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ORIGINAL ARTICLE

# "It's a Rush": Psychosocial Content of Antisocial Decision Making

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**Abstract** Changes in the juvenile justice system have led to more serious sanctioning of adolescents (Heilbrun, Goldstein, & Redding, 2005). A salient question for understanding whether such sanctions are appropriate pertains to whether adolescents are less mature than adults in making decisions that lead to antisocial activity. The current study codes for psychosocial content of antisocial decision making in adolescents (ages 12–17), young adults (18–23), and adults (ages 35–63). Results suggest that adolescents and young adults display increased psychosocial content in their antisocial decision making relative to adults. However, the unique effect of psychosocial content on self-report criminal behavior was significantly greater among adolescents than among adults, whereas for young adults this was not the case. Implications for legal policy are discussed.

**Keywords** Adolescents · Decision making · Juvenile delinquency · Psychosocial maturity

In 1967, with the inception of the juvenile justice system, the Supreme Court differentiated between juvenile and adult developmental maturity, characterizing juveniles as more amenable to treatment and less criminally responsible than adults (*In re Gault*). The Supreme Court decision, *Roper v Simmons* (2005), recently sustained this idea by outlawing the juvenile death penalty as cruel and unusual punishment. However, mechanisms have long been in place that allow for judicial treatment of adolescents that is akin to that of adults, through juvenile waiver to adult court (Salekin, 2002). Since the 1970s, employment of this mechanism has demonstrably increased, with an upsurge in waived cases between 1985 and 1994, and a substantial decline between 1994 and 2002 (Snyder & Sickmund, 2006). At the same time, since 1991 nearly every state has widened the extent to which juveniles are processed by adult criminal courts rather than by juvenile or family courts (ABA, 2004). Current estimates suggest that over 200,000 adolescents are tried in criminal court annually (Allard & Young, 2002).

A salient question for understanding whether adult-like sanctions are appropriate for juveniles pertains to whether adolescents are less mature than adults in making decisions that lead to antisocial activity (Fried & Reppucci, 2001). Theories of psychosocial immaturity posit that adolescent's decision performance lags behind their full cognitive capacity because of vulnerability to psychosocial influences such as heightened peer pressure, decreased risk perception, and shortened future-time perspective. Such psychosocial immaturity is thought to impede adolescent antisocial decision making in real-life contexts (Woolard, Reppucci, & Redding, 1996). Indeed, vulnerability to psychosocial influences has been positively associated with both antisocial decision making (Cauffman & Steinberg, 2000) and delinquency (Modecki, 2008). However, scant work has investigated (1) whether adolescents exhibit increased psychosocial immaturity when making antisocial decisions relative to young adults and adults and (2) whether the unique effect of psychosocial content on criminal behavior is significantly greater among adolescents and young adults than among adults. The current

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study examines both questions and attempts to inform considerations of mitigated criminal responsibility for adolescents (Steinberg & Scott, 2003).

## CONSIDERATION OF (IM)MATURITY IN LEGAL DECISIONS

*Kent v. United States* (1966) delineates three criteria to consider in the transfer decision: (1) potential risk to community, (2) maturity of character, and (3) amenability to treatment (Salekin, Rogers, & Ustad, 2001). These constructs likely extend to decisions affecting juveniles more generally, including adjudication decisions within the juvenile court (Brannen et al., 2006).

Recent research sheds considerable light on the varying import that legal professionals place on the maturity construct when adjudicating adolescents. For example, several studies suggest that the maturity concept may be the least influential of the three *Kent* factors for juvenile court judges (Salekin et al., 2001; Salekin, Yff, Neumann, Leistico, & Zalot, 2002). This research posits that juveniles adjudicated in juvenile court would be unlikely to be found incompetent based on developmental immaturity alone (Viljoen & Wingrove, 2007). Moreover, both forensic diplomats and juvenile court judges report that waived juveniles tend to be low in their sophistication-maturity (Salekin et al., 2001, 2002). On the other hand, Brannen et al. (2006) found that judges do weigh sophistication-maturity, along with risk of dangerousness, when ruling on a hypothetical transfer to adult court, and place lower weight on amenability to treatment. Further, research on public attitudes about the culpability of young offenders suggests that community adults believe that age-based developmental immaturity should mitigate juvenile responsibility (Scott, Reppucci, Antonishak, & DeGennaro, 2006). These mixed findings may be reflective of the ongoing debate in the legal field regarding the role of maturity in transfer decisions (e.g., Feld, 1987 vs. Zimring, 1998). Unfortunately, this debate has occurred in the absence of any real data on age-based differences in maturity of antisocial decision making.

## PSYCHOSOCIAL IMMATURITY

Adolescence is unique in terms of the physical, social, and environmental contexts in which individuals find themselves (Steinberg & Cauffman, 1996). In particular, adolescents are exposed to different peer norms than adults, and may evaluate consequences differently based on increased peer influence, decreased perception of risk, and decreased future time perspective (Scott & Grisso, 1997). At the same time, individuals who are mature in their decision making should be less influenced by psychosocial variables, because their self-identity and personality are more fully formed (Steinberg & Scott, 2003).

Developmental research that has focused on the effect of standardized psychosocial measures: autonomy, independence, emotional temperance, future-time perspective, and perspective of others, on antisocial outcomes finds that psychosocial immaturity peaks at age 15 and then dissipates (Cauffman & Steinberg, 2000). Indeed, most psychosocial variables appear relatively stable beyond age 18, with the exception of emotional temperance which improves through the mid to late twenties (Modecki, 2008). Similarly, contemporaneous research has investigated psychosocial maturity in relation to competence to stand trial, finding that decision making incompetence is mainly seen in adolescents ages 15 and below (see Grisso et al., 2003). In all, available evidence would suggest that adolescents' antisocial decision making likely reflects a strong psychosocial influence relative to older individuals.

Moreover, there is research to suggest that adolescent susceptibility to psychosocial influences may partially reflect changing neurological development (Steinberg & Scott, 2003). For example, findings suggest that the frontal lobe region, an area associated with decision processing, may be immature in adolescents and young adults (Davies & Rose, 1999; Sowell & Jernigan, 1998). As a surrogate, individuals may process certain decisions within the amygdala, a brain region that is frequently associated with emotion (Yurgelun-Todd, Killgore, & Clintron 2003). In addition, while the adolescent limbic system may lead to amplified emotional arousal, adolescents may be less able to regulate their emotions than older individuals (Yurgelun-Todd, 2007). As adolescents mature, functional activity increasingly takes place in the prefrontal cortex. This development seems to occur in concurrence with improved cognitive control and behavioral inhibition (Yurgelun-Todd, 2007). Such work underscores the centrality of emotion to adolescent decision making, and suggests that future maturity research should endeavor to tap emotion-based constructs. However, caution must be taken in relating biological underpinnings to questions of adolescent culpability (Aronson, 2007). It remains to be seen whether adolescent neurological development is predictive of changes in decision performance.

Although physiological findings have yet to be directly associated with psychosocial influences, they do underscore a likely developmental continuum of psychosocial immaturity. For example, even young adults have yet to fully develop neurologically (Sowell, Thompson, Holmes, Jernigan, & Toga, 1999), as the brain does not mature to adult capacity until the early twenties (Giedd et al., 1999). Similarly, strong psychosocial influences such as peer

pressure and sensation seeking likely persist through young adulthood. However, young adult as well as adult choices are thought to reflect individuals' own preferences (Steinberg & Scott, 2003). For example, neither young adults nor adults are restrained in their autonomy, and their identity and character are more highly developed than in adolescence. Speculatively, psychosocial influences on young adult and adult choices are apt to be far less coercive than on adolescent choices (Steinberg & Scott, 2003).

Whereas empirical work has shown age-based differences in psychosocial immaturity, has linked psychosocial immaturity to antisocial decision making (e.g., Cauffman & Steinberg, 2000; Modecki, 2008), and has shown that psychosocial immaturity is reflected within the context of trail defendant decisions (e.g., Grisso et al., 2003), scant research has investigated whether psychosocial influences are manifested within the context of antisocial decision making. Only one study has measured psychosocial content of antisocial decision making, including perceived risks, benefits, peer influence, and consequences, in detained and non-detained adolescents (Fried & Reppucci, 2001). Fried and Reppucci found age differences only on perceived risks, although developmental differences were seen on standardized psychosocial measures of future time perspective and risk perception. However, this work was based on a small sample size and lacked an adult sample for comparison. Thus, no empirical work to date has examined whether adolescent antisocial decision making reveals a comparatively strong psychosocial influence relative to older individuals.

At the same time, past developmental research has operationalized psychosocial maturity utilizing standardized measures of personal responsibility, emotional temperance, and perspective-taking, or has employed more specific measures of risk perception, peer influence, sensation seeking, and future-time perspective (Cauffman & Steinberg, 2000; Grisso et al., 2003). Explicit measures of emotional temperance beyond sensation seeking have not yet been implemented in psychosocial maturity research, although emergent brain-based research suggests that inclusion of such measures is warranted. Further, non-developmental research focused on views of legal professionals has encompassed a broader definition of maturity, including clarity of values, internalized standard for own behavior, and maintaining convictions, in addition to psychosocial influences such as future-time perspective, autonomy, and need for social validation (Salekin et al., 2001). In line with legal-based research, both moral and legal reasoning have been shown to progress developmentally (Tapp, 1976) and are considered distinctive components of adolescent psychosocial development (Salekin, 2002). Moreover, traditional developmental theory suggests that consistently moral behavior is linked with increased maturity (Erikson, 1959; Salekin et al., 2001). Thus, the current study examines age-based differences in the emotion constructs of anger, fear, and sensation seeking and consideration of moral and legal consequences, in additional to psychosocial variables more typically examined in developmental research.

The current study seeks to evaluate the role of psychosocial variables in antisocial decision making by asking adolescents, young adults, and adults to imagine that they are involved in a psychosocially laden situation with strong potential for antisocial behavior. In the context of this work, antisocial behavior is defined in terms of non-socially sanctioned choices (Cauffman & Steinberg, 2000). Participants are asked to list all the reasons why they would and would not engage in the behavior, and reasons are coded for psychosocial content. Psychosocial content refers to the presence of coded psychosocial variables when making antisocial decisions.

Analyses are intended to evaluate whether adolescents exhibit increased psychosocial immaturity, such that psychosocial content is increasingly reflected in their antisocial decision making, relative to young adults and adults. Further, assertions of mitigated adolescent culpability argue that psychosocial variables unduly influence adolescent's antisocial choices relative to older individuals. Thus, this study examines the strength of association between psychosocial content of antisocial decisions and self-report criminal behavior for adolescents, young adults, and adults.

## METHOD

### Participants

The current study consisted of three samples: adolescent, young adult, and adult individuals. The samples differed in their population characteristics: the adolescent sample was drawn from a high school, the young adult sample were undergraduates participating in the study for research credit, and the adult sample were parents of the same undergraduate students. To ensure that there were no significant relations between the young adult and adult samples due to nesting, a series of intraclass correlations (ICCs) were run on all dependent variables, and design effect results showed no significant effects due to clustering.

However, all three groups may have differed on several background variables, one of which is their eligibility to attend post-secondary education. In order to minimize this difference between groups and to provide comparisons with previous psychosocial research (Modecki, 2008), high

school students with average grades lower than a C average were dropped ($n = 15$). Adult individuals with lower education levels were not excluded, as inclusion of these individuals might provide a lower threshold for comparing adolescents' relative immaturity. Further, in order to ensure age-distinctions between adolescents and young adult age-groups, 18-year-old high school students ($n = 23$) were not included in this study.

The adolescent sample (ages 12–17) consisted of 96 male ($M_{age} = 15.44$; $SD = 1.15$) and 105 female ($M_{age} = 15.32$; $SD = 1.27$) students enrolled in a public high school. The school was selected from an industrial/suburban area with a state-average household income. The young adult sample (ages 18–23) consisted of 116 male ($M_{age} = 18.67$; $SD = 1.05$) and 157 female ($M_{age} = 18.23$; $SD = .67$) undergraduates attending the largest public university in the same state from which the adolescent sample was drawn. The adult sample (ages 35–63) consisted of 111 male ($M_{age} = 50.77$; $SD = 4.87$) and 150 female ($M_{age} = 47.98$; $SD = 45.1$) participants.

As seen in Table 1, the participants' race was primarily Caucasian, a lack of racial diversity that is consistent with the demographics of the New England state from which the data were collected. Also as shown in Table 1, the current study utilized parents' (or own and spouse's) education as a proxy for SES. This methodology is consistent with comparable research that has surveyed adolescents (Lamborn, Mounts, Steinberg, & Dornbusch, 1991). In analyses in which SES and average high school grade were co-varied, both were treated as continuous variables, with scores ranging from 0 to 7 and 1 to 6, respectively. Preliminary chi-square analyses showed that the three groups differed with respect to race, but not gender. The three groups also differed with respect to average high school grade and socio-economic status (SES), regardless of whether the variables were treated as nominal or continuous. Thus, race, average grade, and SES were controlled in analyses of group differences. Education level was not included as a control variable, as it was highly confounded with age ($r = .74$; $p < .001$).

**Table 1** Sample demographics information

| | Adolescents (%) | Young-adults (%) | Adults (%) |
|---|---|---|---|
| Gender (% Male) | 47.8 | 42.3 | 42.5 |
| Race (% Caucasian)[a] | 76.2 | 95.3 | 94.6 |
| SES[a] | | | |
| % ≤high school degree | 33.2 | 9.8 | 8.0 |
| % some college education | 35.2 | 44.3 | 42.4 |
| % college degree | 10.7 | 22.2 | 18.3 |
| % ≥some graduate education | 21.0 | 23.7 | 31.3 |
| Average high school grade[a] | | | |
| All A's | 16.6 | 16.0 | 6.1 |
| Primarily A's and B's | 46.3 | 72.7 | 51.0 |
| All B's | 4.9 | 6.5 | 13.8 |
| Primarily B's and C's | 29.3 | 4.7 | 24.1 |
| All C's | 2.9 | 0 | 4.2 |
| Primarily C's and D's | 0 | 0 | 0.8 |

*Note*: SES is a proxy based on own and partner's or both parents' education level. Average high school grade is based on adults' and young adults' average grade for their last year in high school and adolescents' average grade for last full year of school

[a] Adult, young adult, and adolescent differences at $p < .05$

## Materials

### *Psychosocial Content*

The decision vignettes were based on two scenarios from the Youth Decision Making Questionnaire (YDMQ) (Ford, Wentzel, Wood, Stevens, & Siesfeld, 1990), depicting cheating on a test and shoplifting, and an aggression vignette adapted from O'Conner, Archer, and Wu (1992) depicting a provoking situation in a movie theatre. An example vignette is: "You're out shopping with some of your close friends and they decide to take some clothing without paying for it. You don't think it's a good idea, but they say you should take something too."

Next, participants were asked: "When you are deciding what to do, what are the reasons that would make you decide TO take the clothing? Please list as many as you think of," followed by "When you are deciding what to do, what are the reasons that would make you decide NOT TO take the clothing? Please list as many as you think of." The order of questions was counterbalanced across vignettes.

Responses were coded in terms of presence of the following psychosocial content variables: peer influence, sensation seeking, anger, short-term benefits, fear, perceived risk, and legal, short-term, and long-term consequences. Participants received a score of (1) for presence or (0) for absence of each variable on each vignette, and scores were summed for each psychosocial content variable across vignettes to create total scores ranging from 0 to 3.

Responses were consensus coded according to procedures created based on an amalgamation of past decision research (e.g., Cauffman, 1996; Lewis, 1981). A subset of coding guidelines and example responses are included in the Appendix. The principle investigator and four research assistants (upper level undergraduate students trained in research methods) first coded pilot data ($n = 30$) from college students and discussed each code decision.

For the current study, the same four coders worked in teams of two and utilized the amended coding procedure. Teams discussed each code until agreement was reached. To establish inter-team reliability, 10% ($n = 73$) of the surveys were cross-coded across teams. Teams agreed on 94.5% of their initial coding decisions (kappa = .66). In cases of disagreement, the principle investigator decided on the best-fitting response code.

According to Fleiss (1981), kappa values of 0.40–0.75 indicate fair to good reliability, and .40 was considered the minimum kappa for this study. For psychosocial variables included in the study, inter-team reliability and percent agreement were as follows. For psychosocial content in favor of antisocial behavior: peer influence (% agreement = 87%, kappa = .61), sensation seeking (% agreement = 100%, kappa = .97), anger (% agreement = 94%, kappa = .57), and short-term benefits (% agreement = 85%, kappa = .49). For psychosocial content against antisocial behavior: fear (% agreement = 97%, kappa = .80), perceived risk (% agreement = 93%, kappa = .79), legal consequence (% agreement = 97%, kappa = .92), short-term consequence (% agreement = 91%, kappa = .50), and long-term consequence (% agreement = 95%, kappa = .66).

To test internal and external validity of the psychosocial content variables, pairwise correlations were run with standardized psychosocial scales and an antisocial decision making scale.[1] As a criterion for inclusion in the study, associations were required to be significant, but expected to be moderate for two reasons. First, variables measured presence, as opposed to degree, of psychosocial content. Second, similar to Fried and Reppucci (2001), psychosocial content was seen as an application of psychosocial variables in antisocial contexts, as opposed to a different means of measuring psychosocial maturity. All psychosocial content variables were significantly correlated with at least one psychosocial scale and with the antisocial decision making scale, with the exception of "peer influence as a reason not to engage in behavior," which was excluded from the study.

### *Standardized Psychosocial Scales*

In order to provide comparisons with previous studies, four standardized scales measuring general susceptibility to psychosocial variables were included: future-outlook, risk perception, sensation seeking, and resistance to peer influence.

The Future Outlook Inventory (FIO) (Cauffman & Woolard, 1999) is a 14-item scale measuring consideration of future consequences, and is rated on a 4-point Likert scale from "Never True" to "Always True." An example item from this scale is "I think about how things might be in the future." Cronbach's $\alpha = .78$, $M = 2.61$, $SD = .41$, range = 1.14–3.71, and a high score indicates an extended future outlook.

Two measures associated with risk perception were employed, the Risk Perception Scale (Siegel et al., 1994) and the Arnett Inventory of Sensation Seeking (AISS) (Arnett, 1994). The Risk Perception Scale (RPS) taps perceived risk of 18 different risky behaviors, for example, "smoking marijuana" and "having sex without a condom," and is scored on a nine-point Likert scale from 0 "Not at all risky" to 8 "Extremely risky." For this sample, Cronbach's $\alpha = 91$, $M = 5.22$, $SD = 1.30$, range = .11–8, with a high score indicating strong risk perception. The Arnett Inventory of Sensation Seeking (AISS) (Arnett, 1994) is an 18-item scale measured on a 4-point Likert scale from 1 "Does not describe me at all" to 4 "Describes me very well." An example statement is "I can see how it would be interesting to marry someone from a foreign country." The scale was reverse coded so that high scores indicate low sensation seeking. Cronbach's $\alpha = .72$, $M = 2.47$, $SD = .41$, range = 1.16–3.55.

A standardized measure tapped resistance to peer influence, a revised Resistance to Peer Influence Scale (Steinberg & Monahan, 2007). Based on poor reliability on a pilot test, the scale was altered from its original format of two contradictory statements: "Some people go along with their friends just to keep their friends happy. BUT other people refuse to go along with what their friends want to do, even though they know it will make their friends unhappy." to include only a single sentence, such as "Some people go along with their friends just to keep their friends happy." Ten items are measured on a four-point scale from 1 "Very much like me" to 4 "Not at all like me," Cronbach's $\alpha = .71$, $M = 3.16$, $SD = .47$, range = 1.30–4. Items are reverse coded so that a high score indicates high resistance to peer influence.

### *Criminal Behavior*

Criminal behavior was measured with Elliot and Ageton's (1985) self-report delinquency scale. This scale asks "How many times in the last year have you (Used cocaine 'Coke')," consists of 45 items, and measures delinquent and aggressive behavior and substance use. Five status behaviors and four adolescent-specific items were dropped in the current study. A total score measuring whether an individual engaged in the 36 illegal behaviors was calculated. This method has been recognized as a successful

[1] An antisocial decision making scale was also included in the study. Participants were asked, for example: "Would you shoplift or would you refuse to take the item?" Responses were counterbalanced across vignettes, and were measured on a four point scale from 1 "Definitely refuse" to 4 "Definitely shoplift." Cronbach's $\alpha = .62$, $M = 1.88$, $SD = .63$, range = 1–4. High scores indicate high antisocial decision making.

summative method for scoring multiple-item measures of antisocial behavior (Osgood, McMorris, & Potenza, 2002). Cronbach's alpha $\alpha = .87$, $M = 3.8$, $SD = 4.49$, range = 0–36, and a high score indicates participation in a wide range of criminal behavior.

## PROCEDURE

Appropriate IRB approval was obtained through the University. This approval allowed for informed assent from adolescents and passive consent from their parents. For adolescents, permission was obtained from an urban high school to survey students in the classes comprising both lower- and higher-level academic tracks. All students gave informed assent and no parents objected to the study; thus all students present when the survey was conducted participated in the study. Students were told that their participation and responses would not affect their academic status, and were given a debriefing form upon completion of the survey. The young adults sample were college students participating in the experiment for class credit. Students gave informed consent and were given a debriefing form upon completion of the survey. The adult sample was obtained by offering undergraduate students class credit for their parent's participation in the survey. Students addressed packets to their parents, including an assent letter explaining the study and a debriefing form. Parents returned their completed survey in a pre-addressed, pre-stamped enveloped. This method of recruitment yielded a 96% response rate.

## RESULTS

### Analysis Plan

The first set of analyses focused on age-group differences on psychosocial scales using multivariate analysis of covariance. The second set of analyses addressed the study's goal of identifying age-differences in psychosocial content of antisocial decision making utilizing the multinomial logistic regression procedure for ordinal dependent variables in Mplus, version 4.2 (Muthen & Muthen, 2004). Goodness of fit was assessed using the scaled chi-squared statistic and parameter estimates were used to examine the effects of predictor variables within each comparison. The third set of analyses utilized OLS hierarchical regression analyses to assess the predictive utility of psychosocial content in favor of antisocial decisions, above and beyond demographic variables, on criminal behavior for adolescents, young adults, and for adults.

### Psychosocial Scales

To provide comparisons with previous psychosocial maturity findings (Modecki, 2008), a MANCOVA was conducted, utilizing age-group (adolescent, young adult, or adult) and race as the independent variables, standardized psychosocial scales (resistance to peer influence, sensation seeking, risk perception, and future-orientation) as the dependent variables, and average grade and SES as the covariates. Psychosocial scale measures were only significantly related to age-group, although the strength of this association was small (multivariate $F(8, 1410) = 3.74$, Pillai's Trace = .04, $p < .001$, partial $\eta^2 = .02$). As seen in Table 2, pairwise comparisons indicated that adolescents were significantly less mature than adults on measures of sensation seeking, risk perception, and future orientation, and adults were more mature than either young adults or adolescents on the resistance to peer influence measure.

### Psychosocial Content of Antisocial Decisions

Three vignettes asked participants: (1) why they would decide to engage in antisocial behavior and (2) why they would not, and reasons were coded for psychosocial content. Psychosocial content in favor of antisocial behavior was coded for peer influence, sensation seeking, anger, and short-term benefits, and psychosocial content against

**Table 2** Adjusted and unadjusted group means for psychosocial scales for adolescents, young adults, and adults

| Group | Resistance to peer influence | | Sensation seeking[A] | | Risk perception | | Future-orientation | |
|---|---|---|---|---|---|---|---|---|
| | Mean | Adj. mean[B] | Mean | Adj. mean[B] | Mean | Adj. mean[B] | Mean | Adj. mean[B] |
| Adult[C] | 3.44 | 3.53[a] | 2.74 | 2.61[a] | 5.84 | 6.16[a] | 2.86 | 2.84[a] |
| Young-adult[D] | 3.12 | 3.18[b] | 2.43 | 2.38[a,b] | 5.26 | 5.58[a,b] | 2.65 | 2.65[a,b] |
| Adolescent[E] | 2.98 | 3.04[b] | 2.28 | 2.25[b] | 5.08 | 4.90[b] | 2.48 | 2.46[b] |

*Note*: Adjusted means with different superscripts differ at the $p < .05$ level

[A] Arnett Sensation Seeking Inventory is reverse coded, so that higher scores indicate higher psychosocial maturity (and less sensation seeking)

[B] Mean adjusted for average grade and SES

[C] $n = 257$, [D] $n = 269$, [E] $n = 196$

**Table 3** Summary of separate multinomial logistic regression analyses predicting psychosocial content in favor of antisocial behavior

| Younger vs. older age group comparisons | Psychosocial variables | *B* | SE *B* | B | Odds ratio | $R^2$ |
|---|---|---|---|---|---|---|
| Adolescents (.5) vs. adults (−.5) | Anger | 1.55 | .22 | .22*** | 4.69 | .58 |
| | Peer pressure | .73 | .18 | .14*** | 2.06 | .20 |
| | Short-term benefits | 2.00 | .22 | .36*** | 7.38 | .31 |
| | Sensation seeking | .78 | .30 | .16** | 2.18 | .06 |
| $\chi^2_{diff}$ for nested model | 472.91*** | | | | | |
| Young adults (.5) vs. adults (−.5) | Anger | 1.40 | .22 | .25*** | 4.04 | .44 |
| | Peer pressure | 1.43 | .18 | .31*** | 4.17 | .17 |
| | Short-term benefits | .94 | .17 | .20*** | 2.57 | .17 |
| | Sensation seeking | .81 | .28 | .18** | 2.24 | .06 |
| $\chi^2_{diff}$ for nested model | 529.07*** | | | | | |
| Adolescents (.5) vs. young adults (−.5) | Anger | −.05 | .24 | −.01 | .95 | .60 |
| | Peer pressure | −.91 | .18 | −.19*** | .40 | .10 |
| | Short-term benefits | .71 | .21 | .12*** | 2.03 | .44 |
| | Sensation seeking | −.20 | .34 | −.04 | .82 | .05 |
| $\chi_{diff}^2$ for nested model | 494.15*** | | | | | |

*Note*: All analyses controlling for race, average grades for last full year in school, and SES
Significant positive estimates indicate comparison group (.5) is higher than reference group (−.5). Significant negative estimates indicate comparison group (.5) is lower than reference group (−.5)

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

antisocial behavior was coded for: fear, perceived risk, and legal, and moral, and short- and long-term consequences. Participants received a score of (1) for presence or (0) for absence of each variable on each vignette, and variable scores were summed across vignettes to create total scores ranging from 0 to 3.

Because the dependent variables were categorical, three separate MLR analyses investigated whether age-groups differed in the psychosocial content of their decisions favoring antisocial behavior (peer influence, sensation seeking, anger, and short-term benefits), controlling for average grade, SES, and race. Contrast codes compared younger vs. older age groups (see Table 3). In line with the study's hypotheses, adolescents revealed greater psychosocial content in their antisocial decision making than adults on all four indices: anger, peer pressure, short-term benefits, and sensation seeking. However young adults also showed greater psychosocial content than adults on these variables. For adolescent versus young adult comparisons, adolescents displayed greater short-term benefits and decreased peer influence.

Likewise, three separate MLR analyses investigated whether age-groups differed in the psychosocial content of their decisions against antisocial behavior (fear, perceived risk, and legal, moral, and short- and long-term consequences), controlling for average grade, SES, and race. As seen in Table 4, moral reasoning increased with age. Further, adolescents and young adults perceived greater risk and utilized more short-term and fewer long-term consequences than adults. In addition, adolescents displayed decreased fear compared to young adults and adults.

## Strength of Psychosocial Content Predicting Criminal Behavior

Hierarchical regression analyses assessed the predictive utility of psychosocial content in favor of antisocial decisions on criminal behavior for adolescents, young adults, and adults. Evaluation of the criminal behavior score led to the use of the square root transformation to reduce skewness and kurtosis. For all analyses, demographic variables were entered into step one of the regression equation and psychosocial content variables were entered into step two. $R^2$ change scores for each group were then converted to Fisher's $Z$ scores to assess whether the adolescent and young adult correlations significantly differed from that of adults.

For adolescents, average grade was a significant predictor of criminal behavior on step 1 ($F(5, 181) = 5.71, p < .001$, adjusted $R^2 = .11$), and average grade, peer influence, and sensation seeking were significant predictors of criminal behavior on step 2 ($F(9, 177) = 6.57$, $p < .001$, adjusted $R^2 = .21$, $R^2 = .14$ for Step 1; $\Delta R^2 = .11$ for Step 2, $p < .001$). For young adults, gender and SES were significant predictors of criminal behavior on step 1 ($F(5, 267) = 8.82$, $p < .001$, adjusted $R^2 = .13$), and gender, SES, and peer influence were significant predictors of criminal behavior on step 2 ($F(9, 263) = 6.87$, $p < .001$,

**Table 4** Summary of separate multinomial logistic regression analyses predicting psychosocial content against antisocial behavior

| Younger vs. older age group comparisons | Psychosocial variables | *B* | SE *B* | B | Odds ratio | $R^2$ |
|---|---|---|---|---|---|---|
| Adolescents (.5) vs. adults (−.5) | Fear | −.55 | .20 | −.12** | .58 | .08 |
| | Short-term consequences | 1.30 | .20 | .27*** | 3.68 | .07 |
| | Long-term consequences | −.68 | .22 | −.14*** | .51 | .15 |
| | Legal consequences | −.18 | .19 | −.04 | .84 | .00 |
| | Moral reasoning | −1.69 | .21 | −.30*** | .19 | .31 |
| | Perceived risk | 1.47 | .20 | .30*** | 4.33 | .09 |
| $\chi^2_{diff}$ for nested model | 480.84*** | | | | | |
| Young adults (.5) vs. adults (−.5) | Fear | .20 | .19 | .04 | 1.22 | .09 |
| | Short-term consequences | 1.12 | .16 | .25*** | 3.07 | .07 |
| | Long-term consequences | −.35 | .20 | −.08* | .71 | .15 |
| | Legal consequences | −.22 | .17 | −.05 | .80 | .00 |
| | Moral reasoning | −.89 | .17 | −.18*** | .41 | .29 |
| | Perceived risk | 1.28 | .16 | .29*** | 3.59 | .09 |
| $\chi^2_{diff}$ for nested model | 482.31*** | | | | | |
| Adolescents (.5) vs. young adults (−.5) | Fear | −.78 | .20 | −.16*** | .46 | .06 |
| | Short-term consequences | −.14 | .17 | −.03 | .87 | .00 |
| | Long-term consequences | −.25 | .20 | −.05 | .78 | .05 |
| | Legal consequences | .09 | .19 | .02 | 1.10 | .00 |
| | Moral reasoning | −.51 | .18 | −.11** | .60 | .06 |
| | Perceived risk | −.18 | .17 | −.04 | .84 | .01 |
| $\chi_{diff}^2$ for nested model | 536.57*** | | | | | |

*Note*: All analyses controlling for race, average grades for last full year in school, and SES
Significant positive estimates indicate comparison group (.5) is higher than reference group (−.5). Significant negative estimates indicate comparison group (.5) is lower than reference group (−.5)

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

adjusted $R^2 = .16$, $R^2 = .14$ for Step 1; $\Delta R^2 = .05$ for Step 2, $p < .01$). For adults, there were no significant predictors of criminal behavior on step 1 ($F(5, 250) = 1.18$, *ns*, adjusted $R^2 = .00$) or step 2 ($F(9, 246) = 1.44$, *ns*, adjusted $R^2 = .02$, $R^2 = .02$ for Step 1; $\Delta R^2 = .03$ for Step 2, *ns*).

Next, for each age group, $R^2$ change scores were converted to Fisher's *Z* scores. Two difference scores were then calculated to assess: (1) whether the adolescent correlation was significantly higher than the adult correlation and (2) whether the young adult correlation was significantly higher than the adult correlation. As predicted, comparing one-tailed change scores, adolescents had a significantly higher change score than did adults ($r1 - r2 = .17$; $Z = 1.85$, $p < .05$), and the young adult change score was not significantly higher than the adult change score ($r1 - r2 = .05$; $Z = .59$, *ns*).

## DISCUSSION

The current study extends previous research by comparing psychosocial content of antisocial decision making in adolescents, young adults, and adults. Overall, results suggest that adolescents were more influenced by psychosocial variables than adults according to psychosocial scale measures. At the same time, adolescents and young adults displayed increased psychosocial content in their antisocial decision making relative to adults. Of particular note, the unique effect of psychosocial content on self-report criminal behavior was significantly greater among adolescents than among adults, but did not differ significantly between young adults and adults.

In terms of psychosocial scales, adolescents rated higher on sensation seeking and lower on risk perception and future orientation than adults, and adults scored higher than either young adults or adolescents on the resistance to peer influence measure. The lack of differences between adolescents and young adults diverges from past findings (e.g., Cauffman & Steinberg, 2000). Indeed previous research with a similar mean-aged college student sample found that susceptibility to psychosocial variables appears relatively stable beyond age 18, with the exception of emotional temperance (Modecki, 2008). However, unlike previous developmental research this work focused on more specific psychosocial maturity measures. Clearly further research including both expansive and focused maturity measures is

required in order to map out the developmental continuum of psychosocial maturity. Further, this study's findings regarding young adult and adult dissimilarities on resistance to peer influence underscore the importance of incorporating older adult comparisons in psychosocial maturity research.

In addition, the current study hypothesized that adolescents' increased susceptibility to psychosocial influence would be reflected within their antisocial decision making. Findings in this area were somewhat inconsistent with the study's hypotheses. In regard to psychosocial content in favor of antisocial decisions: adolescents and young adults displayed greater psychosocial influence than adults, including anger, peer pressure, short-term benefits, and sensation seeking. At the same time, adolescents demonstrated decreased peer influence in comparison to young adults. This data likely reflects the composition of the young adult sample, which largely comprised 18-year-olds, as recent research designates 18 as the age in which susceptibility to peer influence peaks (Steinberg & Monahan, 2007). In all, these results point to young adult and adolescent similarities in psychosocial content of antisocial decisions. However, the thrust of the developmental immaturity argument posits that psychosocial content will disproportionately affect adolescent antisocial choices, due to their decreased autonomy, and character and identity development. This idea is discussed further below.

In terms of psychosocial content against antisocial behavior, results were somewhat in-line with the study's hypothesis and reflected aspects of adolescent immaturity. For instance, adolescents reported less fear than young adults or adults. Further, adolescents and young adults conveyed more perceived risk, and more short-term and fewer long-term consequences than adults. This former result seems contrary to the study's earlier finding that adolescents and young adults scored lower on the standardized risk perception measure than adults and, indeed, contrary to the intuitive notion that adolescents do not think about risks. Taken together, however, this study's findings demonstrate that although adolescents consider risks, they may continue to underestimate hazards, and do not seem particularly swayed by perceived risk. Emergent decision research similarly posits that adolescents are biased by their positive perceptions of antisocial behavior, and fail to be swayed by negative consequences (Reyna & Farley, 2006).

This study's findings also suggest that moral considerations against antisocial decisions increase with age. These results parallel previous research (e.g., Walker, 1989) and seem to further signal adolescents' developmental immaturity. Moreover, these data provide empirical support for legal researchers' more expansive definition of maturity that includes moral reasoning variables such as maintaining convictions (Salekin et al., 2001). However, it is unclear how this finding might inform the debated role of maturity in transfer decisions. For example, although moral reasoning is traditionally considered a developmental construct (Erikson, 1959), to some, decreased use of moral reasoning might suggest higher dangerousness (see Salekin et al., 2002). Future research would greatly benefit from developmentally focused research that attempts to measure all three *Kent* criteria: sophistication-maturity, risk of dangerousness, and amenability to treatment.

Surprisingly, no age-group differences were found on legal considerations against antisocial decisions. Based on group means, all age groups largely took into account the potential legal implications of their decisions. However, adolescents may continue to underestimate actual legal consequences. For instance, past research finds that when adolescents commit serious crimes, they are often unaware of transfer laws (Redding & Fuller, 2004).

The current study also assessed the predictive nature of psychosocial content on criminal behavior. As anticipated, hierarchical regression results suggest that psychosocial content was associated with participation in criminal behavior for both adolescents and young adults, but not adults. Importantly, the unique effect of psychosocial content on self-report criminal behavior was significantly greater among adolescents than among adults, but did not differ significantly between young adults and adults. These results are in concordance with Scott, Reppucci, and Woolard (1995) thesis over a decade ago that psychosocial variables unduly influence adolescents' antisocial choices. Theoretically, the influence of psychosocial content on young adult criminal behavior may be mediated by developmental maturity in terms of identity, and character. The data suggest that current legal consideration, or lack thereof, of adolescent immaturity is problematic (Salekin et al., 2001, 2002) and contradict developmental findings and public attitudes that age-based immaturity should mitigate juvenile responsibility (Scott et al., 2006).

## Limitations, Conclusions, and Policy Implications

It is also important to note that the study's design has several limitations. First, there were significant cohort differences between the adolescent, young adults, and adult groups. Samples likely differed from each other and from community samples in terms of DSM-IV diagnoses, income level, and other risk and protective factors. Future research should consider broadening their sampling to the larger community and should include a wider array of covariate measures. Second, this work attempts to investigate a developmental construct through the use of sampling and thus is limited by its cross-sectional nature; the lack of longitudinal data prohibits establishing causal

pathways for variables in the models. Future research should attempt to follow individuals over time, from pre-adolescence through middle adulthood, in order to understand developmental changes in psychosocial maturity and decision making. In addition, subsequent work should attempt to measure constructs such as personal identity and autonomy, in order to better understand how these factors might mediate the relations investigated in the current study. Finally, several of the psychosocial content variables had only moderate internal reliability. Future research would benefit from improved construct reliability to further validate these results.

In light of the study's limitations, the current research continues to offer worthwhile insight into age-based differences between juvenile and adult psychosocial maturity. Notably, adolescent criminal behavior indicated a comparatively strong psychosocial influence relative to adults. These results echo theories of developmental immaturity (Scott et al., 1995) and optimistically may inform legal responses to adolescent crime.

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## APPENDIX

Sample Coding Guidelines for Psychosocial Content

Anger (*Respondent must feel anger*) Examples: I was mad; he pissed me off.
Peer Influence (*Friends opinion/influence/expectations*; *if the presence of peers impacts their reasoning*) Examples: peer pressure; makes me more accepted; going along with him; my friend told me to.
Short-term consequence (*Immediate event/consequences of choosing action*) Examples: could get kicked out of theatre; I'd get new clothes.
Sensation Seeking (*Fun, thrilling*, *emotionally exciting*) Examples: fun; excitement; it's a rush.
Fear (*Respondent must feel fear, including fear of embarrassment*) Examples: scared I'll get caught; I'm afraid neighbors will find out.
Long-term consequence (*Must be beyond the short term*; *not the direct result of the decision*) Examples: lose my parents' trust; hurt my reputation.
Legal consequence (*Must specify legal, about the law*) Examples: I don't want to get arrested; fights are illegal; shoplifting is a serious crime; illegal; law; I'm on parole.
Moral consequence (*Must specify morals or being wrong*) Examples: It's against my morals, it's wrong.
Risk Perception (*A judgment of risk; must explicitly list a risk*) Examples: it's dangerous; there's a chance I'd get caught.

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