaviours: [physical assault, vandalism, shoplifting (bagatelles), shoplifting (&gt; €50), insurance fraud, tax evasion, benefit fraud] 10-category scale: not wrong at all – very wrong</p>
Self-control	<p>Assessment of 12 statements: I often do what I enjoy, without thinking about the consequences; Sometimes I take a risk just for the fun of it; I like to take a little risk every now and then; I avoid doing things that can get me into trouble; Security is more important to me than excitement and adventure; When I am really angry, other people had better stay away from me; It is hard for me to look out for myself when this means making things difficult for other people; It is easy for me to empathize with the problems of other people; If things I do upset people, it's their problem not mine; I will try to get the things I want even when I know it's causing problems for other people; I lose my temper pretty easily; When I have a serious disagreement with someone, it's usually easy for me to stay calm. 4-point scale: strongly agree – strongly disagree</p>

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