Published in final edited form as:

Aggress Behav. 2010 ; 36(3): 205–217. doi:10.1002/ab.20343.

Covariation of self- and other-directed aggression among inpatient youth: Continuity in the transition to treatment and shared risk factors

Paul Boxer

Department of Psychology, Rutgers University

Abstract

Although other-directed and self-directed aggression covary in very high risk youth, these forms of aggression infrequently are studied simultaneously. Understanding better their covariation is an important task for improving services to high risk youth. In this study, data from the clinical records of 476 youth admitted to secure inpatient treatment were analyzed to examine relations among self- and other-directed aggression exhibit prior to and during inpatient treatment. Analyses tested the hypotheses that self- and other-directed aggression would tend to covary and display continuity from pre-treatment to in-treatment. Also tested were the hypotheses that youth with histories of co-occurring self- and other-directed aggression would show the highest levels of aggression during treatment and the greatest degree of personal and contextual risk upon entering treatment. These hypotheses were largely supported. Exploratory analyses revealed interesting discontinuities in aggression (aggression emitted only before or during treatment) with critical implications for research and practice with youth receiving clinical care, especially those in institutional placements.

Probably the most commonly accepted operational definition of aggressive behavior is that it subsumes any act committed with the intent to injure or irritate another person (e.g., Eron, 1987; Eron, Lefkowitz, & Walder, 1971; Huesmann, 1998). Some theoreticians have expanded that definition to incorporate the notion that in order for such behavior to be considered aggressive, the target of the act must be motivated to avoid being harmed by it (e.g., Anderson & Bushman, 2002). A central tenet of this operationalization is that aggression involves other-directed harm. However, the vast majority of research on human aggression utilized to develop theoretical conceptions of this behavior has been conducted in typical or at-risk samples, such as representative populations of children from a variety of social-economic settings (e.g., Eron et al., 1971; Moffitt, 1993; NICHD, 2004; Tremblay et al., 1991), including high-risk settings (e.g., Huizinga, Loeber, & Thornberry, 1993; Wiesner, Kim, & Capaldi, 2003); or from undergraduate students (e.g., Bartholow & Anderson, 2002; Berkowitz, 1990; Bushman, 1995). These approaches are not without merit, given parallels between laboratory designs and theory describing “real world” interpersonal aggression (Anderson & Bushman, 1997). Still, even when empirical studies of more atypical populations have been utilized to inform theory building and definitional issues, these populations commonly have been selected for their risk status in relation to the basic definition of aggression, such as elevated risk for childhood physical aggression (Conduct Problems Prevention Research Group, 1999; Huesmann & Guerra, 1997).

Not surprisingly, aggression research within highly atypical samples of both adults and children has proceeded along very different lines. In psychiatric samples, physical aggression towards others is about as common as physical aggression towards the self

(Nijman, Bowers, Oud, & Jansen, 2005). Based on clinical observations, Yudofsky, Silver, and colleagues developed a behavioral rating form for aggression among psychiatric inpatients called the *Overt Aggression Scale* (Yudofsky, Silver, Jackson, Endicott, & Williams, 1986; for similar work see Kolko, 1993). This measure includes ratings of other-directed verbal and physical aggression as well as self-directed physically injurious acts and suicidal gestures. Via this assessment, not only are other- and self-directed acts of aggression demonstrably highly prevalent in isolation, they also tend to covary within individuals. For example, Hillbrand (1995) observed via the Overt Aggression Scale that inpatients with ongoing self-directed aggression and histories of suicidality also showed the highest levels of other-directed verbal and physical aggression. In an outpatient psychiatric sample, Keilp et al. (2006) found that suicide attempters could be differentiated reliably from non-attempters by higher levels of lifetime aggressiveness (as measured via the Brown-Goodwin Aggression History interview).

Though research on the overlap between indicators of self-directed aggression (including nonsuicidal self-injury as well as suicide ideation or attempts) and other-directed aggression (including assaults on others as well as property) has been sparse (Hillbrand, 2001), studies have not been limited to psychiatric samples. Ireland (2001; Ireland & Quinn, 2007) has reported on self-injurious behavior in incarcerated populations of adolescents and adults, and findings from the large-scale National Comorbidity Study have revealed links between suicidality and antisocial behavior (Kessler, Borges, & Walters, 1999). In a community sample of high-risk young urban children (ages 6–9), Wyman et al. (2009) observed that suicidal ideation was linked to oppositionality and conduct problems. This finding is in line with a report from Garrison, McKeown, Valois, and Vincent (1993), who described a similar pattern of relations in a representative sample of high school students.

Findings of covariation between self- and other-directed aggressive acts and tendencies usually have been attributed to the general extreme acting-out, impulsivity, and emotional lability of individuals suffering from high levels of psychopathology (Conner, Duberstein, Conwell, Seidnitz, & Caine, 2001; Keilp et al., 2006; Vivona et al., 1995), and Hillbrand (2001) also underscored the importance of learning histories and emphasized biosocial interactions. Indeed, from a developmental psychopathology perspective, co-occurring self- and other-directed aggressive behavior represents a clear example of multifinality, or the principle that a single array of risk factors can result in different outcomes. Both forms of aggressive behavior can result from a broad matrix of personal, developmental, and ecological risk factors (Boxer, 2007). But when an individual engages in both self- and other-directed aggressive acts, and especially severe self-directed acts (e.g., self-mutilation, serious suicide attempt) and severe other-directed acts (e.g., injurious physical assaults), it is likely the case that the individual has experienced a high loading of both individual and contextual risk and has displayed those behaviors from fairly early in development.

Theorists have converged in their recognition that “early starters,” individuals exhibiting physical aggression from early childhood onward, typically show the most elevated levels and most serious manifestations of physical aggression over time (Frick, 2006; Moffitt, 2006; Patterson & Yoerger, 2002). Although contextual factors certainly contribute to the development of aggression over time, stable internal dispositions evident from early childhood have been implicated in the emergence of persistently violent behavior. Frick and colleagues (e.g., Frick, 2006; Kimonis, Frick, Muñoz, & Aucoin, 2008) have highlighted the role of trait-like callousness and unemotionality in disturbing normal socialization mechanisms that inhibit aggression and promote prosocial responding. Youth with CU traits also show less emotional reactivity and deficits in emotion processing (Kimonis et al., 2008), in theory increasing risk for extreme, uninhibited aggression. A similar general model of self-directed aggression has been advanced by Joiner (2005) and Nock (2009) with

respect to a gradually increasing disinhibition over time to engage in severe and self-harmful acts. For example, Nock, Joiner, Gordon, Lloyd-Richardson, and Prinstein (2006) reported that inpatients with histories of self-injury and suicide attempts reported relatively less pain in response to self-injury. Joiner et al. (2005) discovered that histories of multiple suicide attempts predicted the selection of increasingly more lethal methods in future attempts to commit suicide. Co-occurrence within individuals of self- and other-directed aggression might thus result from the shared set of general factors that increase risk for both forms, with some convergence in regard to developmental socialization and desensitization processes facilitating engagement in serious, injurious behaviors.

In addition to overlap in theorized developmental-emotional processes, other aspects of self- and other-directed aggression support a tendency towards co-occurrence. For example, when emitted at meaningful levels, self- and other-directed aggressive behaviors manifest significant continuity over time. With respect to serious self-injury, studies conducted on individuals with intellectual disabilities suggest that around 70% of these individuals who evidence self-injurious behavior persist in this behavior over time (Emerson et al., 2001). Population-level analyses of data from the nationally representative National Comorbidity Surveys (Kessler et al., 1994) show that about one-third of individuals persist in experiencing suicidal ideation over time (Borges, Angst, Nock, Ruscio, & Kessler, 2008). Of course, just as other-directed aggression manifests in a variety of forms (e.g., direct, indirect; physical, verbal; Björkqvist, Lagerspetz, & Kaukianen, 1992), so does self-directed aggression. Suicide attempts, non-suicidal self-injury, suicidal ideation, and suicidal plans show different prevalence rates, different profiles of risk, and different degrees of persistence (Borges et al., 2008; Jacobson, Muehlenkamp, Miller, & Turner, 2008; Nock & Kessler, 2006; Prinstein et al., 2008). Also like other-directed aggression, the behaviors representing self-directed aggression (alternatively, “suicide-related outcomes,” Borges et al., 2008) can be amenable to intervention (see, e.g., Miller, Rathus, & Linehan, 2007; Nock, Teper, & Hollander, 2007) although recent research has shown that some pre-existing risk conditions can promote remission to suicidal ideation more rapidly (Prinstein et al., 2008).

Other-directed aggressive behavior also manifests substantial continuity over time, particularly among individuals whose aggressiveness began in, and was sustained through childhood (Huesmann & Moise, 1998; Kokko, Pulkkinen, Huesmann, Dubow, & Boxer, 2009). Studies examining trajectories of other-directed aggressive behavior from childhood and into adolescence and beyond have shown repeatedly that individuals who persist in this behavior at levels higher than the norm also tend to show the highest levels of risk factors for aggression as well as psychopathology more generally, such as academic difficulties, negative parenting, and peer relationship problems (Broidy et al., 2003). At the same time, other-directed aggression is quite amenable to psychological treatment, with short-term as well as sustained long-term reductions documented by empirically-based, theoretically grounded, and carefully controlled interventions (Boxer & Frick, 2008). This suggests that treatment can be a meaningful precursor to discontinuity in the persistence of other-directed aggression over time.

Although there is great potential utility for examining other-directed and self-directed aggression jointly in clinical populations of youth, there has been very little research of this kind as much of the work on co-occurrence has been conducted in adult samples. Similar to externalizing and internalizing behavior more generally, research typically divides into one of the two categories, despite a tradition of findings demonstrating the comorbidity of externalizing disorders such as Conduct Disorder and internalizing problems such as Major Depression or suicidality (e.g., Costello, Mustillo, Erkanli, Keeler, & Angold, 2003; Horesh, Gothelf, Ofek, Weizman, & Apter, 1999; Knox, King, Hanna, Logan, & Ghaziuddin, 2000; Young et al., 1995). This study examines covariation and continuity in self- and other-

directed aggressive behavior among adolescents admitted for secure inpatient psychiatric treatment.

In this study, clinical records of adolescent inpatients were coded for indications of engagement in other-directed and self-directed aggressive acts prior to treatment, and evidence of these acts during treatment. Analyses examined covariation among indicators of other- and self-directed aggression during inpatient treatment, and the continuity of these forms of aggressive behavior from pre-treatment to in-treatment. It was hypothesized that the two forms of aggression would show significant covariation, in history as well as during treatment, and significant continuity from pre-treatment to during treatment. Also, based on research suggesting that youth evidencing co-occurrence in self- and other-directed aggression represent the most severe levels of historical risk and ongoing difficulties, it was hypothesized that this subgroup would show the highest levels of aggression during treatment and the highest levels of personal and contextual risk upon admission. Exploratory analyses considered risk markers associated with the persistence of or desistance from aggression from pre-treatment to in-treatment.

Method

Participants

The data analyzed for this study were drawn from the database of a larger project ($N = 484$) examining predictors of aggressive behavior during inpatient treatment in the youth psychiatric population (Boxer, 2007; Boxer, in press; Boxer & Terranova, 2008). The project was a collaboration between university researchers and the clinical staff of a secure, publicly funded inpatient psychiatric hospital in the Midwestern US. In the state where this hospital is located, the facility traditionally has served as the “last resort” treatment center for youth in the public mental health system and thus most inpatients are admitted with high levels of chronic emotional and/or behavioral difficulties and low levels of overall functioning. Participants for this study were the 476 youths (98.3% of full sample) who did not receive any Axis I diagnoses of pervasive developmental disorders (PDD; autism, Asperger’s disorder, etc). Youth with such diagnoses were excluded to minimize the influence of any potentially aggressive stereotypic behavior patterns common to the PDD diagnostic profile on the documentation of aggression prior to and during treatment (see, e.g., Bodfish, Symons, Parker, & Lewis, 2000).

The analysis sample was comprised of youths ages 10–17 years (mean age in years at admission = 13.9, $SD = 2.1$; 250 males, 226 females) admitted consecutively over a 30-month period. The sample was ethnically/racially diverse (males: 45.2% Black/African-American, 46% White/Caucasian, 2.4% Hispanic/Latino/a, 1.2% Native American, 5.2% Other or Mixed-Racial; females: 45.6% Black/African-American, 41.6% White/Caucasian, 2.7% Hispanic/Latino/a, 0.9% Native American, 9.2% Other or Mixed-Racial). The only inpatients excluded from the record sampling were children younger than 10 because the hospital did not permit seclusion or restraint interventions as a matter of policy with inpatients in that age range. Participants represented a wide range of economic backgrounds per US Census 2000 data on participants’ home ZIP codes (median home values from \$27,800 to \$309,800; percent of local population in poverty from 2% to 39%; median household incomes from \$17,680 to \$87,740). Participants came from a variety of custodial situations: homes with two biological parents or one biological/one step-parent (26.2%), single parents only (34.5% biological mother, 3.8% biological father), grandparents (5.7%), adoptive parents (12.2%), foster parents (3.6%), extended families (10.7%), or another configuration (3.3%). Mean length of stay in the facility was 96 days ($SD = 116.9$); median length of stay was 36 days with a range of 1 to 636 days.

Measures/Sources of Data

This study relied on existing clinical records. Data were obtained from a variety of sources: Intake reports completed by teams consisting of a psychiatrist, psychologist, social worker, and psychiatric nurse; a computerized critical incident database maintained by the hospital's Chief Information Officer with data extracted from incident reports filed by nurses, child care workers, and/or psychiatrists; daily observation logs completed by child care workers; medical notes and orders made by unit psychiatrists during the course of treatment; and treatment logs and plan notes kept by therapists. It should be noted that intake clinicians were required to assess risk for other- and self-directed aggression during treatment by inquiring about histories of these behaviors at intake. Except for information contained in the critical incident database, all data were collected and coded by master's-level clinical psychology interns working in the host facility. All data were de-identified by the host facility before being transferred to the author in order to adhere to the Health Information Portability and Accountability Act (HIPAA).

History of self- and other-directed aggressive behavior—Coders rated the presence and extent of four different forms of self- or other-directed aggression: physical aggression towards peers, adults, or self (excluding suicide attempts); and suicide attempts. Coders used a three-point rating system to indicate the extent of the first three forms. Codes reflected the developmental persistence of each form with *0 = none mentioned*, *1 = form of aggression noted during a single developmental period*, and *2 = form of aggression noted during two or more developmental periods*. Discrete developmental periods considered were early childhood (ages 0–4), middle childhood (ages 5–10), early adolescence (ages 11–13), and middle adolescence (ages 14–17). In line with research and theory showing that persistence of aggression over time indicates more serious difficulties (e.g., Moffitt, 2006), higher scores reflected greater persistence of the behavior. Coders also recorded the number of *suicide attempts* noted in the intake narrative.¹

Self- and other-directed aggressive behavior during inpatient treatment—Aggression during treatment was measured by a number of indicators, corrected when appropriate to control the effect of length of stay: (1) *Critical incidents of self- or other-directed aggression*: number of seclusions and restraints in which youth were involved due to self-directed or other-directed provocation (from the computerized incident database maintained by the hospital's information office).² (2) *Special precautions for self- or other-directed aggression*: percentage of time youth was maintained on 1:1 supervision by child care staff due to psychiatrist determination of elevated risk for self- or other-directed aggressive behavior (from medical orders). (3) *Behavior Management Plans for self- or other-directed aggression*: number of special treatment plan components instantiated to target self- or other-directed aggressive behavior, and duration of those components (from treatment logs). (4) *Everyday incidents of self- or other-directed aggression*: number of sub-critical incidents (i.e., no imminent risk of harm to self or other) of self- or other-directed

¹Some studies have found differences between adolescents exhibiting nonsuicidal self-injury (NSSI) and suicide attempts (SA), although both groups show some features of elevated psychiatric impairment relative to adolescents who exhibited no self-harmful behavior and co-occurrence of NSSI/SA is fairly common in high-risk samples (Boxer, in press; Jacobson et al., 2008). For the present analysis, because the aggression indicators collected during treatment do not discriminate between clear suicidal gestures and nonsuicidal self-injury, these two forms of self-directed aggression are combined in determining history of the behavior.

²*Seclusion* involves moving an individual into an unfurnished room and preventing him or her from exiting until the he or she is deemed no longer to be at risk for harming self or other. *Restraint* refers to a restricting an individual's movement via three possible methods. *Physical restraint* involves staff limiting movement by holding a youth. *Mechanical restraint* involves the use of some apparatus to limit movement (e.g., strapping a youth to a bed). *Chemical restraint* involves the use of medication to reduce agitation. Chemical restraint is not applied as such at the host facility and thus none of the incidents recorded for this study involved that form of restraint. Incidents occur when a member of the treatment staff determines that a youth's behavior is presenting the threat of imminent harm to him- or herself or another person. There are no other circumstances at the host facility that allow the use of seclusion or restraint.

aggression observed by child care staff and noted in daily process logs, sampled during first, middle, and last weeks of treatment (from daily observation logs). Table 2 presents these indicators in greater detail, showing the computation of each variable along with sample descriptives. Where appropriate, these indicators were corrected to control the effect of length of stay (LOS; e.g., total incidents divided by days in treatment) given that LOS is a critical covariate of involvement in serious aggression during inpatient treatment (Boxer, 2007).

Personal and contextual risk markers—Coders also extracted information regarding a variety of identified risk markers for aggressive behavior, including: 1) *maltreatment* (physical, sexual, and emotional abuse as well as neglect; coded as 0 = none noted, 1 = form of maltreatment mentioned, but no legal status noted, and 2 = form of maltreatment noted as ‘substantiated’; see Boxer & Terranova, 2008, for evidence of validity); 2) *prior out-of-home placements* (counts of previous placements in psychiatric hospitals, residential treatment centers, foster homes, and juvenile detention); 3) *age of onset for first incident of any noteworthy aggressive behavior*; 4) *Global Assessment of Functioning (GAF) score* (American Psychiatric Association, 2000); and 5) *externalizing, internalizing, and critical problems* indicated by the Devereaux Scales of Mental Disorders (DSMD; Naglieri, LeBuffe, & Pfeiffer, 1994).

Procedures

All procedures were reviewed and approved by human subjects research committees at the host facility, the state agency overseeing activities at the facility, and the author’s university. Information contained in the inpatient charts was coded by three clinical psychology interns trained by the author. The three coders first coded independently a set of 55 cases (11% of the sample) which overlapped with 55 cases from a pilot feasibility study (Boxer, Bhandari, & Bow, 2003). Because those 55 cases had been coded using a system very similar to the one implemented in the current study, the 55 were used to establish interrater reliability among the coders and with the codes assigned during the feasibility study. Reliability analyses indicated that all three interns were coding at adequate levels of agreement with the feasibility study (all codes > 70% agreement; most codes > 80% agreement) and at very high levels with one another (intraclass correlation coefficients > .90). Next, the three coders reviewed and coded the remaining 429 cases independently (distributed across the three coders; one coded 110 cases, one 115, and the other 204). Critical incident data were extracted from the facility’s computerized database and provided directly by the facility’s Chief Information Officer.

Results

Covariation between self- and other-directed aggression

Table 1 shows descriptive statistics for histories of aggression. As shown, the majority of youth in the sample had histories of both self-directed (deliberate self-injury or suicide attempt) and other-directed (physical aggression towards peers or adults) aggressive acts. Histories of any engagement in any form of self- or other-directed aggression tended to covary, $\chi^2(1) = 3.06, p = .08$. Table 2 shows descriptive statistics for the indicators of aggression during treatment. Within categories (e.g., special precautions), self-directed and other-directed aggression were correlated significantly. Table 3 shows correlations among all of the aggression indicators.

Differences in youth with different profiles of co-occurring self- and other-directed aggression

To examine the validity of the indicators included in Tables 2–3 for differentiating among youth by their aggression histories, youth were assigned to one of four groups: no aggression in history ($n = 40$, 8.4%), only self-directed aggression in history ($n = 64$, 13.4%), only other-directed aggression in history ($n = 106$, 22.2%), or both types of aggression in history combined ($n = 266$, 55.8%). With respect to the composition of these groups, females were more likely than males to be in the self-directed only group (66% female), and less likely than males to be in the other-directed only group (28% female) ($p < .01$). Distribution by sex was not significantly unequal in the no aggression (58% female) and combined (49% female) groups. The combined group was significantly younger in comparison to the self-directed only group ($p < .05$) with no other group differences in age. Distribution by ethnic minority status (i.e., minority vs. non-minority) was fairly equal across all four groups.

This grouping variable was used as the between groups factor for a series of one-way analyses of variance (ANOVA) computed to evaluate group differences in the indicators of aggression during treatment and the historical risk markers. Log-transformed versions of the aggression indicators were used as dependent variables to correct for skewness in the indicators. Single-*df* contrasts were computed to evaluate the hypothesis that the combined group would show significantly more aggression during treatment, and higher levels of personal and contextual risk, than would the other three groups. Given interest in testing theoretical propositions from a relatively less-developed area of inquiry, an alpha level of .05 was set for rejecting the null hypothesis to guard against Type II error.

Contrast analyses indicated that for all indicators but one (special precautions for self-directed aggressive behavior), the combined group produced the highest levels of aggression during treatment when compared to the other three groups pooled (see Table 4 for *t*, *p*, and Cohen's *d* values). Contrast analyses also indicated that for all risk markers but one (intake Global Assessment of Functioning score), the combined group exhibited the highest levels of risk compared to the other groups (see Table 5 for *t*, *p*, and Cohen's *d* values).

Continuity in self- and other-directed aggression from pre-treatment to in-treatment

The next set of analyses explored the nature of continuity and discontinuity of these behaviors. The indicators of critical incidents, special precautions, and behavior management plans were recoded such that any non-zero value on any of those three categories within each type of behavior (self- or other-directed) constituted evidence of any aggression (coded as 1), and zero values on all three indicated no aggression (coded as 0). Table 6 shows the cross-tabulation of any self- or other-directed aggression in history with evidence of any self- or other-directed aggression during treatment. As displayed, in most cases aggressive behavior produced substantial continuity from pre-treatment to in-treatment. In addition (not shown in table), among youth who exhibited both self-directed *and* other-directed aggression in their history, 74% showed both self-directed *and* other-directed aggression during treatment and 97% showed self-directed *or* other-directed aggression during treatment.

Discontinuity in aggression from pre-treatment to during treatment also was examined, first with respect to youth who showed no evidence of aggression in history, but behaved aggressively during treatment. This form of discontinuity was more evident with respect to self-directed aggressive behavior as compared to other-directed aggressive behavior. A total of 146 youth showed no evidence of self-directed aggression in their history, yet 81 (55%) of these youth displayed self-directed aggression during treatment. In contrast, a total of 104 youth showed no evidence of other-directed aggression in their history, but only 30 (29%) of

these youth engaged in other-directed aggression during treatment. These two proportions indicating discontinuity rates are significantly different per Fisher's Exact Test, $p < .0001$.

Discontinuity with respect to youth behaving aggressively pre-treatment, but not during treatment, was by comparison less likely. A total of 330 youth showed evidence of self-directed aggression in their history, and 31 (9%) refrained from self-directed aggression during treatment. A total of 372 youth showed evidence of other-directed aggression in their history, and 59 (16%) refrained from this form of aggression during treatment according to the measured indicators. These two proportions are significantly different per Fisher's exact Test, $p < .01$.

Exploring factors associated with discontinuity of aggression

Despite the different patterns of discontinuity, as noted and shown in Table 6 most youth displayed the expectable continuity in self- and other-directed aggression. The final set of analyses explored individual differences between youth relative to the nature of *discontinuity* in their aggressive behavior. These analyses focused on two groups for each type of aggression: "emerging" (no aggression in history, any aggression in treatment) and "desisting" (any aggression in history, no aggression in treatment). Independent-samples *t*-tests were conducted to compare these groups on a variety of personal and contextual risk factors commonly associated with aggressive behavior. Again an alpha level of .05 was set to guard against Type II error. Table 7 presents the results of these tests along with associated effect size estimates (Cohen's *d*). As shown, the "desisting" group was higher on almost all risk markers with respect to self-directed aggression, and on markers of psychopathology for other-directed aggression.

Discussion

This investigation relied upon data extracted from the clinical records of 484 adolescents in secure inpatient treatment to examine covariation and continuity in two forms of aggressive behavior: other-directed and self-directed physical aggression. Analyses produced an interesting pattern of results. Other- and self-directed aggression covaried significantly in this population. Histories of the two forms of aggression were modestly related, and various indicators of those behaviors during treatment were consistently correlated within and across multiple indicator categories. Youth who showed both other- and self-directed aggression prior to inpatient admission also tended to show the most aggression during treatment and exhibit the greatest degree of personal and contextual risk prior to treatment. These findings are consistent with prior empirical work on individuals with histories of co-occurring self- and other-directed aggression as well as a theoretical formulation linking extreme self- and other-directed aggressive behaviors through developmental socialization and desensitization mechanisms.

Covariation in other-directed and self-directed aggressive behavior

Research by King and colleagues (Kerr et al., 2008; King et al., 2006; Knox et al., 2000) has illuminated the covariation of assaultive behavior and suicidal tendencies in psychiatrically hospitalized adolescents. With Yudofsky's observational *Overt Aggression Scale* and similar observational rating approaches (see Kolko, 1993), other psychiatric researchers have documented the co-occurrence of self-injurious and assaultive acts in adolescents (Connor, Melloni, & Harrison, 1998; Vivona et al., 1995) and adults (Hillbrand, 1995; Yudofsky et al., 1986). Epidemiological studies have documented co-morbidities in conduct problems and internalizing syndromes (Costello et al., 2003), underscoring the atypicality of the population within which these two problem clusters covary. Still, despite some efforts to examine self- and other-directed aggression jointly, published studies are limited almost

exclusively to documenting the simple co-occurrence of those behaviors with less attention to characteristics or processes that might shed light on their covariation (Hillbrand, 2001).

An important recent exception was offered by Kerr et al. (2008). Using a prospective longitudinal design in a sample of 270 acutely suicidal youth, these authors investigated a number of theoretically specified links among other-directed aggression, general internalizing symptoms, and suicidal ideation and attempts. One key finding from this study was that levels of other-directed aggression moderated suicidal tendencies such that internalizing symptoms were more predictive of suicidal behaviors among youth high in aggression. The theoretical treatment and analysis of these issues by Kerr et al. (2008) thus suggest that self-directed and other-directed aggression covary most meaningfully at very elevated levels of maladjustment, and that augmented risk for suicidal behavior might ultimately be the effect of the distress and disarray produced by covarying assaultive and depressive tendencies and their tangible sequelae. This view is consistent with other theoretical explanations offered to account for co-occurring self-and other-directed aggression (Connor et al., 2001; Hillbrand, 2001).

Kerr et al.'s (2008) design included a time 1 assessment in-hospital and two assessments post-discharge, and thus focused more on aggressive behaviors *in vivo*. In the present study, aggressive behaviors measured retrospectively were analyzed to examine patterns of covariation extending *in vitro*, during inpatient treatment. This design produced findings overlapping somewhat with Kerr et al.'s observations in that meaningful covariation between self- and other-directed aggression was related to the overall severity level of the behavior. Youth who entered secure inpatient treatment with histories of both self-directed and other-directed aggressive behavior generally showed the highest levels of these behaviors during their treatment stay – in terms of critical incidents and the necessity of specialized behavior management plans. This is consistent with the idea summarized in Kerr et al. (2008) and raised by others (e.g., Vermeiren et al., 2003, cited in Kerr et al.; also see Horesh et al., 1999) of an “affect-to-impulse” process whereby highly assaultive and self-injurious youth are characterized by high levels of impulsivity, emotion dysregulation, and sensation-seeking tendencies that can produce both self-and other-directed aggressive acts.

Importantly, youth with histories of both self- and other-directed aggression also entered treatment with the highest levels of personal and contextual risk. This is consistent with Hillbrand's (2001) biosocial view of co-occurring self- and other-directed aggressive behavior. This particular observation also squares with contemporary formulations of extreme assaultive and self-injurious behavior. Frick, Moffitt and others (Frick, 2006; Moffitt, 2006; Patterson & Yoerger, 2002; Shaw et al., 2000) have noted that youth showing the most severe levels of aggression typically show risk profiles incorporating personal as well as contextual liabilities in addition to significantly earlier starting points on their aggressiveness. Theory by Joiner (2005) and Nock (2009) implies developmental processes in escalations from mild to severe self-injury and increasingly lethal suicide attempts, in addition to high levels of personal-contextual risk (especially child maltreatment). Notably, youth in this study with histories of co-occurring self-and other-directed aggression had the earliest ages of onset in their aggressiveness. Future research and theoretical work should continue to emphasize the high levels of risk in populations of youth showing extreme levels of self-directed and other-directed aggressive behaviors.

Continuity and discontinuity in other-directed and self-directed aggressive behavior

The findings presented here underscore that both self-directed and other-directed aggression do seem to share one key underlying characteristic – that of continuity. Continuity is a hallmark of developmental models of other-directed aggressive behavior (Huesmann & Moise, 1998; Kokko et al., 2009), consistent with observations in the clinical risk

assessment literature that the most reliable predictor of future violence is past violence (Borum & Verhaagen, 2006; Monahan, 1981). Continuity in aggressive behavior from pre-treatment to in-treatment was substantial for both forms of aggressive behavior. The most striking observation, as noted earlier, was that the proportion of youth who showed *both* forms of aggression pre-treatment and engaged in *either* self- or other-directed aggression during treatment was 97%. This means that an intake clinician at the host facility would be able to predict with almost perfect certainty that a youth entering treatment with a history of both types of aggression will engage in some kind of aggression during his or her stay at the facility.

An interesting counterpoint to observations of continuity was the pattern of discontinuities revealed. Many youth with no measured history of aggression before treatment behaved aggressively during treatment. Self-directed aggression was more likely than was other-directed aggression to emerge during treatment if it had not been evident previously. Further, patterns in the data suggest that discontinuity in the other direction was less common – few youth who behaved aggressively pre-treatment refrained from aggression during treatment. Youth who manifest aggression pre-treatment, and then fail to do so during treatment, probably are responding positively to the multi-component treatment afforded by the hospital milieu – e.g., staff management, psychotherapy, and/or psychotropic medication. However, what about those youth who did not manifest aggression pre-treatment, but did so once in treatment? Analysis of risk markers suggests that these youth are admitted with levels of risk significantly lower than are youth admitted with histories of aggression who do not go on to aggress in treatment.

“Emerging” aggression in treatment represents a form of discontinuity of great interest to understanding the potential for contextual forces to elicit aggression. Much has been made in recent years of “peer contagion” of antisocial behavior (Dishion, McCord, & Poulin, 1999), which describes the tendency of youth to increase in aggression and related antisocial acts as the function of their exposure to aggressive or generally antisocial peers, although some have noted a lack of evidence for this phenomenon (Weiss et al., 2005). Recent studies conducted by Prinstein and his colleagues, among others (for review, see Heilbron & Prinstein, 2008) demonstrate that contagion effects also are possible for “non-suicidal self-injury” – deliberate self-directed aggressive acts such as burning and cutting. Contagion effects might accrue particularly in circumstances when youth are attempting to “fit in” by adopting the behavioral norms of new peer groups. This possibility is supported by the observation that “emerging” self-directed aggressors had significantly fewer institutional placements than did “desisting” self-directed aggressors: Given their less elaborate histories of out-of-home placements, they have less experience with navigating or affiliating with the high-risk sorts of peer groups likely to be found in institutional settings. Thus, “new” aggressive behaviors in youth remanded to residential treatment could be the result of the peer contagion processes theorized by Dishion, Prinstein, and others. More research is needed to investigate these ideas.

Implications

As a translational investigation – converting clinical data to research data in the service of addressing theoretical and empirical issues – this study has immediate implications for research and policy. First, the study highlights the basic utility of clinical data for empirical research aims and underscores the potential for “value added” approaches to handling clinical data. Second, with regard to the focus of the investigation, the size ($N = 476$) and scope of the investigation illuminates the importance of very high risk, atypical youth populations for studying issues relevant to the wider youth population. The discontinuity in aggressive behavior evident for some youth is a new contribution of this study to the larger field of youth aggression research, and is line with recent efforts by developmental and

social psychologists to examine “off diagonals” – i.e., individuals whose developmental trajectories do not conform to typical prediction models (Feinstein & Peck, 2008).

The observations in this study of covariation as well as continuity (and discontinuity) will be useful to practitioners who work with assaultive and/or self-injurious youth, and especially those in psychiatric settings. The data suggest that it is reasonable to expect that both self- and other-directed forms of aggression will manifest in these youth, and potentially even persist over time. From the standpoint of assessment in particular, based on the current study clinicians should be advised that there seems to be a near-certainty that youth with histories of both forms of aggression will continue to show at least one form of aggression during milieu treatment.

Acknowledgments

This study was funded by a grant from the National Institute of Mental Health (R03 MH72980). The author acknowledges the support provided by Robert Bailey, James Bow, Joy Wolfe Ensor, Rashmi Bhandari, Ruth Robinson, Esther Petrovich, Elizabeth Rakstis, Vicki Alley, Dianne Tomaine, and Judy Valentine. Assistance with data coding was provided by Sara Chase, Jessica Luitjohan, Rebecca Gerhardstein, Sarah Savoy, and Andrew Terranova.

References

- Anderson CA, Bushman BJ. External validity of “trivial” experiments: The case of laboratory aggression. *Review of General Psychology*. 1997; 1:19–41.
- Anderson CA, Bushman BJ. Human aggression. *Annual Review of Psychology*. 2002; 53:27–51.
- Bartholow BD, Anderson CA. Effects of violent video games on aggressive behavior: Potential sex differences. *Journal of Experimental Social Psychology*. 2002; 38:283–290.
- Berkowitz L. On the formation and regulation of anger and aggression: A cognitive neoassociationistic analysis. *American Psychologist*. 1990; 45:494–503. [PubMed: 2186678]
- Björkqvist K, Lagerspetz KM, Kaukianen A. Do girls manipulate and boys fight? Developmental trends in regard to direct and indirect aggression. *Aggressive Behavior*. 1992; 18:117–127.
- Bodfish JW, Symons FJ, Parker DE, Lewis MH. Varieties of repetitive behavior in autism: Comparisons to mental retardation. *Journal of Autism and Developmental Disorders*. 2000; 30:237–243. [PubMed: 11055459]
- Borges G, Angst J, Nock M, Ruscio A, Kessler R. Risk factors for the incidence and persistence of suicide-related outcomes: A 10-year follow-up study using the National Comorbidity Surveys. *Journal of Affective Disorders*. 2008; 105:25–33. [PubMed: 17507099]
- Borum, R.; Verhaagen, D. *Assessing and managing violence risk in juveniles*. New York: Guilford Press; 2006.
- Boxer P. Aggression in very high-risk youth: Examining developmental risk in an inpatient psychiatric population. *American Journal of Orthopsychiatry*. 2007; 77:636–646. [PubMed: 18194044]
- Boxer P. Variations in risk and treatment factors among adolescents engaging in different types of deliberate self-harm: Extension of Jacobson et al. (2008) with an inpatient sample. *Journal of Clinical Child and Adolescent Psychology*. In press.
- Boxer, P.; Bhandari, RP.; Bow, JN. Exploration of factors predicting seclusion and restraint among child and adolescent psychiatric inpatients. Poster presented at the annual meeting of the Association for the Advancement of Behavior Therapy; Boston, MA. 2003 November.
- Boxer, P.; Frick, PJ. Treating conduct disorder, aggression, and antisocial behavior in children and adolescents: An integrated view. In: Steele, R.; Roberts, M.; Elkin, TD., editors. *Handbook of evidence-based therapies for children and adolescents*. New York: Sage; 2008.
- Boxer P, Terranova AM. Effects of multiple maltreatment experiences among psychiatrically hospitalized youth. *Child Abuse and Neglect*. 2008; 32:637–647. [PubMed: 18582936]

- Broidy LM, Nagin DS, Tremblay RE, et al. Developmental trajectories of childhood disruptive behavior disorders and adolescent delinquency: A six-sample replication. *Developmental Psychology*. 2003; 39:222–245. [PubMed: 12661883]
- Bushman BJ. Moderating role of trait aggressiveness in the effects of violent media on aggression. *Journal of Personality and Social Psychology*. 1995; 69:950–960. [PubMed: 7473040]
- Conduct Problems Prevention Research Group. Initial impact of the fast track prevention trial for conduct problems: I. The high-risk sample. *Journal of Consulting and Clinical Psychology*. 1999; 67:631–647. [PubMed: 10535230]
- Conner KR, Duberstein PR, Conwell Y, Seidlitz L, Caine ED. Psychological vulnerability to completed suicide: A review of empirical studies. *Suicide and Life-Threatening Behavior*. 2001; 31:367–385. [PubMed: 11775713]
- Connor DF, Melloni RH Jr, Harrison RJ. Overt categorical aggression in referred children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1998; 37:66–73. [PubMed: 9444902]
- Costello EJ, Mustillo S, Erkanli A, Keeler G, Angold A. Prevalence and development of psychiatric disorders in childhood and adolescence. *Archives of General Psychiatry*. 2003; 60:837–844. [PubMed: 12912767]
- Dishion TJ, McCord J, Poulin F. When interventions harm: Peer groups and problem behavior. *American Psychologist*. 1999; 54:755–764. [PubMed: 10510665]
- Emerson E, Kiernan C, Alborz A, Reeves D, Mason H, Swarbrick R, Mason L, Hatton C. Predicting the persistence of severe self-injurious behavior. *Research in Developmental Disabilities*. 2001; 22:67–75. [PubMed: 11263631]
- Eron LD.; Walder, LO.; Lefkowitz, MM. *Learning of aggression in children*. Boston: Little, Brown; 1971.
- Eron L. The development of aggressive behavior from the perspective of a developing behaviorism. *American Psychologist*. 1987; 42:435–442. [PubMed: 3605821]
- Feinstein L, Peck S. Unexpected pathways through education: Why do some students not succeed in school and what helps others beat the odds? *Journal of Social Issues*. 2008; 64:1–20. [PubMed: 19526067]
- Frick PJ. Developmental pathways to conduct disorder. *Child and Adolescent Psychiatric Clinics of North America*. 2006; 15:311–331. [PubMed: 16527658]
- Garrison CZ, McKeown RE, Valois RF, Vincent ML. Aggression, substance use, and suicidal behaviors in high school students. *American Journal of Public Health*. 1993; 83:179–184. [PubMed: 8427319]
- Heilbron N, Prinstein MJ. Peer influence and adolescent nonsuicidal self-injury: A theoretical review of mechanisms and moderators. *Applied and Preventive Psychology*. 2008; 12:169–177.
- Hillbrand M. Aggression against self and aggression against others in violent psychiatric patients. *Journal of Consulting and Clinical Psychology*. 1995; 63:668–671. [PubMed: 7673545]
- Hillbrand M. Homicide-suicide and other forms of co-occurring aggression against self and against others. *Professional Psychology: Research and Practice*. 2001; 32:626–635.
- Horesh N, Gothelf D, Ofek H, Weizman T, Apter A. Impulsivity as a correlate of suicidal behavior in adolescent psychiatric inpatients. *Crisis*. 1999; 20:8–14. [PubMed: 10365500]
- Huesmann, LR. The role of social information processing and cognitive schemas in the acquisition and maintenance of habitual aggressive behavior. In: Geen, RG.; Donnerstein, E., editors. *Human aggression: Theories, research, and implications for policy*. New York: Academic Press; 1998. p. 73–109.
- Huesmann LR, Guerra NG. Children's normative beliefs about aggression and aggressive behavior. *Journal of Personality and Social Psychology*. 1997; 72:408–419. [PubMed: 9107008]
- Huesmann, LR.; Moise, J. The stability and continuity of aggression from early childhood to young adulthood. In: Flannery, DJ.; Huff, CR., editors. *Youth Violence: Prevention, Intervention, and Social Policy*. Washington, DC: American Psychiatric Press; 1998. p. 73–95.
- Huizinga D, Loeber R, Thornberry T. Longitudinal study of delinquency, drug use, sexual activity, and pregnancy among children and youth in three cities. *Public Health Reports*. 1993; 108(suppl 1): 90–96. [PubMed: 8210279]

- Ireland JL. A descriptive analysis of self-harm reports among a sample of incarcerated adolescent males. *Journal of Adolescence*. 2001; 23:23–46.
- Ireland JL, Quinn K. Officer attitudes towards adult male prisoners who self-harm: Development of an attitudinal measure and investigation of sex differences. *Aggressive Behavior*. 2007; 33:63–72. [PubMed: 17441007]
- Jacobson CM, Muelenkamp JJ, Miller AL, Turner JB. Psychiatric impairment among adolescents engaging in different types of deliberate self harm. *Journal of Clinical Child and Adolescent Psychology*. 2008; 37:363–375. [PubMed: 18470773]
- Joiner, TE. Why people die by suicide. Cambridge, MA: Harvard University Press; 2005.
- Joiner TE, Conwell Y, Fitzpatrick KK, Witte TK, Schmidt NB, Berlim MT, et al. Four studies on how past and current suicidality relate even when “everything but the kitchen sink” is covaried. *Journal of Abnormal Psychology*. 2005; 114:291–303. [PubMed: 15869359]
- Keilp JG, Gorlyn M, Oquendo MA, Brodsky B, Ellis SP, Stanley B, Mann JJ. Aggressiveness, not impulsiveness or hostility, distinguishes suicide attempters with major depression. *Psychological Medicine*. 2006; 36:1779–1788. [PubMed: 16959059]
- Kerr DCR, Washburn JJ, Feingold A, Kramer AC, Ivey AZ, King CA. Sequelae of aggression in acutely suicidal adolescents. *Journal of Abnormal Child Psychology*. 2008; 35:817–830. [PubMed: 17534711]
- Kessler RC, Borges G, Walters EE. Prevalence of and risk factors for lifetime suicide attempts in the National Comorbidity Survey. *Archives of General Psychiatry*. 1999; 56:617–626. [PubMed: 10401507]
- Kessler RC, McGonagle KA, Zhao S, Nelson CB, Hughes M, Eshleman S, Wittchen HU, Kendler KS. Lifetime and 12-month prevalence of *DSM-III-R* psychiatric disorders in the United States: Results from the National Comorbidity Survey. *Archives of General Psychiatry*. 1994; 51:8–19. [PubMed: 8279933]
- Kimonis ER, Frick PJ, Muñoz LC, Aucoin KJ. Callous-unemotional traits and the emotional processing of distress cues in detained boys: Testing the moderating role of aggression, exposure to community violence, and histories of abuse. *Development and Psychopathology*. 2008; 20:569–589. [PubMed: 18423095]
- King CA, Knox MS, Henninger N, Nguyen TA, Ghaziuddin N, Maker A, Hanna GL. Major depressive disorder in adolescents: Family psychiatric history predicts severe behavioral disinhibition. *Journal of Affective Disorders*. 2006; 90:111–121. [PubMed: 16352346]
- Knox M, King C, Hanna GL, Logan D, Ghaziuddin N. Aggressive behavior in clinically depressed adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*. 2000; 39:611–618. [PubMed: 10802979]
- Kokko K, Pulkkinen L, Huesmann LR, Dubow EF, Boxer P. Continuity of aggression from childhood to adulthood: A two-country analysis. *Journal of Research on Adolescence*. 2009; 19:9–34. [PubMed: 19890485]
- Kolko DJ. Further evaluation of inpatient child behavior ratings: Consistency across settings, time, and sources. *Journal of Emotional and Behavioral Disorders*. 1993; 93:251–260.
- Miller, AL.; Rathus, JH.; Linehan, MM. Dialectical behavior therapy with suicidal adolescents. New York: Guilford Press; 2007.
- Moffitt, TE. Life-course-persistent versus adolescence-limited antisocial behavior. In: Cicchetti, D.; Cohen, DJ., editors. *Developmental psychopathology, Vol 3: Risk, disorder, and adaptation*. 2. Hoboken, NJ, US: Wiley; 2006. p. 570-598.
- Naglieri, JA.; LeBuffe, PA.; Pfeiffer, SI. *Devereaux Scales of Mental Disorders*. San Antonio, TX: The Psychological Corporation; 1994.
- Nijman H, Bowers L, Oud N, Jansen G. Psychiatric nurses' experiences with inpatient aggression. *Aggressive Behavior*. 2005; 31:217–227.
- Nock MK. Why do people hurt themselves? New insights into the nature and functions of self-injury. *Current Directions in Psychological Science*. 2009; 18:78–83. [PubMed: 20161092]
- Nock MK, Joiner TE, Gordon K, Lloyd-Richardson E, Prinstein MJ. Non-suicidal self-injury among adolescents: Diagnostic correlates and relation to suicide attempts. *Psychiatry Research*. 2006; 144:65–72. [PubMed: 16887199]

- Nock M, Kessler R. Prevalence of and Risk Factors for Suicide Attempts Versus Suicide Gestures: Analysis of the National Comorbidity Survey. *Journal of Abnormal Psychology*. 2006; 115:616–623. [PubMed: 16866602]
- Nock M, Teper R, Hollander M. Psychological treatment of self-injuring among adolescents. *Journal of Clinical Psychology*. 2007; 63:1081–1089. [PubMed: 17932981]
- Patterson, GR.; Yoerger, K. A developmental model for early- and late-onset antisocial behavior. In: Reid, JB.; Snyder, J.; Patterson, GR., editors. *Antisocial behavior in children and adolescents: A developmental analysis and model for intervention*. Washington, DC: American Psychological Association; 2002. p. 147-172.
- Prinstein MJ, Nock MK, Simon V, Aikins JW, Cheah CSL, Spirito A. Longitudinal trajectories and predictors of adolescent suicidal ideation and attempts following inpatient hospitalization. *Journal of Consulting and Clinical Psychology*. 2008; 76:92–103. [PubMed: 18229987]
- Vivona JM, Ecker B, Halgin RP, Cates D, Garrison WT, Friedman M. Self-and other-directed aggression in child and adolescent psychiatric inpatients. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1995; 34:434–444. [PubMed: 7751257]
- Weiss B, Caron A, Ball S, Tapp J, Johnson M, Weisz JR. Iatrogenic effects of group treatment for antisocial youth. *Journal of Consulting and Clinical Psychology*. 2005; 73:1036–1044. [PubMed: 16392977]
- Wyman PA, Gaudieri PA, Schmeelk-Cone K, Cross W, Brown CH, Sworts L, et al. Emotional triggers and psychopathology associated with suicidal ideation in urban children with elevated aggressive-disruptive behavior. *Journal of Abnormal Child Psychology*. 2009; 37:917–928. [PubMed: 19479370]
- Young SE, Mikulich SK, Goodwin MB, Hardy J, Martin CL, Zoccolillo MS, Crowley TJ. Treated delinquent boys' substance use: Onset, pattern, relationship to conduct and mood disorders. *Drug and Alcohol Dependence*. 1995; 37:149–162. [PubMed: 7758404]
- Yudofsky SC, Silver JM, Jackson W, Endicott J, Williams D. The Overt Aggression Scale for the objective rating of verbal and physical aggression. *American Journal of Psychiatry*. 1986; 143:35–39. [PubMed: 3942284]

Table 1

Indicators of aggressive behavior in history (N = 476)

Indicators	M	SD	None noted (%0)	Some history (%1)	Extensive history (%2)
<i>Self-directed aggression</i>					
Phys agg to self, not suicidal	.85	.84	210 (44.1)	127 (26.7)	139 (29.2)
Suicide attempts ¹	.79	1.22	265 (55.7)	119 (25.0)	92 (19.3)
Correlation	.275**				
<i>Other-directed aggression</i>					
Phys agg to peers	1.16	.85	139 (29.2)	121 (25.4)	216 (45.4)
Phys agg to adults	.94	.88	198 (41.6)	108 (22.7)	170 (35.7)
Correlation	.614**				
Proportion any self-directed agg	69.3% (n = 330)				
Proportion only self-directed agg	13.4% (n = 64)				
Proportion any other-directed agg	78.2% (n = 372)				
Proportion only other-directed agg	22.3% (n = 106)				
Proportion self plus other agg	55.9% (n = 266)				

¹For descriptive purposes, "some history" = 1 suicide attempt, "extensive history" = 2 or more attempts. Range of suicide attempts = 0–8.

Table 2

Indicators of aggressive behavior during inpatient treatment

Indicator/Computation	N	M	SD	Range
Critical incidents (total incidents divided by days in treatment)				
Due to self-directed aggression	476	.005	.021	0–.29
Due to other-directed aggression	476	.024	.056	0–.35
Correlation (self with other)	.477**			
Special precautions (days on special precaution divided by days in treatment)				
Due to self-directed aggression	476	.257	.288	0–1
Due to other-directed aggression	476	.196	.257	0–1
Correlation (self with other)	.312**			
Behavior Management Plans (BMP; weeks on BMP divided by weeks in treatment)				
Due to self-directed aggression	484	.023	.115	0–1
Due to other-directed aggression	484	.065	.196	0–1
Correlation (self with other)	.431**			
Everyday incidents of aggression (number of incidents observed during a 7 day period)				
Due to self-directed aggression				
First week	474	.347	1.120	0–16
Middle week	287	.252	.674	0–5
Last week	323	.044	.251	0–3
Due to other-directed aggression				
First week	475	1.335	2.337	0–20
Middle week	287	1.187	1.710	0–14
Last week	324	.637	1.387	0–17
Correlations (self with other)				
First week	.296**			
Middle week	.128**			
Last week	.123**			

Table 3

Correlations among indicators of aggressive behavior during treatment

	1	2	3	4	5	6	7	8	9	10	11	12
<i>Critical incidents</i>												
1 Self-directed	--											
2 Other-directed	.48**	--										
<i>Special precautions</i>												
3 Self-directed	.07	-.03	--									
4 Other-directed	.02	.23**	.31**	--								
<i>Behavior management plans</i>												
5 Self-directed	.14**	.09*	-.03	-.01	--							
6 Other-directed	.15**	.37**	-.11*	.08	.43**							
<i>Everyday incidents</i>												
7 Self-directed week 1	.21**	.08	-.04	-.08	.17**	.14**	--					
8 Self-directed week 2	.20**	.03	.25**	.06	.25**	.07	.48**	--				
9 Self-directed week 3	.10	.09	.18**	.10	.09	.04	.39**	.46**	--			
10 Other-directed week 1	.13**	.28**	-.19**	.03	.19**	.37**	.30**	.17**	.04	--		
11 Other-directed week 2	.27**	.44**	.16**	.35**	.17**	.26**	.10	.13*	.19**	.44**	--	
12 Other-directed week 3	.14*	.37**	.08	.28**	.08	.34**	-.03	.02	.12**	.25**	.37**	--

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

Note. Boldfaced correlations represent single-behavior relations across multiple methods for self-directed aggression; italicized correlations represent single-behavior relations across multiple methods for other-directed behaviors.

Table 4

Results of planned single-df contrasts between combined group (self/other-directed aggression in history) and other groups for indicators of aggression during treatment

Indicator	t	p	d
<i>Critical incidents</i>			
Self-directed	2.06	.040	.190
Other-directed	3.83	.000	.353
<i>Special precautions</i>			
Self-directed	-1.95	.052	.180
Other-directed	2.37	.018	.218
<i>Behavior management plans</i>			
Self-directed	2.75	.006	.253
Other-directed	4.76	.000	.438
<i>Everyday incidents</i>			
Self-directed week 1	4.25	.000	.392
Self-directed week 2	2.23	.027	.265
Self-directed week 3	2.49	.013	.279
Other-directed week 1	6.34	.000	.584
Other-directed week 2	4.06	.000	.483
Other-directed week 3	2.38	.018	.266

Table 5

Results of planned single-df contrasts between combined group (self/other-directed aggression in history) and other groups for markers of personal and contextual risk

Risk marker	t	p	d
Physical abuse	5.91	.000	.544
Sexual abuse	3.67	.000	.338
Emotional abuse	3.99	.000	.367
Neglect	3.26	.001	.300
Age of any aggression onset	-6.90	.000	.635
Prior hospitalizations	4.83	.000	.445
Prior residential treatment placements	4.01	.000	.369
Prior foster care placements	2.63	.009	.242
Prior juvenile detention placements	2.27	.024	.209
Intake GAF	-1.48	.139	.136
DSMD-Internalizing	3.86	.000	.390
DSMD-Externalizing	5.37	.000	.543
DSMD-Critical pathology	5.32	.000	.538

Note. Lower age of aggression onset is indicative of greater risk.

Cross-tabulations of aggression in history with aggression during treatment

	Self-directed aggression during treatment			Other-directed aggression during treatment		
	No	Yes	% cont	No	Yes	% cont
Aggression in history						
None	14	26	35%	25	15	63%
Other-directed, no self-directed	51	55	48%	11	95	90%
Self-directed, no other-directed	1	63	98%	49	15	77%
Other- and self-directed	30	236	92%	48	218	85%

Note. “% cont” = Percentage of youth showing continuity in behavior (e.g., total number of youth showing no aggression during treatment divided by total number of youth showing no aggression in history).

Comparison of “emerging” and “desisting” subgroups on markers of personal and contextual risk for self- and other-directed aggressive behavior

Table 7

Risk marker	Self-directed aggression				Other-directed aggression			
	Result	t	p	d	Result	t	p	d
Physical abuse	D > E	3.22	.002	.614	--	.05	.964	.011
Sexual abuse	--	1.19	.236	.227	--	.92	.361	.197
Emotional abuse	D > E	3.23	.002	.616	--	1.22	.225	.262
Neglect	--	1.29	.201	.246	--	1.38	.171	.296
Age of any aggression onset	D < E	2.60	.011	.523	--	.97	.337	.208
Prior hospitalizations	D > E	3.89	.000	.742	--	.87	.384	.187
Prior residential treatment placements	D > E	2.44	.016	.465	--	.87	.389	.187
Prior foster care placements	--	.17	.866	.032	--	.16	.867	.034
Prior juvenile detention placements	--	.59	.557	.113	--	.31	.756	.066
Intake GAF	--	.61	.545	.116	--	1.35	.180	.293
DSMD-Internalizing	D > E	2.69	.008	.552	D > E	2.92	.005	.693
DSMD-Externalizing	D > E	2.88	.005	.591	D > E	2.93	.005	.695
DSMD-Critical pathology	D > E	2.54	.004	.521	D > E	2.08	.041	.494

Note. GAF = Global Assessment of Functioning; DSMD = Devereaux Scales of Mental Disorders; E = emerging (no aggression pre-treatment, any during treatment), D = desisting (any aggression pre-treatment, none during).