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## Assessment of Cheating Behavior in Young School-Age Children: Distinguishing Normative Behaviors From Risk Markers of Externalizing Psychopathology

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### Abstract

The central goal of this longitudinal study was to develop a laboratory-based index of children's covert cheating behavior that distinguished normative rule violations from those that signal risk for antisocial behavior. Participants ( $N = 215$  children) were drawn from a community population and oversampled for externalizing behavior problems (EXT). Cheating behavior was measured using two resistance-to-temptation tasks and coded for extent of cheating, latency to cheat, and inappropriate positive affect. Mothers rated internalized conduct and three forms of self-regulation: inhibitory control, impulsivity, and affective distress. Mothers and teachers reported EXT concurrently (T1) and 4 years later, when children averaged 10 years of age (T2). Children categorized as severe cheaters manifested lower inhibitory control, greater impulsivity, and lower levels of internalized conduct at T1. Children in this group also manifested higher levels of EXT in home and school settings at T1 and more EXT in the school setting at T2, even after accounting for T1 ratings.

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Children's ability to follow rules unmonitored is one of the main goals of socialization and a major milestone of early development (e.g., Grusec & Goodnow, 1994; Hoffman, 1994; Kochanska & Aksan, 2006). Internalized rule-compatible conduct, an important

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subcomponent of the emergent conscience, can be detected at early stages of development (Aksan & Kochanska, 2005). Across the toddler to preschool transition, children increasingly exhibit more rule-following behavior in the absence of close supervision (Gralinski & Kopp, 1993; Kochanska, Coy, & Murray, 2001). Young school-age children who have failed to develop internalized standards of conduct are at elevated risk for a host of adjustment problems, particularly conduct disorder (Olson, Sameroff, Lunkenheimer, & Kerr, 2009). Thus, assessment of children's self-guided rule violations may yield a risk marker of serious and persistent antisocial behavior (i.e., more disruptive and destructive forms of externalizing behavior; Shaw & Winslow, 1997). In what follows, we discuss methods for assessing children's covert rule breaking, using a resistance to temptation paradigm.

## COVERT RULE VIOLATIONS AS MEASURES OF POORLY INTERNALIZED MORAL CONDUCT

Internalized conduct in children typically has been assessed using rigged game tasks akin to Sears, Rau, and Alpert's (1965) resistance to temptation paradigm. In this paradigm, poor internalization is marked by a willful violation of rules, or cheating. For example, in a study examining deceitful behavior in a resistance to temptation task, children were instructed to identify familiar toys without peeking, based on the toys' sounds. After correctly matching a few of the toys, the experimenter left the room for 1 min, then returned to test for the recognition of the last toy, which the child would not be able to correctly identify unless she peeked (Talwar & Lee, 2008). With this design, there was an 82% cheating rate in children between 3 and 8 years of age, with no significant gender differences (Talwar & Lee, 2008). Other studies have confirmed that cheating is relatively common among young children (Asendorpf & Nunner-Winkler, 1992; DePalma, Madey, & Bornschein, 1995; Kochanska & Murray, 2000; Spinrad et al., 1999; Talwar, Gordon, & Lee, 2007; Woolgar, Steele, Yabsley, & Fonagy, 2001). Studies have also shown that boys and girls are equally likely to succumb to a temptation to cheat (see Silverman, 2003).

Under certain conditions, early disregard for rules under temptation may signal risk for serious adjustment problems. Given that deception and weak internalization of rules are principal characteristics of covert antisocial behaviors (Hinshaw, 2005; Loeber & Schmalzing, 1985), early cheating behavior may be a predictor of future antisocial behavior. Hinshaw, Simmel, and Heller (1995) examined the psychometric properties of laboratory assessments of covert behavior by observing school-aged boys with and without attention-deficit hyperactivity disorder. The participants were instructed to work on an assignment for which the answers were "accidentally" left behind in an unsupervised room with partially hidden objects (e.g., money, toys, cards). Hinshaw et al. found that ratings of antisocial behavior correlated with observed stealing and property destruction but not cheating.

Unfortunately, the manner in which cheating behavior has been assessed in past research may be insufficient for distinguishing at-risk from normally developing children. In prior studies where rigged game tasks have been used to evaluate children's cheating behavior, cheating has been defined as frequency of rule violations. Notable exceptions have included Kochanska, Murray, Jacques, Koenig, and Vandegest's (1996) codes for latency to

transgress, extent of transgression, and instances of rule-compatible conduct. It may be possible to assess young children's cheating behavior in ways that spotlight more subtle aspects of cheating and differentiate normative from abnormal rule violation patterns. As shown next, addressing aspects of cheating that signify deficits in inhibitory control, impulsivity, and emotion regulation may yield a more sensitive index of weak internalized moral conduct and of non-normative behavior.

## **MULTIPLE REGULATORY SYSTEMS GOVERN CHEATING BEHAVIOR**

Self-guided moral actions reflect competence in several self-regulatory domains (Frick & Morris, 2004; Kochanska & Aksan, 2006; Kochanska et al., 1996; Rothbart & Ahadi, 1994). In what follows, we discuss three interrelated components of self-regulation that should be considered in an assessment of children's internalized rule-following behavior: inhibitory control, impulsivity, and affective distress in response to transgressions.

### **Inhibitory Control**

Inhibitory/effortful control has shown strong associations with the development of internalized conduct (Kochanska, 1994; Kochanska et al., 1996; Olson, Sameroff, Kerr, Lopez, & Wellman, 2005). The higher-order executive capacity to override a dominant response with a subdominant response facilitates children's ability to follow rules without external guidance (Kochanska & Aksan, 2006; Posner & Rothbart, 2000; Rothbart & Bates, 2006). Hence, early internalized conduct is best understood using a framework organized around the core competency of inhibitory control. Low inhibitory control may deter children from internalizing codes of moral conduct (Kochanska & Knaack, 2003). Although no such causal pathway has been experimentally tested, children who fail to internalize rules because of low inhibitory control may face long-term conduct problems. Consistent with this claim, early deficits in inhibitory control have been associated with concurrent and later externalizing behavior problems (Eisenberg et al., 2001; Eisenberg et al., 2005; Kerr, Lopez, Olson, & Sameroff, 2004; Muris & Ollendick, 2005; Murray & Kochanska, 2002; Olson et al., 2005).

Unusually high levels of behavioral inhibition have been associated with internalizing problems such as anxiety (Kagan, 2008). Of interest, anxiety may be protective against social impairment and serious externalizing problems, such as criminality (Quay & Love, 1977; Walker, Lahey, Russo, & Frick, 1991). In other studies, however, co-occurring conduct problems and internalizing symptoms have been associated with poorer outcomes (Kerr, Tremblay, Pagani, & Vitaro, 1997; Sourander et al., 2007). Perhaps certain facets of internalizing symptoms (e.g., social withdrawal) exacerbate externalizing problems, whereas other facets (e.g., fearful shyness) inhibit them (Lahey & Waldman, 2003).

### **Impulsivity**

Impulsivity, a temperament trait characterized by weak executive control and behaviors that lack forethought or planning, may also disrupt or impede the pathway to healthy internalized conduct (Hughes, White, Sharp, & Dunn, 2000; Morgan & Lilienfeld, 2000; Nigg, 2000; Olson, Bates, Sandy, & Schilling, 2002; Solanto et al., 2001). Extreme impulsivity may

render a child physiologically incapable of abiding by social norms, even if he or she knows the rules and “wants” to follow them. Impulsivity and inhibitory control are theoretically and empirically interrelated. Nonetheless, impulsivity is theoretically distinct from inhibitory control in that it constitutes a motor-reflex form of regulation that is less cognitively complex (Eisenberg & Morris, 2002). The two constructs also have been empirically linked with different behavioral outcomes. For example, Eisenberg, Spinrad, and colleagues (2004) reported that impulsivity and inhibitory control were differentially related to resiliency and adjustment of school-aged children 2 years later. Based on this research, it seems important to consider inhibitory control and impulsivity as two related yet distinct constructs.

Impulsivity may have far-reaching implications for understanding children’s behavioral adjustment. For example, impulsivity is a main clinical symptom of attention-deficit hyperactivity disorder (American Psychiatric Association, 2000), and has been associated with oppositional defiant disorder and conduct disorder (August, Realmuto, Macdonald, Nugent, & Crosby, 1996; Frick, O’Brien, Wootton, & McBurnett, 1994; Newcorn et al., 2001). Children who display chronic impulsive behavior may be more likely to develop and sustain conduct problems (Moffitt, Caspi, Harrington & Milne, 2002; Olson, Schilling, & Bates, 1999; Snyder, Prichard, Schrepferman, Patrick, & Stoolmiller, 2004). In addition, impulsivity has been regarded as one of the core dimensions of childhood psychopathy, a precursor of antisocial personality disorder and adult psychopathy (Frick, Bodin, & Barry, 2000; Frick et al., 1994). Given these considerable risks, it is essential to incorporate constructs of impulsivity in our understanding of rule-following behavior.

### **Affective Responses to Misbehavior**

The third domain involves deviations in emotion regulation. Affective distress, or emotional discomfort in response to wrongdoings, is embedded in many theoretical models that explain the formation of internalized conduct and conscience (Gray, 1991; Hoffman, 1983; Kochanska & Aksan, 2006). Affective distress may indicate guilt, shame, or a fearful temperament (Kochanska, Gross, Lin, & Nichols, 2002). Theoretically, affective distress functions to prevent future wrongdoing and cultivate internalized conduct as an internal signaling system (Kochanska, 1995; Kochanska et al., 2001; Kochanska et al., 2002). Indeed, deficient affective distress also has been closely linked to the development of callous-unemotional traits, which are typified by a fundamental lack of empathy or guilt (Blair, 1995). Children with callous-unemotional traits and fearless temperaments are apt to have a reward dominant response style, a common attribute of psychopathic adults (O’Brien & Frick, 1996). This subgroup of young transgressors is at higher risk for engaging in instrumental aggression and serious antisocial behavior than other groups of children with conduct problems (Barry et al., 2000; Frick, Cornell, Barry, Bodin, & Dane, 2003).

Relatedly, children with high levels of callous-unemotional traits may manifest positive arousal in the context of breaking rules or hurting others. Several studies have linked inappropriate positive affect to externalizing problems in children (e.g., Arsenio, Cooperman, & Lover, 2000; Arsenio & Lover, 1997; Miller & Olson, 2000). Cimbara and McIntosh (2003) found that children with conduct disorders responded to vignettes about

delinquent acts with feelings of excitement and happiness. In addition, the expression of positive affect in response to deviant acts has been shown to be a mechanism by which peers model and reinforce deviant behavior (Snyder et al., 2005). Thus, it is important to assess children's inappropriate positive emotional responses in resistance to temptation tasks, because they potentially indicate key deficits in the development of emotion regulation.

## THE CURRENT STUDY

In summary, there are three regulatory systems that affect the development and expression of rule-following behavior. The central goal of the current study was to develop a measure of children's cheating behavior that differentiated elevated risk for disruptive behavior problems from normative rule violations. We posited that cheating behavior reflects three underlying self-regulation processes: inhibitory control, impulsivity, and affective distress. Distinguishing these features could allow for a more meaningful analysis of cheating severity, especially as it relates to the development of internalized conduct and antisocial behavior in children. Severe cheating behavior was defined as showing clear disregard for rules, cheating soon after the start of the task, and displaying emotional satisfaction during or after transgressions. Less severe cheating included periods of sustained rule-following and the absence of apparent pleasure after an eventual transgression. Our main hypothesis was that greater cheating severity would be concurrently and prospectively associated with higher levels of mother- and teacher-rated externalizing problem behavior. Conversely, the mere presence of cheating behavior was expected to index normal variability in young children's adjustment. In addition, we expected that our observational measure of cheating severity would show convergent validity with maternal ratings of children's internalized conduct and self-regulation.

## METHOD

### Participants

Participants were 215 children (101 girls) who took part in an ongoing longitudinal study of young children at risk for school-age conduct problems (Olson et al., 2005). Children were approximately 5½ years old at Time 1 (T1) and 10 years old at Time 2 (T2). Families were recruited from local and regional preschool centers, newspaper ads, and pediatrician referrals. Children were recruited at age 3 to represent the full range of externalizing symptom severity on the Child Behavior Checklist/2–3 (Achenbach, 1992), with an oversampling of young children in the upper range of the Externalizing Problems scale. Children who experienced severe familial disruption (e.g., in initial stages of divorce at time of recruitment) or severe economic hardship or who manifested grave health problems and/or cognitive impairments (I.Q. <70) were not included in the study. Families were representative of the local population. The majority of children were of European American heritage (86%), and most others were identified as African American (5%) or biracial (8%). Most mothers were married (89%), 3% were living with a partner, 5% were single (never married), and 3% were divorced. The median annual family income was \$52,000, ranging from \$20,000 to more than \$100,000.

Follow-up assessments were conducted at ages 5½ (full wave with laboratory component) and 10 years (truncated wave with parent and teacher reports only). Sample attrition primarily reflected families moving out of town and was not selective based on key study variables such as child sex, family socioeconomic status, or child adjustment,  $F(1, 215) = 1.86, 2.10, \text{ and } 1.30$ , respectively (all  $ps > .05$ ).

## Procedure

Since 1999 our project has been reviewed and approved annually by the University of Michigan Behavioral Sciences Institutional Review Board. Parents completed informed consent documents during all assessment periods; a home visitor was available to explain details of the study and address questions and concerns. Child assent was obtained prior to laboratory testing. After the child's parent dropped him or her off, there was a 30-min rapport-building session during which the examiner showed the child around the child care center where testing was carried out and played with him or her in a supportive and nondirective manner. Next, the examiner said, "I've got some games in the other room that I want to show you. Do you want to come with me?" If the child refused, the examiner said, "Okay," and the session was terminated.

**Mother and teacher reports**—At T1, mothers were interviewed in their homes by a female social worker and then asked to complete a packet of questionnaires when children were 5½ ( $M = 63.41$  months,  $SD = 2.71$ ). At T2, mothers provided follow-up ratings of their child's behavioral adjustment using the same measures that were completed at T1. Kindergarten teachers (T1) and elementary school teachers (T2) provided ratings of children's behavioral adjustment. Families were paid for their involvement and teachers were given gift certificates for their participation.

**Laboratory assessment of cheating behavior**—Most of the children ( $n = 189$ ) participated in a 4-hr laboratory assessment located at a preschool on a weekend morning. After building rapport, graduate student examiners individually administered two cheating tasks adapted from Kochanska et al. (1996) that were designed to measure internalization of rules. Children's behaviors during the tasks were videotaped. A colorful gift bag was placed in plain sight, and the experimenter told the child not to peek at the prize inside. Children were told they could win the prize inside if they played two "easy" games; in truth, both games were extremely challenging for children this age. For the first game, the child was instructed to stand on an X marked on the floor and was given a bag with 20 beans. To win the prize, the child was told that he or she had to throw all of the beans into a cup placed 10 feet away, without stepping off the X. The examiner reminded the child not to peek, left the testing room, and shut the door. Two minutes later, the experimenter knocked on the door, waited 5 s, and reentered the room. The examiner told the child "good try" regardless of performance and explained that he or she had another chance to win the prize. In the second game, the child was instructed to sit on the floor and was given a baseball and a child's sock. To win the prize, children were told they had to put the baseball into the sock using only their pinky fingers. The examiner demonstrated this action, reminded the child not to peek at the prize, and then left the room again. The examiner followed the same reentry routine and pretended to reread the instructions for the game. The examiner then explained that he or she

had made a mistake by making the games more difficult than they were supposed to be and that the child should get the prize for his or her hard work.

## Measures

**Internalized conduct and affective distress**—At T1, mothers rated early conscience using the My Child Questionnaire (Kochanska, DeVet, Goldman, Murray, & Putnam, 1994), which consists of 100 items, each ranging from 1 (*extremely untrue, not at all characteristic of my child*) to 7 (*extremely true, very characteristic of my child*). Internalized moral conduct was measured by the 20-item Internalized Conduct scale ( $\alpha = .80$ ). Affective Distress was assessed with three subscales (our alphas): Guilt ( $\alpha = .80$ ), Empathy ( $\alpha = .79$ ), and Sensitivity to Wrong-doing ( $\alpha = .82$ ), which include items such as “Likely to look remorseful or guilty when caught in the middle of a forbidden activity”; “Will feel sorry for other people who are hurt, sick or happy”; and “Shows concern when a toy is broken.” These three subscales were moderately correlated ( $r = .45$ ) and were combined into a single scale ( $\alpha = .71$ ).

**Inhibitory control and impulsivity**—Inhibitory control and impulsivity were assessed at T1 using mothers’ ratings on the Child Behavior Questionnaire (Rothbart, Ahadi, Hershey, & Fisher, 2001). The Child Behavior Questionnaire is a caregiver report measure designed to assess 15 temperament attributes in children between the ages of 3 and 7. The Inhibitory Control ( $\alpha = .77$ ) and Impulsivity ( $\alpha = .80$ ) scales were used, because they directly correspond to constructs of self-regulation highlighted in our study.

**Child externalizing problems**—Mothers completed the Child Behavior Checklist for ages 6–18 (CBCL/6–18; Achenbach & Rescorla, 2001) at T1 and T2. The CBCL is a commonly used, 99-item, 3-point scale, from 2 (*very true or often true of the child*) to 0 (*not true of the child*), rating inventory that measures a child’s behavioral and emotional problems based on parents’ observations over the previous 2 months. The CBCL consists of two empirically derived dimensions of child problem behavior: Externalizing (with subscales in Aggressive Behavior and Rule-Breaking Behavior) and Internalizing (with subscales in Anxious/Depressed Behavior and Withdrawn Behavior). The Teacher Report Form for ages 6–18 (TRF/6–18; Achenbach & Rescorla, 2001) was completed at T1 by kindergarten teachers ( $n = 190$ ) and at T2 by elementary school teachers. The TRF/6–18 and parent CBCL/6–18 are structurally identical. Child conduct problems were measured by the Externalizing scale, as rated by mothers and teachers.

**Laboratory assessment of cheating behavior**—Three undergraduate research assistants coded videotapes of the two cheating tasks using an interval-based coding scheme. The presence or absence of relevant behaviors was coded every 10 s, starting when the experimenter left the room at the initiation of the first task. Interrater reliability on rule breaking and cheating, computed using Cohen’s kappa, ranged from .80 to .81 (25% of sample; exact agreement between independent paired codings). For each task, coders documented three dependent variables:

**Latency to cheat**—Coders recorded the time it took for participants to cheat. Children who did not cheat in a given task were assigned a time value of 120 s (the maximum length) so that latency *z* scores could be computed for all participants.

**Extent of rule breaking**—During the beans–cup game, cheating was recorded when children threw beans toward the cup while stepping off the X or placed beans directly in to the cup (which required walking the 10 feet from the X). In addition, coders rated the extent to which cheating was completed by the end of the first task. Children who actively adhered to the rules (e.g., demonstrated rule following by adjusting their feet to stay on the X) and did not cheat received a rating of zero. A rating of 1 was assigned to children who threw a bean at the cup from a distance while standing off the X (no explicit cheat but no adherence). Ratings of 2 through 4 were given to children who placed one bean (= 2), multiple beans (= 3), or who poured all of the beans at once (= 4) directly into the cup.

Rule breaking during the ball–sock game was recorded when children attempted to push the ball into the sock using any fingers other than their pinkies. Cheating was defined as successfully getting the ball into the sock using fingers other than the pinkies. Children were rated on the degree to which they cheated by the end of the task. A rating of 0 was given if no cheating and no rule breaking took place, 1 if the child broke the rules but did not successfully cheat, and 2 if the child cheated (i.e., they successfully placed the ball in the sock using more than just their pinkies).

**Inappropriate affect during rule breaking**—Coders also recorded the number of intervals that children displayed positive affect during and after cheating for both tasks. Positive affect included smiling, grinning, or laughing. For example, one child waited until the examiner left the room, immediately poured all beans in the cup, and ran back to the X. The child then smiled, exclaimed “Yes!” and danced. Children who showed inappropriate positive affect at least once during either of the tasks were identified. Hence, children who cheated but did not express joy during or after transgressions received a rating of 0, whereas those who showed inappropriate positive affect received a rating of 1.

**Cheating severity index**—An overall cheating severity score was calculated by aggregating the standardized scores of latency, extent, and positive affect of both tasks ( $\alpha = .74$ ). Scores ranged from  $-.97$  to  $1.51$ , with larger scores indicating higher levels of severity. To differentiate normal from abnormal cheating behavior, a categorical code was created by truncating the summary *z* score into three groups. Group cutoffs were based on the distributional quartiles. Children with scores below the lower quartile were considered “unlikely cheaters” ( $n = 51$ ; 27%), children with scores in the interquartile range were considered “normative cheaters” ( $n = 91$ ; 48%), and children with scores in the upper quartile were regarded as “severe cheaters” ( $n = 47$ ; 25%). This complex severity index was compared to a simpler measure of cheating behavior that indexed whether children cheated on neither ( $n = 70$ ; 37%), or at least one ( $n = 119$ ; 63%) of the tasks.



## RESULTS

### Descriptive Statistics

Descriptive statistics for study variables are presented in Table 1. Of 189 children, 119 (63%) cheated at least once, and 70 (37%) children did not cheat at all. Among those who cheated, 21 (18%) cheated only in the first task, 57 (48%) cheated only in the second task, and 41 (34%) children cheated on both tasks. In the first task, boys (26%) cheated significantly less than girls (41%),  $\chi^2(1, N = 189) = 4.47, p < .05$ . However, no significant gender differences were found for cheating behavior in the second task,  $\chi^2(1, N = 189) = .76, ns$ . Children were divided into the three cheating severity groups. Means and standard deviations for cheating behavior by group are provided in Table 2.

The median rating for the extent of cheating in the beans–cup game was 1 (no explicit cheat but no adherence;  $SD = 1.34$ ). In the ball–sock game, children received a median rating of 2 (successfully placed the ball in the sock using more than just their pinkies;  $SD = .74$ ). The extent of cheating did not significantly differ by gender in either of the two tasks. On average, cheaters in the first task ( $n = 62$ ) cheated within 46.65 s ( $SD = 38.63$ ) from the start of the task. In the second task, cheaters ( $n = 98$ ) took an average of 32.20 s ( $SD = 33.08$ ) to cheat. Children who cheated on both tasks ( $n = 41$ ) cheated significantly faster in the second task ( $M = 23.34$  s,  $SD = 29.86$ ) than in the first task ( $M = 45.93$  s,  $SD = 39.22$ ),  $t(40) = 3.54, p = .001$ . Inappropriate positive affect occurred in 23 (37%) of the cheaters in the first task and 47 (48%) of the cheaters in the second task. Out of all cheaters, 64 (54%) displayed inappropriate affect during or after transgressions at least once. Display of inappropriate positive affect did not significantly differ by gender on either task.

Concurrent and prospective associations among study variables were examined using zero-order correlations (Table 3). As expected, extent of rule breaking was significantly negatively correlated with inhibitory control, and hastiness of cheating was significantly positively correlated with impulsivity. The negative association between inappropriate positive affect and maternal ratings of children’s affective distress around transgressions did not reach significance. However, the presence of positive affect in concert with cheating behavior correlated significantly with relatively low levels of inhibitory control and with relatively high levels of impulsivity.

### Correspondence Between Cheating Behavior and Measures of Self-Regulation

A multivariate analysis of variance was used to test whether the cheating severity assessment reflected deficits in self-regulation while accounting for the effects of gender. Cheating group status and gender were set as independent variables, whereas impulsivity, inhibitory control, and affective distress were entered as dependent variables. A main effect for cheating group status was obtained,  $F(6, 338) = 3.11, p < .01$ . As predicted, children in the three cheating groups differed significantly on maternal ratings of impulsivity,  $F(2, 172) = 5.98, p = .003$ , and inhibitory control,  $F(2, 172) = 3.82, p = .02$ . Post hoc analyses revealed that children in the severe group had higher ratings of impulsivity ( $M = 4.71, SD = .86$ ) than children in the normative ( $M = 4.36, SD = .81$ ) and unlikely ( $M = 4.11, SD = .76$ ) groups ( $ps < .05$ ). Children in the severe group also received lower ratings of inhibitory control ( $M =$

4.64,  $SD = .82$ ) than those in the normative group ( $M = 5.05$ ,  $SD = .88$ ) and unlikely cheater group ( $M = 5.00$ ,  $SD = .70$ ;  $ps < .05$ ). However, the association between cheating group and affective distress did not reach statistical significance,  $F(2, 172) = 1.84$ ,  $p = .16$  (unlikely group  $M = 4.83$ ,  $SD = .54$ ; normative group  $M = 5.06$ ,  $SD = .55$ ; severe group  $M = 4.90$ ,  $SD = .55$ ). Girls were rated as having greater inhibitory control,  $F(1, 172) = 7.24$ ,  $p < .01$ , and affective distress,  $F(1, 172) = 9.16$ ,  $p < .01$ , than boys. However, gender did not moderate the effects of cheating severity on self-regulation,  $F(6, 338) = .70$ ,  $ns$ .

A multivariate analysis of variance also was used to test associations between the dichotomous cheating index and the three self-regulation measures. The main effect for cheating group was significant,  $F(3, 174) = 5.04$ ,  $p < .01$ . However, post hoc tests revealed that neither inhibitory control nor affective distress significantly differentiated the groups,  $F(1, 176) = 2.41$ ,  $ns$ , and  $F(1, 176) = 1.22$ ,  $ns$ , respectively. The presence of cheating behavior was significantly related to impulsivity,  $F(1, 176) = 12.50$ ,  $p < .001$ . Children who cheated on a task had significantly higher levels of impulsivity ( $M = 4.56$ ,  $SD = .85$ ) than children who cheated in neither of the tasks ( $M = 4.10$ ,  $SD = .77$ ),  $t(178) = 3.63$ ,  $p < .001$ . Gender did not significantly moderate these associations,  $F(3, 174) = .46$ ,  $ns$ .

Finally, Welch's analysis of variance showed that mother-rated internalized conduct was significantly associated with cheating severity group status,  $F(2, 99.76) = 3.48$ ,  $p < .05$ . Welch's analysis of variance was used because the internalized conduct scores had a skewed distribution for children in the severe cheater group. According to Fisher's least significant difference post hoc analyses, children in the severe cheater group ( $M = 3.78$ ,  $SD = .74$ ) had significantly lower ratings of internalized conduct than children in the normative ( $M = 4.10$ ,  $SD = .91$ ) and unlikely cheater ( $M = 4.19$ ,  $SD = .95$ ) groups ( $ps < .05$ ).

### Relationship Between Severity Group and T1 Ratings of Externalizing Behavior

A one-way analysis of variance revealed an effect of cheating severity group on both mother-reported externalizing problems,  $F(2, 174) = 5.12$ ,  $p < .01$ , and teacher-reported externalizing problems,  $F(2, 163) = 3.43$ ,  $p < .05$ . Consistent with our hypothesis, children who were categorized as severe cheaters had significantly more severe mother-rated externalizing problems ( $M = 9.05$ ,  $SD = 7.31$ ) than children in the normative ( $M = 6.14$ ,  $SD = 5.77$ ) and unlikely ( $M = 5.37$ ,  $SD = 4.04$ ) groups ( $ps < .01$ ). Children in the severe group also had significantly more severe teacher-rated externalizing problems ( $M = 6.70$ ,  $SD = 10.87$ ) than children in either of the two other groups (normative group  $M = 3.54$ ,  $SD = 6.72$ ; unlikely group  $M = 2.76$ ,  $SDs = 4.69$ ; ( $ps < .05$ ). Cheaters did not significantly differ from noncheaters in either mother or teacher ratings of externalizing behavior,  $t(176) = 1.89$  and  $t(166) = 1.95$ , respectively ( $ps > .05$ ).

### Longitudinal Prediction of Externalizing Behavior at Age 10 Years

Hierarchical linear regression analyses were used to examine longitudinal associations between cheating severity at T1 and later ratings of externalizing behavior at age 10. Teacher ratings of externalizing behavior at T2 were log transformed to better meet normality assumptions. Cheating severity groups were dummy coded, with the unlikely cheater group as the comparison group. In the first set of regressions, cheating severity was

entered with gender as a covariate. In a second set, T1 ratings of externalizing behavior were entered to control for the stability of externalizing behavior. The same procedure was repeated with the dichotomous cheating variable as the main predictor.

Results showed that children in the severe cheating group had higher levels of teacher-rated externalizing problems at age 10 years ( $\beta = .26, p < .01$ ), even after accounting for T1 teacher ratings ( $\beta = .20, p < .05$ ; Table 4). Severe cheating group membership also predicted later mother ratings of externalizing behavior ( $\beta = .27, p < .01$ ). This effect did not hold after accounting for T1 mother ratings ( $\beta = .08, ns$ ). Cheating (as opposed to not cheating) predicted higher levels of both mother ( $\beta = .16, p < .05$ ) and teacher ratings ( $\beta = .19, p < .05$ ) at T2. However, these effects were not statistically significant after controlling for T1 ratings (Table 5).

## DISCUSSION

Cheating behavior is common among preschool-aged boys and girls. In the current study, 63% of 5- to 6-year-old children cheated at least once during a laboratory visit. However, there may be meaningful variability in the way cheating is carried out. The main purpose of our study was to determine whether normal cheating behavior could be differentiated from covert rule violations that signal elevated risk for antisocial behavior. Toward this end, children's cheating behavior in resistance to temptation tasks was coded for degree and hastiness of rule breaking and for the presence of inappropriate positive affect. These criteria were chosen to reflect self-regulatory deficits that play important roles in the development and expression of internalized conduct and mental health outcomes (Kochanska & Aksan, 2006; Olson et al., 2009). Thus, children categorized as severe cheaters during resistance to temptation tasks violated rules more extensively and in less time, and they were more likely to display inappropriate positive affect compared with same-age peers who showed some cheating behavior or did not cheat at all.

Our main hypothesis was that children who committed the most severe rule violations would manifest higher levels of contemporaneous and future externalizing behavior problems than others. This hypothesis was largely supported. Kindergarten-age children who showed some cheating behavior were no more likely than others to have elevated levels of externalizing symptoms. On the other hand, those who covertly violated rules more quickly, extensively, and with displays of inappropriate affect had higher levels of disruptive problem behavior in both home and school settings at ages 6 and 10 years. After accounting for the stability of ratings, severe cheating was predictive of later behavior problems in the school, but not home context. Of interest, cheaters (i.e., children who cheated in at least one of the tasks) were reported as having higher levels of externalizing behavior by both mothers and teachers approximately 5 years later. However, this association disappeared after controlling for initial ratings of problem behavior, suggesting that the original findings reflected stability in children's externalizing behaviors across the school-age period. These combined findings demonstrated that although cheating behavior was common among young school-age children, the *quality* of children's covert rule violations yielded important information about their behavioral risk status.

Our second research goal was to examine associations between children's covert rule violations and independent measures of self-regulation. As expected, children in the severe cheating group were rated by mothers as higher in impulsivity and lower in inhibitory control and internalized conduct than others. These findings supported our contention that significant covert rule violations reflect deficits in multiple systems of self-regulation (e.g., McCabe, Cunningham, & Brooks-Gunn, 2004; Olson et al., 2009).

Contrary to expectation, children in the severe cheating group were no more likely than others to be perceived by mothers as showing low levels of affective distress surrounding misbehavior in home settings. By definition, covert rule breaking is enacted in secrecy. Therefore mothers may have had little opportunity to observe this behavior in their young children. In addition, if a child is caught in the act of covert rule breaking, acting gleeful would not be a wise strategy for mitigating parental anger. Similar arguments apply to the assessment of covert rule violations in school settings. For these reasons, the laboratory environment may provide an optimal setting for assessing children's motivation to secretly violate rules. On balance, the present measures of cheating behavior were "victimless" and may not have elicited capacities, such as empathy, guilt, and perspective taking that influence children's moral behavior (Kochanska et al., 2002). Thus, associations between cheating and affective distress may have been underestimated. An important direction for future research would be to examine early developmental indices of covert antisocial behaviors that impact the rights and well-being of others.

Consistent with a previous meta-analysis of gender differences in resistance to temptation (Silverman, 2003), boys and girls were equally likely to engage in covert rule violations at all levels of severity. Nonetheless, this was surprising given that girls received higher ratings of inhibitory control and affective distress as well as lower ratings of externalizing behavior. These discrepant findings may further evince advantages of observational measures of children's covert behavior relative to informants' reports. For example, mothers may tend to overlook girls' covert misbehavior. Alternatively, girls may be more skilled than boys at hiding their wrongdoings from mothers, thus undermining the accuracy of mother reports. This finding also suggests that in some particular types of misbehavior (in this case, covert rule violations) boys and girls are equally vulnerable. The growing literature on relational aggression, a harmful behavior often perpetrated covertly, reinforces this point.

### Strengths and Limitations

Our study had significant strengths and limitations. Noteworthy strengths included assessments of early developmental risk that spanned multiple constructs, three different settings (home, school and the laboratory), and multiple informants; use of a prospective longitudinal design; use of both observational and rating measures of children's behavior; and the participation of relatively equal numbers of boys and girls. Furthermore, we compared a detailed rule-breaking assessment to a simpler yes/no index, which allowed us to differentiate problematic cheating from normative cheating.

We also wish to highlight features of this study that may limit the generalizability of our findings. First, most children in the study were from intact, two-parent middle-class families. Therefore, our findings may not generalize to children growing up in other family

constellations or to those whose families experience severe economic hardship. Second, reflecting the local population, children and parents in our study primarily were from European American backgrounds. Thus, our findings may have limited generalizability to racially and ethnically diverse groups of young children. Third, children in our constrained community sample represented the full range of the externalizing problems spectrum with a disproportionate number in the medium-high to high range. However, relatively few had externalizing problem scores in the extreme range, limiting generalizability to clinically referred groups of children.

An additional limitation involved the way cheating was assessed. The present coding system may not have captured the full variability of rule-breaking on the cheating tasks. For example, in the beans–cup game, coders were able to score this dimension of cheating using two cues: observing the child dropping one or more beans in the cup (or pouring the entire bag), and listening for the sound of the bean(s) being dropped in the cup. Given the way the task was videotaped, coders could discern the sound of one bean from more than one bean being put in the cup but could not reliably make further distinctions. In future studies, this task could be improved by using larger stimuli (e.g., balls thrown in a basket) or by training a second video camera on the cup.

Regarding the ball–sock game, a 3-point coding system for this dimension of cheating may not be ideal. This task presented children with more of a fine motor challenge than was initially anticipated. Thus, children spent a good deal of time positioning and repositioning the stimuli in between attempts to push the ball into the sock. Unfortunately, it was not possible for the coding team to reliably discern this kind of behavior from unsuccessful and aborted attempts to violate the rules of the game. Again, in future studies this task could be refined by using larger stimuli or by introducing additional rules (e.g., “It is against the rules of the game to ever touch the sock”). Also, it may be advantageous to introduce one or more additional cheating tasks to the battery as a way to capture more variability on this dimension of cheating. Notably, the use of a multidimensional index of cheating allowed for additional variability in children’s responses and may offset this limitation.

### Implications for Research, Policy, and Practice

Our findings supported the utility of a multifaceted assessment of children’s covert rule violations as a risk marker of concurrent and later externalizing behavior. By definition, certain types of antisocial behavior, particularly covert rule violations, are difficult to accurately measure. Typically, covert rule infractions come to light in later childhood and adolescence when they are serious enough to be detected and punishable by law (e.g., stealing or property destruction). Delineating early precursors to these more serious forms of covert antisocial behavior may help improve delinquency prevention efforts. For example, if severe cheating is a precursor to future delinquent acts, then understanding antecedents of severe cheating (e.g., temperament traits, socialization from parents and peers) could aid in spotting a point of entry for preventive interventions.

Notably, however, our findings did not show that severe cheating precedes later *covert* antisocial behavior. Rather, later maladjustment was measured using a broad externalizing behavior scale encompassing both covert and overt problem behaviors. In future studies, it

would be interesting to determine whether young children who engage in serious covert rule violations are at elevated risk for covert forms of later antisocial behavior. Tracking the developmental sequelae of covert versus overt dimensions of externalizing may advance our understanding of conduct disorder, an extremely heterogeneous category of problem behaviors.

We have shown that nonnormative variations in young children's willingness to engage in clandestine rule breaking may be evaluated reliably using a brief observational assessment paradigm. Although this kind of procedure may be helpful in clinical settings, some may worry that analogue observational assessments are not cost-effective. This concern is reflected by the schism between assessments that are championed by researchers and assessments that are used in clinical practice (Mash & Foster, 2001). An important goal in child-focused practice settings is accurate identification of children who are vulnerable to long-term antisocial behavior. Given the inherent difficulty in measuring covert antisocial behavior, use of observational tasks may greatly aid in comprehensively assessing a child's behavioral profile. Pending further study, brief observation paradigms may provide important tools for the clinical assessment of externalizing pathology in young children (Brotman, Gouley & Chesir-Teran, 2005; McCabe, Rebello-Britto, Hernandez, & Brooks-Gunn, 2004; Wakschlag et al., 2002), particularly as ways of distinguishing normal variations in behavioral adjustment from behaviors that signal elevated risk.

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TABLE 1

## Means and Standard Deviations of Study Variables

	M		SD		Gender Differences
	Boys	Girls	Boys	Girls	
Regulatory Systems					
Inhibitory Control	4.79	5.12	0.85	.75	G > B, $p < .01$
Impulsivity	4.41	4.34	0.89	.76	
Affective Distress	4.86	5.09	0.56	.51	G > B, $p < .01$
Cheating Behavior (z Scores)					
Extent	-0.07	0.09	0.76	.81	
Hastiness	-0.12	0.15	0.74	.84	G > B, $p < .05$
Positive Affect	-0.04	0.05	0.99	1.02	
Overall Cheating Severity	-0.07	0.10	0.70	.75	
Internalized Conduct	3.99	4.12	0.90	.89	
Child Externalizing Problems					
T1 CBCL Externalizing (Mother)	7.05	6.11	6.44	5.20	
T1 TRF Externalizing (Teacher)	5.46	2.55	8.87	5.66	B > G, $p < .05$
T2 CBCL Externalizing (Mother)	6.32	4.52	7.09	4.78	
T2 TRF Externalizing (Teacher)	4.81	1.89	7.62	4.05	B > G, $p < .01$

**TABLE 2**  
Cheating Behavior Characteristics of Cheating Severity Groups

	M			SD		
	Unlikely	Normative	Severe	Unlikely	Normative	Severe
<b>Beans-Cup Task</b>						
Extent of Cheat	0.20	1.09	2.70	0.40	1.10	1.14
Latency to Cheat <sup>a</sup>	n/a	59.58	37.30	n/a	42.16	33.42
Positive Affect (%) <sup>a</sup>	n/a	19	50	n/a	40	51
<b>Ball-Sock Task</b>						
Extent of Cheating	0.55	1.54	1.91	0.50	0.62	0.28
Latency of Cheat <sup>b</sup>	n/a	44.36	16.65	n/a	34.62	23.36
Positive Affect (%) <sup>b</sup>	n/a	34	72	n/a	48	45
No. of Tasks With Cheating	0	0.89	1.68	0	0.55	0.47
Gleeful Cheater (%)	n/a	29	85	n/a	46	36

Note: Cheating group had a significant effect on all variables ( $p < .01$ ) for all but latency in the bean-cup task ( $p < .05$ ).

<sup>a</sup>  $n = 62$ .

<sup>b</sup>  $n = 98$ .

**TABLE 3**  
 Correlations Among Child Self-Regulation, Cheating Behavior and Externalizing Problems

	1	2	3	4	5	6	7	8	9	10	11	12
(1) Inhibitory Control	—	-.48***	.30***	.58***	-.19*	-.16*	-.08	-.21**	-.52***	-.39***	-.52***	-.39**
(2) Impulsivity		—	-.15*	-.29***	.28***	.31***	.25***	.16*	.31***	.31***	.33***	.25***
(3) Affective Distress			—	.35***	.01	.03	.11	-.09	-.23***	-.16*	-.13	-.07
(4) Internalized Conduct				—	-.21**	-.19**	-.14	-.19*	-.48***	-.15*	-.41***	-.18*
(5) Overall Cheat Severity					—	-.88***	.87***	.79***	.21**	.12	.22**	.21**
(6) Extent of Cheating						—	-.83***	.46***	.19*	.15	.19*	.22**
(7) Hastiness of Cheat							—	.45***	.16*	.12	.21**	.22**
(8) Inappropriate Affect								—	.17*	.05	.17*	.10
(9) T1 CBCL-M EXT									—	.51***	.67***	.47***
(10) T1 TRF-T EXT										—	.44***	.62***
(11) T2 CBCL-M EXT											—	.60***
(12) T2 TRF-T EXT												—

Note: CBCL = Child Behavior Checklist; TRF = Teacher Report Form; M = mother ratings; T = teacher ratings; EXT = child externalizing problems.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**TABLE 4**  
 Hierarchical Regression of Cheating Severity Group Predicting Externalizing Behavior

Outcome Variables	Controlling for T1 Ratings			Controlling for T1 Ratings		
	B	SE B	$\beta$	B	SE B	$\beta$
T2 Mother ratings of EXT						
Gender	-1.93	.96	-.15*	-.79	.82	-.06
Normative Group	1.33	1.19	.11	.47	1.01	.04
Severe Group	3.83	1.34	.27**	1.09	1.18	.08
T1 Mother Ratings of EXT				.65	.07	.62***
T2 Teacher Ratings of EXT						
Gender	-.21	.07	-.23**	-.13	.07	-.14*
Normative Group	.12	.08	.13	.11	.08	.12
Severe Group	.27	.09	.26**	.20	.09	.20*
T1 Teacher Ratings of EXT				.03	.004	.46***

Note: EXT = child externalizing problems.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .

**TABLE 5**  
 Hierarchical Regression of Cheating (Yes/No) Predicting Externalizing Behavior

Outcome Variables				Controlling for T1 Ratings		
	B	SE B	$\beta$	B	SE B	$\beta$
T2 Mother Ratings of EXT						
Gender	-2.29	1.00	-.18*	-.83	.82	-.06
Cheated at Least Once	2.16	1.05	.16*	.61	.86	.04
T1 Mother Ratings of EXT				.68	.06	.66***
T2 Teacher Ratings of EXT						
Gender	-.22	.07	-.24**	-.14	.07	-.15*
Cheated at Least Once	.18	.07	.19*	.12	.07	.13
T1 Teacher Ratings of EXT				.03	.004	.46***

Note: EXT = child externalizing problems.

\*  $p < .05$ .

\*\*  $p < .01$ .

\*\*\*  $p < .001$ .