



JUVENILE FIRESETTING IN MALMÖ, SWEDEN

THE INTERACTION BETWEEN MORALITY
AND SELF-CONTROL

ROBERT BRESKI

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Deliberate firesetting is a dangerous behavior that is associated with considerable costs annually. It has been estimated that young people under the age of 18 are responsible for a large proportion of all firesetting incidents. Moreover, firesetting has been linked to serious antisocial and aggressive behaviors and behavioral difficulties among juveniles and has been found to predict later delinquency, which makes this an important area to study. Some previous studies have found support for the importance of factors akin to self-control, e.g., impulsivity, for juvenile firesetting. This study applied an aspect of situational action theory (SAT), where self-control is viewed as part of crime propensity, but of lesser importance than morality, to the study of juvenile firesetting for the first time. Analyzing self-report data from two waves of the longitudinal Malmö Individual and Neighbourhood Development Study (MINDS), this study examines a key proposition of situational action theory, namely that morality is more important than self-control and that self-control is relevant in the explanation of crime (firesetting) only for individuals with lower levels of morality. The results indicate support for this proposition.

Keywords: Arson, firesetting, interaction effect, juvenile, morality, self-control, situational action theory

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INTRODUCTION

Every year, around 10,000 deliberate fires are set in Sweden (Myndigheten för samhällsskydd och beredskap [MSB] 2012). Until 2009, there was an increasing trend in the annual rates of deliberate fires that occurred outdoors, which was followed by a decline and then a stabilization at around 0.4 incidents per 100,000 inhabitants annually (Gerell 2019). The total costs associated with deliberate firesetting have been estimated to approximately one billion Swedish kronor per year (MSB 2012).

According to self-reports in the Swedish school survey on crime, with participants who attend ninth grade (15-16 years old), between 2.4 and 3.4% for the years 2015-2019 reported that they had set something valuable on fire without permission (Brottsförebyggande rådet [Brå] 2020). This behavior is more common among boys than among girls (*ibid.*), and different estimations include that young people under the age of 18 are responsible for more than 60% (MSB 2012) or between 50 and 80% of all firesetting incidents (Terjestam & Rydén 1999).

A Swedish study found that “want to see it burn”, “want to destroy something”, and boredom were among the most common motives for firesetting among children and adolescents (Terjestam & Rydén 1996), and a meta-analysis found that fire-specific factors, such as history of fire involvement and fascination with fire, were among the strongest correlates of firesetting (Perks et al. 2019). General delinquency and mental health disorders, among other factors, were also found to be correlated with firesetting (*ibid.*). However, the diagnosis pyromania appears to be quite rare, both among adult (Dickens & Sugarman 2012) and juvenile firesetters (Lindgren et al. 2013). The strongest fire-specific correlate in the Perks et al. (2019) meta-analysis was history of fire involvement, which was also identified as the best predictor of firesetting recidivism among juveniles in a systematic review (Kennedy et al. 2006).

Deliberate firesetting among children is not just a delinquent and dangerous behavior in itself, but has also been found to be associated with elevated levels of delinquency at a later stage, compared to non-firesetting juvenile delinquents (Becker et al. 2004). Indeed, juvenile firesetting may be the most important predictor of antisocial behavior and behavioral difficulties (Del Bove et al. 2008) and tends to co-occur with other forms of antisocial and aggressive behaviors (Stickle & Blechman 2002). Thus, juvenile firesetting has been suggested to be a marker of youth with more serious disturbances (McCarty & McMahan 2005; Stickle & Blechman 2002) and is an area of great importance for the field of criminology.

Research on juvenile firesetting has generally focused on risk factors, establishing a wide range of factors that precede and relate to this behavior (see “Literature review” below). Since empirically supported risk factors tend to be based on between-individual, rather than within-individual, differences, it is not known to what extent they have causal effects on offending (Farrington 2005), and it has been suggested that “most identified ‘risk factors’ (crime predictors) are markers and symptoms rather than causes” (Wikström 2020, page 190). Among the identified predictors of juvenile firesetting are factors that can be considered related to the concept of self-control, such as impulsivity and attention problems

(see “Literature review”). Self-control is important within situational action theory, a contemporary, influential criminological theory, where it is assumed to form the basis of individuals’ crime propensity together with morality (Wikström et al. 2012). However, morality has rarely been considered in research on juvenile firesetting, and when constructs akin to self-control have been studied, the influence of and potential interactions with morality, as suggested by situational action theory (see “Theoretical framework” below), have not been taken into account.

The present study aims to contribute to the literature by examining whether morality is more important for – i.e., a stronger predictor of – juvenile firesetting than self-control and whether the association between self-control and firesetting is stronger for individuals with low morality, both of which are suggested by situational action theory (Wikström et al. 2012). By applying this aspect of situational action theory, which was devised to move beyond the focus on risk factors to instead focus on causes (Wikström 2020), to juvenile firesetting, research on juvenile firesetting can also begin to move beyond the aforementioned risk factor paradigm which has characterized this field of enquiry. Moreover, since situational action theory claims to be a general theory that applies to all forms of crime and rule breaking (Wikström 2010; Wikström et al. 2012), a test of the theory’s applicability to juvenile firesetting, which, to the best of the author’s knowledge, has not been conducted before, is relevant.

Terminology

Arson is a legal term that has its origins in the description of adult firesetting, which implies that motive and intent, which characterize adult firesetting as arson, also apply when juvenile firesetting is to be defined as arson (Gaynor & Hatcher 1987). Since arson is a legal term, its definition may differ across jurisdictions (Gannon & Pina 2010). Moreover, Hickey (2015) suggests that arson refers to adult behavior, whereas firesetting is used to describe juvenile behavior. For these reasons, the broader term firesetting will be used in this paper.

THEORETICAL FRAMEWORK

Situational action theory (SAT) is a general theory of crime and rule breaking (Wikström 2010; Wikström et al. 2012). The theory views crime as moral action or, specifically, as the breach of moral rules stated in law. Central to situational action theory is the notion that individuals commit crimes because they view them as viable action alternatives. A person’s likelihood of seeing crime as an action alternative is dependent upon his or her crime propensity in interaction with his or her exposure to criminogenic settings (ibid.).

A person’s crime propensity, in turn, is seen as being grounded in his or her morality and ability to exercise self-control (Wikström 2010; Wikström et al. 2012). Of these, morality is viewed as more fundamental for crime propensity in the sense that it determines whether an individual perceives crime as an action alternative or not; only when crime is perceived as a viable action alternative does self-control exert its influence. When crime is not seen as a viable action alternative, there is no need for (internal or external) control (ibid.). Thus, low self-control should be more strongly associated with crime for individuals with

low morality, i.e., those who may view crime as an action alternative in the first place.

A person's crime propensity is viewed as interacting with settings that encourage the commission of crime (Wikström 2010; Wikström et al. 2012). A person with a certain crime propensity in a setting with certain temptations or provocations may or may not engage in crime, depending upon a perception-choice process. Choices are made either as a result of deliberation or habitually, and self-control is relevant only when the individual deliberates over what action to take (ibid.). Thus, self-control in situational action theory is first and foremost situational in nature, which differs from self-control in Gottfredson and Hirschi's (1990) self-control theory, where it is viewed as an individual trait (Wikström & Treiber 2007). However, this study focuses solely on the propensity aspect of the theory, not on settings.

LITERATURE REVIEW

The literature review begins with a description of empirically supported correlates of juvenile firesetting to give an overview of this field of enquiry, followed by a brief summary of findings from research on interactions between morality, self-control, and crime.

Correlates of juvenile firesetting

As is generally the case for other forms of delinquent and antisocial behavior, juvenile firesetting has been found to be more prevalent among boys than among girls (e.g., Bowling et al. 2013; MacKay et al. 2009; Martin et al. 2004; Tanner et al. 2015). Firesetting among children and adolescents has been linked to impulsivity (Hoerold & Tranah 2014; Kolko & Kazdin 1991; Sakheim & Osborn 1999; Tanner et al. 2015) and related traits and behaviors like hyperactivity (Bowling et al. 2013; Kolko et al. 1985; McCarty & McMahan 2005), irritability (Del Bove et al. 2008), and attention problems (Bowling et al. 2013; Del Bove et al. 2008; Lyons et al. 2010). As mentioned in the introduction, these factors can be viewed as related to self-control, which is important within situational action theory, but the role of morality in the explanation of juvenile firesetting has not been studied.

Furthermore, diagnoses and mental health disorders that have been associated with juvenile firesetters include depression, psychological distress and feelings of hopelessness (Lyons et al. 2010; MacKay et al. 2009; Martin et al. 2004), trauma symptoms (Lyons et al. 2010), ADHD and ADHD symptoms (Bowling et al. 2013; McCardle et al. 2004), conduct disorder (Kazdin & Kolko 1986; McCardle et al. 2004; Sakheim & Osborn 1999), and mental health diagnoses in general (Baglivio et al. 2017).

The literature has also established that factors related to juveniles' parents and families appear to be important correlates of firesetting. Such factors include dysfunctional families (Lyons et al. 2010; Martin et al. 2004); lack of parental supervision, monitoring or control (Kazdin & Kolko 1986; Kolko & Kazdin 1990; MacKay et al. 2009; Sakheim & Osborn 1999); low levels of parental warmth, affection and involvement (Kazdin & Kolko 1986; McCarty & McMahan 2005); interparental hostility and disagreement (Kazdin & Kolko 1986; Kolko & Kazdin

1990; McCarty & McMahon 2005); parental depression or psychological distress (Kazdin & Kolko 1986; Kolko & Kazdin 1990; McCarty & McMahon 2005); harsh parental discipline (Kolko & Kazdin 1989; McCarty & McMahon 2005); and mild, ineffective parental discipline (Kolko & Kazdin 1989). Additionally, several studies have found that juvenile firesetters are more likely than non-firesetters to have experienced physical and other forms of abuse during childhood (Baglivio et al. 2017; Lyons et al. 2010; Martin et al. 2004; McCarty & McMahon 2005; Root et al. 2008; Showers & Pickrell 1987).

In addition to parental and familial risk factors, research has found correlations between difficulties in school and juvenile firesetting. Poor school performance has quite consistently characterized firesetters in comparison to non-firesetters (Bowling et al. 2013; Lyons et al. 2010; Martin et al. 2004; McCardle et al. 2004). Similarly, Bowling et al. (2013) found that poor attitude towards school was related to firesetting, and Wooden and Berkey's (1984) study showed that firesetters performed worse on school-related indicators like learning problems, behavioral difficulties in school, and truancy. Other important predictors of juvenile firesetting appear to be fire-specific factors, such as fire interest, fire curiosity, preoccupation with fire, and fire-related affect (Kolko & Kazdin 1989; Sakheim & Osborn 1999; Watt et al. 2015). However, Hoerold and Tranah (2014) failed to find a statistically significant relationship between fire interest and firesetting in their study.

Furthermore, juvenile firesetters appear to be more likely to also engage in other forms of criminal, delinquent, antisocial or problem behaviors. Externalizing behaviors (Bowling et al. 2013; Walsh et al. 2004); internalizing problems (Bowling et al. 2013; Del Bove et al. 2008); oppositional behavior (Lyons et al. 2010; McCarty & McMahon 2005); high risk-taking/sensation seeking (MacKay et al. 2009; Martin et al. 2004); running away from home (Lyons et al. 2010; McCardle et al. 2004); self-injurious or suicidal behaviors or intent (Lyons et al. 2010; MacKay et al. 2009; Martin et al. 2004; Tanner et al. 2015); and general delinquency/antisociality (Baglivio et al. 2017; Del Bove et al. 2008; Kolko & Kazdin 1991; Kolko et al. 1985; Lyons et al. 2010; MacKay et al. 2009; McCardle et al. 2004; McCarty & McMahon 2005; Martin et al. 2004; Stickle & Blechman 2002; Walsh et al. 2004; Watt et al. 2015), including aggression and violence (Del Bove et al. 2008; Kolko et al. 1985; McCarty & McMahon 2005; Sakheim & Osborn 1999; Showers & Pickrell 1987; Stickle & Blechman 2002) are among the problem behaviors that correlate with juvenile firesetting in previous research. Indeed, Martin et al. (2004) found that adolescent firesetters engaged in extreme antisocial behavior, and Stickle and Blechman (2002) concluded that firesetting juvenile offenders were more antisocial than non-firesetting offenders. Similarly to what has been found for criminality more generally, an early onset of fire play/firesetting (Hoerold & Tranah 2014; MacKay et al. 2009) or crime in general (Stickle & Blechman 2002) has been linked to more firesetting at a later time in some studies. Moreover, alcohol (MacKay et al. 2009) and other substance use (Del Bove et al. 2008; MacKay et al. 2009; Martin et al. 2004) has also been associated with firesetting among juveniles, but it was not among the stronger correlates in the study by Lyons et al. (2010), possibly due to the low age of the sample studied in that case.

Finally, some studies have shown that juvenile firesetters are characterized by callous-unemotional traits or low empathy (Hoerold & Tranah 2014; Sakheim &

Osborn 1999; Watt et al. 2015) and cruelty (Kolko et al. 1985; McCardle et al. 2004; Sakheim & Osborn 1999), including animal cruelty (Baglivio et al. 2017; McCarty & McMahon 2005; Sakheim & Osborn 1999; Walsh et al. 2004). Firesetting, animal cruelty, and enuresis (bedwetting after the age of five) are the three components of what has been labelled the Macdonald triad (Leary et al. 2017; Parfitt & Alleyne 2020) or the ego triad (Slavkin 2001). This theory hypothesizes that the co-occurrence of these behaviors during childhood is predictive of interpersonal violence, including serial murder, later in life (Parfitt & Alleyne 2020). Although Singer and Hensley (2004) found some support for a link between juvenile firesetting and adult serial murder through case studies of three serial killers, a review of the literature (Parfitt & Alleyne 2020) concluded that it is rare for all three behaviors in the triad to co-occur as predictors of future violence and that enuresis is the weakest predictor. This is consistent with Hickey's (2015) suggestion that enuresis, unlike firesetting and animal cruelty, is an involuntary, unconscious, and non-violent behavior, which makes it more problematic to link it to violent crime. Similarly, Slavkin (2001) found that animal cruelty among juvenile firesetters could predict firesetting recidivism, but that enuresis could not.

To summarize, and as mentioned earlier, previous research on juvenile firesetting is largely based on risk factors. For many of the abovementioned correlates, it is unclear how and why they would cause firesetting (Wikström 2020). In the absence of a causal process linking these factors to the outcome, claims of causality are spurious (ibid.). In contrast, the current study applies the propensity aspect of situational action theory, a theory devised to move beyond risk factors, to examine *for whom* self-control is important in the explanation of firesetting.

Interaction effects between morality and self-control

Several studies that have examined the impact of both morality and self-control on various forms of crime and delinquency have found morality to be a stronger predictor than self-control (e.g., Antonaccio & Tittle 2008; Hirtenlehner & Kunz 2016; Tittle et al. 2010; Wikström & Svensson 2010), which is in line with the postulates of situational action theory. Studies that have investigated whether an interaction effect between morality and self-control is present in the explanation of offending have generally found at least some support for this, i.e., that the association between self-control and crime is stronger for those who have lower morality (Antonaccio & Tittle 2008; De Li 2004; Hirtenlehner & Kunz 2016; Ivert et al. 2018; Schoepfer & Piquero 2006; Svensson et al. 2010; Wikström & Svensson 2010). The exception, that did not find any support at all for an interaction effect, is the study by Gallupe and Baron (2014), that explored associations between morality, self-control, and drug use among 300 homeless street youth in Canada.

Otherwise, for example, an early study by De Li (2004) examined the effects of, and interactions between, self-control and social bonds in relation to juvenile delinquency. In this study, the social bond of belief can be regarded as akin to morality. Here it was found that low self-control is related to crime at all levels of belief, but the association is much stronger when belief is low (ibid.). Antonaccio and Tittle (2008), in a study of a sample of the general population in Ukraine, found support for the importance of both morality and self-control for the intention to offend. This study also found some weak support for the existence of an interaction effect: high self-control was found to be a protective factor against

projected offending only for individuals with high morality (ibid.). Another earlier study in this field that also examined intentions to offend was conducted by Schoepfer and Piquero (2006), who also found some evidence in support of an interaction effect between morality and self-control in the explanation of intentions to offend, in this study among university students.

Although most research into this relationship has been conducted on adolescents, which is the focus of the current thesis, and other young individuals, some support for the interaction has also been found among older respondents and the general, adult population (Antonaccio & Tittle 2008; Hirtenlehner & Kunz 2016; Tittle et al. 2010), although these results are not unequivocal. However, as mentioned, in general, the empirical evidence suggests that an interaction effect indeed exists, as exemplified by the study by Svensson et al. (2010), who found support for it in three different countries and across different operationalizations of the constructs involved. Additionally, the interaction between morality and self-control in relation to offending has been found to apply similarly to boys and girls (Ivert et al. 2018).

Some studies, such as Gallupe and Baron's (2014) study which examined drug use, have investigated if the interaction effect could be found for specific, selected crime types. Nonetheless, no study to date has investigated the empirical support for an interaction effect between morality and self-control in the explanation of firesetting specifically, which is the contribution of the present study. Given the claims of situational action theory of being a general theory, applicable to all kinds of crime and rule breaking, this is a relevant endeavor.

AIM AND HYPOTHESES

The aim of this study is to examine one of the core assumptions of situational action theory, namely the relative importance of morality and self-control as it relates to offending, in this case firesetting. The study will test the following hypotheses:

- 1) Morality is more strongly associated with juvenile firesetting than is self-control.
- 2) There is an interaction effect between morality and self-control in the explanation of juvenile firesetting, such that self-control is more important for individuals with low levels of morality.

METHODS

Sample

The data for the present study are drawn from the Malmö Individual and Neighbourhood Development Study (MINDS), which is a longitudinal research project based at the Department of Criminology at Malmö University that began in 2007 (Chrysoulakis 2020; Ivert & Torstensson Levander 2014). MINDS aims to "contribute to a better understanding of the causes and prevention of young people's involvement in crime, but also to study how exposure to social settings

affects other aspects of adolescent development and health” (Ivert & Torstensson Levander 2014, page 179) and is modelled on the Peterborough Adolescent and Young Adult Development Study (PADS+), which is conducted at the Institute of Criminology at the University of Cambridge (see Wikström et al. 2012).

MINDS follows a randomized sample of adolescents who were born in 1995 and lived in Malmö, Sweden in 2007 (Chrysoulakis 2020; Ivert & Torstensson Levander 2014). The total sample comprises 525 individuals, which is around 20% of the total birth cohort (ibid.). The present study employs questionnaire-derived data from the second and third data collection waves from the years 2010-2011 and 2011-2012, when the adolescents were 15-16 (answering questions referring to when they were 14-15 years old, in eighth grade) and 16-17 (answering questions referring to when they were 15-16 years old, in ninth grade) years old, respectively. Figure 1 shows an overview of the MINDS data collection waves.

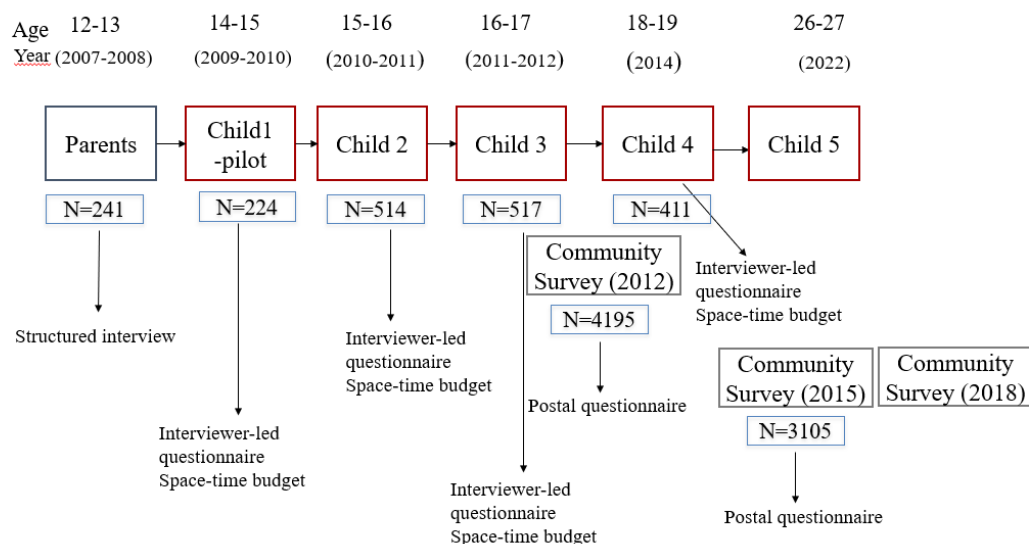


Figure 1. Data collection waves in the MINDS study.

Measures

The dependent variable is drawn from third and the independent variables from the second data collection wave, in order to have the proposed causal order established. To determine whether an interaction effect between morality and self-control related to firesetting is present, analyses were performed based on the following measures of the constructs involved:

Firesetting, ninth grade (assessed at wave three) is the dependent variable and is operationalized through the question “How many times have you set something on fire that you should not have set on fire during ninth grade?”. This question is a follow-up question to a question asking whether the respondents have set something on fire that they should not have set on fire during ninth grade, aimed at those who have done so on some occasion. The question used as the dependent variable could be answered by the respondents through writing a number. In total, 74 individuals reported that they had engaged in firesetting behavior at least once during ninth grade. Of these, two outliers, flagged as such by SPSS (80 and 100 claimed instances of firesetting during ninth grade), were removed when the analyses were performed. The analyses explored associations between this dependent variable and the following independent variables:

Morality is measured in the form of vandalism-relevant morality, which has been done in previous research (Hirtenlehner & Leitgöb 2021). This was chosen since firesetting could be understood as a variant of vandalism. Thus, the complete morality scale from the MINDS study was not used, but the following two questions were extracted from the index and combined: “How wrong is it for someone your age to paint graffiti on a house wall?” and “How wrong is it for someone your age to smash a street light for fun?”. The possible responses range from very wrong, wrong, a little wrong, to not wrong at all, and high values on the scale indicate poor morality. This two-item “scale” had a Cronbach’s alpha of .73.

Self-control is measured through a combination of the following eight items: “when I am really angry, other people better stay away from me”; “I often act on the spur of the moment without stopping to think”; “I sometimes find it exciting to do things that may be dangerous”; “I don’t devote much time and effort to preparing for the future”; “sometimes I will take a risk just for the fun of it”; “I often try to avoid things that I know will be difficult”; “I never think about what will happen to me in the future”; and “I lose my temper pretty easily”. The response alternatives are strongly disagree, disagree, agree, and strongly agree, and high values correspond to poor self-control. The eight items, which are based on the Grasmick et al. (1993) self-control scale, were combined into an additive scale with a Cronbach’s alpha of .68.

Analytical strategy

First, an ordinary least squares (OLS) regression analysis was performed where, in the first model, morality and self-control were included as independent variables. Through this OLS regression, the first hypothesis (that morality is more strongly associated with firesetting than is self-control) could be tested. In the second model, morality and self-control as a multiplicative interaction term was added, to begin to test the second hypothesis. The interaction term was created through first mean centring the two independent variables and then multiplying them with each other; also, the mean centred versions of the independent variables were used when these variables were entered on their own in the first model, to avoid multicollinearity (Jaccard et al. 1990; Svensson et al. 2010; Wikström & Svensson 2010).

An interaction effect represents a moderated relationship, where the independent variable is associated with the dependent variable, but where this association varies with changes in another independent variable (Wikström & Svensson 2010). The effects of interaction terms in OLS regression models are difficult to interpret, but it has been suggested to examine the *p* value of the interaction term and changes in the *F* value (Jaccard et al. 1990; Wikström & Svensson 2010) and the *R*² (Stat Trek n.d.).

Following this OLS regression, separate regressions between self-control and firesetting were estimated with morality at high, medium, and low levels, respectively. As was done by Wikström and Svensson (2010), morality was used as the moderator variable, with one standard deviation below the mean representing low morality, within one standard deviation of the mean representing medium morality, and one standard deviation above the mean representing high morality. (The mean for vandalism-relevant morality was 2.5 and the standard deviation was 1.6.) This is followed by a visualization of the interaction between

morality and self-control in the prediction of firesetting presented in the form of a plot (Wikström & Svensson 2010). All data analyses were performed using SPSS (IBM SPSS Statistics 28, IBM, New York, US).

Ethical considerations

In a Swedish context, four main ethical principles applying to research in the social sciences have been put forward (Vetenskapsrådet 2002). Two of them state that participants should be informed about the purposes of research in which they participate and that informed consent should be obtained, respectively (ibid.). Pertaining to MINDS, the participants were informed about how and why the study was conducted and about potential benefits to the individual and society at large. The participants were also informed that they could terminate their participation in the study at any time, without being required to provide a reason for doing so.

The participants were guaranteed confidentiality throughout the process, which fulfills another of the four ethical principles (Vetenskapsrådet 2002). Confidentiality is important given the sensitive nature of questions included in the questionnaire, including questions about involvement in firesetting behavior. Given the protection of the integrity of the participants and the costs and dangers associated with firesetting, the collection and analysis of these data could be justified. All data collected for MINDS are utilized solely for relevant research purposes, which is in fulfillment of the final ethical principle (ibid.). Moreover, MINDS has been ethically approved by the Regional Ethics Board in Lund before the first and the fourth data collection waves (reference numbers 2007/201 and 2014/826, respectively).

RESULTS

The results of the OLS regression are displayed in Table 1. As can be seen for Model 1, both low morality and low self-control assessed for eighth grade are significantly positively related to firesetting in ninth grade. The standardized Beta coefficient reveals that low morality has a somewhat stronger effect on firesetting than low self-control (Beta = .174 compared to .100), which is in line with the assumptions of situational action theory and confirms the first hypothesis of the current study. The adjusted R^2 , which is used because of the rather small sample and small number of juveniles who have engaged in firesetting at least once during ninth grade, shows that low morality and low self-control explain 4.7% of the variance in firesetting.

When the interaction term is introduced in Model 2, the effects of low morality and low self-control by themselves on firesetting both decrease slightly, and the impact of low self-control is no longer significant on the .05 level ($p = .052$). However, the interaction term is significant at the .05 level ($p = .017$), there is an increase in the variance explained by the model to 5.7%, and there is a significant change in the F value when the interaction term is entered. These findings support the hypothesis about an interaction effect between morality and self-control related to juvenile firesetting and warrant a further investigation of the interaction effect.

Table 1. OLS regression analysis predicting firesetting in ninth grade.

Predictors	Model 1				Model 2			
	B	SE	Beta	<i>p</i>	B	SE	Beta	<i>p</i>
Low morality	.139	.039	.174	<.001	.129	.039	.162	<.001
Low self-control	.031	.015	.100	.041	.030	.015	.094	.052
Low morality × Low self-control					.022	.009	.111	.017
Constant	.388				.343			
Adjusted <i>R</i> ²	.047				.057			
<i>F</i> value change from previous model (sig. <i>F</i> change)					5.716			(.017)

The OLS regressions between self-control and firesetting at different levels of morality (see Table 2) show that the impact of self-control on firesetting is only significant for individuals with low morality.

Table 2. Effect of self-control on firesetting at low, medium, and high levels of morality.

	<u>Low morality</u>	<u>Medium morality</u>	<u>High morality</u>
	B	B	B
Low self-control	.141*	.022	.014

Note: B: unstandardized regression coefficient. **p*<.05

The interaction effect is illustrated in Figure 2, where self-control clearly is most strongly associated with firesetting for individuals with low morality. As mentioned previously, high values on the self-control measure indicate low levels of self-control, which should be remembered when interpreting the plot in Figure 2.

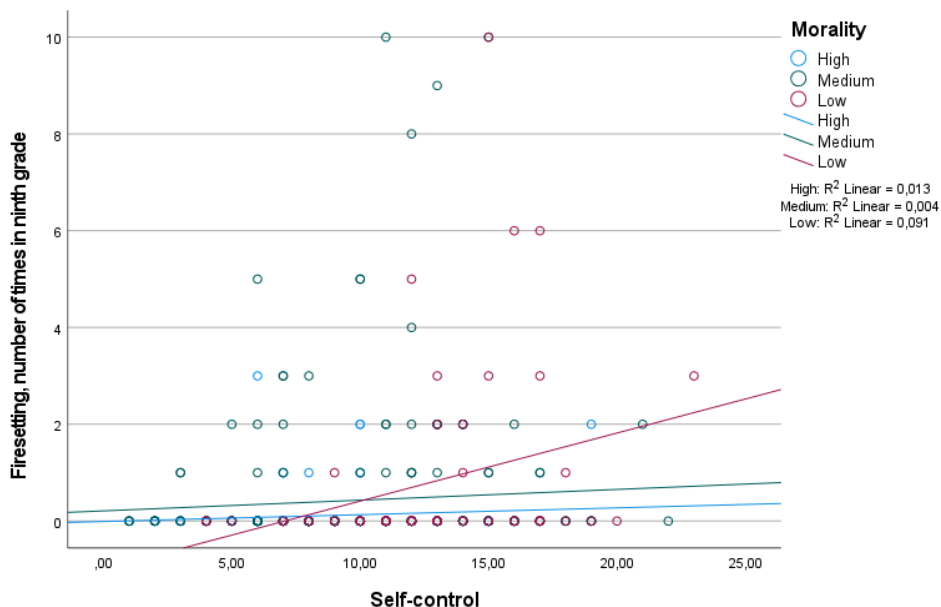


Figure 2. The effect of self-control on juvenile firesetting by morality.

DISCUSSION AND CONCLUSIONS

This study aimed to test whether morality is more strongly associated with juvenile firesetting than is self-control and whether an interaction effect between morality and self-control in the explanation of juvenile firesetting could be detected, as suggested by situational action theory. The results indicated support for both hypotheses. In the current study, morality has a stronger relationship to juvenile firesetting than that of self-control (Beta: .174 vs. .100 in Model 1 and .162 vs. .094 in Model 2), which confirms the first hypothesis. This is in line with results in previous research (Antonaccio & Tittle 2008; Hirtenlehner & Kunz 2016; Tittle et al. 2010; Wikström & Svensson 2010).

There is also support for the second hypothesis, regarding an interaction effect between morality and self-control in the explanation of juvenile firesetting. This is also similar to findings in other studies on interactions between morality and self-control in crime causation (Antonaccio & Tittle 2008; De Li 2004; Hirtenlehner & Kunz 2016; Ivert et al. 2018; Schoepfer & Piquero 2006; Svensson et al. 2010; Wikström & Svensson 2010). The present results indicate the presence of such an interaction effect, albeit a rather weak one: the adjusted R^2 increased from .047 to .057 from Model 1 to Model 2, where the interaction term was introduced. This is somewhat similar to the results in the study by Hirtenlehner and Kunz (2016), where the introduction of the interaction term resulted in a 0.7% increase in the explained variance. However, because of the difficulty of detecting interaction effects in non-experimental studies, it has been suggested that as little as a 1% explanation of the total variance should be regarded as important (Hirtenlehner & Kunz 2016; McClelland & Judd 1993). Nonetheless, self-control is most strongly related to firesetting among juveniles with low levels of morality. Rather than Gottfredson and Hirschi's (1990) self-control theory, this supports situational action theory, which views self-control as dependent upon the levels of morality.

The extant, mostly risk factor oriented, research on juvenile firesetting has found associations between this behavior and factors like impulsivity and related constructs such as hyperactivity, irritability, and attention problems (Bowling et al. 2013; Del Bove et al. 2008; Hoerold & Tranah 2014; Kolko & Kazdin 1991; Kolko et al. 1985; Lyons et al. 2010; McCarty & McMahan 2005; Sakheim & Osborn 1999; Tanner et al. 2015). Impulsivity can be considered as related to low self-control and it is one of the elements of self-control that the Grasmick et al. (1993) scale, which is the basis for the self-control measures in this study, taps into. The findings of the present study suggest that, since these earlier studies did not consider interactions with morality or other variables, it is unknown to what extent the importance of impulsivity would remain the same if this had been done. One contribution of the present study is to shed some light on the conditions required for self-control to be relevant as an explanatory factor in relation to juvenile firesetting. Additionally, by applying one aspect of situational action theory to juvenile firesetting, this paper has expanded the literature of tests of the theory in various contexts and for various forms of crime and rule breaking, and the results should at least be considered encouraging for the theory.

Given the focus of the study on the crime propensity aspect of situational action theory, and if subsequent studies should confirm the importance of primarily (vandalism-relevant) morality, but also self-control, for juvenile firesetting, the question is how these insights translate into practice or policy, i.e., crime

prevention. Situational action theory proposes that changing individuals' crime propensities is an important part of effective crime prevention (Wikström & Treiber 2017). Moral education, which parents and teachers can engage in to increase young people's morality, may be a promising avenue for crime prevention and needs more exploration (ibid.). For those individuals for whom low self-control is important, cognitive nurturing, through exercise of cognitive capacities and executive capabilities, is an area with some empirical support (ibid.). Given the results of this study, these methods of changing individuals' crime propensity is something that should be considered in relation to juvenile firesetting.

This study is limited by the small number of juveniles who had self-reported involvement in firesetting behavior that was studied. This makes it difficult to generalize the results to a wider population. Furthermore, the study only investigated one aspect of situational action theory and did not take the importance of the settings in which behavior occurs into account. Future research could advance the knowledge of the causes of juvenile firesetting, as well as other specific crime types, by analyzing all aspects of situational action theory.

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