

Predicting Suicidal Tendencies Among High Risk Youth With the General Theory of Crime

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ABSTRACT

This study examines whether suicidal tendencies among a group of juveniles who have come to the attention of Child Protective Services can be predicted by self-control theory. Using data from the National Survey of Child and Adolescent Well-Being, we find that self-control predicts suicidal tendencies. In addition, the effect of self-control remains significant even when controlling for the juveniles' depression and previously reported suicidal thoughts and behaviors. This study lends further support to the claim that self-control serves as a general explanation for a wide range of problematic outcomes. In addition, these findings provide caseworkers with another tool for assessing the risk of suicide among high risk youth.

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Over the last three decades, child and adolescent suicide has emerged as one of the major health problems in the United States and many countries (Bridge, Goldstein, and Brent 2006). Studies find that 15–25% of American adolescents report suicidal ideation (Lewinsohn, Rohde, and Seeley 1996). Suicide is the third leading cause of death among adolescents (Anderson and Smith 2003). According to the Centers for Disease Control, 11% of all deaths among those aged 12–19 were from suicide while 13% were due to homicide (Miniño 2010). Youth with histories of child physical, sexual abuse, and/or neglect are at even higher risk of suicidal ideation, attempts and completion (Brent et al. 1999; Johnson et al. 2002; Molnar, Berkman, and Buka 2001; Santa Mina and Gallop 1998).

Although studies on suicide have been conducted since the early days of sociology, the majority of recent work has largely focused on different psychological problems that increase the risk of suicide, such as depression and other mood disorders (Beautrais et al. 1996; Garrison et al. 1991), substance use disorders (Ellis and Trumpower 2008), and Post-Traumatic Stress Disorder (Mazza 2000). In contrast, this study seeks to apply a dominant criminological theory to understand the causes of suicide. Specifically, this study uses the general theory of crime, also known as self-control theory, to predict suicidal tendencies among a group of high risk juveniles.

Self-control theory

The general theory of crime (Gottfredson and Hirschi 1990) is one of the most tested, and supported, theories in the field of criminology. One reason for the abundance of work on this theory is due to its claim of being a general theory, capable of explaining a wide range of imprudent, deviant, and criminal behaviors. The general theory argues that self-control, or the ability to resist temptations of the moment (Gottfredson and Hirschi 1990:87), is the characteristic that predicts involvement in crime and other behaviors that share elements in common with crime. Self-control is developed in early childhood, through adequate supervision and appropriate punishments administered by a caregiver who is invested in the child (Gottfredson and Hirschi 1990:97–98). After self-

control is established, it continues to have a relatively stable impact on an individual's behavior across time. Therefore, individuals with high levels of self-control should be resistant to crime and analogous behaviors across the life course and in a variety of settings.

The claim of stability is the recent focus of a number of studies. There are two possible ways to interpret the argument of stability within the theory. First, Gottfredson and Hirschi (1990) focus on the relative levels of offending between individuals or groups of individuals across the life course. Although the absolute level of problematic behaviors may shift over time, due to changes in opportunities, maturation, or other factors, the propensity to engage in deviant acts remains relatively stable in comparison to others with greater or lesser self-control (Gottfredson and Hirschi 1990:137). They identify this as the "stability problem" (1990:107) and argue that research clearly establishes that "differences between people in the likelihood that they will commit criminal acts persist over time." They propose that self-control will continue to have an impact on criminal and deviant acts throughout the life course and thus can explain this relative stability between groups. Those with high self-control will persistently engage in less deviance than those with low self-control, thus maintaining a stable difference in offending.

The second interpretation of stability is that self-control is a trait that is in the process of development in the early childhood years but stabilizes and remains fairly consistent within the individual early in the life-course. This form of stability is based on a later claim by Hirschi and Gottfredson (2001:91) that even though some influences later in life may increase self-control, "differences observed at ages eight to 10 tend to persist from then on." It is this interpretation that has been largely tested within the literature. Several recent studies have examined this type of absolute stability in self-control by assessing whether individual self-control measured at one age is consistent with self-control measured at a later age (Arneklev, Cochran, and Gainey 1998; Burt, Simons, and Simons 2006; Hay and Forrest 2006; Hay et al. 2010; Raffaelli, Crockett, and Shen 2005; Turner and Piquero 2002; Vazsonyi and Huang, 2010). While there are some findings that up to 20% of samples can shift in their self-control (Burt et al. 2006; Hay and Forrest 2006), the majority of studies find consistent support of the stability hypothesis.

One claim of the general theory of crime is that self-control is developed early in life and largely within the family. Research has established that processes that occur in early childhood, specifically parenting practices related to adequate and fair supervision and discipline, do in fact influence the level of self-control an individual possesses (Gibbs, Giever, and Martin 1998; Hay 2001; Hope, Grasmick, and Pointon 2003; Nofziger 2008; Polakowski 1994; Pratt, Turner, and Piquero 2004; Unnever, Cullen, and Pratt 2003). A recent review of studies on the role of the family on self-control (Cullen et al. 2008) proposes more work is needed on this topic, particularly in the way that other forms of social learning occur within the family, and how self-control can be learned in other settings. However, in spite of some authors who have questioned whether parenting is the primary source of socialization and delinquency (Harris 1998; Rowe and Flannery 1994) there is evidence that parental behaviors directly influence the self-control and subsequent behaviors of the child.

While tests of the above pieces of the theory are important, and have been subject to increasing numbers of studies, the vast majority of the research has focused on the claim that this is a general theory, capable of explaining "all crimes at all times, and for that matter, many forms of behavior that are not sanctioned by the state" (Gottfredson and Hirschi 1990:117). The authors of this theory argue that all criminal acts, and many other behaviors, share similar elements or characteristics that make them more likely to be engaged in by individuals with low self-control. Specifically, Gottfredson and Hirschi (1990:89–90) argue that crimes are acts that provide relatively easy and immediate gratification of desires that do not take much planning or specific skills. In addition, these acts provide excitement or a thrill to the participant but they are also risky, potentially leading to injury, pain, or other forms of long-term consequences. Contrary to popular fiction of a "big score," most crimes provide very minimal benefits, which tend to be transitory and not adequate for the long term well-being of the offender. These behaviors are argued to be appealing to individuals with low self-control. Such people

tend to be short-sighted, focused on immediate desires rather than long-term consequences of behaviors, prefer not to put themselves to a great deal of effort to fulfill their desires, and act on impulse.

Criminal acts are not the only behaviors that are likely to be engaged in by those with low self-control. Acts such as smoking, engaging in risky sexual activities, drinking, participating in extreme sports, driving recklessly, or simply failing to save money for emergencies or the future all share characteristics with crime and are therefore considered to be analogous to crime. The argument in the general theory is that since the individual with low self-control is focused on the here and now, even at the risk of future goals and well-being, they are at high risk to engage in any and all of these analogous behaviors.

This claim is important within the theory because it expands the scope of potentially explained behaviors beyond those just officially labeled crimes. Empirical studies have explored this aspect of this theory by examining criminal behaviors as diverse as driving under the influence (Keane, Maxim, and Teevan 1993), drug use, property crimes, and violence (LaGrange and Silverman 1999; Longshore 1998). In addition, studies have examined non-criminal behavior including being involved in accidents or engaging in risky driving practices (Junger and Tremblay 1999; Junger, West, and Timman 2001), skipping classes (Gibbs and Giever 1995), academic dishonesty (Cochran et al. 1998), and juvenile bullying (Nofziger 2003). Recent work has also extended this theory to predicting victimization (Nofziger 2009; Piquero et al. 2005; Schreck 1999). Thus, there is a great deal of support that self-control is in fact a powerful explanation of a wide range of behaviors.

In addition to these behavioral outcomes, there has been some research in psychology that addresses how self-control may influence mental health, including depression (Rehm 1977) and other forms of pathology (Tangney, Baumeister, and Boone 2004). However, only one study to date has examined how suicidal behaviors may be influenced by self-control. In a study of the effects of bullying victimization, Hay and Meldrum (2010) include self-control in their predictive models of self-harm, including suicidal ideation. Some of their analyses found that individuals with high self-control were less likely to report suicidal ideation.

Some may argue that suicide is not congruent with crime characteristics, but it is in fact very consistent with these elements. Individuals with low self-control focus on immediate gratification, engage in risky behaviors, act impulsively, and often resort to violence when their expectations are not met. Empirical research on adolescent suicide has found that many of these characteristics are also related to suicidal behaviors.

For example, impulsivity, one of the hallmark characteristics of those with low self-control, has been found to elevate adolescent suicide risk and behaviors (Kashden et al. 1993; Kingsbury et al. 1999). Studies find that a large proportion of adolescent suicides involved little planning, if any, and the suicide methods used were largely determined by what was easily available (Brent et al. 1999; Gunnell, Murray, and Hawton 2000). Second, just like youth with low self-control, suicidal behaviors among adolescents most frequently co-occur with other risky behaviors such as smoking, binge drinking, having unprotected sex, carrying weapons, and substance abuse (Brent et al. 1999; Ellis and Trumpower 2008; King et al. 2001; Shafii et al. 1988). Third, individuals with low self-control will have a minimal tolerance for frustration, and may act violently when their desires are not met (Gottfredson and Hirschi 1990). Psychology studies have found that impulsive aggression—the tendency to react to frustration with hostility and/or aggression—significantly elevates the odds of suicidal behaviors independent of depression or other mood disorders (Beautrais, Joyce, and Mulder 1999; Brent et al. 1994). Finally, as noted by Gottfredson and Hirschi (1990:90), what individuals gain from risky acts is not always pleasure but “relief from momentary irritation.” Thus, individuals with low self-control may seek relief through deliberate self-harm, including suicide. Since suicidal behaviors are analogous to other risky behaviors that have been empirically linked to low self-control, we hypothesize that youth with lower self-control will have higher suicidal tendencies.

Data and methods

The data used for this study is from the first cohort of the National Survey of Child and Adolescent Well-Being (NSCAW-I). These data are the first national probability sample of children and adolescents referred to child protective services for suspected abuse or neglect. These are particularly useful data for the current study as past work indicates that abused children have significantly higher rates of suicide, even controlling for depression (Fergusson, Horwood, and Lynskey 1996; Molnar et al. 2001). Moreover, separation from family and/or family discord is one of the most likely precipitants to child and adolescent suicide (Brent et al. 1994). Therefore, by using data from children who are within the child protection system, this study targets youth who may be at high risk for suicide.

These data were collected by the Department of Health and Human Services (DHHS) to examine a range of outcomes. The NSCAW-I cohort was developed from a sample of children who had contact with child protective services between October 1999 and December 2000. This cohort was selected from two groups of children in 92 different sampling units in 97 counties across the country. The “Child Protective Services” (CPS) subsample consists of children who were involved in an investigation for child abuse or neglect in the 15-month sampling frame. This group included children from zero to fourteen years old and those both in- and out-of-home care. The second subsample, the “Longer Term Foster Care Children” (LTFC) is made up of children who had been placed in care situations out of their homes for approximately one year at the time of the selection period. For both subsamples, data were collected across five waves from the child, caseworker, current caregiver, teacher, and former caregiver for each respondent.

The current study limits these data in several ways. First, only data from children and current caregivers were used as these are the groups who are asked the key variables being studied. In addition, data were only used from waves 1, 3, and 4. Wave 2 did not include self-report surveys of juveniles and nearly all respondents are missing on the dependent variable in wave 5.¹ Finally, as the measure of depression used in these analyses is only asked of those seven years of age or older, the sample was limited to those in this age range at wave 1. With these restrictions, the final sample for this study was 2,659 juveniles between the ages of 7 and 16 at the time of the initial wave of data collection.

By limiting our analysis to this age range, and this particular type of sample, our analysis is not representative of the entire population of juveniles. Since suicidal tendencies in the general population of juveniles are relatively low, it is useful to examine a group that is potentially at greater risk. We are able to test whether we can predict this outcome with self-control theory in this potentially high risk sample, which may indicate whether it is viable to apply the theory to predict suicidal thoughts and behaviors within the broader juvenile population. More importantly, if we can predict indicators of suicidal risk among this sample of children using a measure of self-control, it may provide a valuable tool for case workers to decrease this behavior among their juvenile clients by more easily identifying who may be at highest risk.

Dependent variable: Suicidal ideation

The dependent variable in this study indicate juveniles’ suicidal tendencies as reported by the current caregiver. The items used for the dependent variable come from the Child Behavior Check List (CBCL) developed by Achenbach (1991). The CBCL is a standardized assessment tool of children’s and juveniles’ problematic behaviors. Commonly, the CBCL is divided into Internalizing and Externalizing categories with related subscales (such as Withdrawn, Somatic Complaints, and Anxious/Depressed for the Internalizing group and Externalizing subscales of Conduct Problems

¹Respondents in wave 5 were older adolescents or young adults. The data collected in wave 5 focused on their life circumstances and did not include the same suicide items.

or Aggressive behavior). Individual items assess a wide range of behaviors such as whether the child is destructive, has problems sleeping, feels anxious, or is involved in various delinquent behaviors.

While there are self-administered uses of the CBCL for older youth, it is more common that a parent or other caretaker completes this assessment tool. In either case, the respondent indicates how well each statement represents the child or juvenile (not true—as far as the caregiver knows, somewhat or sometimes true, very true or often true). The benefit of using such a scale, as opposed to a self-report of suicidal intent, is that this scale can be used to assess children as young as two years old. In addition, the time frame is wider than alternative measures because it asks caregivers about “now or in the past 6 months.” In comparison, the Children’s Depression Inventory (CDI), which asks juveniles about suicidal thoughts, only asks juveniles about their feelings in “the past two weeks” (Kovaks 1992). For the current study, we draw on the CBCL completed by the current caregiver for each respondent in our sample.

Two items are used to assess suicidal tendencies. The first asks the caregiver if the child “deliberately harms themselves or attempts suicide” and the second whether the child “talks about killing self.” These two items were coded from zero (not true, as far as the caregiver knows), to two (very true or often true) with higher numbers representing greater risk of suicide. The items were then added together to create a variable ranging from zero to four. This variable was created for each wave included in analyses.

Independent variable: Self-control

One of the most enduring questions in tests of self-control theory is the best method of measuring this concept. While some of the critics argue that most existing measures entirely miss the fundamental meaning of this concept (Marcus 2004), the majority of the debate centers on whether self-control should be measured with attitudinal responses, behavioral indicators, or some combination (see, e.g., DeLisi 2001; Hirschi and Gottfredson 1993; Longshore, Turner, and Stein 1996; Piquero, MacIntosh, and Hickman 2000; Tittle, Ward, and Grasmick 2004; Ward et al. 2010). While most early tests of the theory used attitudinal measures, and most commonly the Grasmick et al. scale (1993), a wide range of scales are currently in use and studies indicate that both behavioral and attitudinal measures consistently predict deviant outcomes (Pratt and Cullen 2000). Rather than developing new measures of self-control, a number of recent studies (see, e.g., Boutwell and Beaver 2010; Pratt et al. 2004; Turner and Piquero 2002; Turner, Piquero, and Pratt 2005) measured this concept with established behavioral assessment tools. Such measures are typically based on scales such as the Behavior Problem Index (Zill and Peterson 1986), which was developed in part from the CBCL (Achenbach and Edelbrock 1983). The benefit of using such scales is that they have been subjected to numerous tests for reliability and validity (see Achenbach and Rescorla 2001) and are available in many existing data sets.

This study employs caregiver responses on the CBCL in wave 1 to measure self-control. Wave 1 is selected to measure self-control in order to help establish causal order between self-control and suicidal tendencies in later waves. In addition, past findings of relative stability in self-control demonstrate that this is a generally consistent trait, with typically only slight shifts over time within the individual’s self-control. Our focus is not on these possible changes in the absolute values of self-control but whether the relative levels of self-control between individuals predicts suicidal ideation. In addition, since the caregiver may be a different person in each wave, and may have vastly different amounts of experience with the child, using a repeated measure of self-control in each wave may reflect the fact that the reporter is different, rather than a true change in the juvenile’s level of self-control.

This last problem may be solved by using a self-reported measure of self-control. The CBCL is asked of juveniles in the NSCAW-I, but only those who are 11 and older. Therefore, this would severely limit the sample and miss the younger children who are at risk for suicidal ideation. In comparison, the current caregivers complete the CBCL for children in their care who are as young as

4 years old. Therefore, we elected to use the caregiver reported self-control in order to include the largest number of respondents.² While some may question the validity of using caregiver reports, studies have established that maternal reports are valid in determining self-control in children (Wright and Beaver 2005). In addition, it may be valuable to use reports from caregivers as it enables researchers and caseworkers to measure self-control in younger children who may be incapable of completing a self-report survey or interview.

The CBCL is made up of 115 items. Many of these are not theoretically relevant to our study. Thus, a factor analysis was conducted on the specific items that were theoretically consistent with the concept of self-control. We focused on items that reflected the inability or unwillingness of the youth to delay gratification and acting for immediate gain at the risk of future pain or loss. These most closely represent the conceptualization of self-control as the inability to resist temptations of the moment. These items included indicators of the impulsivity of the youth, aggressive behaviors, and self-centered acts. The results of this analysis resulted in a scale consisting of 17 items (Alpha = .901, Mean = 11.12). The Appendix provides the factor loadings for each individual item in this scale as well as the scale statistics. These 17 items were added together to create the final measure of self-control, ranging from zero to 34, with higher numbers representing lower self-control.

Control variables

Studies consistently find that approximately 50–80% of adolescents with suicidal ideation, or who attempted or completed suicide, suffer from depression (Garrison et al. 1991; Gould et al. 1998; Houston, Hawton, and Shepperd 2000; Lewinsohn et al. 1996; Molnar et al. 2001; Moscicki 1995). Therefore, this is a vital control to include in the current analyses. The only measure for depression in the NSCAW-I is the CDI. Developed by Kovacs and Beck (1977), the CDI is a 27-item self-report survey administered to children between the ages of 7 and 14 to assess depressive symptomatology. Many studies have evaluated this scale (e.g., Craighead et al. 1998; Saylor et al. 1984; Smucker et al. 1986) and found high levels of validity and high internal consistency across both age and sex. For each item in this scale, respondents select between different statements that best describe their feelings. For example, one item asks them to consider how they have felt in the past two weeks and select one of the following responses “I hate myself, I do not like myself, or I like myself.”

Within the NSCAW-I, most of these items asked the respondents about their feelings in the two weeks prior to the survey administration but others were more open and did not provide a specific time frame. One item specifically asked the juvenile if they had thought about killing themselves in the past two weeks. Since this would presumably be collinear with our dependent variables,³ we eliminated this item from the analyses. The remaining 26 items were subjected to a series of principle components factor analyses to determine which were reflective of depression for this particular sample. Since it is very possible that the juvenile’s level of depression may have changed over the three waves, and we were most interested in controlling for current levels of depression on suicidal ideation, we developed a measure of depression for each wave. Rather than having different items in the measure at each wave, we determined the best possible measure of depression that was consistent over the three waves. Therefore, we eliminated

²In order to establish whether self-reports and current caregiver reports of self-control were similar in the NSCAW-I data, we did conduct several analyses. The factor analyses revealed very similar patterns, with only slight variations in the strength of the factor loadings and one item, “Cruel to Animals,” that did not load on the self-control factor in the self-reports from the juveniles. Pearson correlation analyses also indicated that the caregiver reported self-control and the child’s self-reported levels were highly correlated (.390, $p < .001$). Therefore, we are confident that the caregiver report provides not only an adequate measure of self-control but is superior as it allows us to measure this at younger ages.

³Analyses were conducted to assess the relationship between our measures of suicide as reported by the caregivers and this single item from the CDI. The results indicated that these measures were highly correlated ($p < .001$), and therefore that the children’s own reports of their suicidal ideation was consistent with caregiver reports of these tendencies.

items that loaded below .30 on factor one in any of the three waves. The remaining 19 items were combined into an additive scale, coded to indicate higher levels of depression. The reliability of these scales ranged from an alpha of .854 to .784 (see the Appendix for items and statistics for each wave).

As with most studies of suicide, we included controls for demographic characteristics of age, sex, and race/ethnicity. With respect to age, suicide attempts and completions increase with age but studies have found no age difference in the prevalence of current suicidal ideation (Bridge et al. 2006; Lewinsohn et al. 1996). Sex is the largest sociodemographic correlate of suicide behaviors (Moscicki 1995). Suicidal ideation and attempts are two to three times higher in girls compared to boys (Grunbaum et al., 2002; Lewinsohn et al. 1996), and this gap widens with age (Fergusson, Woodward, and Horwood 2000; Grunbaum et al. 2004). However, suicide completion is far higher among adolescent males than females (Bridge et al. 2006). Race/ethnic differences have also been reported in the literature on adolescent suicide. For example, white and Hispanic adolescents are more likely than black adolescents to have considered suicide (Grunbaum et al. 2002).

In the NSCAW-1 age, sex, and race/ethnicity are collected from multiple sources, including the child, the caseworker, the current caregiver, and the former caregiver. As one might expect, data from multiple sources generally results in consistent responses but occasional slippage also occurs. Therefore, we used the responses provided from the child, believing that the child's own self-identity would be the most accurate representation of their demographic characteristics. Sex was coded as 0 for females and 1 for males. Age was measured at the time of the first wave of data collection, ranging from 7–16 years old. Race is coded as a series of dummy variables, with the majority identifying as “Only White” (the omitted variable in multivariate analyses), or “Only Black.” Since respondents could report multiple racial, and ethnic, identifications and a small percent were classified as “unknown,” any who did not identify as the two dominant groups of Only White or Only Black were grouped into an “other race/ethnicity” dummy variable. The last control in analyses was whether the juvenile was in the CPS or LTFC group in order to assess whether the experiences of a recent investigation or long-term out-of-home placement significantly influenced suicidal tendencies.

Analytic strategy

Univariate and bivariate analyses were conducted to examine the distribution of suicidal tendencies and its relationship to self-control and depression. Specifically, we examine the Pearson correlation coefficients between all the variables in the model. Then, multivariate analyses were conducted with Poisson regression models to examine the effects of self-control on suicidal tendencies for each of the three waves.

One limitation of this study is establishing causal order between self-control and suicidal tendencies in the first wave. However, because self-control is developed at young ages, with most studies indicating self-control is established around the age of eight and remains relatively stable after this point (Beaver and Wright 2007; Hay and Forrest 2006; Turner and Piquero 2002), it is reasonable to argue that self-control either is developed prior to any suicidal outcomes in this sample, or at least to be co-occurring in wave 1. In addition, self-control is assessed prior to caregiver reports of the juveniles' suicidal thoughts and actions that occur in waves 3 and 4 and therefore, can be considered to predate, and logically be part of the cause of these later measures of suicidal tendencies.

Findings

The sample used in these analyses are made up of 2,659 youth between the ages of 7 and 16 at wave 1. As seen in Table 1, the sample is fairly evenly divided by sex (females = 52.6%). Whites are the largest group at 44.5% and blacks make up 27.6% of the sample. All other racial and ethnic categories

Table 1. Descriptive statistics of sample at wave 1.

	Valid		Item Statistics			
	Frequency	Percent	Mean	St Dev	Range	N
Sex			.47	.50	0-1	2659
Female	1398	52.6				
Male	1261	47.4				
Age			10.62	2.47	7-16	2659
Seven	340	12.8				
Eight	300	13.0				
Nine	281	12.4				
Ten	248	11.7				
Eleven	265	11.2				
Twelve	243	10.3				
Thirteen	282	11.7				
Fourteen	284	12.4				
Fifteen	115	4.3				
Sixteen	2	.1				
Race						2659
White	1183	44.5				
Black	735	27.6				
Other/ Mix	741	27.9				
Sample						2659
CPS	2323	87.4				
LTFC	336	12.6				

constitute 27.9% of the sample. This racial distribution is consistent with national numbers from Child Protective Services that report approximately 3.7 million investigations and 772,000 substantiated cases of child abuse or neglect in the United States in 2008 (USDHHS 2010:25). Of the substantiated victims, 51.3% were girls, which is very similar to the percentage of girls in the study sample. The race and ethnicity of children from the national data is not directly comparable to the study sample because their counts for each racial group separate those of Hispanic origin (USDHHS 2010:30). However, the overall percentages are similar as African-American and Hispanic children comprise 21.9% and 20.8% of child victims in the United States, respectively, and whites, 45.1%. Therefore, while our sample slightly over-represents blacks, it does reasonably reflect the characteristics of the population of children who are abused and neglected in the United States.

The first step in the analyses was to assess how common suicidal tendencies were among this sample. As seen in Table 2, caregivers reported that 24.2% of the sample had at least one suicidal thought over the three waves. This is similar to prior studies that reported approximately 20% of adolescents had suicidal thoughts over their lifetime (Lewinsohn et al. 1996; Grunbaum et al. 2002). More specifically, 13.2% of the sample had suicidal tendencies in wave 1, 11.3% in wave 3, and 10.0% in wave 4.

Suicidal ideation did vary in important ways among the different groups in this sample, as presented in Table 3. While there were no significant differences by sex, age was correlated with suicidal tendencies. Children who were older were more likely to have such tendencies in waves 1 and 3 (.086 and .068, $p < .001$, respectively), although this relationship was non-significant in wave four. This is somewhat inconsistent with previous research that finds suicide attempts and completions increase throughout adolescence and are highest in young adults (Bridge et al. 2006). Black respondents also had lower suicidal tendencies than whites, although the relationship was not statistically significant in wave 2. Being from the CPS, as opposed to the LTFC subsample was not significantly correlated with suicidal tendencies. Therefore, it does not appear that the length of time the child has been in the CPS system influences this outcome. As expected from the existing literature, one of the strongest correlates with the suicide variable was depression. Children who were depressed were significantly more likely to display suicidal tendencies in waves 1, 3 and 4 (.160, .113, and .072, $p < .001$, respectively). Consequently, we expect depression to have a substantial effect

Table 2. Caregiver reported suicidal tendencies by wave.

	Valid		Statistics			
	Frequency	Percent	Mean	St Dev	Range	N
Wave 1			.21	.61	0–4	2582
0	2241	86.8				
1	202	7.8				
2	100	3.9				
3	22	.9				
4	17	.7				
Wave 3			.16	.56	0–4	2232
0	2002	89.7				
1	133	6.0				
2	66	3.0				
3	20	.9				
4	11	.5				
Wave 4			.16	.53	0–4	2209
0	1989	90.0				
1	126	5.7				
2	67	3.0				
3	20	.9				
4	7	.3				

Table 3. Bivariate correlations of study variables.

	Age	Male	Black	Other Race	LFTC	CDI Wave 1	CDI Wave 3	CDI Wave 4	Self-Control	Suicide Wave 1	Suicide Wave 3
Male	-.075***										
Black	.012	.004									
Other Race	-.025	-.006	-.384***								
LFTC	.050*	.022	.102**	-.034							
CDI Wave 1	-.039	-.042*	-.018	.035	-.087***						
CDI Wave 3	-.046*	-.045*	.021	.003	-.072***	.507***					
CDI Wave 4	-.013	-.095***	.011	-.010	-.013	.434***	.480***				
Self-Control	.044*	.165***	-.027	-.075***	.047*	.207***	.162***	.176***			
Suicide W 1	.083***	.022	-.059**	-.003	-.016	.160***	.113***	.072***	.376***		
Suicide W 3	.068***	.005	-.039	.007	.023	.171***	.214***	.092***	.223***	.352***	
Suicide W 4	.034	-.015	-.056**	.010	.021	.076***	.148***	.135***	.182***	.242***	.350***

Note: LFTC (Long-Term Foster Care); CDI (Children's Depression Inventory)

Number of valid cases in parentheses

* $p < .05$, ** $p < .01$, *** $p < .001$

Since the purpose of this study is to test whether self-control theory can predict suicidal tendency, the key relationship to examine is that between self-control and this outcome. Based on the correlation analyses, poor self-control is significantly and positively related to suicidal tendencies at all three waves (.376, .223, .182; respectively, $p < .001$). These coefficients are some of the highest in the bivariate analysis, providing support for the hypothesis that self-control predicts suicidal thoughts and actions.

Poisson regressions

The next step in the analysis was to examine how well self-control predicts the level of suicidal tendencies. Given that the dependent variable, which measures a very small range of relatively rare events, is positively skewed with many low-count observations and no observations below zero, using ordinary least squares (OLS) regression would lead to biased estimates (Long 1997). Poisson regression is the appropriate technique when the dependent variables are count outcomes of relatively rare events. This analytical technique models the logarithm of expected counts instead of the expected counts directly. The simplest model reads as $\text{Ln}(\lambda_i) = \beta_0 + \beta_1 x_i$ in which the outcome variable is the logarithm of expected counts.

Table 4. Poisson regression coefficients and corresponding standard errors for individual waves of caregiver reports of juveniles' suicidal tendencies.

	Wave 1		Wave 3		Wave 4	
Age	.075***	(.020)	.077***	(.024)	.028	(.028)
Male	-.263***	(.100)	-.151	(.125)	-.169	(.139)
Black	-.581***	(.134)	-.214	(.154)	-.440*	(.176)
Other Race	-.066	(.115)	.087	(.141)	.008	(.158)
CPS Sample	-.053	(.149)	-.210	(.180)	-.105	(.194)
Low Self Control	.131***	(.007)	.051***	(.009)	.043***	(.009)
Wave 1 Depression	.032***	(.006)				
Wave 3 Depression			.089***	(.011)		
Wave 4 Depression					.054***	(.013)
Wave 1 Suicide			.552***	(.056)		
Wave 3 Suicide					.640***	(.061)
Intercept	-.5009	(.343)	-.624	(.496)	-4.478	(.554)
Log-Likelihood	-980.504		-729.475		-642.180	
Pearson Chi-square	2,633.752	1.20/df	2,480.978	1.37/df	2,340.207	1.45/df
BIC	2,202.589					
<i>n</i>	2,203		1,808		1,610	

Standard errors in parentheses, BIC (Bayesian Information Criterion).

* $p < .05$, ** $p < .01$, *** $p < .001$.

Poisson regression assumes the amount of variation in the data is equal to the conditional means; a condition that is often violated. One of the most common violations is overdispersion, in which the variance of the dependent variable is larger than the conditional means. If overdispersion is present, estimates of the standard errors and confidence limits will be too small, leading to an artificially low p -value and overestimation of the statistical significance. Consequently, Poisson models must be diagnosed for overdispersion. A common test is the model Pearson-chi square to degrees of freedom ratio, which must be less than two. If it is greater than 2.0 overdispersion is present, suggesting Poisson regression is an inappropriate analytical technique. The Pearson chi-square to degrees of freedom test in the current study, as displayed in Table 4, suggest that overdispersion is not a problem for any of the regression models as the ratios were all well below 2.0.

Table 4 presents the results from the Poisson regressions for suicidal tendencies at each wave. Both age and race are significant in these models. Older juveniles are at slightly higher risk than younger children for suicide tendencies in waves 1 and 3, and those who are black are at less risk than white juveniles in waves 1 and 4. In addition, males are less likely to display suicidal tendencies than girls, but this relationship became non-significant once controls for the prior level of suicidal tendency were included in the models. As expected, current levels of depression increased reported suicidal thoughts and behaviors in all three waves.

Low self-control significantly predicted increasing suicidal tendencies in every wave and retained statistical significance even in the full models. This is therefore a conservative assessment of the importance of self-control in these analyses. By controlling for the previous wave's level of suicidal tendencies, this captures any other effects that contribute to this outcome that are not captured in the model. In other words, we may not know all of what contributes to the reported level of suicidal thoughts and behaviors in wave one. But, by controlling for the level of the dependent variable in the prior wave in each of our models, we are assessing the importance of self-control while controlling for unspecified causes of earlier suicidal tendencies. Since self-control does remain a significant predictor of suicidal tendencies at each wave, there is strong support for the importance of self-control in predicting the risk of suicidal thoughts and behaviors.

Discussion

This study was designed to determine whether self-control could be used to predict the tendencies toward suicide among a group of potentially high risk youth. By doing this we not only are able to potentially demonstrate the further power and scope of the theory but also to develop a better

understanding of the risks of this type of behavior in children and adolescents. Therefore, this study contributes to the theoretical literature on self-control while suggesting possible applications for social service workers and caregivers of children in protective services and the foster care system.

Based on our analyses, we argue that this general theory is supported as an explanation of behaviors that are analogous to crime, including suicide. The current study found that self-control predicted suicidal tendencies, even when controlling for depression and previous levels of suicidal tendencies. Those with lower self-control are at greater risk for displaying tendencies toward suicide. This indicates that if we can identify children who possess poor self-control at early ages, we may be able to minimize juvenile suicides through interventions designed to increase self-control.

The fact that self-control continued to predict suicidal tendencies, even when controlling for depression, is an important finding. Since self-control was measured based on the caregivers' knowledge about the child, we were not dependent on the child being able to express themselves, or being willing to talk about their feelings to a researcher, to assess whether they are at risk for suicide. In contrast, most measures of depression require reports from the individual and are limited to those who are old enough to understand the questions and respond appropriately. By drawing on a measure of self-control provided by someone other than the child, we could identify high risk youth from the reports of parents, caretakers, teachers, or other respondents who have regular contact with the child. Using a measure that is based on observed behaviors and impressions about the child, rather than requiring the child to report on their own depression, counselors and others can intervene and potentially help these children and youth at earlier ages and before symptoms of depression are obvious.

The CBCL, the basis of the measure of self-control in this study, has been applied to children as young as four years old (Achenbach 1991). Although self-control is not thought to reach a stable level until the child is a bit older, indicators of potential problems at these younger ages may allow caregivers to work specifically on building self-control in order to prevent not only suicidal tendencies and depression but a wide range of problematic behaviors. While most young children and adolescents would not normally be subjected to such tests, or be reachable for targeted interventions, the population that is the basis for the current study is regularly evaluated and does undergo counseling and other therapy. Specifically, when children are referred to child protective services, there is the opportunity to intervene in a way that can have substantial positive effects in the long-term outcomes for these children, in spite of the fact that the abuse or neglect they have encountered may put them at high risk for problem behaviors.

Our analyses also suggest poor self-control increases the risk for suicidal tendencies even while controlling for depressive symptoms. This is consistent with prior studies that compare adolescents with and without mental health disorders who commit suicide. Those studies found that youth without mental health problems were more likely to have had disciplinary and/or legal problems and more likely to have acted impulsively if an easily available method was at hand than adolescent suicides without mental health disorders (Brent et al. 1993; Marttunen et al. 1998). Moreover, studies have found that approximately 40% of suicide completers under the age of 16 did not appear to have to have any mental health disorder, but often acted impulsively depending on the availability of methods for suicide (Groholt et al. 1998; Shaffer et al. 1996). Therefore, identifying impulsive youth, through an assessment of low self-control, may be beneficial in catching some at risk youth who do not display other mental health symptoms.

One related area of future research is to examine the role of self-control in creating positive peer relationships. It is likely that youth with low self-control are more likely to have difficulty getting along with peers, which may lead to feeling depressed and suicidal, as prior research suggests (Hall-Lande et al. 2007). For example, Betts and Rotenberg (2007), argue that trust between peers requires the ability to plan for the future and control their behaviors. They found that children who have higher self-control were more able to build positive and stable relationships with their peers. In addition, past work outside criminology has found that interventions that increase self-control decrease depression (Fuchs and Rehm 1977; Kornblith et al. 1983). Thus, future work should

continue to more carefully assess the relationship between self-control, depression, and peer relationships.

Future studies should also investigate other factors that are relevant to suicide risk in this population. Children who are maltreated and removed from their home may be at increased risk of having low self-control due to inadequate parenting. Abuse and/or neglect may also cause or exacerbate underlying mental health disorders. Thus, it would be very beneficial for future research to examine the role of various types of maltreatment, the effects of continued maltreatment, and the effects of different types of placement on the risk of suicidal tendencies among maltreated children and youth.

One limitation of the current study is that the sample is not representative of the juvenile population. Instead, these are children who have been investigated by child protective services. Even if no maltreatment was verified in such investigations, the stress and intrusion into the family from this process may have a substantial impact on juveniles. For those who were abused or neglected, there is even greater risk of adverse effects from these experiences. In addition to coping with the actual experiences, these children may be removed from their homes and placed into various forms of foster care, or may undergo continued victimization within their homes of origin. Since these experiences have been found to increase the risk of suicide (Brent et al. 1994; Fergusson et al. 1996; Molnar et al. 2001), this is a fairly unique population. Thus, future research should apply the theory of self-control to a general juvenile population to assess the impact on suicidal ideation more broadly.

This study begins to shed light on suicidal tendencies among youth and adolescents by applying the general theory of crime to this problem. By being able to theoretically predict which youth are at high risk for suicide, it may be possible to intervene before other symptoms, such as depression, are apparent. While a great deal of future research needs to be conducted to explore the complex relationships between maltreatment, depression, and suicide, this study indicates that an examination of such processes needs to include an assessment of self-control.

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Appendix: Items and statistics for key variables

Self-control—wave 1

"Below is a list of items that describe children and youths. For each item that describes your child *now or within the past 6 months*, please fill in the bubble under 2 if the item is very true or often true of your child. Fill in the bubble under 1 if the item is somewhat or sometimes true of your child. If the item is not true of your child, fill in the bubble under 0."

	Factor	Scale statistics:
	Loading	Alpha = .901
Argues a lot	.692	N = 2527
Bragging, boasting	.545	Mean = 11.12
Can't concentrate, can't pay attention for long	.583	StDev = 7.31
Cruel to animals	.397	Min = 0
Cruelty, bullying, or meanness to others	.702	Max = 34
Demands a lot of attention	.634	
Destroys his/her own things	.587	
Doesn't seem to feel guilty after misbehaving	.564	
Gets hurt a lot, accident prone	.381	
Impulsive or acts without thinking	.748	
Lying or cheating	.669	
Showing off or clowning	.599	
Stubborn, sullen, or irritable	.718	
Sudden changes in mood or feelings	.686	
Temper tantrums or hot temper	.733	
Threatens people	.685	
Teases a lot	.619	

Children's depression inventory—waves 1, 3, and 4

Items either asked specifically on past two weeks, or just asked generally how the respondent has felt, with the following lead-in to the section.

"Kids sometimes have certain feelings and ideas. I am going to read 3 sentences and I want you to pick the sentence that comes the closest to saying how you have felt..."

Descriptions below indicating highest response category (coded toward increasing depression).

<i>Item</i>	Factor Loadings		
	Wave 1	Wave 3	Wave 4
I am sad all the time	.623	.622	.599
I do everything wrong	.619	.551	.585
Nothing is fun at all	.584	.504	.525
I am sure that terrible things will happen to me	.477	.464	.519
I do not want to be with people at all	.506	.478	.470
I look ugly	.578	.477	.455
I am tired all the time	.469	.516	.492
I worry about aches and pains all the time	.416	.425	.457
I feel alone all the time	.682	.671	.693
I do not have any friends	.522	.492	.562
I do very badly in subjects I used to be good in	.471	.432	.450
Nothing will ever work out for me	.531	.426	.428
I hate myself	.600	.386	.374
All bad things are my fault	.491	.305	.313
I feel like crying every day	.554	.458	.427
Things bother me all the time	.592	.498	.505
I have trouble sleeping every night	.457	.337	.369
I never have fun at school	.442	.352	.364
I can never be as good as other kids	.463	.377	.379
<i>Statistics</i>			
Alpha	.854	.784	.794
<i>n</i>	2293	2327	2643
Mean	26.37	31.41	31.17
St. Dev.	6.43	4.23	4.19

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