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Adolescents' Text Message Communication and Growth in Antisocial Behavior across the First Year of High School

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Abstract

This study examined whether adolescents communicate about antisocial topics and behaviors via text messaging and how adolescents' antisocial text message communication relates to growth in rule-breaking and aggression as reported by youth, parents, and teachers. Participants ($n = 172$; 82 girls) received BlackBerry devices configured to capture all text messages sent and received. Four days of text messages during the 9th grade year were coded for discussion of antisocial activities. The majority of participants engaged in at least some antisocial text message communication. Text messaging about antisocial activities significantly predicted increases in parent, teacher, and self-reports of adolescents' rule-breaking behavior, as well as teacher and self-reports of adolescents' aggressive behavior. Text message communication may provide instrumental information about how to engage in antisocial behavior and reinforce these behaviors as normative within the peer group.

Keywords

Text Messaging; Antisocial Behavior; Deviancy Training; Peer Contagion

During adolescence, peer relationships influence the development of beliefs and behaviors (Buhrmester, 1990; Steinberg & Morris, 2001), perhaps especially antisocial behavior (Dishion & Patterson, 2006). Adolescents who engage in antisocial behavior are at risk for myriad adjustment problems during their adolescent years and as they enter adulthood (Dishion & Patterson, 2006; Moffitt & Caspi, 2001). Adolescents spend time with peers who engage in similar levels of antisocial behavior, such as substance use (Bauman & Ennett, 1996; Simons-Morton & Farhat, 2010), aggression (Espelage, Holt, & Henkel, 2003), and rule-breaking (Monahan, Steinberg, & Cauffman, 2009). Affiliating with peers who engage in antisocial behavior may provide opportunities for adolescents to learn how to engage in these behaviors (Piehler & Dishion, 2007) and may establish these activities as normative within the peer group (Dishion, Spracklen, Andrews & Patterson, 1996). The opportunity to be in nearly constant contact with peers via electronic communication may facilitate peer influence. In a large nationwide survey, adolescents reported that their preferred mode of communication with peers is text messaging (Lenhart, Ling, Campbell, & Purcell, 2010). Given the discreet nature of text messaging, this increased access to peers may be especially important for involvement with antisocial activities.

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This study will investigate specific features of adolescents' text message communication that may relate to increasing involvement in antisocial activities. The content of adolescents' text messages will be examined to identify whether the discussion of antisocial behavior in adolescents' text messages predicts an increase in engaging in antisocial activities, as rated by parents, teachers, and the adolescents themselves.

Antisocial Behavior in Adolescence

Adolescents may engage in various antisocial activities, typically defined as behaviors that violate legal or societal rules or are aversive to the victims of these behaviors (Dishion & Patterson, 2006). Antisocial behaviors tend to change with age. Whereas antisocial behavior exhibited by a young child may manifest in the form of temper tantrums or non-compliance, adolescent forms may involve substance use or theft (Snyder, et al., 2005). Moreover, antisocial behaviors are often classified as either overt or covert.

Overt antisocial behaviors are generally reactive and unconcealed, such as hitting a peer when furious. In contrast, covert antisocial behaviors involve avoiding adult detection and are often coordinated with peers, such as theft, substance use, or collaborating with friends to secretly retaliate against a peer (Dishion & Patterson, 2006). As children transition into adolescence, covert antisocial behavior becomes more frequent as adolescents' efforts to conceal their antisocial activities become increasingly sophisticated and peer collaboration becomes more common (Snyder, et al., 2005). Delinquent behaviors are antisocial activities that are illegal, such as theft, assault, and drug use (Dishion & Patterson, 2006). Given the detrimental consequences of delinquent behaviors, it is not surprising that youth expend great effort to hide these activities from parents and other authorities. The private nature of text message communication provides an ideal forum to plan and discuss these activities. As such, text message communication may be a powerful source of peer influence.

Peer Influence on Involvement with Antisocial Behavior

One of the most powerful predictors of adolescents' delinquency is affiliation with deviant peers (Brehwald & Prinstein, 2011; Gifford-Smith, Dodge, Dishion & McCord, 2005). The frequency with which adolescents interact with their peers plays an important role in the influence the peer group has on adolescents' behavior. Adolescents' frequent interaction with deviant peers may influence their behavior in a number of ways. Teens may observe the behavior of their peer group to identify what the cultural norms are for that group, as a reference for which activities they deem acceptable (Maddock & Glanz, 2005). If they believe certain behaviors are normative within their social group, teens may feel pressure to conform to those attitudes and activities (Bandura, 1986; Barry & Wentzel, 2006). Even activities that may be unacceptable at a societal level (e.g., cheating, theft, substance use) may be perceived as appropriate within a specific peer group. Peers may also serve an instrumental function in an adolescent's involvement in delinquent behaviors. More experienced peers may be able to share advice on how and where to engage in various antisocial activities without detection by parents, school administrators, or other authorities (Boxer, Guerra, Huesmann, & Morales, 2005).

The *peer contagion hypothesis* suggests that the aggregation of deviant youth increases their involvement in deviant activities (Boxer, et al., 2005; Dishion & Dodge, 2005). Increasing exposure to other antisocial adolescents may create a subculture that encourages antisocial beliefs and behavior. Furthermore, by segmenting these children and adolescents off from more normative youth, it may further limit their opportunities to observe and engage with more appropriate attitudes and behaviors. Although aggregating delinquent youth often occurs in intervention settings, the peer contagion hypothesis suggests that the effect will be

contrary to the desired outcome. For example, in one intervention study, deviant youth who were aggregated together showed significantly higher increases in tobacco use and problem behaviors at school than adolescents in the self-directed and control groups (Dishion & Andrews, 1995).

This iatrogenic effect was explained by *deviancy training*, which occurs when antisocial youth reinforce their peers' discussion and involvement in antisocial behavior (Dishion et al., 1996). Antisocial dyads are more likely to discuss deviant topics than dyads of children who do not engage in antisocial behavior (Dishion, Andrews, & Crosby, 1995). Furthermore, when deviant youth interact, antisocial topics are more likely to be encouraged (e.g., laughed at, complimented) or followed by additional antisocial comments (Piehler & Dishion, 2007). This deviancy training process may establish deviant topics as normative within the peer setting and can have long lasting effects. In a longitudinal study of 206 children, involvement with deviant peers in fourth grade predicted growth in new forms of antisocial behavior from fourth through twelfth grade (Patterson, Dishion & Yoerger, 2000). However, this relation was fully mediated by deviancy training in the 8th grade. These findings suggest that communication about antisocial topics may be a mechanism through which the peer contagion hypothesis operates. In this way, the development of antisocial behavior is a reciprocal phenomenon, driven by the relation between children's discussion of these activities and the encouragement that this discussion receives from peers. While a comment about rule-breaking or aggression may in effect "test the waters" as to whether a particular behavior or discussion topic is considered appropriate within the peer group, a positive response such as laughter or agreement may in turn solidify the positive attitude towards the antisocial conversation.

Although most research examining the peer contagion hypothesis has focused on intervention programs that aggregate delinquent youth (Boxer, et al., 2005; Dishion, McCord & Poulin, 1999), adolescents' interaction with their peers outside of these intervention and school settings may also play an important role in peers' influence on delinquent behavior. Given that the friends that are likely to be the most influential are those that an adolescent interacts with voluntarily and frequently (Agnew, 1991; Dishion, et al., 1995), it is important to examine how discussion of antisocial behavior with peers relates to adolescents' later behavior in naturalistic, self-selected settings. Furthermore, restricting observation to dyadic interactions (e.g., Dishion, et al., 1996; Piehler & Dishion, 2007) may not capture the differential influence that deviant communication may have when it is with a single friend versus an entire peer group. Youth may seek out means of communication that are subtle and covert when discussing antisocial behavior (Dishion & Patterson, 2006; Ling & Yttri, 2002). Text message communication may therefore be an ideal means for peers to discuss rule-breaking activities.

Text Message Communication

Text messages (also known as Short Message Service; SMS's) allow users to send and receive written messages under 161 characters in length via mobile phones. A nationally representative survey of 799 adolescents between 12–17 years old found 98% percent of adolescents who use text messaging report sending at least one text per day, with a median rate of 60 messages sent per day (Lenhart, et al., 2010). Teens also frequently use SMS during the school day; 77% percent of teens with cell phones report bringing phones to school, and of those, 64% admit to sending and receiving text messages during class (Lenhart, et al., 2010).

Given the privacy of text messages, this form of electronic communication may provide the ideal opportunity to plan and discuss antisocial activities beyond the realm of adult

supervision. Mobile phones provide a line of communication with peers that adolescents physically control (Ling, 2004b). Parental monitoring may play an important role in the development of antisocial behavior (Dodge, Greenberg, Malone, & Conduct Problems Prevention Research Group, 2008; Tompsett & Toro, 2010). In a study of 1278 adolescents in 6th and 8th grade, teens' perceptions of how aware their parents were of their whereabouts and activities negatively predicted the development of problem behavior (Veronneau & Dishion, 2010). Although parental monitoring negatively predicts association with delinquent peers (Dodge, et al., 2008), evidence suggests that parents are generally ineffective at monitoring electronic forms of communication (Livingstone & Bovil, 1999) and youth view text messaging as free from parental supervision (Davie, Panting, & Charlton, 2004; Ling & Yttri, 2002; Wilska, 2003). Even if parents monitor their children's physical location and activities, when communicating with peers via SMS, "parents can readily be avoided and censorship by parents or others is virtually impossible" (Davie, et al., 2004, p. 361).

Indeed, the ability to communicate with peers privately is a driving force for the adoption of text message communication among many adolescents (Ling & Yttri, 2002). Although text message communication appears to be an ideal method for conversing about antisocial activities, little empirical research has examined the role of text messaging in adolescents' antisocial behavior. Research that has examined how adolescents use SMS has primarily relied on adolescents' self-reports of their text messaging (Lenhart, 2012; Ling, 2004a; Ling, 2005a). Although these studies provide useful insight, it is possible that adolescents will not report their frequency of SMS communication accurately out of fear of adults taking their devices. Furthermore, given the heavy use of text messaging (Lenhart, 2012), it is also possible that adolescents will not recall the extent of an entire day's text messaging with complete accuracy. Direct observation of adolescents' text messages will likely provide a more accurate assessment of youths' text messaging habits.

One of the few studies that has examined the relation between text message communication and antisocial behavior found that adolescents who reported sending and receiving text messages frequently were more likely to engage in a variety of antisocial or delinquent activities, including theft, problems at school, and drinking (Ling, 2005a). Another study examined the relation between trajectories of physical and social aggression in grades 3–7 and text message usage gathered from billing records. Youth on the high physical aggression, high social aggression, and high joint physical and social aggression trajectories sent text messages with greater frequency at age 15 (Underwood, Rosen, Beron & Ehrenreich, 2013). Although these findings provide some support for a correlation between text message communication and involvement with delinquency, they do not illuminate precisely how these two phenomena may be related. What is it about text message communication that relates to higher rates of antisocial behavior? Direct observation of the content of adolescents' SMS communication may provide insight into whether text messages are providing a venue for negative peer influence. Only two studies have investigated the actual content of text message communications (participants either read the last three sent messages to a phone interviewer, or recorded an entire day's messages in a diary: Ling, 2005b; Ling & Baron, 2007, respectively). However, both of these studies used the content for linguistic analyses and did not investigate antisocial conversation. To date, no study has examined how the content of adolescents' text messages relates to later involvement in antisocial activities.

The Current Study

This study investigated the relation between adolescents' text message communication with peers about deviant behaviors and their later involvement in antisocial behavior. Given that

use of text messaging peaks during adolescence and early adulthood (Ling, 2010), text messaging may be an important form of peer influence as youth enter high school. Furthermore, youth are most susceptible to peer influence during early and mid-adolescence (Monahan, et al., 2009), and involvement in antisocial activity may increase in mid-adolescence (Dishion & Andrews, 1995; Monahan, et al., 2009). Observing participants' text message communication during the ninth grade year may be a developmentally important period for peer influence and text message usage.

Previous observational studies of deviant peer communication have been conducted in constrained settings: either the laboratory (Dishion, et al., 1996; Patterson, et al., 2000; Piehler & Dishion, 2007) or removing children from class for pull-out intervention sessions (Boxer, et al., 2005). Although laboratory observation has provided a strong foundation of evidence for the importance of peer influence in the development of antisocial behavior, the restriction of these studies to controlled laboratory settings makes it difficult to generalize to adolescents' more naturalistic communication with peers. Direct observation of adolescents' text message communication may be a more ecologically valid means of observing adolescents' communication exchanged with peers not only because it is a more naturalistic environment in which adolescents would normally interact with their peers, but also because it allows participants to choose their interaction partners. Instead of limiting the observed interactions to a sample of at-risk friend dyads (Dishion, et al., 1996) or those randomly assigned to interact (Dishion & Andrews, 1995), this study will observe the natural interactions with the individuals that the participant communicates with most frequently and freely via text messaging. Adolescents' text messages may provide a unique window into adolescents' social lives (Greenfield & Yan, 2006).

Hypotheses

The first goal of this study is to examine and describe adolescents' communication about antisocial topics via SMS communication. To what extent do adolescents engage in communication about deviant and delinquent topics? The second purpose of this study is to investigate the relation between antisocial SMS communication and subsequent involvement in antisocial behavior. It is hypothesized that the amount of text message communication pertaining to antisocial activities during the 9th grade will positively predict involvement in antisocial activities as assessed by parents, teachers, and self-report following the 9th grade, while controlling for baseline antisocial behavior. This hypothesis extends previous research suggesting that discussing deviant activities predicts later involvement in those activities (Dishion, et al., 1999; Piehler & Dishion, 2007). Texting with a peer about rule-breaking activities may not only provide instrumental information about illegal and antisocial behavior (e.g., how and where to engage in these behaviors), but may also reinforce the notion that these activities are accepted within the peer group.

Analyses will also examine if gender moderates the relation between antisocial communication and involvement in antisocial behavior. Many of the studies examining the relation between deviant communication and later involvement in deviant activities have included only male participants (Dishion, et al., 1995; Dishion, et al., 1996; Patterson, et al., 2000). Of those studies that have included both males and females, few gender effects have been reported (Dishion & Andrews, 1995; Espelage, et al., 2003; Granic & Dishion, 2003). It is possible that antisocial communication may relate to later involvement in antisocial behavior differently for boys and girls. Given the lack of gender differences in these relations in previous research, these analyses will be exploratory and no particular effects are predicted.

Method

Participants

Participants were part of an ongoing longitudinal study examining the precursors, trajectories, and outcomes of social and physical aggression. Participants were originally recruited from elementary schools in a school district in a suburb of a large metropolitan area in the southern-central United States during their 3rd grade year. Researchers sent letters home to invite parents and their children to participate in a five-year laboratory study about children's friendships. Prior to their annual visit during the summer before entering high school (9th grade year), participants were invited to participate in the second wave of the research project. At this time, the details of the project were explained to the participants and their parents, including that they would be provided with a BlackBerry device configured to capture all text message and email communication sent and received by the BlackBerry phone. The sample for this analysis will include 172 participants (82 girls) provided with BlackBerries, their parents, and Language Arts teachers ($n = 134$) who completed reports of the participant's involvement in antisocial behavior in the ninth and tenth grades. Fifty-four percent of parents reported the participant as Caucasian, 22.1% African American, 20.3% Hispanic, and 3.6% reported being of another race, mixed race, or did not report their race. Of those whose parents reported annual income, 14.8% earned less than \$25,000, 22.8% earned \$25,000 – 50,000, 14.2% earned \$51,000 – 75,000, 21.6% earned \$76,000 – 100,000, and 26.5% earned more than \$101,000. The average number of years of parental education was 15 for both mothers and fathers, suggesting some college education. Participants were distributed across 47 different high schools during the ninth grade; however, the majority (56.4%) attended three large high schools (each with enrollment greater than 1,900 students during the year these data were collected; U.S. Department of Education, 2008–2009). Six participants had no text message communication for the entire year, and accordingly were excluded from these analyses. To identify if these participants differed from the rest of the sample, t-tests were conducted; no statistically significant differences were found for any of the control variables, or baseline reports and outcome ratings of aggressive or rule-breaking behavior. Attrition between the summer before ninth grade and the summer before tenth grade was 6.4% ($n=11$), predominantly as a result of participants moving out of state. T-tests were conducted, and these participants did not differ significantly on baseline ratings of rule-breaking or aggressive behavior as reported by parents, teachers, or self-report or in the rate of antisocial utterances exchanged via SMS.

Procedures

The timeline of when measures were completed and when text messaging data were collected is presented in Figure 1. At the end of participants' 8th grade year, language arts teachers rated the adolescents' psychological adjustment and involvement with rule-breaking and aggressive behaviors. During the summer prior to entering the 9th grade, participants and the parent most familiar with the adolescent's peer relations came into the lab or were visited at their home by graduate and undergraduate research assistants. Participants and parents completed measures assessing the adolescent's psychological adjustment and involvement with antisocial activities. The measures completed during the summer prior to the 9th grade year served as parent, teacher, and self-reported baseline ratings of involvement with antisocial activities. During the summer visit prior to entering the 9th grade, 152 of the parents were mothers (20 fathers).

At the conclusion of these sessions with the participant and his or her parent, the participant adolescent was provided with a new BlackBerry device. Service plans with unlimited text messaging and unlimited data plans for internet and email were provided by the

investigators. All incoming and outgoing electronic communication was captured and stored in a secure, off-site archive maintained by Global Relay, a company specializing in archiving textual communication. A Certificate of Confidentiality granted by the NIH ensured that communication about delinquent and illegal behavior would remain confidential. Adolescent participants and their parents were explained the details of the confidentiality as well as the circumstances in which the investigators would be obligated to break this confidentiality (i.e., suicidality, imminent harm to others, and child or elder abuse). The archive presents text messages in a daily digest form, and is designed to automatically search for a customized list of words and phrases that may indicate necessary intervention (e.g., “kill myself”, “want to die”). Instances of these words and phrases are flagged and the digest is reviewed before and after the flagged word(s) to identify if parents or authorities need to be informed (for additional information about this method and ethical considerations, see Underwood, et al., 2012). Throughout the course of the entire study, three participants’ parents had to be contacted as a result of comments about suicide. Communication with parents about suicidal discussion was handled by the principle investigator of the study who is a clinical psychologist.

For ecological validity, participants were not constrained from using other devices. Eighty one percent of the sample reported owning cell phones prior to being provided a BlackBerry device by the investigators. However, several types of evidence suggest that the participants used the BlackBerries heavily. First, the frequencies of text message communication exchanged over the provided BlackBerries were similar to those reported in national surveys (Lenhart, 2012). Second, adolescents reported using the BlackBerries between *Most of the time* and *Always* ($M = 4.64$, $SD = 0.70$), and liking the BlackBerry a great deal, with the average response being between *Like it* and *Like it a lot* on the 5-point scale ($M = 4.65$, $SD = 0.72$, Underwood, et al., 2012). Third, rates of profanity and discussion of sexual themes were comparable to rates found in previous studies of unsupervised electronic communication forums, which suggests that participants were not overly concerned with censoring themselves (Subrahmanyam, Smahel & Greenfield, 2006; Underwood, et al., 2012). Fourth, these BlackBerries were so attractive to our participants that they would notify us immediately if there was any problem, desperately pleading “I CAN’T READ MY TEXTS.” Approximately 85 BlackBerries per year had to be replaced due to loss, damage, or theft.

At the end of participants’ 9th grade year, Language Arts teachers again rated adolescents’ psychological adjustment and involvement in antisocial behavior. Sessions with the participants and their parents were again conducted during the summer prior to the 10th grade. The ratings collected during the summer prior to the 10th grade year served as parent, teacher, and self-reported outcome ratings of adjustment and involvement with antisocial activities. For the visit prior to 10th grade, 145 of the parents were mothers (27 fathers). Nine participants had different parents report on their baseline and outcome ratings of antisocial behavior. Parents, teachers, and participants were all compensated fifty dollars for their time at the conclusion of each visit.

Measures

Adolescent, parent, and teacher reports of antisocial behavior—Participants, parents, and teachers rated the adolescents’ involvement in aggressive and rule breaking behaviors during the summers prior to the 9th and 10th grade school years. During the summer prior to 9th grade, participants completed the Youth Inventory – 4: Self Report (YI-4; Gadow & Sprafkin, 2009). The YI-4 includes 128 four-point items (0 – *Never*; 1 – *Sometimes*; 2 – *Often*; 3 – *Very Often*) examining a wide range of behaviors and personality traits. Baseline rule-breaking was assessed using the Conduct Disorder subscale, comprised

of 15 items (e.g., “I skip school”, “I stay out at night when I am not supposed to”, “I break into houses, buildings, or cars”). The Conduct Disorder subscale has been found to correlate with conduct disorder in a clinical population and has good internal reliability ($\alpha = .83$; Gadow & Sprafkin, 2009). To examine baseline self-reports of aggressive behavior, three items were selected to create an Aggressive Behavior subscale (“I threaten to hurt people”, “I start physical fights” and “I try to physically hurt people”). These three items were strongly correlated in this sample ($r_s > .55$) and had satisfactory internal reliability ($\alpha = .79$). The YI-4 served as self-reports of baseline rule-breaking and aggressive behavior.

During the summer prior to the 9th grade, the participants’ parents and teachers completed the Achenbach System of Empirically Based Assessment (ASEBA) forms (Achenbach & Rescorla, 2001). The ASEBA is a set of 112 three-point items (0 – *not true*; 1 – *somewhat or sometimes true*; 2 – *very true or often true*) allowing parents and teachers to rate the participant adolescents’ behavior problems. During the summer visit prior to the 9th grade, parents completed the parent version of the ASEBA; the Child Behavior Checklist (CBCL). Of concern to this study are the CBCL’s Rule-Breaking Behavior and Aggressive Behavior subscales. The Rule-Breaking Behavior subscale is comprised of 17 items (e.g., “breaks rules”, “lies, cheats”, “sets fires”; $\alpha = .77$). The Aggressive Behavior subscale includes 18 items (e.g., “argues a lot”, “gets in fights”, “attacks people”; $\alpha = .88$). The participants’ teachers completed the teacher version of the ASEBA; the Teacher Report Form (TRF) during the summer prior to the 9th grade year. Of interest to this study are the TRF’s 12-item Rule-Breaking and 20-item Aggressive Behavior subscales (α ’s = .84 and .92, respectively).

During the summer visit prior to the 10th grade, participants completed the self-report version of the ASEBA; the Youth Self Report (YSR; Achenbach & Rescorla, 2001). Relevant to the current analyses are the YSR’s 15-item Rule-Breaking Behavior subscale ($\alpha = .84$) and 17-item Aggressive Behavior subscale ($\alpha = .83$). Parents and teachers also completed the ASEBA forms (the CBCL and TRF respectively) during the summer prior to the 10th grade. The Rule-Breaking and Aggressive Behavior subscales had good internal reliability for both parent ($\alpha = .85$ and .89 respectively) and teacher report ($\alpha = .84$ and .93 respectively). Comparison of a nationally representative sample of both referred and non-referred adolescents found the CBCL, YSR, and TRF were all highly valid. The Aggressive Behavior and Rule-Breaking Behavior subscales significantly correlate with Conduct Disorder and Oppositional Defiant Disorder ($r = .63, p < .001$ and $r = .64, p < .001$ respectively; Achenbach & Rescorla, 2001). This sample’s ratings on rule-breaking and aggressive behavior, presented in Table 3, were generally comparable to a normative, national sample’s mean ratings of parent, teacher, and self-reported rule-breaking ($M = 2.5, 1.55, \text{ and } 3.65$ respectively) and aggressive behavior ($M = 4.55, 2.55, \text{ and } 6.25$ respectively; Achenbach & Rescorla, 2001).

Communication with peers about antisocial activities—Given that over 500,000 text messages were archived each month, coding all archived SMS content was not feasible. Four days of text messaging for each participant were selected for micro-coding during the 9th grade year: two days in the fall prior to the school’s homecoming football game and dance (referred to as the “Data Point 9.1”) and the day before Valentine’s Day and Valentine’s Day (in February, referred to as the “Data Point 9.2”). These two 2-day periods were chosen because we anticipated increased social interaction (both positive and negative) to coincide with the numerous social activities associated with Homecoming and Valentine’s Day. If a participant did not have any archived communication during these two periods (as a result of non-use or phone malfunction), alternative dates were chosen by expanding the search before and after the given 2-day period.

Once four days of communication had been selected, the transcripts were saved into two Microsoft Word documents (the Data Points 9.1 and 9.2 in two separate transcripts). Transcripts were then formatted for coding. The contact list stored in the participants' BlackBerry was used to replace phone numbers with the name as it appeared in the phonebook. Most numbers were stored with simply a name; however some entries provided insight into the person's relationship with the participant (e.g., "mom", "the most annoying little brother in the world", "best gf in the universe"). Although we do not have informed consent from all of the individuals whose contact information are stored in the participants' phones, leading researchers in the field of electronic communication contend that because the information does not need to be uniquely identifiable, these data can be observed without informed consent (Subrahmanyam, et al., 2006; Underwood, et al., 2012). Despite observing the names in the phonebook as the participant labeled them, this information is rarely identifiable (e.g., "Uncle Rick", "Jennifer", "Doug").

Formatted transcripts were randomly distributed to a team of 24 trained micro-coders. A graduate research assistant trained graduate and undergraduate micro-coders for approximately 8 weeks. Coders were required to achieve inter-coder reliability greater than $\kappa = .6$ on the final five practice transcripts prior to completing training. Following training, twenty percent of the transcripts were coded by a second coder to ensure continued inter-rater reliability.

Transcripts from the two days selected during the fall were coded first. Coders read through the transcript and coded each utterance in a Microsoft Excel file. The coding system was designed to identify who the participant was sending text messages to and receiving text messages from, as well as the content of each utterance. The contact name and context of the communication was used to distinguish between parents ($\kappa = .75$), peers ($\kappa = .87$), and siblings ($\kappa = .79$). Thus all SMS communication (including both that sent from the participant and received by the participant) was coded. The coding system was developed primarily to capture utterances about social aggression and antisocial topics; however of interest to these analyses are the codes identifying communication about substance use, property crimes, physical aggression, and rule-breaking. Each utterance refers to a complete thought. Accordingly, an individual text message may contain a single utterance, or multiple utterances. An overview of the antisocial codes and illustrative examples are presented in the Appendix.

Illicit substance codes—The Illicit Substance Code was designed to capture discussion about purchasing and using illegal substances. The Substance Code achieved high reliability ($\kappa = .90$).

Property crime—The Property Crime code captured references to theft or destruction of others' property. This included discussion of behaviors such as stealing, graffiti, and trespassing on private or abandoned property. Due to the fact that this code was a very low base rate behavior and coders agreed on every occurrence, the Property Crime code achieved perfect reliability ($\kappa = 1.0$).

Physical aggression—The physical aggression code identified references to engaging in physical aggression. This includes both recalling instances of physical aggression as well as planning or threatening to engage in physical aggression. The Physical Aggression code had strong reliability ($\kappa = .72$).

Rule breaking—This code identified discussions about intentionally violating rules or breaking the law, as well as defying authority figures. This code included behaviors such as

truancy, sneaking out at night, getting arrested (regardless of the reason), and involvement with gangs. The Rule Breaking code was highly reliable ($\kappa = .94$).

Results

Descriptive Statistics for Text Message Usage

The frequency of text message use was highly variable across the entire sample. Table 1a presents descriptive statistics of the sample's total SMS communication (incoming and outgoing messages) for non-antisocial utterances, as well as the rates of antisocial utterances in general and within the four code categories. T-tests were conducted to examine whether text message usage differed by gender. There were no significant differences between the total number of utterances sent and received by boys and girls, or the number of antisocial utterances sent and received by boys and girls. When the four antisocial topic codes were examined individually, there were no significant differences between boys' and girls' discussion of rule-breaking, illicit substance use, physical aggression, or property crimes.

Table 1b presents the number and percentages of participants who exchanged (both sent and received) different frequencies of each type of antisocial communication (participants who did not send or receive any antisocial utterances are not included in Table 1b). The largest proportion of the sample sent or received 1–5 antisocial utterances over the four day sample. Table 2 presents correlations between the frequencies of incoming and outgoing SMS messages. Sent and received messages about each of the four individual antisocial utterance codes were highly correlated (r 's .69–.97), illustrating that sending messages about these topics is highly correlated with receiving them.

Does Antisocial Text Messaging Predict Increases in Antisocial Behavior?

To examine the relation between antisocial utterances and aggression and rule-breaking behavior, the antisocial communication variable was calculated by dividing the number of all antisocial codes exchanged with peers by the total number of coded utterances (see Dishion et al, 1995; Dishion et al, 1996; Granic & Dishion, 2003; Piehler & Dishion, 2007). In line with previous research designs that have excluded observations with siblings (e.g. Dishion, et al., 1996), utterances exchanged with siblings were excluded to limit the effects to peer influence; however analyses were also conducted including all antisocial utterances and the results were similar. Regression analyses were also conducted with separate proportions for incoming and outgoing antisocial utterances, as well as raw frequencies instead of proportions for incoming, outgoing, and total antisocial utterances. These analyses showed the same general pattern of results. Given the high correlations found between sent and received antisocial utterances (and in line with previous studies of antisocial communication; see Piehler & Dishion, 2007), results for regression analyses using the total proportion are presented here. Because engaging in antisocial communication and observing peers' discussion of antisocial topics are both believed to contribute to peer contagion, both incoming and outgoing content were included in the antisocial communication variable (Granic & Dishion, 2003; Piehler & Dishion, 2007). Square root transformations were performed on all baseline and outcome ratings of rule-breaking and aggressive behavior because distributions were positively skewed. Because scale scores for these variables included zero as a possible value, a constant of "1" was added to each of the scores before performing the transformations (see Kline, 2010). Examination of the plots involving the distribution of the residuals and their predicted values indicated that the transformed variables approximated a normal distribution and did not suggest any severe violations of regression assumptions. Cooke's Distances were calculated to identify possible outliers, and all regression analyses were run with the outliers included as well as removed. Because

removing outliers did not meaningfully change the results, all analyses presented here were conducted with the outliers included.

All analyses were conducted separately with self-, teacher, and parent reports of rule-breaking behavior or aggressive behavior as the dependent variable, resulting in six regression equations. In each regression equation, the reporter of baseline ratings corresponds to the rater of outcome ratings. For analyses with parent and teacher reports, the ASEBA instruments were used for both baseline and outcome ratings. For self-report, the YI-4 was used for baseline ratings and the ASEBA-YSR was used for the outcome ratings.

Although 172 participants had text messaging data, only those with both baseline and outcome data for each rater relevant to a given regression equation were included in the analysis. Given that these results examine the pattern of relations across three different raters, participants who had missing data were dropped from the relevant regression equation instead of imputing a score from another rater. T-tests were conducted to examine if participants missing either baseline or outcome ratings of antisocial behavior were significantly different from those with complete data; participants with missing data did not differ significantly. Table 3 presents correlations between baseline and outcome scores for antisocial behavior across all raters as well as rates of antisocial communication. The number of participants included in each regression analysis is presented in Table 4.

To test the hypothesis that participants' text message communication about antisocial activities during the 9th grade year predicts involvement in antisocial behavior prior to entering the 10th grade, linear regressions were conducted using the following formula:

$$Y \text{ antisocial behavior} = \beta_0 + \beta_1 \text{ gender} + \beta_2 \text{ baseline antisocial behavior} + \beta_3 \text{ total utterances} + \beta_4 \text{ proportion of antisocial communication} + \varepsilon_1$$

The interaction between proportion of antisocial communication and gender was included in all regression analyses; however, it did not achieve significance in any of the models. Accordingly, the interaction term is not included in the results presented below.

Rule-breaking—The first set of analyses included self-, teacher, and parent reports of rule-breaking behavior as the outcome variables in three separate regression analyses, presented in Table 4a. Gender, total SMS utterances, and baseline rule-breaking were entered as control variables, along with antisocial communication. Proportion of antisocial communication was a significant predictor of rule-breaking behavior as rated by self-, teacher, and parent report ($\beta = .28, .37, \text{ and } .24$ respectively; all p 's < .01).

Aggressive behavior—Table 4b presents the analyses conducted with self-, teacher, and parent ratings of aggressive behavior as the outcome variables. Gender, total SMS utterances, and baseline aggressive behavior were entered as control variables, along with antisocial communication. Proportion of antisocial communication was a significant predictor of aggressive behavior as rated by self- and teacher reports (β 's = .25 and .22 respectively; all p 's < .01), however it was not a significant predictor of parent ratings of aggressive behavior ($\beta = -.00; p = .95$).

Discussion

Overall, the results supported the hypothesis that text messaging about antisocial activities relates to later involvement in rule-breaking and aggressive behavior as rated by parents, teachers, and the adolescents themselves. Examination of adolescents' SMS communication

with peers over four days revealed that the majority of the sample did engage in at least some discussion of rule-breaking, property crimes, illicit substance use, or physical aggression with their peer group.

Adolescents' Use of SMS for Discussing Antisocial Activities

Over the entire four-day sample, the majority of participants sent or received at least one antisocial utterance, with a mean of 1.62% antisocial utterances. This is similar to the findings of other studies that have examined antisocial and deviant talk in normative dyads. For instance, one study compared differences in deviant conversations by persistently antisocial dyads and normative dyads and found the average percent of time spent discussing deviant talk ranged from 1.7 – 11.3% (Piehler & Dishion, 2007). It is not surprising that this normative sample's average percent of antisocial utterances was closer to the normative group in the previous study. Furthermore, the criteria for coding conversational topics as antisocial were much stricter in this study. Although discussion of rule-breaking and substance use were coded as deviant in both studies, Piehler and Dishion (2004) also included any discussion that was deemed inappropriate for a laboratory setting, such as vulgarity or hurtful discussion about peers. If this more extended view of deviant talk were applied to these text messaging data, the mean percent of antisocial utterances would increase greatly. Of those participants who did engage in antisocial discussion, they generally did so infrequently. Across all four antisocial topic codes, the majority sent or received five total utterances or fewer. This is not surprising given that previous research that has examined even highly deviant dyads has found that delinquent talk does not dominate the conversation (Dishion, et al., 1996; Piehler & Dishion, 2007).

The utterances about antisocial talk examined in this study also differed from previous observational data in that some of the conversations about antisocial activity occurred at the time adolescents were actually engaging in the behaviors. Instead of capturing general discussions of prior antisocial behavior (e.g., participants recalling previous instances of antisocial behavior, or commenting on rule-breaking activities in general), participants used SMS communication to organize involvement in specific activities, as well as discuss antisocial behavior at the time it was occurring. The high correlations found between incoming and outgoing antisocial utterances also provide support for the notion that communication about antisocial topics is reciprocal in nature. It is not simply making an antisocial comment or hearing one from a peer that is such a powerful socializing force, but the back and forth exchange of deviant discourse.

Antisocial SMS Utterances as a Predictor of Rule-Breaking and Aggressive Behavior

The results for rule-breaking as the outcome variable were generally consistent across all three raters: antisocial SMS utterances significantly predicted increases in rule-breaking behavior. Although antisocial SMS communication was also a significant predictor of aggressive behavior as rated by self- and teacher report, it was not a significant predictor of parent reports of aggressive behavior. With the exception of parent reports of aggressive behavior, antisocial utterances sent to and received from peers during the 9th grade year were associated with increases in rule-breaking and aggressive behavior prior to entering the 10th grade year. These findings provide further support for the peer contagion hypothesis that interaction with deviant peers is associated with increases in antisocial behavior.

Discussion of antisocial topics is believed to facilitate increases in antisocial behavior in two ways: (1) it establishes group norms by conveying that involvement in delinquent behavior is an appropriate way to behave and (2) it provides instrumental knowledge about how best to engage in these behaviors (Boxer, et al., 2005; Dishion, et al., 1996). The examples of discussion about antisocial activities presented in the Appendix exemplify that both of these

components occur in SMS communication. Comments about involvement in antisocial behavior were often met with laughter from peers, conveying the impression that this behavior is normative and appropriate. This reinforcement is akin to Dishion et al.'s (1996) concept of *deviancy training*. Furthermore, because text message communication allows youth to be in nearly constant contact with their peers, there is no need for any lag time between engaging in antisocial behavior and receiving reinforcement from peers about it.

The ability to provide instrumental information about antisocial behavior is also facilitated by the ability to communicate in real time, regardless of physical location. The examples in the Appendix show discussing how to successfully sneak out at night, the best drug paraphernalia for conserving marijuana, and scheduling the time and location for two adolescents to fight each other. These conversations go beyond simply establishing these behaviors as normative; they provide detailed information on how best to engage in antisocial behavior. Although youth can discuss these topics when they are together, SMS conversation allows discussion regardless of location or whether adult supervision is present. Given that encouragement of antisocial activities as well as the exchange of information about antisocial behavior are both present in adolescents' SMS communication, it is not surprising that engaging in discussion about antisocial topics predicts increases in rule-breaking and aggressive behavior.

The interaction between gender and antisocial communication was not a significant predictor of rule-breaking or aggressive behavior by any rater. Although survey data have found that girls report sending and receiving SMS messages more frequently than boys (Lenhart, 2012), direct examination of billing records found no differences in boys' and girls' usage of SMS communication (Underwood, et al., 2012). This study is consistent with existing research suggesting that the peer contagion hypothesis is not significantly moderated by gender (Boxer, et al., 2005; Granic & Dishion, 2003). It is also interesting that, with the exception of self-reported rule-breaking behavior, the overall number of utterances exchanged was not associated with increases in involvement in antisocial behavior. This would indicate that it is not simply the volume of communication exchanged between adolescents that is associated with increases in problem behavior, but the content of that communication.

These findings must be interpreted carefully in light of methodological limitations. First, because communication about antisocial behavior is a low base-rate behavior, analyses of how specific types of antisocial texting related to distinct forms of antisocial behavior was not possible. In addition, the possibility remains that participants may have attempted to hide the true extent of their antisocial communication by refraining from antisocial discussion and instead opting for alternative forms of communication when discussing antisocial topics. However, the openness with which participants discussed antisocial, profane, and negative topics suggests that they were not concerned with censoring themselves (see Underwood, et al., 2012). In contrast, it is also possible that participants intentionally sent artificial utterances about antisocial topics simply because they were being observed, though this seems unlikely because participants were not aware of which days were selected for micro-coding and sending false messages to peers would have involved a social penalty.

It is also worth noting that although the participants were dispersed across 47 schools, approximately half of the sample was enrolled in the same three high schools. Although these high schools were all very large (averaging over 2,300 students), it is nonetheless possible that participants communicated with each other, challenging the non-independence of some of the data. Future studies utilizing telephone numbers to examine peer networks could investigate if peer networks overlapped, and how this might affect the relation between antisocial text messaging and subsequent behavior. Another limitation of this study

is that due to missing data, some participants were excluded from each of the regression analyses. Although t-tests suggested that the excluded participants did not differ in any statistically significant way, this reduction in power may have affected the ability to detect some of the relations examined. Another limitation entails our selection of the two 2-day periods of time that were expected to have high rates of social interaction for micro-coding. Although coding a larger subsample was not possible due to the overwhelming volume of communication, because these 2-day periods were both around social events and were on a Friday and Saturday, it is possible that the frequency of antisocial communication may have been higher than if weekdays had been selected. Although this may have impacted the prevalence of antisocial communication, any effect of the day would likely be similar across the sample and thus should not affect the relation between text message communication and subsequent antisocial behavior. Nonetheless, future examination of how antisocial text message communication may differ across hours of the day and different days of the week is an important future direction.

Despite these limitations, this study had methodological strengths. Although text messaging has become an extremely important means of communication among youth (Lenhart, 2012), no previous study has directly and unobtrusively observed adolescents' use of this medium. This study's observation of text messages provides a unique opportunity to examine naturalistic conversations between adolescents and their peer network. This naturalistic method of observation adds support to studies conducted in more controlled laboratory or intervention settings (Boxer, et al., 2005; Dishion, et al., 1996; Piehler & Dishion, 2007). These results have important implications for future research and policy. Adolescents' association with deviant peers often occurs under the auspices of group interventions or punishment, such as in-school-suspension. The time spent with deviant peers in these settings has already been associated with increased deviancy (Dishion, et al., 1995), however, through SMS communication, aggregating these youth together may have an increasingly powerful iatrogenic effect. Interaction between two youth that may previously have been limited to the length of a detention session can now continue electronically with the simple exchange of a phone number. If text message communication extends the reach of social influence, it may require increased monitoring. A transactional cascade model of the development of antisocial behavior proposes that the final two causal factors associated with adolescent violence are low parental monitoring and affiliation with deviant peers (Dodge, et al., 2008). These results suggest that SMS communication is a meaningful avenue for deviant peer affiliation, and may warrant increased parental monitoring.

Although these findings are consistent with previous research suggesting that deviant communication is a mechanism through which antisocial behavior develops (Dishion, et al., 1995), the possibility remains that adolescents who engaged in antisocial discussion were already on a trajectory of increasing antisocial behavior. Evidence suggests that youth who engage in high levels of antisocial behavior beginning in childhood and continue to increase during adolescence show a distinct profile from youth who initiate their antisocial behavior during adolescence (Moffitt & Caspi, 2001). Future research that controls for the trajectory of involvement in antisocial behavior instead of antisocial behavior at a single time point will better evaluate this possibility. Future research should also examine the features of deviancy training via SMS more directly. Although the examples in the Appendix suggest that the reinforcement component of deviancy training is present in text messaging, this coding system did not allow us to test how reinforcement of antisocial comments relates to escalation of deviant talk or increases in antisocial behavior. In addition, although sent and received messages about antisocial topics were highly correlated, further examination of the reciprocal nature of SMS communication warrants further investigation.

These findings also highlight the need for teachers and school administrators to redouble their efforts to limit their students' ability to text during school. Participants were commonly observed using text messages as a way to coordinate antisocial activities occurring within the school. The ability to discuss deviant topics in plain sight without adult supervision is one of the features that appeals to adolescents the most (Ling, 2010; Ling & Yttri, 2002). The ability to evade normal efforts to monitor students is an important characteristic of SMS communication.

Although communicating about antisocial topics and with deviant peers was associated with increases in rule-breaking and aggressive behavior, SMS may also be an important forum for other aspects of interpersonal communication. Text messages are likely an important source of prosocial communication between youth and their peers, parents, and teachers. A better understanding of the role of text message communication in other aspects of adolescents' social lives is a critical next step in understanding adolescents' development in a digital age.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Figure 1.

Timeline for collection of baseline and outcome measures of antisocial behavior and observed text message communication

Table 1a

Descriptive Statistics for Total Antisocial and Non-Antisocial Utterances (Both Sent and Received) via SMS Over a 4 Day Period (Total $n = 172$)

Type of Utterance	Number of Participants ^a	Mean Number of Utterances ^b	SD	Min.	Max.
Non-Antisocial Utterances	172 (100%)	426 (98.38%)	401.2	3	2136
Antisocial Utterances (Collapsed)	102 (59.3%)	7 (1.62%)	21.9	0	253
Rule-Breaking	53 (30.81%)	1.8 (.42%)	4.6	0	36
Illicit Substances	48 (27.91%)	3.2 (.74%)	17.8	0	217
Physical Aggression	57 (33.14%)	1.7 (.39%)	5.1	0	40
Property Crimes	11 (6.4%)	0.2 (.05%)	1.2	0	11
Total Utterances	172 (100%)	433	409.6	3	2201

^aNumbers inside parentheses indicate percentage of sample exchanging given type of communication.

^bNumbers inside parentheses indicate mean percentage of each type of content.

Table 1b

Number and Percentage of Participants Sending/Receiving Utterances about Rule-Breaking, Physical Aggression, Property Crime, and Illicit Substances

Utterance Frequency	Rule-breaking		Physical Aggression		Property Crime		Illicit Substances	
	Number of Participants	% of Sample ^a	Number of Participants	% of Sample ^a	Number of Participants	% of Sample ^a	Number of Participants	% of Sample ^a
1-5	33	62.30%	44	77.20%	9	81.80%	32	66.70%
6-10	12	22.70%	6	10.80%	1	9.10%	6	12.50%
11-15	4	7.60%	4	7.20%	1	9.10%	4	8.30%
16-20	2	3.80%	1	1.80%	0	0.00%	0	0.00%
21-25	0	0.00%	0	0.00%	0	0.00%	2	4.20%
26-30	1	1.90%	0	0.00%	0	0.00%	0	0.00%
> 31	1	1.90%	2	3.60%	0	0.00%	4	8.30%
Total	53	100.00%	57	100.00%	11	100.00%	48	100.00%

^a Only those who sent/received at least one antisocial utterance are included in calculation of Percentage of the Sample

Table 2
Correlations Between Incoming, Outgoing, and Total Utterances about Rule-Breaking, Property Crimes, Illicit Substances, and Physical Aggression

	N	M	SD	Outgoing				Incoming				Incoming & Outgoing	
				Rule Breaking	Property Crimes	Illicit Subst's	Phys Agg	Antisocial Collapsed	Rule Breaking	Property Crimes	Illicit Subst's	Phys Agg	Antisocial Collapsed
Outgoing	172	1	2.76	--	.35**	.55**	.15*	.7**	.84**	.21**	.57**	.13	.68**
	172	.11	.61	--	--	.01	.11	.15	.34**	.82**	.33	.23	.2**
	172	2.2	11.7			--	.05	.95**	.57**	-.01	.97**	-.01	.87**
	172	.99	3.24				--	.3**	.13	.12	.04	.69**	.27**
	172	4.3	14.1					--	.68**	.1	.92**	.18*	.93**
Incoming	172	.75	2.01						--	.13	.62**	.22**	.78**
	172	.11	.59							--	.03	.29**	.2**
	172	1.3	6.84								--	-.00	.91**
	172	.84	2.58									--	.36**
	172	3	8.86										--
Incoming & Outgoing	172	7.3	22.5										--

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

Table 3

Correlation Coefficients Between Baseline and Outcome Reports of Aggressive and Rule-Breaking Behavior as Rated by Parent, Teacher, and Self-Report, and Observed Antisocial SMS Communication

	N	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Self - Agg Behavior - G8	163	1.12	.28	-												
2 Self - Rulebreaking - G8	164	1.51	.71	.61**	-											
3 Self - Agg Behavior - G9	153	2.63	.92	.27**	.29**	-										
4 Self - Rulebreaking - G9	153	2.32	.86	.28**	.43**	.77**	-									
5 Par - Agg Behavior - G8	167	1.83	.85	.05	.13	.21*	.21*	-								
6 Par - Rulebreaking - G8	167	1.44	.62	.08	.2*	.16	.2*	.75**	-							
7 Par - Agg Behavior - G9	153	1.78	.87	.1	.13	.22**	.25**	.74**	.69**	-						
8 Par - Rulebreaking - G9	153	1.5	.72	.25**	.36**	.37**	.42**	.61**	.76**	.77**	-					
9 Tea - Agg Behavior - G8	160	1.58	.94	.15	.2*	.28**	.23**	.28**	.29**	.29**	.3**	-				
10 Tea - Rulebreaking - G8	160	1.44	.69	.28**	.42**	.28**	.31**	.27**	.37**	.29**	.41**	.69**	-			
11 Tea - Agg Behavior - G9	147	1.62	1.03	.23**	.18*	.56**	.27**	.31**	.36**	.43**	.5**	.41**	.31**	-		
12 Tea - Rulebreaking - G9	147	1.44	.69	.32**	.3**	.37**	.38**	.33**	.4**	.43**	.55**	.39**	.38**	.76**	-	
13 Percent Antisocial Talk	172	1.62	21.9	.37**	.4**	.33**	.4**	.13	.17*	.11	.35**	.27**	.45**	.29**	.42**	-

* $p < .05$,

** $p < .01$

Table 4a

Regression Analyses Predicting Parent, Teacher, and Self-Reports of 9th Grade Rule Breaking from Gender and Delinquent SMS Utterances

	Self Report			Teacher Report			Parent Report		
	<i>b</i>	SE	β	<i>b</i>	SE	β	<i>b</i>	SE	β
Gender	.09	.13	.05	.1	.1	.08	.08	.08	.05
Baseline Rule-Breaking ^a	.34**	.1	.27**	.23**	.09	.22**	.85**	.06	.72**
Total Utterances	.00*	.00	.17*	.00	.00	.07	-.00	.00	-.01
Antisocial Utterances	10.24**	3.0	.28**	10.7**	2.41	.37**	7.41**	1.66	.24**
<i>n</i>			138			134			142

^a Baseline Rule Breaking collected in 8th grade. Baseline and outcome ratings have corresponding reporters

* $p < .05$;

** $p < .01$

Regression Analyses Predicting Parent, Teacher, and Self-Reports of 9th Grade Aggressive Behavior from Gender and Delinquent SMS Utterances

Table 4b

	Self Report			Teacher Report			Parent Report		
	<i>b</i>	SE	β	<i>b</i>	SE	β	<i>b</i>	SE	β
Gender	.16	.15	.09	.21	.16	.1	.07	.1	.04
Baseline Aggressive Behavior ^a	.4	.33	.11	.35**	.09	.32**	.77**	.06	.73**
Total Utterances	.00	.00	.13	.1	.00	.1	.00	.00	.08
Antisocial Utterances	9.46**	3.44	.25**	9.44**	3.56	.22**	-.14	2.21	-.00
<i>n</i>			137			134			142

^a Baseline Aggressive Behavior collected in 8th grade. Baseline and outcome ratings have corresponding reporters

* *p* < .05;
** *p* < .01