

Does Mother Know Best? Adolescent and Mother Reports of Impulsivity and Subsequent Delinquency

Jordan Bechtold · Caitlin Cavanagh ·
Elizabeth P. Shulman · Elizabeth Cauffman

Received: 5 August 2013 / Accepted: 5 December 2013
© Springer Science+Business Media New York 2013

Abstract Although impulsivity is one of the strongest psychological predictors of crime, it is unclear how well impulsivity, measured at a specific moment in adolescence, predicts criminal behavior months or years into the future. The present study investigated how far into the future self-reports and parents' reports of a youth's impulsivity predicted whether he engaged in illegal behavior, whether one reporter's assessment was more predictive than the other's, and whether there is value in obtaining multiple reports. Data were obtained from a 6-year longitudinal study of adjudicated juvenile offenders ($n = 701$ mother-son dyads). Youth ($m = 15.93$ years old; $sd = 1.14$) and their mothers independently reported on adolescents' impulsivity at the initial assessment. We examined the prospective correlation of these measures with illegal behavior, assessed by official records of arrests and youths' self-reports of offending across the 72-month study period. Youths' and mothers' reports of the adolescents' impulsivity were weakly, but significantly, correlated with one another. Furthermore, mothers' ratings of their sons' impulsivity predicted arrest up to 6 years into the future, whereas youths' reports did not significantly predict arrest beyond 30 months. With respect to youths' self-reports of offending, mothers' ratings of impulsivity again predicted farther

into the future (as late as 6 years later) than did youths' self-reports of impulsivity, which were not predictive beyond 4 years. However, across the first 4 years, youths' self-reports of impulsivity explained more variance in self-reported offending than did mothers' ratings. The results underscore the endurance of the predictive utility of an assessment of impulsivity and the importance (and accuracy) of parents' reports of developmental constructs, even when their children are adolescents.

Keywords Parental reports · Adolescence · Impulsivity · Risk assessment · Delinquency

Introduction

Impulsivity is one of the strongest psychological predictors of crime (e.g., Gottfredson and Hirschi 1990; Farrington 1995; Cruise et al. 2008). It is not surprising, therefore, that measures designed to gauge risk of offending assess impulsivity (Langton 2006; Mulvey and Iselin 2008). However, adolescence is a period of growth in impulse control (Steinberg et al. 2008). It is therefore unclear how well impulsivity, measured at a specific moment in adolescence, serves as a predictor of criminal behavior months or years into the future. Another consideration with respect to using impulsivity to predict future offending is whether there is value in obtaining information from multiple reporters.

Because of concerns related to adolescents' perspicacity and self-insight, many assessments and protocols call for multi-informant and multi-method assessments, including parents' reports of psychological constructs, like impulsivity (Achenbach et al. 1987; Kraemer et al. 2003; Tackett 2011). Probation officers, for example, typically solicit

J. Bechtold (✉) · C. Cavanagh · E. Cauffman
Department of Psychology and Social Behavior, University of California, 4201 Social and Behavioral Sciences Gateway,
Irvine, CA 92697-7085, USA
e-mail: jbechtol@uci.edu

E. P. Shulman
University of Pennsylvania, Philadelphia, PA, USA

E. P. Shulman
Temple University, Philadelphia, PA, USA

parental reports on youths' behaviors and characteristics before making treatment and sanction recommendations to the court. Whether parents are useful reporters of their adolescent children's developmental traits, such as impulsivity, remains unknown. Understanding the degree to which self-reports and parental reports of impulsivity predict later offending is informative for juvenile justice practitioners. More accurate assessment of recidivism risk could improve intervention efforts.

The present study seeks to identify how far into the future self-reports and parental reports of youths' impulsivity can predict whether a youth engages in illegal behavior. We also test whether there is increased explanatory power when both reporters' assessments are used to predict law-breaking. We test our research questions in a sample of known delinquents. This sample is advantageous because the arrest rate for the population of American 10–17 year olds is low—less than 6 % (OJJDP 2009). The recidivism rate for juvenile offenders is much higher; therefore, sampling this population helps to ensure a high enough rate of illegal behavior to permit statistical analysis (Snyder and Sickmund 2006).

Our analysis considers two different measures of antisocial behavior: youth self-reports and official court records. It is important to include self-report in addition to official evidence of law-breaking because most illegal behavior among adolescents goes undetected by law enforcement (Farrington et al. 2003). Self-reports are likely to capture these undetected illegal acts and, therefore, may serve as a more accurate measure of law-breaking behavior (Maxfield et al. 2000). The correlation between self-reports and official arrest data is often relatively low ($r = .22$; Monahan et al. 2009). Consequently, using both self-reports and official arrest data allows us to capture two unique measures of antisocial and illegal behavior.

The relationship between impulsivity and criminal behavior is noncontroversial: prior theory and research in psychological and criminological fields consistently indicate that highly impulsive adolescents begin offending earlier (Carroll et al. 2006) and engage in more delinquent behavior (e.g., Farrington 1995; Pratt and Cullen 2000; Watt et al. 2004) than those who are less impulsive. Indeed, Gottfredson and Hirschi's classic General Theory of Crime (1990, 1993) suggests that deficits in self-control and a heightened focus on immediate gratification—defining features of impulsivity—might be the only individual psychological variables that contribute to antisocial behavior. A recent analysis of data from the same longitudinal study of serious juvenile offenders used in the present study bore out the strong relationship between impulsivity and offending: youths whose impulsivity remained high were more likely to continue offending than those whose impulsivity declined (Monahan et al. 2009).

Given the scientific consensus on the relationship between impulsivity and antisocial behavior, the question is not *whether* measures of impulsivity can predict crime, but rather (1) how far into the future a single measure of impulsivity can predict criminal behavior; and (2) whether parents' perspective adds any unique predictive power above and beyond youths' self-reports.

Parents are often called upon to make important judgments for and about their children. Just as parents make physical health judgments (e.g., to report a child's physical symptoms to doctors), parents are also called upon to report on their children's mental health (e.g., Kendall and Flannery-Schroeder 1998). Furthermore, although there are many situations that require parents to do so, little is known about the accuracy with which parents report on characteristics that change with development during adolescence, like impulsivity. Consequently, it is unclear whether parents' reports of their adolescent children's impulsivity are actually predictive of the children's subsequent behavior. Do parents, as conventional wisdom holds, know their child best when it comes to developmental characteristics? Parents might have more information than their children from which to base an assessment of impulsivity. Also, they view their children's behaviors from an outside perspective and are not subject to self-reflection biases (though, surely, parents cannot be regarded as objective). Furthermore, parental reports may be more accurate than self-reports if immature psychosocial capacities interfere with adolescents' self-perception (e.g., Wasserman et al. 2004).

The use of parental reports has long been supported in diagnosing child psychopathology (e.g., Kendall and Flannery-Schroeder 1998). Meta-analytic data suggests that parents are consistent with other reporters (i.e., parents, teachers, and youth) when diagnosing externalizing symptomatology (e.g., delinquency, antisocial behavior, and aggression; Duhig et al. 2000). Prior mental health studies also find agreement between parent and child reports with respect to symptomatology when participants are asked to report on concrete and observable behavioral indicators of internalizing disorders (Herjanic and Reich 1982). Also relevant is the observation that, whereas parents are reliable reporters of their children's externalizing symptomatology, they appear to be poorer at recognizing their children's internalizing symptoms (e.g., Kolko and Kazdin 1993; Youngstrom et al. 2000).

Though some aspects of impulsivity are demonstrated overtly (e.g., outwardly expressed behaviors, thoughts, and actions without evidence of forethought; Weinberger and Schwartz 1990), other features of impulsivity reflect internal thought processes and cognitive faculties (inhibited or controlled behaviors, thoughts, and actions; Weinberger and Schwartz 1990). In other words, impulsivity has

both external and internal components. Given parents' relative difficulty in perceiving internal characteristics of their adolescent children's psychopathologies, it is possible that parents would have difficulties assessing internal aspects of their children's impulsivity. Thus, it remains unclear whether parents would be useful reporters of adolescents' impulsivity.

It may be challenging for parents to report on impulsivity in their adolescent children, not only because impulsivity is partly internal, but also because it is a moving target. Generally, the capacity to control one's impulses develops gradually across adolescence and young adulthood, and is usually not fully mature until the mid-20 s (Steinberg 2007; Strang et al. 2013). However, the development of impulse control progresses at different rates for different individuals and, for any given adolescent, may advance in fits and starts (Steinberg and Morris 2001). The dynamic nature of impulsivity may make it difficult for parents to assess it accurately in their children. Though this question has not been directly addressed in prior work with respect to impulsivity, a study of parental and child expectations for the onset of developmental milestones found that parents consistently estimated later initiation of the developmental factors than did children (Dekovic et al. 1997). Furthermore, follow-up studies of young children with ADHD, find that parental reports and self-reports of ADHD symptoms in early adulthood may be highly discrepant (Barkley et al. 2002). These studies have indicated that parents and youth view ADHD symptoms differently. Particularly, parental reports of ADHD symptoms in adolescence reflect greater ADHD-related impairment than do self-reports (Hinshaw et al. 2012). However, parents may be differentially attuned to certain types of symptoms during adolescence; over time, parents reported fewer impulsivity-related traits, but steady levels of inattention (Hinshaw et al. 2006).

Present Study

The present study is a prospective longitudinal study that followed adjudicated juvenile offenders for 6 years (72 months). Youth and their mothers reported independently on the adolescents' impulsivity at the initial assessment, which occurred between November, 2000 and January, 2003. We examine the prospective correlation of these measures with illegal behavior across the full length of the study. To gauge illegal behavior, we use two approaches: self-reports of offending and official records of arrest. Our goals are (1) to determine how far into the future initial assessments of impulsivity predict offending, (2) to investigate whether youths' or their mothers' reports are more accurate predictors of crime, and (3) to assess the value of obtaining multiple reports.

Because of ongoing development in impulse control during adolescence, we hypothesize that impulsivity will only predict offending in the short term. Also, because impulsivity (and changes in impulsivity) are only partly detectable to outside observers, we expect that self-reports of impulsivity will be more sensitive and therefore more predictive of self-reported offending and arrests than will be parents' reports. However, because different reporters are likely to be attuned to different aspects of development, we hypothesize that models that include mothers' reports of impulsivity, in addition to youths' reports of impulsivity, will be significantly better than models that only include youths' reports.

Method

Participants

Assessments of 701 male juvenile offenders (19.4 % White, 40.5 % Black, 36.1 % Hispanic, 4 % other) and their biological mothers were obtained from the Pathways to Desistance study (for details of the study methodology, see Schubert et al. 2004). Analyses were limited to mother-son dyads to eliminate potential sources of between-subject differences and because mothers were the most common collateral respondents. Over 67 % of respondents were biological mothers, compared to 11 % who were biological fathers; the remaining collateral interview respondents were biological grandmothers (6.8 %), aunts (3.7 %), biological sisters (3.4 %), adoptive mothers (1.1 %), or other (e.g., biological brother, biological grandfather, stepfather, stepmother, friend, girlfriend; all categories <1 %).

Juvenile offenders in Maricopa County, Arizona and Philadelphia, Pennsylvania were eligible for study participation if they were 14 to 17 at the time of the offense and had been adjudicated delinquent for a felony offense or similarly serious non-felony offense (e.g., misdemeanor weapons offense). At the time of the baseline interview, youth in the sample were, on average, 15.93 (*sd*: 1.16) years old and had an average of 3.33 (*sd*: 2.32; range: 1–15) prior arrests. The average age of first arrest was 14.76 (*sd*: 1.66). Of the mothers, approximately 42.8 % never graduated from high school, 25.8 % received a high school diploma, 6.7 % went to business or trade school, 19.3 % received some college education or graduated from a 2-year college, and about 5 % graduated from a 4-year college. Approximately 18 % of mothers self-reported having been arrested or jailed at least once in their lifetime. The sample used in the present study did not differ from the entire Pathways sample on demographic or study variables (see Table 1).

Table 1 Descriptive statistics for analytic sample and complete pathways sample

	Analytic sample (n = 701)	Complete sample (n = 1,354)
Demographics		
Age of youth at baseline <i>m</i> (<i>sd</i>)	15.9 (1.2)	16.04 (1.1)
Range	14–18	14–18
Race and ethnicity		
% White	19.4	20.2
% Black	40.5	41.4
% Hispanic	36.1	33.5
% Other	4.0	4.8
Prior arrests <i>m</i> (<i>sd</i>)	3.3 (2.3)	3.2 (2.2)
Age of first prior arrest	14.8 (1.7)	14.9 (1.6)
Impulsivity assessments: <i>m</i> (<i>sd</i>)		
Youths' reports	3.0 (1.0)	3.0 (1.0)
Mothers' reports ^a	3.0 (.9)	3.1 (.9)
Official arrest records		
% Arrested @ 6 mo.	17.4	15.7
% Arrested @ 12 mo.	18.5	16.5
% Arrested @ 18 mo.	19.3	17.6
% Arrested @ 24 mo.	22.3	20.2
% Arrested @ 30 mo.	20.7	17.7
% Arrested @ 36 mo.	19.7	17.4
% Arrested @ 48 mo.	19.3	17.4
% Arrested @ 60 mo.	21.4	17.8
% Arrested @ 72 mo.	16.6	15.2
Youth self-reports of offending		
% Offended @ 6 mo.	60.8	58.7
% Offended @ 12 mo.	54.4	51.3
% Offended @ 18 mo.	49.4	47.3
% Offended @ 24 mo.	47.8	44.8
% Offended @ 30 mo.	39.6	38.4
% Offended @ 36 mo.	39.0	38.7
% Offended @ 48 mo.	47.9	45.9
% Offended @ 60 mo.	45.9	44.0
% Offended @ 72 mo.	42.3	40.8

^a Note that collateral reporters for the complete sample consisted of biological mothers (67.8 %), biological fathers (11.0 %), biological grandmothers (6.8 %), Aunts (3.7 %), biological sisters (3.4 %), or other (e.g., adoptive parents, stepparents, foster parents, cousins)

Procedures

Trained research personnel monitored court records and eligible participants were recruited immediately following adjudication. Twenty percent of youth (or their parents) declined to participate in the study. After parent consent and youth assent were obtained, mother-son dyads were interviewed separately at a convenient location for interviewees

[e.g., participant's home, secure facility (if confined), convenient location in participant's neighborhood]. The baseline interview consisted of a variety of background, behavioral, and psychological assessments and typically lasted about four hours (administered over two consecutive days). Follow-up interviews assessed similar measures, lasted approximately 2 hours, and were conducted every 6 months for the first 3 years of study enrollment and annually for 3 years after that (total of eight waves of data across 6 years). Court records of arrests were also obtained from each site at each time point. Youth and mothers were compensated for study participation and sample retention was excellent: approximately 90 % of participants completed each follow up interview.

Measures

Official Record of Arrest (Hereafter Referred to as "Arrests")

Official court records were obtained to calculate a record of filed petitions at follow-up interviews (6, 12, 18, 24, 30, 36, 48, 60, and 72 months after the baseline interview). Due to the low base rate and non-normal distribution of arrests within each interval between interviews (the 6 months prior to each interview), a dichotomous variable was created to indicate whether the youth was arrested at least once during each interval. On average, 20 % of youth in the analytic sample were arrested in each interval (range: 16–22 %), with approximately 77 % of the sample rearrested at least once during study period (see Table 1). These binary rearrest variables were used as primary outcome variables.

Self-reports of Offending (Hereafter Referred to as "Offending")

Delinquent behavior was assessed with a revised version of the Self-Report of Offending scale (Huizinga et al. 1991). The Self-Report of Offending scale assessed whether youth engaged in any of 22 different types of criminal activity in the recall period ("in the last 6 months"). Sample behaviors include: carjacking, damaging property, stealing, rape, taking something by force, and physically attacking another person. To facilitate comparison with the results of analyses predicting arrest, a binary variable was used that indicated whether youth reported having engaged in at least one offense at each time point. However, the same pattern of results emerged when a continuous variable was used as the measure of self-reported offending. On average, approximately 47 % of youth offended in each recall period (range: 39–60 %), with approximately 90 % of youth offending at least once during study period (see Table 1).

Impulsivity

Youths' impulsivity was assessed by adolescents and their mothers using the Impulse Control scale of the Weinberger Adjustment Inventory (WAI; Weinberger and Schwartz 1990). Sample items are, "I stop and think things through before I act (reverse coded)," and "I say the first thing that comes into my mind without thinking enough about it." Questions were asked the same way to the youth and his mother except "your child" was substituted for "I." To our knowledge, this is the first study to adapt the WAI to record parents' assessment of their child's maturity. Youth and mothers read eight statements and assessed the degree to which each statement matched the youth's behavior in the prior 6 months (5-point response scale: 1 = false; 5 = true). Items on the impulse control were reverse coded when necessary, averaged together (separately for youth and mother), and standardized, with higher scores representing more impulsiveness. Psychometric analyses indicated that impulse control had acceptable internal consistency for both youths and their mothers ($\alpha_{\text{youth}} = .76$; $\alpha_{\text{mother}} = .70$). This measure has also been well validated in clinical and non-clinical samples (e.g., Weinberger 1997). Youths' and mothers' reports of impulsivity were assessed at the baseline interview and were used as the main predictor variables in all analyses.

Demographics

Youth self-reported their date of birth as well as their race and ethnicity. Age (centered at its mean) was considered for use as a control variable.

Opportunity to Offend (i.e., "Street Time")

The proportion of time "on the street" (relative to time spent in a secure facility) was used as a control variable. Scores range from 0 to 1, with higher scores indicating more time on the streets (i.e., more opportunities to offend and to be arrested). Proportion of time on the street was created for each follow-up recall period, centered, and used as a control variable in all of the analyses.

Plan of Analysis

Mplus 5.1 was used for the analyses in the present study. To address the main research questions, we conducted a series of logistic regressions in which arrest and offending at each follow-up was regressed on mothers' reports and youth self-reports of impulsivity at baseline. (In the analyses presented here, mothers' reports and self-reports were included in the model together; however, the variables' effects were nearly identical when modeled separately.) In

all of the analyses, we controlled for street time. Youth's age at baseline was considered as a covariate but rejected because it did not explain a significant amount of variance in arrest or offending.

We also used a two-step structural equation modeling framework to determine which of the two reports (i.e., youths' or mothers' reports of impulsivity) was *more* predictive of arrests or offending at each follow up time point. In the initial model, we allowed the estimated effects of mothers' and youths' reports of impulsivity on arrest and offending to differ from one another. In the second model, we constrained these two regression coefficients to be equal. We compared model fit indices and ran a formal test for differences in model fit (e.g., Chi Square Difference Test; "difftest") between the initial (unconstrained) and constrained model. If the model fit statistics worsened significantly when the parameters were forced to be equal, this would indicate that the estimates are, in fact, different from one another. Using a similar approach, we also compared models that included both mothers' reports and youths' reports to nested models that only allowed youths' reports to have an effect on the outcome variables. This was achieved by eliminating the effect of mothers' reports in the constrained model (i.e., setting effect equal to "0"). This allowed us to conduct formal tests to determine whether mothers' reports made a significant contribution over and above youths' reports of impulsivity in predicting arrest and offending.

Results

Table 2 shows the correlations between the mothers' and youths' reports of impulsivity with the outcome variables. This table reveals that youths' and mothers' reports of the adolescents' impulsivity were weakly, but significantly, correlated ($r = .186$, $p < .001$). This table also reveals that youths' self-reports of impulsivity were significantly related to offending at all time points except 72 months (average $r_{\text{point-biserial}(rb)} = .153$; r_s from .064 to .230) and significantly related to youth arrest at 6 and 30 months (average $r_{rb} = .050$; r_{spb} from .005 to .102). (Youths' self-reports of impulsivity were significantly correlated with the continuous offending variable at every time point, average $r = .194$; r_s from .147 to .270.) Mothers' reports were significantly related to dichotomous offending at 6, 24, 48, 60, and 72 months (average $r_{rb} = .109$; r_{srb} from .048 to .187) and significantly related to youth arrest at 6, 24, 30, 60, and 72 months (average $r_{pb} = .060$; r_{spb} from -.003 to .123). (Mothers' reports were significantly related to continuous offending at 6, 48, 60, and 72 months, average $r = .095$; r_s from .037 to .180.) The dichotomous offending and arrest variables were significantly correlated at all

Table 2 Bivariate correlations between primary independent and dependent variables in analytic sample

	Youths' reports of impulsivity (<i>r</i>)	Mothers' reports of impulsivity (<i>r</i>)
Youths' reports impulsivity	–	.186***
Mothers' reports impulsivity	–	–
Official arrest records		
Arrest @ 6 mo.	.102**	.123**
Arrest @ 12 mo.	.029	.026
Arrest @ 18 mo.	.061	.016
Arrest @ 24 mo.	.005	.086*
Arrest @ 30 mo.	.090*	.081*
Arrest @ 36 mo.	.070	.037
Arrest @ 48 mo.	.056	–.003
Arrest @ 60 mo.	.009	.091*
Arrest @ 72 mo.	.032	.079*
Youth self-reports of offending		
Offending @ 6 mo.	.230***	.122**
Offending @ 12 mo.	.211***	.069
Offending @ 18 mo.	.164***	.076
Offending @ 24 mo.	.150***	.091*
Offending @ 30 mo.	.127**	.073
Offending @ 36 mo.	.165***	.048
Offending @ 48 mo.	.173***	.156***
Offending @ 60 mo.	.093*	.161***
Offending @ 72 mo.	.064	.187***

Pearson correlation was used to test association between youths' reports and mothers' reports of impulsivity. Point-biserial correlation was used to test associations between impulsivity reports and dichotomous reports of arrest and offending

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

time points r_{phi} coefficient ϕ (6 months)= .140; r_{ϕ} (12 months)= .227; r_{ϕ} (18 months)= .221; r_{ϕ} (24 months)= .195; r_{ϕ} (30 months)= .207; r_{ϕ} (36 months)= .245; r_{ϕ} (48 months)= .136; r_{ϕ} (60 months)= .124; r_{ϕ} (72 months)= .150. (Continuous offending and dichotomous arrest were also significantly correlated at all time points: r_{pb} (6 months)= .217; r_{pb} (12 months)= .232; r_{pb} (18 months)= .233; r_{pb} (24 months)= .169; r_{pb} (30 months)= .225; r_{pb} (36 months)= .273; r_{pb} (48 months)= .177; r_{pb} (60 months)= .206; r_{pb} (72 months)= .140.)

How Many Months into the Future can Mothers' and Youths' Reports of Impulsivity Predict Youth Arrest?

Controlling for street time, logistic regressions indicated that youths' and mothers' reports of youths' impulsivity significantly predicted youth arrest at the 6 and 30-month follow-ups (see Table 3). Additionally, mothers' reports of impulsivity were significantly associated with youth arrest

at several additional time points: 24, 60, and 72-month follow up interviews (see Table 3). At each of these time points, higher impulsivity scores were related to increased odds of youth arrest. There were no follow-up time points at which youths' reports, but not mothers' reports, of impulsivity predicted arrest.

To test formally whether the regression coefficients for mothers' and youths' reports of impulsivity differed significantly from one another at each follow-up, we compared the models in which each parameter was estimated freely to nested models in which the two coefficients were constrained to be equal. If constraining the parameters to be equal resulted in a significant decrement in model fit (as measured by the change in the Chi square statistic—diffest in Mplus), then we concluded that the coefficients were unequal in magnitude (see Table 3). At the 6-month time point, when both mothers' and youths' reports were significantly associated with arrest, the two regression coefficients were of comparable magnitude; constraining them to be equal did not significantly worsen model fit. Similarly, at the 30-month time point, the magnitude of the effects of mothers' reports and youths' reports were similar; the model fit did not deteriorate when the parameters were forced to be equal. However, as indicated by the significant Chi square statistic at the 24 and 60-month time points, mothers' reports of impulsivity were significantly stronger predictors of arrest than were youth self-reports of impulsivity.

How Many Months into the Future can Mothers' and Youths' Reports of Impulsivity Predict Youth Offending?

Logistic regressions indicated that mothers' reports of impulsivity were only predictive of youth offending in the short-term, at 6-months, and in the long-term, at 48, 60, and 72-months (see Table 3). However, youths' reports of impulsivity were significantly related to self-reported offending at every time point up until the 48-month interview. As expected, higher impulsivity scores were associated with more offending.

We compared models in which mothers' reports and youths' reports were estimated freely to nested models in which the two coefficients were constrained to be equal. As indicated by the significant Chi square statistics for the 6, 12, 18 and 36-month time points in Table 3, the magnitudes of the effects of youths' reports of impulsivity on offending were significantly greater than those of mothers' reports at those time points. Conversely, mothers' reports of impulsivity were more predictive of offending at 72-months. The non-significant Chi square statistics for other time points indicate that youths' and mother's reports of impulsivity were similarly predictive of offending at those time points.

Table 3 Youths' and mothers' reports of youths' impulsivity predicting self-reports and official reports of antisocial and illegal behavior six to seventy-two months after impulsivity assessments

Time point	Official reports of arrests ^a				Self-reports of offending ^a			
	N	Youths' reports of impuls. OR (95 % CI)	Mothers' reports of impuls. OR (95 % CI)	χ^2 Diff. ^b	N	Youths' Reports of Impuls. OR (95 % CI)	Mothers' reports of impuls. OR (95 % CI)	χ^2 Diff. ^b
6 mo.	657	1.31 (1.06, 1.62)*	1.43 (1.15, 1.78)***	.38	656	1.58 (1.33, 1.87)***	1.19 (1.01, 1.40)*	11.44**
12 mo.	662	1.06 (.87, 1.29)	1.11 (.91, 1.35)	.13	662	1.52 (1.29, 1.79)***	1.07 (.91, 1.26)	18.28***
18 mo.	641	1.12 (.91, 1.37)	.99 (.81, 1.22)	1.34	640	1.37 (1.17, 1.61)***	1.11 (.94, 1.30)	6.88*
24 mo.	642	.98 (.81, 1.19)	1.26 (1.04, 1.53)*	5.95*	642	1.33 (1.13, 1.56)***	1.14 (.97, 1.33)	3.77
30 mo.	641	1.24 (1.02, 1.50)*	1.22 (1.00, 1.49)*	.021	640	1.27 (1.08, 1.50)**	1.11 (.95, 1.31)	2.58
36 mo.	638	1.15 (.94, 1.40)	1.05 (.87, 1.28)	.81	637	1.40 (1.19, 1.66)***	1.04 (.88, 1.22)	12.56**
48 mo.	629	1.20 (.99, 1.46)	.99 (.81, 1.20)	3.12	627	1.35 (1.14, 1.58)***	1.30 (1.11, 1.53)**	.15
60 mo.	633	.98 (.81, 1.19)	1.32 (1.09, 1.61)**	9.31**	628	1.09 (.92, 1.28)	1.33 (1.12, 1.56)***	5.57
72 mo.	604	1.01 (.82, 1.26)	1.30 (1.04, 1.61)*	4.47	601	1.05 (.89, 1.25)	1.45 (1.22, 1.71)***	13.71**

Youths' and mothers' reports were entered together

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

^a Binary logistic regressions (maximum likelihood estimator)

^b χ^2 Difference Test ("difftest" option in Mplus) was used to test whether the model fit of the constrained model was a significantly inferior fit than the model fit of the unconstrained model (Probit regression (weighted least squares—WLSMV—estimator) was used instead of logistic regression to test for differences in model fit)

Does the Inclusion of Mothers' Reports of Impulsivity Add Value Over and Above Youth Self-Reports?

We also tested whether mothers' reports explained significant variance in arrest and offending over and above youths' reports of impulsivity. Models in which the effect of mothers' reports of impulsivity on arrest or offending was constrained to zero (while the effect of youths' reports of impulsivity was freely estimated) fit worse than models in which that effect was allowed to be estimated (see Table 4). This suggests that mother's reports of impulsivity have incremental predictive validity. Thus, models that include both youths' and mothers' reports of impulsivity are better than those that rely solely on youth self-reports.

Discussion

Being able to assess a youth's risk for future offending is of great practical importance to clinical and juvenile justice professionals. The results of the present study shed light on whether parental reports of an adolescent's impulsivity adds any value, over and above youth self-reports, in making risk assessments. We find that mothers' reports provide unique information that aids in predicting whether their children will be arrested at subsequent time points. Furthermore, mothers' reports are predictive of arrest at more future time points than are youths' self-reports, with mothers' reports remaining predictive (an impressive) 6 years into the future. In contrast, the latest point at which

Table 4 Test of model fit between models with and without mothers' reports

Time point	Arrest χ^2 Diff. χ^2	Offending χ^2 Diff. χ^2
6 mo.	11.25***	4.33*
12 mo.	.98	.72
18 mo.	.00	1.58
24 mo.	5.22*	2.45
30 mo.	4.10*	1.61
36 mo.	2.16	.19
48 mo.	.01	10.06**
60 mo.	8.25**	11.53***
72 mo.	5.36*	18.72***

Mothers' reports were set to "0" in the constrained (null) model. A significant Chi square suggests that the constrained model fit significantly worse than an unconstrained model (alternative model; model that allows mothers' reports to have an effect on the outcome variables). All tests had one degree of freedom

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

youths' baseline self-reports of impulsivity predicted arrest was 30 months later. Mothers' reports of impulsivity also predicted youth's self-reported offending behaviors at 6, 48, 60, and 72-months after impulsivity assessments.

However, youths' self-reports of impulsivity also demonstrated predictive utility. Self-reports of impulsivity were predictive of later offending at every time point up until 4 years after the impulsivity assessment. The odds ratios indicate that the magnitude of the relationships between self-reported impulsivity and offending are higher overall

than the magnitude of the relationships between self-reports or parental reports of impulsivity and arrest. Although some scholars have expressed concerns that correlations between self-reported independent and dependent variables will be inflated due to common method bias or shared method variance, we do not believe that phenomenon fully accounts for our findings. We argue that impulsivity is less correlated with arrest than with offending because a number of external factors influence the chances that an offense will lead to an arrest. These factors include whether the crime is detected, whether it is reported to law enforcement, whether police decide to accept and file the charges, and whether there is enough evidence for a charge to be sustained. Police have a great deal of discretion when determining whom to arrest (Black 1970; Kraus and Hasleton 1982). On the other hand, characteristics of the individual should, in theory, account for a relatively larger proportion of the variance in whether that individual offends in the first place (reflected in self-reported offending). In fact, there is a large discrepancy between rates of adolescent offending and adolescent arrests: although 60–90 % of adolescents likely engage in delinquent behavior (Farrington 2009; Moffitt 1993), only a small percentage of these youth are actually arrested (Brame et al. 2012; OJJDP 2009).

Despite the risk of shared method variance, self-report measures are used commonly in research on adolescence to obtain psychological, behavioral, and attitudinal data. The validity of adolescent self-report measures has been demonstrated for assessment of alcohol use (Winters et al. 1990), drug use (Needle et al. 1983), tobacco use (Wills and Cleary 1997), antisocial and illegal behaviors (Brame et al. 2004), suicidal ideation (De Man and Leduc 1994), sexual behavior (Orr et al. 1997; Sieving et al. 2005; Venable et al. 2009), and other health-promoting or health-risking behaviors (Weston et al. 1997). In fact, some scholars have suggested that children and adolescents may be the best reporters of their own internalizing symptomatology (Hogue et al. 2012; Youngstrom et al. 2000). In addition to demonstrating high concordance with official records and behavioral indicators, Brener et al. (2002) found that adolescents' self-reports of 72 items related to risky behaviors (e.g., drug, alcohol, and tobacco use; sexual behavior) demonstrated acceptable test–retest reliability when adolescent participants responded to the same items on two occasions 2 weeks apart. Self-reports of offending are also considered a more sensitive assessment of youths' true degree of antisociality because youths are aware of their own illegal behaviors that may not come to the attention of others (i.e., police; Maxfield et al. 2000).

Overall, our findings suggest that both self-reports and parental reports of impulsivity are useful in assessing the risk of future law-breaking behavior among adolescents.

Despite growth in impulse control during adolescence (e.g., Steinberg et al. 2008), rank-order stability in impulsivity allows assessments of this trait to be used to predict behavior. This is consistent with decades of research in the United States and elsewhere that has shown that aspects of self-control and impulsivity, measured in childhood, are strong predictors of future educational and occupational success (Moffitt et al. 2011; Mischel 2011), physical health (Mischel et al. 2011; Schlam et al. 2012), and criminal behavior (Farrington 1995; Mischel et al. 2011; Moffitt et al. 2011).

The low correlation between mothers' and youths' self-reports of impulsivity suggests that adolescents and their mothers are sensitive to different aspects of the youths' impulsivity (or are differently sensitive to the same aspects of the youths' impulsivity). Furthermore, the aspects to which mothers are more sensitive appear to be those that increase the risk of arrest. Although our study did not test this directly, it seems likely that mothers could be more attuned to externally observable elements of impulsivity (for example, to poor behavioral regulation), whereas adolescents could be better able to report on less-observable phenomena, such as poor emotional regulation. Future research should try to disentangle the features of impulsivity to which mothers and youth are more (or less) attuned.

Mothers could have difficulty assessing some aspects of their adolescent children's impulsivity because of biopsychosocial changes associated with development in this period (Lerner and Steinberg 2009; Paikoff and Brooks-Gunn 1991). These normative transitions likely affect the dynamic between mothers and their adolescent children. Since self-individuation from the parent is a developmental task in adolescence, the parent-adolescent relationship may be characterized by increased adolescent inaccessibility and conflict, and decreased warmth (e.g., McGue et al. 2005). Thus, as children transition into adolescence, it may be more difficult for mothers to access children's internal states (Lerner et al. 1996), including their impulsivity. Unfortunately, because there is no “gold-standard” measure of impulsivity, our study cannot speak to whether youths' or parents' reports provide the more accurate measure of impulsivity: we can only test whether one reporter's assessment, compared to the other, is more predictive of future criminal behavior. Our results suggest that these two types of reports provide distinct information that relates differently to offending than to arrest.

The present study has several methodological strengths, most notably the use of a longitudinal, multi-informant, and multi-method design; however, there are limitations that should be considered. First, adolescent offenders are a heterogeneous group (Tarolla et al. 2002). Individual differences between offenders may dispose some adolescents

to be more accurate reporters of their own impulsivity than others. Since mothers are likewise a diverse population, some may be better than others at reporting their children's impulsivity. Future research should investigate whether individual differences in parent (such as parenting style), youth (such as sex and intelligence), and the parent-child relationship (such as degree of warmth and communication) affect the degree to which youths' and parents' reports are useful for predicting future illegal behavior. Second, it is important to bear in mind that our sample was comprised of serious adolescent offenders. It is therefore unclear whether the results would generalize to the average (non-arrested) teenager. Also, because our sample did not include female adolescents we do not know whether the same pattern of findings would emerge for females. Last, although our impulsivity measure is well validated, we only used a single measure of adolescent impulsivity that may not capture all facets of this construct.

Conclusion

Our study revealed two key findings. First, assessments of impulsivity in adolescence are predictive of offending and arrest for a remarkably long period of time. That a mother's assessment of her adolescent son's impulsivity would remain predictive of his likelihood of engaging in illegal behavior or his odds of arrest up to 6 years later was surprising given that adolescence is a time when impulsivity is in flux. Youths' reports also predicted arrest 30 months and offending 48 months into the future. Our findings do not imply that impulsive adolescents are doomed to be chronic offenders. Yet, the persistent, deleterious effects of impulsivity underscore the importance of developing interventions and investing in policies that help to foster greater impulse control in youth—particularly those at elevated risk of delinquency.

Finally, the most important message in the present study is that mothers and adolescents provide different perspectives on impulsivity, both of which are valuable for predicting future behavior. Mothers appear to have insight into their children's capacities that is uniquely predictive of later arrest and offending. Therefore, when possible, mothers should be asked to provide data for their children's risk assessments. In addition to being paramount for practice, it is important for researchers to know whether there is value in collecting collateral reports, given the substantial costs associated with obtaining these additional data. Our analysis suggests this extra effort and investment is worthwhile.

Acknowledgments Data for this article were obtained from the Pathways to Desistance study. The authors are grateful to Edward

Mulvey (Principal Investigator), Carol Schubert (Study Director), and the co-Investigators, site coordinators, and working group members; Laurie Chassin, George Knight, Sandra Losoya, Laurence Steinberg, Robert Brame, Jeffrey Fagan, and Alex Piquero. We are also grateful to the many individuals who served as study interviewers. Funding for the Pathways study was obtained from Arizona Governor's Justice Commission, Center of Disease Control, John D. and Catherine T. MacArthur Foundation, National Institute on Drug Abuse (R01 DA 019697 05), National Institute of Justice (2008-IJ-CX-0023), Office of Juvenile Justice and Delinquency Prevention (2005-JK-FX-K001), Pennsylvania Commission on Crime and Delinquency, Robert Wood Johnson Foundation, William Penn Foundation, and William T. Grant Foundation.

Author contributions JB performed the statistical analysis and helped to compose and edit the manuscript; CC helped to compose and edit the manuscript; EPS assisted with the analytic plan and helped to compose and edit the manuscript; EC is the Principal Investigator on the project and participated in the design and coordination of data collection and helped to compose and edit the manuscript. All authors read and approved the final manuscript.

References

- Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, 101, 213–232. doi:[10.1037/0033-2909.101.2.213](https://doi.org/10.1037/0033-2909.101.2.213).
- Barkley, R. A., Fischer, M., Smallish, L., & Fletcher, K. (2002). The persistence of attention-deficit/hyperactivity disorder into young adulthood as a function of reporting source and definition of disorder. *Journal of Abnormal Psychology*, 111, 279–289. doi:[10.1037/0021-843X.111.2.279](https://doi.org/10.1037/0021-843X.111.2.279).
- Black, D. J., and Reiss, A. J. Jr. (1970). Police control of juveniles. *American Sociological Review*, 35, 63–77. Retrieved from <http://www.jstor.org/stable/2093853>.
- Brame, R., Fagan, J., Piquero, A. R., Schubert, C. A., & Steinberg, L. (2004). Criminal careers of serious delinquents in two cities. *Youth Violence and Juvenile Justice*, 2, 256–272. doi:[10.1177/1541204004265877](https://doi.org/10.1177/1541204004265877).
- Brame, R., Turner, M. G., Paternoster, R., & Bushway, S. D. (2012). Cumulative prevalence of arrest from ages 8–23 in a national sample. *Pediatrics*, 129, 21–27. doi:[10.1542/peds.2010-3710](https://doi.org/10.1542/peds.2010-3710).
- Brener, N. D., Kann, L., McManus, T., Kinchen, S. A., Sundberg, E. C., & Ross, J. G. (2002). Reliability of the 1999 youth risk behavior survey questionnaire. *Journal of Adolescent Health*, 31, 336–342. doi:[10.1016/S1054-139X\(02\)00339-7](https://doi.org/10.1016/S1054-139X(02)00339-7).
- Carroll, A., Hemingway, F., Bower, J., Ashman, A., Houghton, S., & Durkin, K. (2006). Impulsivity in juvenile delinquency: Differences among early-onset, late-onset, and non-offenders. *Journal of Youth and Adolescence*, 35, 519–529. doi:[10.1007/s10964-006-9053-6](https://doi.org/10.1007/s10964-006-9053-6).
- Cruise, K. R., Fernandez, K., McCoy, W. K., Guy, L. S., Colwell, L. H., & Douglas, T. R. (2008). The influence of psychosocial maturity on adolescent offenders' delinquent behavior. *Youth Violence and Juvenile Justice*, 6, 178–194. doi:[10.1177/1541204007313229](https://doi.org/10.1177/1541204007313229).
- De Man, A. F., & Leduc, C. P. (1994). Validity and reliability of a self-report suicide ideation scale for use with adolescents. *Social Behavior and Personality: An International Journal*, 22, 261–266. doi:[10.2224/sbp.1994.22.3.261](https://doi.org/10.2224/sbp.1994.22.3.261).
- Dekovic, M., Nboom, M. J., & Meeus, W. (1997). Expectations regarding development during adolescence: Parental and

- adolescent perceptions. *Journal of Youth and Adolescence*, 26, 253–272. doi:10.1007/s10964-005-0001-7.
- Duhig, A. M., Renk, K., Epstein, M. K., & Phares, V. (2000). Interparental agreement on internalizing, externalizing, and total behavior problems: A meta-analysis. *Clinical Psychology: Science and Practice*, 7, 435–453. doi:10.1093/clipsy.7.4.435.
- Farrington, D. P. (1995). The development of offending and antisocial behaviour from childhood: Key findings from the Cambridge study in delinquent development. *Journal of Child Psychology and Psychiatry*, 36, 1–35. doi:10.1111/j.1469-7610.1995.tb01342.x.
- Farrington, D. (2009). Conduct disorder, aggression, and delinquency. In R. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (3rd ed., Vol. 1, pp. 683–722). New York, NY: Wiley.
- Farrington, D. P., Jolliffe, D., Hawkins, J. D., Catalano, R. F., Hill, K. G., & Kosterman, R. (2003). Comparing delinquency careers in court records and self-reports. *Criminology*, 41, 933–958. doi:10.1111/j.1745-9125.2003.tb01009.x.
- Gottfredson, M., & Hirschi, T. (1990). *A general theory of crime*. Stanford, CA: Stanford University Press.
- Gottfredson, M., & Hirschi, T. (1993). A control theory interpretation of psychological research on aggression. In R. B. Felson & J. T. Tedeschi (Eds.), *Aggression and violence: Social interactionist perspectives* (pp. 47–68). Washington, DC: American Psychological Association.
- Herjanic, B., & Reich, W. (1982). Development of a structured psychiatric interview for children: Agreement between child and parent on individual symptoms. *Journal of Abnormal Child Psychology*, 10, 307–324. doi:10.1007/BF00912324.
- Hinshaw, S. P., Owens, E. B., Sami, N., & Fargeon, S. (2006). Prospective follow-up of girls with attention-deficit/hyperactivity disorder into adolescence: Evidence for continuing cross-domain impairment. *Journal of Consulting and Clinical Psychology*, 74, 489–499. doi:10.1037/0022-006X.74.3.489.
- Hinshaw, S. P., Owens, E. B., Zalecki, C., Huggins, S. P., Montenegro-Navado, A. J., Schrodek, E., et al. (2012). Prospective follow-up of girls with attention-deficit/hyperactivity disorder into early adulthood: Continuing impairment includes elevated risk for suicide attempts and self-injury. *Journal of Consulting and Clinical Psychology*, 80, 1041–1051. doi:10.1037/a0029451.
- Hogue, A., Dauber, S., Lichvar, E., & Spiewak, G. (2012). Adolescent and caregiver reports of ADHD symptoms among inner-city youth: Agreement, perceived need for treatment, and behavioral correlates. *Journal of Attention Disorders*, . doi:10.1177/1087054712443160.
- Huizinga, D., Esbensen, F., and Weiher, A. (1991). Are there multiple paths to delinquency? *Journal of Criminal Law and Criminology*, 82, 83–118. Retrieved from <http://www.jstor.org/stable/1143790>.
- Kendall, P. C., & Flannery-Schroeder, E. C. (1998). Methodological issues in treatment research for anxiety disorders in youth. *Journal of Abnormal Child Psychology*, 26, 27–38. doi:10.1023/A:1022630706189.
- Kolko, D. J., & Kazdin, A. E. (1993). Emotional/behavioral problems in clinic and nonclinic children: Correspondence among child, parent and teacher reports. *Journal of Child Psychology and Psychiatry*, 34, 991–1006. doi:10.1111/j.1469-7610.1993.tb01103.x.
- Kraemer, H. C., Measee, J. R., Ablow, J. C., Essex, M. J., Boyce, W. T., & Kupfer, D. J. (2003). A new approach in integrating data from multiple informants in psychiatric assessment and research: Mixing and matching contexts and perspectives. *American Journal of Psychiatry*, 160, 1566–1577. doi:10.1176/appi.ajp.160.9.1566.
- Kraus, J., & Hasleton, S. L. (1982). Juvenile offenders' diversion potential as a function of police perceptions. *American Journal of Community Psychology*, 10, 171–182. doi:10.1007/BF00896422.
- Langton, L. (2006). Low self-control and parole failure: An assessment of risk from a theoretical perspective. *Journal of Criminal Justice*, 34, 469–478. doi:10.1016/j.jcrimjus.2006.09.002.
- Lerner, R. M., Lerner, J. V., von Eye, A., Ostrom, C. W., Nitz, K., Talwar-Soni, R., et al. (1996). Continuity and discontinuity across the transition of early adolescence: A developmental contextual perspective. In J. A. Graber, J. Brooks-Gunn, & A. C. Petersen (Eds.), *Transitions through adolescence* (pp. 3–22). Mahwah, NJ: Erlbaum.
- Lerner, R., & Steinberg, L. (Eds.). (2009). *Handbook of adolescent psychology* (3rd ed.). Hoboken, NJ: Wiley.
- Maxfield, M. G., Weiler, B. L., & Widom, C. S. (2000). Comparing self-reports and official records of arrests. *Journal of Quantitative Criminology*, 16, 87–110. doi:10.1023/A:1007577512038.
- McGue, M., Elkins, I., Walden, B., & Iacono, W. G. (2005). Perceptions of the parent-adolescent relationship: A longitudinal investigation. *Developmental Psychology*, 41, 971–984. doi:10.1037/0012-1649.41.6.971.
- Mischel, W. (2011). Self-control theory. In P. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (Vol. 2, pp. 1–22). Thousand Oaks, CA: SAGE Publications Inc.
- Mischel, W., Ayduk, O., Berman, M. G., Casey, B. J., Gotlib, I. H., Jonides, J., et al. (2011). 'Willpower' over the life span: Decomposing self-regulation. *Social Cognitive and Affective Neuroscience*, 6, 252–256. doi:10.1093/scan/nsq081.
- Moffitt, T. E. (1993). Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review*, 100, 676–701. doi:10.1037/0033-295X.100.4.674.
- Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., et al. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences*, 108, 2693–2698. doi:10.1073/pnas.1010076108.
- Monahan, K. C., Steinberg, L., Cauffman, E., & Mulvey, E. P. (2009). Trajectories of antisocial behavior and psychosocial maturity from adolescence to young adulthood. *Developmental Psychology*, 45, 1654–1668. doi:10.1037/a0015862.
- Mulvey, E. P., and Iselin, A. M. R. (2008). Improving professional judgments of risk and amenability in juvenile justice. *The Future of Children/Center for the Future of Children, the David and Lucile Packard Foundation*, 18, 35–57. Retrieved from <http://www.editlib.org/p/72629>.
- Needle, R., McCubbin, H., Lorence, J., & Hochhauser, M. (1983). Reliability and validity of adolescent self-reported drug use in a family-based study: A methodological review. *Substance Use and Misuse*, 18, 901–912. doi:10.3109/10826088309033058.
- Office of Juvenile Justice and Delinquency Prevention (2009). *Statistical Briefing Book*. Retrieved from http://www.ojjdp.gov/ojstatbb/crime/JAR_Display.asp?ID=qa05200.
- Orr, D. P., Fortenberry, D. J., and Blythe, M. J. (1997). Validity of self-reported sexual behaviors in adolescent women using biomarker outcomes. *Sexually Transmitted Diseases*, 24, 261–266. Retrieved from <http://journals.lww.com/stdjournal/pages/default.aspx>.
- Paikoff, R. L., & Brooks-Gunn, J. (1991). Do parent-child relationships change during puberty? *Psychological Bulletin*, 110, 47–66. doi:10.1037/0033-2909.110.1.47.
- Pratt, T. C., & Cullen, F. T. (2000). The empirical status of Gottfredson and Hirschi's general theory of crime: A meta-analysis. *Criminology*, 38, 931–963. doi:10.1111/j.1745-9125.2000.tb00911.x.

- Schlam, T. R., Wilson, N. L., Shoda, Y., Mischel, W., & Ayduk, O. (2012). Preschoolers' delay of gratification predicts their body mass 30 years later. *The Journal of Pediatrics*, 162, 90–93. doi:10.1016/j.jpeds.2012.06.049.
- Schubert, C. A., Mulvey, E. P., Cauffman, E., Steinberg, L., Hecker, T., Losoya, S. H., et al. (2004). Operational lessons learned from the pathways to desistance project. *Youth Violence and Juvenile Justice*, 10, 1–19. doi:10.1177/1541204004265875.
- Sieving, R., Hellerstedt, W., McNeely, C., Fee, R., Snyder, J., & Resnick, M. (2005). Reliability of self-reported contraceptive use and sexual behaviors among adolescent girls. *Journal of Sex Research*, 42, 159–166. doi:10.1080/00224490509552269.
- Snyder, H. N., and Sickmund, M. (2006). *Juvenile offenders and victims: 2006 national report*. Washington, DC: US Department of Justice, Office of Justice Programs, Office of Juvenile Justice and Delinquency Prevention. Retrieved from <http://ojjdp.ncjrs.org/publications/index.html>.
- Steinberg, L. (2007). Risk taking in adolescence: New perspectives from brain and behavioral science. *Current Directions in Psychological Science*, 16, 55–59. doi:10.1111/j.1467-8721.2007.00475.x.
- Steinberg, L., Albert, D., Cauffman, E., Banich, M., Graham, S., & Woolard, J. (2008). Age differences in sensation seeking and impulsivity as indexed by behavior and self-report: Evidence for a dual systems model. *Developmental Psychology*, 44, 1764–1778. doi:10.1037/a0012955.
- Steinberg, L., & Morris, A. M. (2001). Adolescent development. *Journal of Cognitive Education and Psychology*, 2, 55–87. doi:10.1891/194589501787383444.
- Strang, N. M., Chein, J. M., & Steinberg, L. (2013). The value of the dual systems model of adolescent risk-taking. *Frontiers in Human Neuroscience*, 7, 1–4. doi:10.3389/fnhum.2013.00223.
- Tackett, J. L. (2011). Parent informants for child personality: Agreement, discrepancies, and clinical utility. *Journal of Personality Assessment*, 93, 539–544. doi:10.1080/00223891.2011.608763.
- Tarolla, S. M., Wagner, E. F., Rabinowitz, J., & Tubman, J. G. (2002). Understanding and treating juvenile offenders: A review of current knowledge and future directions. *Aggression and Violent Behavior*, 7, 125–143. doi:10.1016/S1359-1789(00)00041-0.
- Vanable, P. A., Carey, M. P., Brown, J. L., DiClemente, R. J., Salazar, L. F., Brown, L. K., et al. (2009). Test–retest reliability of self-reported HIV/STD-related measures among African-American adolescents in four US cities. *Journal of Adolescent Health*, 44, 214–221. doi:10.1016/j.jadohealth.2008.09.002.
- Wasserman, G. A., Ko, S. J., & McReynolds, L. S. (2004). *Assessing the mental health status of youth in juvenile justice settings*. Washington, DC: United States Department of Justice, Office of Juvenile Justice and Delinquency Prevention.
- Watt, B., Howells, K., & Delfabbro, P. (2004). Juvenile recidivism: Criminal propensity, social control, and social learning theories. *Psychiatry, Psychology, and Law*, 11, 141–153. doi:10.1375/pplt.2004.11.1.141.
- Weinberger, D. A. (1997). Distress and self-restraint as measures of adjustment across the life span: Confirmatory factor analyses in clinical and nonclinical samples. *Psychological Assessment*, 9, 132–135. doi:10.1037/1040-3590.9.2.132.
- Weinberger, D. A., & Schwartz, G. E. (1990). Distress and restraint as superordinate dimensions of self-reported adjustment: A typological perspective. *Journal of Personality*, 58, 381. doi:10.1111/j.1467-6494.1990.tb00235.x.
- Weston, A. T., Petosa, R., & Pate, R. R. (1997). Validation of an instrument for measurement of physical activity in youth. *Medicine and Science in Sports and Exercise*, 29, 138–143. doi:10.1097/00005768-199701000-00020.
- Wills, T. A., & Cleary, S. D. (1997). The validity of self-reports of smoking: Analyses by race/ethnicity in a school sample of urban adolescents. *American Journal of Public Health*, 87, 56–61. doi:10.2105/AJPH.87.1.56.
- Winters, K. C., Stinchfield, R. D., Henly, G. A., & Schwartz, R. H. (1990). Validity of adolescent self-report of alcohol and other drug involvement. *Substance Use and Misuse*, 25, 1379–1395. doi:10.3109/10826089009068469.
- Youngstrom, E., Loeber, R., & Stouthamer-Loeber, M. (2000). Patterns and correlates of agreement between parent, teacher, and male adolescent ratings of externalizing problems. *Journal of Counseling and Clinical Psychology*, 68, 1038–1050. doi:10.1037/0022-006X.68.6.1038.

Author Biographies

Jordan Bechtold is a doctoral candidate at the University of California, Irvine. Her primary research interests include adolescent risk taking and delinquency, minors' experiences in the justice system, and the policy implications of developmental science.

Caitlin A. Cavanagh is a graduate student at the University of California, Irvine. Her research examines the family context of juvenile offenders, and the intersection between families and legal policy.

Elizabeth P. Shulman is a postdoctoral fellow at the University of Pennsylvania and Temple University. Her research examines adolescent psychosocial development, risky decision-making in adolescence, and the legal and social policy implications of developmental research findings.

Elizabeth Cauffman is a Professor and Chancellor's Fellow in the Department of Psychology and Social Behavior at the University of California, Irvine. Dr. Cauffman's research addresses the intersect between adolescent development and the juvenile justice system. She has published over 80 articles, chapters, and books, and findings from her research have been used to inform both practice and policy.