

Aspirations, Expectations and Delinquency: The Moderating Effect of Impulse Control

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Abstract Although prior research finds a robust link between delinquent behavior and expectations, or an adolescent's perceived likelihood of obtaining one's future goals, fewer studies have evaluated aspirations, or the perceived importance of achieving one's goals. In addition, few studies consider how individual traits such as impulsivity affect the degree to which expectations and aspirations motivate or deter delinquent behavior. We contribute to this body of research by evaluating the independent effects of expectations and aspirations, and the aspiration-expectation gap (i.e., strain) on delinquent behavior during the year following an adolescent's first arrest using a large ($N = 1117$), racially/ethnically diverse sample of male adolescents (46.55% Latino, 35.81% Black, 14.95% White, and 2.69% Other race). In addition, we considered how impulse control interacts with expectations, aspirations, and strain to motivate behavior. Our results indicated that both aspirations, expectations and strain uniquely influence criminal behavior. Importantly, aspirations interacted with impulse control, such that aspirations affected delinquency only among youth with higher impulse control. Our findings suggest that aspirations may only influence behavior if youth also have the psychosocial capabilities to consider their future aspirations when behaving in the present.

Keywords Aspirations · Expectations · Delinquency · Impulse control · First-time offenders

Introduction

Adolescence is a developmental period during which young people begin to think about and plan for their futures, thoughts which serve as important motivators of behavior (Massey et al. 2008). Future beliefs include both aspirations (i.e., the importance they ascribe to achieving their goals) and expectations (i.e., the perceived likelihood of achieving their goals). When youth hold hopeful expectations and aspirations about the future, they are relatively more likely to achieve greater academic success (Arbona 2000) and exhibit healthy behaviors (McDade et al. 2011) and they are less likely to abuse substances (Borowsky et al. 2009). Prior research considers how these findings extend to a prominent adolescent risk behavior: delinquency (e.g., Iselin et al. 2012; Chen and Vazsonyi 2011; Knight et al. 2016). Despite prior notions that expectations and aspirations fundamentally differ between delinquent and law-abiding youth (e.g., delinquent youth hold maladaptive expectations and aspirations) (Oyserman and Markus 1990), recent work suggests that considerable heterogeneity in future expectations and aspirations exists even among serious juvenile offenders (Iselin et al. 2012). Indeed, many adolescent offenders report high aspirations and expectations, despite their encounters with law enforcement (Iselin et al. 2012). Although prior research has not found a strong connection between aspirations and delinquency, studies have shown that having optimistic future expectations is correlated with

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lower rates of delinquency (Iselin et al. 2012, Knight et al. 2016).

Few studies distinguish between holding optimistic aspirations and expectations and demonstrating the psychosocial capacity to act in accordance with these beliefs. One of the most robust predictors of delinquency is impulsivity (Gottfredson and Hirschi 1990; Moffitt et al. 2011; Cauffman et al. 2005), and while adolescents may aspire and expect to obtain their goals, impulsive youth tend to disregard the future when behaving in the present. Adolescents' ability to control their impulses, therefore, may affect whether they successfully consider their aspirations and expectations in the heat of the moment. Few studies have considered how an adolescent's impulse control affects the degree to which one behaves in line with one's expectations and aspirations. The limited body of research evaluating expectations, aspirations and impulsivity typically report low to moderate correlations between constructs (Chen and Vazsonyi 2011; Nagin and Pogarsky 2004). The present study examined the interactive effects of impulsivity, expectations, and aspirations on delinquency among a sample of juvenile offenders.

Aspirations, Expectations, and Delinquency

Researchers typically distinguish aspirations and expectations as independent constructs. Although sometimes used interchangeably, aspirations and expectations analytically assess different aspects about future beliefs (Weiss 1961). Aspirations represent the importance one ascribes to achieving his or her future goals, whereas expectations represent an individual's perceived chances of attaining them (Knight et al. 2016). Despite the overlap among the two constructs, not all youth with optimistic aspirations hold similarly high expectations (Hanson 1994). For example, among 208 8th grade students, 47% of participants reported a one-level gap between their aspirations and expectations (e.g., aspiring to obtain a Bachelor's degree but expecting to obtain an Associate's degree, Kirk et al. 2012). Whereas some research considers both expectations and aspirations as important predictors of behavior (Iselin et al. 2012; Knight et al. 2016), others critique aspirations as "idealized hopes," and view expectations as "more probabilistic assessments of what is likely to come" (pg. 946, Baird et al. 2008). In line with this view, Reynolds and Pemberton (2001) argue that educational expectations represent more concrete, realistic future beliefs that serve as the necessary link between aspirations and actual achievement.

Empirical evidence identifies expectations as an influential and robust predictor of delinquent behavior. Adolescents with low expectations for their future perceive fewer dangers associated with risk taking (Harris et al.

2002), associate with more delinquent peers (Jackman and MacPhee 2015), and are more likely to engage in a range of minor and serious problem behaviors (Chen and Vazsonyi 2011). Although informative, these studies only measure adolescent expectations and not aspirations. Because expectations and aspirations represent unique constructs, it may be inaccurate to assume these factors similarly predict behavior. In one of the few studies to examine both expectations and aspirations and their association with offending and substance use, Knight and colleagues (2016) used data from the National Youth Survey, a sample of over 1400 adolescents. Participants indicated the importance and perceived chances of achieving important developmental goals such as having a good job or career, graduating from college, or getting married. Both low expectations and aspirations were correlated with concurrent offending and substance use, yet only expectations prospectively predicted these behaviors (Knight et al. 2016).

Iselin and colleagues (2012) evaluated expectations and aspirations among a sample of adolescent offenders, all of whom had been found guilty of a serious offense (in most cases, a felony-level offense). They found that expectations were a more robust predictor of hours of legal employment than were aspirations, yet only aspirations were significantly related to lower probabilities of having an illegal job. In addition, juvenile offenders with higher expectations reported fewer crimes the following year, whereas aspirations were only a marginally significant predictor of future re-offending. These findings partially support the notion that expectations, not aspirations, may be most useful when predicting delinquency. Importantly, both studies found some preliminary evidence for a relation between aspirations and offending, warranting additional research on this topic. Moreover, these findings underscore the importance of future expectations for juvenile offenders, a population typically understood as holding pessimistic views of their life chances (Oyserman and Markus 1990).

Researchers have also questioned whether the disjuncture between expectations and aspirations meaningfully predicts behavior. This idea received considerable attention among those testing criminological strain theories (Merton 1938; Cohen 1965; Cloward and Ohlin 2013). Early strain theorists argued that individuals who hold high aspirations for the future but acknowledge they are unlikely to achieve their goals are more likely to engage in crime because of the frustration associated with this realization (Agnew 1985). Importantly, these individuals will report higher delinquency compared than those reporting both low expectations and aspirations (Agnew 1985). Lacking empirical support and growing criticism (see Agnew 1992), Agnew revised the definition of strain to include indicators beyond the discrepancy between aspirations and expectations. Although revised strain perspectives consider additional

definitions of strain (e.g., the removal of positively valued goals; Agnew 1992) a recent report found that large differences between aspirations and expectations (i.e., higher strain) predicted drug use and offending over time (Knight et al. 2016). Evaluating the effects of strain in this manner provides the opportunity to understand the behavior of this unique group of individuals who report high aspirations, yet are not confident they will achieve their goals.

Aspirations, Expectations and Impulse Control

Beyond considering if future expectations, aspirations and strain are predictive of delinquency, another pertinent question to consider is *for whom* they matter most. Past literature has overwhelmingly emphasized the main effects of aspirations and expectations without considering the notion that these factors may be more effective motivators for some youth than others. The ability to control one's impulses is a capacity that may play an important role in determining whether expectations and aspirations genuinely influence behavior. Impulsivity is a consistent and strong predictor of juvenile crime (Cauffman et al. 2005; Moffitt et al. 2011) and may be key to understanding the inconsistent and often weak relations between aspirations and delinquency. That is, strong impulse control may be necessary for aspirations to exert influence on delinquency. In calm and non-emotional contexts, youth may acknowledge the importance of developmental goals such as attending college or supporting one's family. Impulsive youth, however, may not consider these aspirations during times when they need them most: in emotionally arousing situations. Because prior research focuses on the main effect of aspirations, we do not know how impulse control moderates the impact of these beliefs.

The interactive effects of aspirations and impulse control on adolescent behavior are not well understood. The limited studies that do evaluate interactions with impulse control focus on interactions with expectations, rather than aspirations. One analysis of Add Health data examined the interaction between future expectations and impulsivity in the prediction of both minor and more serious delinquent behaviors among a nationally representative sample of 7th–12th grade students ($N = 8657$) (Clinkinbeard 2013). They measured two aspects of future expectations: achievement/education expectations (e.g., likelihood of attending college) and health/mortality expectations (e.g., likelihood of living to age 35). Future educational expectations interacted with impulsivity, whereby expectations reduced delinquent behavior more strongly among youth with low impulse control (Clinkinbeard 2013). The cross-sectional data analysis limited the authors' interpretations, however, as the analyses could not account for prior levels

of offending (which may have influenced expectations, rather than the reverse).

To our knowledge, only one longitudinal study provides evidence that impulsivity moderates the association between expectations and problem behavior. Chen and Vazsonyi (2011) analyzed three waves of data from Add Health, including data from 1873 participants ranging between 11 and 21 years old across the three assessments. The relation between future expectations, assessed by youth's perceptions of the likelihood of living to the age of 35, being killed by age 21, and getting HIV or AIDS, and problem behaviors (both minor and serious) was stronger for youth with low impulse control (Chen and Vazsonyi 2011). In line with Clinkinbeard (2013), optimistic future expectations were particularly influential for youth low in impulse control. The authors did not include a measure of aspirations or strain, and therefore could not examine these interactions.

Current Study

The current study has three aims. First, we evaluate whether aspirations predict delinquency, above and beyond the effect of expectations. Next, we consider whether strain, as defined by the difference score between aspirations and expectations, similarly predicts delinquency. Finally, we assess the role impulse control plays in the relation between future expectations, aspirations, strain and delinquency. Similar to Clinkinbeard (2013) and Chen and Vazsonyi (2011), we evaluate the interactive effect of impulse control and expectations, but also extend this research and ask whether impulsivity also interacts with future aspirations and strain. Importantly, delinquent behavior was assessed for 1 year following the participants' first arrest, providing a longitudinal design to evaluate these questions.

We also extend previous work by examining the effects of future expectations, aspirations, strain and impulse control on the behavior of juvenile offenders, all of whom had recently been arrested for the first time. This sample is a particularly important group to examine considering that their recent experiences with the justice system leave them vulnerable to future offending and arrests (Huizinga et al. 2003; Liberman et al. 2014). Understanding the factors that deter continued crime among first-time offenders offers important implications for intervention. Compared to Add Health, this sample provides the opportunity to evaluate youth at high risk for future offending and who, as a group, likely commit offending at a greater level of severity. Based on prior research, we hypothesize that expectations will predict future offending, whereas associations between aspirations and offending will be weak or non-existent. In addition to the main effects of aspirations and expectations,

we expect strain (i.e., the aspiration-expectation gap) to predict delinquency, such that higher strain will predict higher levels of offending. Finally, we expect a significant interaction between impulse control and each future-oriented belief (i.e., expectations, aspirations and strain), such that high expectations, aspirations, and strain will reduce offending more strongly among youth with high impulse control. That is, high aspirations and expectations and low strain will do little to reduce delinquent behavior when unaccompanied by the psychosocial capacity to control one's impulses.

Method

Participants

The sample included 1216 male juvenile offenders, ages 13 to 17 ($M = 15.28$, $SD = 1.29$), from the Crossroads Study. Crossroads follows male adolescent offenders after their first official contact with the juvenile justice system. Each participant had been arrested for a range of low-level offenses, with the most frequent charges including vandalism (17.5%) and theft (16.7%). Approximately 18.2% of participants committed a violent index offense. Youth were sampled from three sites: Philadelphia, Pennsylvania ($N = 533$); Jefferson Parish, Louisiana ($N = 151$); and Orange County, California ($N = 532$). Consistent with the overrepresentation of racial/ethnic minority youth in the juvenile justice system, the sample was racially diverse: Latino (46.55%), Black (35.81%), White (14.95%), and Other race (2.69%).

Procedures

Signed parental consent and youth assent were obtained for all participants before interviews were conducted. Participants were informed of the nature of the study and were told that there was no penalty for not participating. The Institutional Review Board (IRB) at all three institutions approved the study procedures. Upon obtaining consent, youth completed an interview a maximum of 6 weeks after the disposition hearing for their first arrest, and follow-up interviews approximately 6 months and 12 months after their initial interview. Face-to-face interviews with the youth ranged from 2–3 h and were documented using a secure, computer-administered program at locations convenient for participants. A Privacy Certificate issued by the Department of Justice protects participants' privacy by exempting their responses and identity from subpoenas, court orders, or other types of involuntary disclosures. Participants were given a detailed explanation of the Privacy Certificate before beginning the interview and were

reminded again before sensitive questions were asked, such as questions about offending.

Measures

Demographic information

Youth self-reported general demographic information, including age and race. Youth also reported on the highest level of education that either of his parents had received, which was used as a proxy for socioeconomic status (Galobardes et al. 2007; Lynch and Kaplan 2000). Using this assessment strategy, adolescents in this age group produce accurate estimates of their parents' SES (see Lien et al. 2001). Approximately 29.9% of the sample did not have a parent who had graduated from high school, and 70.1% had at least one parent who had obtained at least a high school diploma. Age, race and parent education were statistically accounted for due to their relation to delinquency (Moffitt et al. 2002; Elliott and Ageton 1980; Wright et al. 1999, Agnew et al. 2008;). All demographics were recorded at the baseline interview.

IQ

During the baseline interview, The Wechsler Abbreviated Scale of Intelligence (WASI; Wechsler 1999) was administered to assess the participants' IQ. Participant IQ was included as a covariate due to the well-established relation between IQ and delinquency (Loeber et al. 2012). The WASI offers a brief and reliable measure of general intelligence that was formed using several subscales for the full Wechsler measure of intelligence and normed across the life span (Ryan et al. 2003). A full-scale IQ estimate was created by combining scores from the verbal ability scale (Vocabulary) and the performance ability scale (Matrix Reasoning). Studies have illustrated that the WASI yields strong psychometric properties, especially its strong convergent validity with more extended measures of intelligence in samples of adolescents (Canivez et al. 2009).

Impulse control

Impulse control was assessed at baseline interview using the 8-item Impulse Control subscale of the Weinberger Adjustment Inventory (WAI; Weinberger and Schwartz 1990). Participants were asked to assess how accurately (1 = *False* to 5 = *True*) each statement matched their behavior in the previous 6 months (e.g., "I say the first thing that comes into my mind without thinking enough about it", "I should try harder to control myself when I'm having fun"). The scale was coded such that higher scores indicate greater impulse control. The scale had good reliability ($\alpha = 0.74$).

Expectations and aspirations for the future

Expectations for the future were assessed at the baseline interview using the Perceptions of Opportunities measure to assess the adolescent's prediction of his future adult success (adapted from Menard and Elliott 1996). The 14-item measure (7 items relate to aspirations, 7 items relate to expectations) assesses the participants' importance of and perceived likelihood for achievement in domains relating to school, work, family, and law abiding behavior. Scales tap participants' Aspirations (e.g., "How important is it to you to have a good job or career?") and Expectations (e.g., "What do you think your chances are to earn a good living?"). Participants responded on a 5-point Likert scale ranging from "Not at all important/Poor" to "Very important/Excellent". The seven items for each scale were averaged to create composite expectations and aspirations subscales. Each scale demonstrated adequate reliability (aspirations $\alpha = 0.75$, expectations $\alpha = .89$). In addition, *strain* was calculated by subtracting the adolescents' expectations score from their aspiration score. Higher scores indicate a larger difference between one's aspirations and expectations. To assist with interpretation (and preclude negative difference scores), participants were excluded from the analyses if their expectations exceeded their aspirations ($N = 40$).

Self-reported offending

Offending behavior was assessed at three time points: the baseline, 6 month and 12 month interview using the Self-Report of Offending scale (SRO; Huizinga et al. 1991). At each interview, participants reported if they had been involved in any of 24 various criminal acts, ranging from selling drugs to homicide, at any point during the past 6-months. 6-month and 12-month data were combined to create a year-long composite variety score, and the baseline variety score was included as a covariate. The variety scores indicate the number of different types of offenses the youth had committed during the 6 months preceding each interview. The variety score approach has several advantages over summing how frequently youth offend. This methodology provides a consistent and valid estimate of involvement in illegal activity over a given recall period (Osgood et al. 2002). Variety scores are highly correlated with measures of seriousness of antisocial behavior yet present a lower risk of recall bias compared to self-reports of frequency of offending (Hindelang et al. 1981; Osgood et al. 2002). In addition, frequency outcomes tend to be poorly distributed, as the modal response for each of the behaviors tends to be zero, with only a small number of respondents engaging in the behavior many times (Osgood et al. 2002). Variety scores are the preferred method for summarizing individual criminality because they assess heterogeneity in

crime types, giving more weight to more serious behaviors that may be discounted if they occur less frequently than less serious behaviors (Sweeten 2012).

Analytic Plan

Because the dependent outcome is a count variable with a skewed distribution, ordinary least squares regression (OLS) would not be an appropriate method to analyze the data (Long 1997; Long and Freese 2003). Additionally, the distribution of the outcome was over dispersed by lower values, and the variance of the outcome exceeded the means ($M = 2.00$, Variance = 7.99). Therefore, negative binomial regression models were used to avoid violating the assumptions of a regression (Gardner et al. 1995). Results of likelihood ratio tests indicate that negative binomial regression were the most appropriate analyses for the data. Accordingly, negative binomial regression analyses were used to determine whether expectations, aspirations and strain predicted self-reported offending and were also used to test potential interactions with impulse control.

Negative binomial regressions were used to examine which independent variables were related to offending, accounting for age, IQ, parent education (dichotomous, with less than high school diploma as the comparison group), race (categorical, with White youth as the reference group), impulse control, and previous self-reported offending. In the first model (Model 1), aspirations, expectations, and the control variables were entered. Accounting for aspirations and expectations within the same statistical model enabled us to evaluate the independent effect of each predictor. For the second model (Model 2), strain and the control variables were entered. The final three models examined the interactions between each variable of interest and impulse control. Expectations was included as a control in Model 3 and aspirations was included as a control in Model 4. Model 5 included the interaction term between strain and impulse control. All variables included in the interaction terms (e.g., aspirations, expectations, strain and impulse control) were mean centered to reduce multicollinearity. Because the dependent variable was created using a composite of 6-month and 12-month interview data, only participants with re-offending data at both interviews ($N = 1117$) were included in the analyses.

Results

Descriptive statistics are presented in Table 1 and a bivariate correlation matrix between study variables is presented in Table 2. As noted in the table, aspirations and expectations were significantly correlated ($r = .48$, $p < .001$). Also as expected, both of the variables were

positively correlated with impulse control ($r = .17, p < .001$ and $r = .16, p < .001$, respectively) and negatively correlated with self-reported delinquency across the 12-month follow-up period ($r = -.23, p < .001$ and $r = -.26, p < .001$, respectively). The correlation coefficient between strain and impulse control ($r = -.07, p = .02$) and strain

and delinquency ($r = .18, p < .001$) were smaller in size, but statistically significant.

Results of the first negative binomial regression model indicate that both aspirations ($IRR = .82, SE = .07, p = .03$) and expectations ($IRR = .80, SE = .04, p < .001$) showed unique negative associations with offending (Table 3). Collinearity diagnostics indicated that variance inflation was not an issue ($VIFs < 1.3$). Strain showed a positive association with offending ($IRR = 1.31, SE = .07, p < .001$), such that higher strain was associated with higher offending.

In the next set of models, the interactions between impulse control and each future-oriented belief were analyzed. Results indicate that the interactions between impulse control and expectations ($p = .09$) and impulse control and strain were not significant ($p = .47$). However, the interaction between impulse control and aspirations was significant ($IRR = .72, SE = .07, p = .001$; Fig. 1), even after accounting for the same set of covariates as well as expectations (Table 4). Results of post-hoc simple slopes analyses indicate that the slope for youth with low (-1 SD) impulse control was not significantly different from zero ($dydx = -.02, SE = .26, CI = -.52, .49, p = .95$). The slope for those with mean level of impulse control was significantly different than zero ($dydx = -.62, SE = .21, CI = -1.03, -.21, p = .003$), as was the slope for those high ($+1$ SD) in impulse control ($dydx = -1.12, SE = .34, CI = -1.78, -.45, p = .001$). In other words, a one-unit increase in aspirations was associated with a 0.62 unit decrease in offending for youth with average impulse control, and a 1.12 unit decrease in offending for youth with high impulse control.

As a check for robustness, we fit supplementary models in which the sample was split into tertiles based on scores for impulse control. These analyses provide additional information on the nature of the effect that aspirations have on offending at varying levels of impulse control (i.e., the bottom, middle and upper 33% of the distribution). The supplementary analyses confirmed Model 3, as we

Table 1 Descriptive statistics

Demographics		
Age		
M(SD), range	15.3(1.28)	13–18
Race (%)		
White	14.95%	
Black	35.81%	
Latino	46.55%	
Other	2.69%	
IQ		
M(SD), range	88.51 (11.65)	55–128
Parent education (%)		
Less than a high school degree	29.05%	
More than a high school degree	70.95%	
Impulse control		
M(SD), range	3.24 (.86)	1–5
Aspirations		
M(SD), range	4.67 (.45)	2.14–5
Expectations		
M(SD), range	3.79 (.80)	1.14–5
Strain		
M(SD), range	.92(.68)	0–3.28
Offending		
Prior offending		
M(SD), range	1.49 (2.12)	0–17
One year offending		
M(SD), range	2.00 (2.83)	0–18

Table 2 Bivariate correlation matrix between study variables

	1	2	3	4	5	6	7	8
1. Age	–							
2. IQ	.06	–						
3. Parent education	.05	.14***	–					
4. Baseline offending	.09**	.08**	.04	–				
5. One year offending	.03	–.004	–.01	.51***	–			
6. Impulse control	–.01	.03	–.03	–.30***	–.23***	–		
7. Aspirations	–.05	.01	.05	–.19***	–.23***	.17***	–	
8. Expectations	–.10***	–.09**	.09**	–.23***	–.26***	.16***	.48***	–
9. Strain	.07*	.10**	–.07*	.13***	.18***	–.07*	–	–

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

Table 3 Negative binomial regression results for predicting self-reported offending 1 year later

	Model 1			Model 2		
	IRR (SE)	95% CI	<i>b</i>	IRR (SE)	95% CI	<i>b</i>
Latino ^a	.99 (.11)	.79, 1.23	-.01	.98(.03)	.78, 1.24	-.01
Black ^a	.94 (.11)	.75, 1.18	-.06	.90(.11)	.71, 1.14	-.11
Other ^a	.86 (.21)	.54, 1.40	-.15	.86(.21)	.53, 1.40	-.15
Age	.96 (.03)	.91, 1.02	-.04	.97(.03)	.91, 1.03	-.03
IQ	.995 (.003)	.99, 1.00	-.01	.995(.003)	.99, 1.00	-.004
Parent Education ^b	1.01 (.09)	.85, 1.20	.01	.97(.09)	.83, 1.19	-.003
Baseline Offending	1.20 (.02)***	1.16, 1.25	.19	1.23(.02)***	1.18, 1.28	.21
Impulse Control	.83 (.04)***	.76,.92	-.18	.81(.04)***	.73,.89	-.21
Aspirations	.82 (.07)*	.69,.98	-.20			
Expectations	.80 (.04)***	.72,.89	-.22			
Strain				1.31(.07)***	1.17, 1.46	.27
LR χ^2	256.18			246.02		
Pseudo R ²	.06			.06		

IRR Incident risk ratio

^a Reference group is White

^b Reference group is “Less than high school diploma”

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

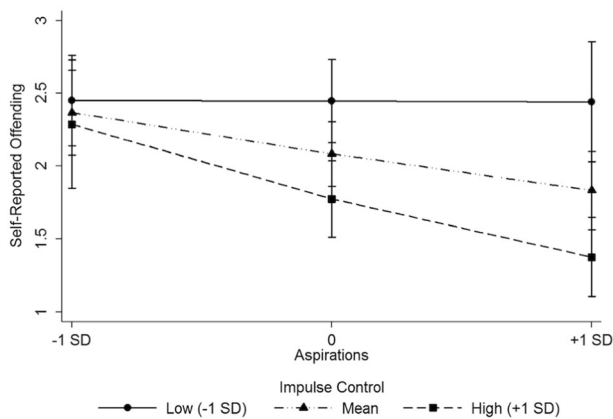


Fig. 1 Interaction of youth impulse control and aspirations for the future. Note. Controls are expectations, prior self-reported offending, age, IQ, parental education, and race/ethnicity

found that interaction between impulse control group membership and aspirations was significant ($p = .04$), indicating that the slope of aspirations is different for at least one of the impulse control groups. Results of post-hoc simple slopes analyses indicate that the slopes for the low ($dydx = -.08$, $SE = .30$, $CI = -.66, .50$, $p = .79$) and medium impulse control groups ($dydx = -.48$, $SE = .33$, $CI = -1.12, .16$, $p = .14$) were not significantly different from zero. However, the slope for those high in impulse control was significantly different than zero ($dydx = -1.07$, $SE = .45$, $CI = -1.95, -.20$, $p = .02$). Specifically, a one-

unit increase in aspirations was associated with a 1.07 unit decrease in offending for youth with high impulse control. The interaction between impulse control and expectations, as well as strain and impulse control, was not significant.

Follow-up analyses also were conducted to evaluate whether differences in offending significantly differed among the three impulse control groups at specific aspiration levels (low, average and high). Results showed that among those with low (-1 SD) aspirations, there were no significant differences in offending between the high and low ($p = .18$), the high and medium ($p = .18$), or the medium and low impulse control groups ($p = .93$). Among those with average aspirations, there were significant differences in reoffending between the high and medium impulse control groups ($dydx = -.87$, $SE = .18$, $CI = -1.22, -.51$, $p < .001$) and the high and low impulse control group ($dydx = -.70$, $SE = .18$, $CI = -1.06, -.34$, $p < .001$). The medium and low impulse control groups did not significantly differ in offending ($p = .42$). Among those with high ($+1$ SD) aspirations, there were significant differences in offending between the high and medium impulse control groups ($dydx = -.87$, $SE = .23$, $CI = -1.32, -.45$, $p < .001$) and the high and low impulse control groups ($dydx = -1.21$, $SE = .24$, $CI = -1.68, -.73$, $p < .001$). The medium and low impulse control groups did not significantly differ in offending ($p = .23$). The differences between the high and medium and the high and low groups are depicted in Fig. 2 (significant differences between the groups exist where the confidence intervals do not overlap with zero).

Table 4 Negative binomial regression interaction results for predicting self-reported offending 1 year later

	Model 3			Model 4			Model 5		
	IRR(SE)	95% CI	<i>b</i>	IRR	95% CI	<i>b</i>	IRR	95% CI	<i>b</i>
Latino ^a	1.02(.12)	.82, 1.28	.02	.996(.11)	.80, 1.24	-.003	.99(.12)	.78, 1.24	-.01
Black ^a	.96(.11)	.76, 1.20	-.04	.94(.11)	.75, 1.18	-.06	.90(.11)	.71, 1.14	-.11
Other ^a	.87(.21)	.54, 1.40	-.14	.89(.22)	.55, 1.44	-.12	.87(.22)	.53, 1.42	-.14
Age	.96(.03)	.90, 1.01	-.04	.96(.03)	.91, 1.02	-.04	.97(.03)	.91, 1.03	-.03
IQ	.995(.11)	.99, 1.00	-.005	.995(.003)	.99, 1.00	-.005	.99(.003)	.99, 1.00	-.005
Parent Education ^b	1.03(.09)	.86, 1.22	.03	1.01(.09)	.85, 1.21	.01	1.00(.09)	.83, 1.20	-.001
Baseline Offending	1.21(.02)***	1.16, 1.25	.19	1.21(.02)***	1.16, 1.25	.19	1.23(.02)***	1.18, 1.28	.21
Impulse Control	.83(.04)***	.76, .91	-.19	.83(.04)***	.76, .91	-.19	.81(.04)***	.73, .89	-.21
Aspirations	.75(.07)**	.63, .90	-.28	.81(.07)*	.67, .96	-.22			
Expectations	.80(.04)***	.72, .89	-.22	.80(.04)***	.72, .87	-.23			
Strain							1.31(.07)***	1.17, 1.47	.27
Aspirations x IC	.72(.07)***	.59, .88	-.33						
Expectations x IC				.91	.82, 1.01	-.09			
Strain x IC							1.05(.07)	.92, 1.21	.05
LR χ^2	267.00***			259.06***			246.54***		
Pseudo R ²	.0651			.0631			.028		

IRR incident risk ratio, IC impulse control

^a Reference group is White

^b Reference group is "Less than high school diploma"

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

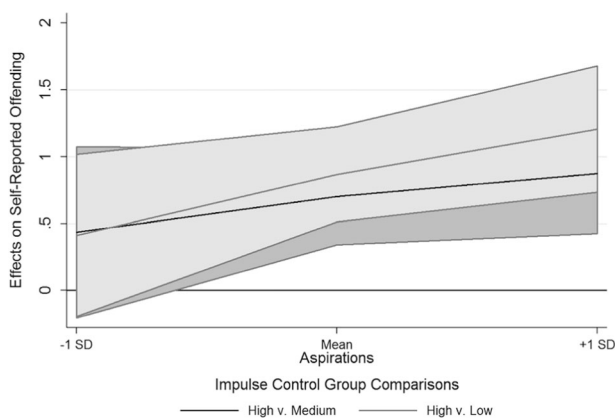


Fig. 2 Differences in offending between the high vs. medium and high vs. low impulse control at varying levels of aspirations. *Note.* Significant differences between groups exist when the confidence intervals do not overlap with zero. Confidence Intervals for high v. medium impulse control group comparisons are in *dark gray*

Discussion

A large body of evidence supports the notion that optimistic aspirations and expectations reduce risk behaviors, including sexual risk taking (Sipsma et al. 2013), smoking

cigarettes (McDade et al. 2011), and a host of other problem behaviors (Chen and Vazsonyi 2011; Iselin et al. 2012). In line with this research, the current study finds that aspirations and expectations each predicted delinquent behavior 1 year following an adolescent's first arrest. Juvenile offenders who reported future goals as important and who were confident that they would achieve these goals engaged in less crime, suggesting these beliefs indeed influence behavior. These results remained even after accounting for several potentially confounding variables, including impulse control and prior delinquency.

The present findings align with past literature on the importance of both future expectations and impulse control in predicting delinquency. Youth with more optimistic expectations were less likely to engage in crime, a finding which suggests that adolescents who perceive their future goals as possible and likely report less criminal behavior (Iselin et al. 2012; Knight et al. 2016). Greater impulse control was also associated with less delinquent behavior, another finding worth emphasizing. Criminological theories such as Gottfredson and Hirschi's (1990) General Theory of Crime have long recognized the importance of impulse control as a predictor of delinquency, a relation confirmed in many previous studies (e.g., Cauffman et al. 2005; Moffitt et al. 2011; White et al. 1994). Interventions should

continue to target impulse control and help adolescents develop skills relating to self-control to reduce delinquent behaviors. In fact, a recent meta-analysis evaluated the effectiveness of behavioral interventions targeting self-control and concluded that these programs not only improve self-control, but reduce delinquency among children and adolescents (Piquero et al. 2016).

In contrast to prior research, we found that aspirations predicted delinquency above and beyond the effect of expectations. However, we found that aspirations may not be equally influential for all young people. The results of our study indicate that having optimistic aspirations for the future was associated with lower levels of offending only among youth with relatively higher impulse control. For youth low in impulse control, aspirations appeared to have little influence. Adolescents who have difficulty suppressing their impulses may not be able to use their future aspirations to guide their behavior when deciding whether to commit a crime. Because crime typically occurs during unplanned and emotionally arousing situations, aspirations may not substantially deter more impulsive youth.

Interestingly, our hypothesis that impulse control would moderate the effect of future expectations on delinquency was not supported. These findings conflict with prior research, which reports that a significant interaction between future expectations and impulse control (Chen and Vazsonyi 2011). Several distinctions between the two studies are worth noting. Chen and Vazsonyi's (2011) measure of future life expectations focuses on indicators relating to life expectancy (e.g., how old an adolescent expects to live), a measure quite different from the present measure, which consists of items relating to the likelihood of achieving future goals such as attending college or obtaining a good job. In addition, the authors analyze data from Add Health, a nationally representative sample of high school students, a group vastly different from the current sample of male, first-time juvenile offenders. Not only do these samples vary across race/ethnicity (66% non-Hispanic white compared to 14%) and gender, they also vary in regards to their recent contact with the justice system. Whether these or other methodological differences account for the inconsistent findings awaits further research. However, it is important that future expectations were associated with fewer future offenses and this was not confined to only those high on impulse control.

Because expectations, compared to aspirations, may serve as more realistic indicators of one's future (Reynolds and Pemberton 2001), it is possible that expectations motivate behavior more consistently, even among youth with poor impulse control. Further, we measured aspirations by asking youth how important they rate a future goal. The generally high scores on this scale in our sample suggests that most juvenile offenders readily acknowledge the value

of achieving important developmental goals. Although youth may recognize the importance of these goals, however, they may fail to consider whether they behave in ways that are consistent with their goals. In contrast, youth who expect to achieve their goals may already have a plan in place and more easily recognize the incongruity between optimistic expectations and crime.

In addition to the independent effects of aspirations and expectations, the current study assessed strain by calculating a difference score between the two variables. Although youth who hold both low aspirations and expectations are vulnerable for future offending, youth who aspire high yet expect little may also be at risk for reckless behavior. Indeed, we found that higher strain (i.e., a larger discrepancy among aspirations and expectations) predicted higher delinquency 1 year later, a finding that aligns with a recent study that similarly evaluated the aspiration-expectation difference score (Knight et al. 2016). Due to criticism related to Strain Theory (Agnew 1992), few recent studies have evaluated this difference score in relation to delinquency. The current findings suggest that future research should continue to explore the utility of this variable.

There are several strengths of this study worth noting. The present study builds on the body of literature examining the relation between expectations, aspirations and delinquency. Longitudinal data provided the opportunity to establish temporal ordering between the constructs of interest, an important study feature, because it is likely that engagement in criminal behavior affects adolescents' beliefs about the future (and not just the reverse). Our focus on aspirations and expectations specifically in a large sample of first-time juvenile offenders is an additional strength. First arrests are significant predictors of negative life outcomes, such as dropping out of high school (Sweeten 2006). Therefore, it is important that we expand our understanding of how enhancing juvenile offenders' aspirations and expectations may protect this vulnerable population. Because juvenile crime is associated with the slower development of impulse control and other indicators of psychosocial maturity (Monahan et al. 2013), reinforcing future expectations among this sample may be a helpful way to counteract the risk associated with poor impulse control. Although impulse control strengthens as juvenile offenders age (Monahan et al. 2013), interventions may consider targeting delinquency through alternative mechanisms (e.g., increasing expectations for a successful future) while this psychosocial capacity is still developing.

Evaluating aspirations and expectations among a sample of first-time offenders serves as both a strength and a limitation of this study. Although the current study expands on prior research examining similar constructs within nationally representative samples of adolescents (e.g., Add

Health), the current study's findings may not generalize to broader adolescent populations. That is, all participants had been arrested shortly before they reported their aspirations and expectations. These recent interactions with the justice system may have affected their aspirations and expectations, a possibility to consider when interpreting the current findings. Future research should examine how changes in aspirations and expectations after a first arrest subsequently affect delinquent behavior, an important question the current study cannot address.

Several additional limitations require discussion. Participants reported on all major constructs of interest: aspirations, expectations, impulse control, and delinquency. The sole use of self-report measures creates the potential problem of shared method variance; future research should assess these constructs using multiple raters and other assessment methods (e.g., behavioral indicators of impulsivity; official records of rearrests). Second, although our measure of expectations and aspirations aligns with recent research (Iselin et al. 2012; Knight et al. 2016) other researchers have defined expectations using alternative indicators, such as life expectancy (Harris et al. 2002), future orientation (Stoddard et al. 2011) and measures of aspirations that assess an adolescents' hope or ambition of achieving a goal (Kirk et al. 2012). Thus, the current findings may not generalize to alternative definitions of expectations and aspirations. Prior research also indicates some important gender differences regarding future aspirations and expectations (see Massey et al. 2008 for a review). Because the current sample is limited to males, the present analyses cannot address this topic. Finally, although the longitudinal design of the present study improves upon cross-sectional research, a 1-year follow up is a relatively short period. Future research should apply a developmental approach to these questions and evaluate the moderating effect of impulsivity as youth age, particularly as impulse control improves.

Conclusions

Adolescence is an important developmental period during which youth begin to think about and plan for their future, thoughts that ultimately prompt both healthy and maladaptive behaviors (see Massey et al. 2008). Youth who have been arrested face a unique set of challenges, as early arrests put youth at risk for continued law enforcement contact (Lieberman et al. 2014). We found that high expectations, aspirations, impulse control and low strain all uniquely predicted lower levels of self-reported offending during the year following a first arrest. Further, while impulse control did not moderate the relation between expectations and delinquency or strain and delinquency, it did influence

aspirations. Specifically, high aspirations reduced delinquency only among youth with high impulse control. Thus, encouraging positive aspirations may only benefit youth who are less impulsive, whereas improving impulse control may be more important for other youth. Finally, it is worth highlighting that the expectations and aspirations of juvenile offenders are typically characterized as negative and pessimistic (Oyserman and Markus 1990). The present study, along with recent research on the future beliefs of juvenile offenders (Iselin et al. 2012), depicts a different picture. Many juvenile offenders, at least first-time offenders, have high aspirations and expectations for their futures. Rather than dismiss the expectations and aspirations of juvenile offenders as unrealistic, future research and interventions should focus on helping youth channel their expectations and aspirations when they are most needed.

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Authors' Contributions Each author made substantial contributions to the present study. A.M. conceived of the study idea, performed the statistical analysis, and drafted the manuscript; C.S. aided in the statistical analysis and helped draft the manuscript; P.F. and L.S. participated in the design and coordination of the study, helped revise the manuscript and provided expert advice on adolescent development and delinquency. E.C. participated in the design and coordination of the study, revised the manuscript, and provided expert knowledge on adolescent psychosocial development.

Conflict of Interest The authors declare that they have no competing interests.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standard.

Informed Consent Informed consent was obtained from all individual participants included in the study.

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