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Anger and Assaultiveness of Male Forensic Patients with Developmental Disabilities: Links to Volatile Parents

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Aggressive Behavior, 34, 380-393

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Abstract

This study with 107 male forensic patients with developmental disabilities investigated whether exposure to parental anger and aggression was related to anger and assaultiveness in hospital, controlling for background variables. Patient anger and aggression was assessed by self-report, staff-ratings, and archival records. Exposure to parental anger/aggression, assessed by clinical interview, was significantly related to patient self-reported anger, staff-rated anger and aggression, and physical assaults in hospital, controlling for age, IQ, length of hospital stay, violent offense history, and childhood physical abuse. Results are consonant with previous findings concerning detrimental effects of witnessing parental violence and with theory on acquisition of cognitive scripts for aggression. Implications for clinical assessment and cognitive restructuring in anger treatment are discussed.

Keywords: anger, aggression, parental violence, hospital patients, developmental disabilities

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From childhood onward, the life circumstances and psychosocial experiences of people with developmental disabilities[1] are conducive to the activation of anger and aggressive behavior. Recurrent thwarting of physical, emotional, and interpersonal needs, as well as cognitive functioning deficits, impair their psychosocial adjustment, particularly those who reside in custodial settings. The present study examines whether the anger and aggressive behavior of hospitalized male offenders with developmental disabilities are related to childhood experiences of parental anger and parental fighting, as well as to abuse victimization. We pursue this research question with an eye toward its broader theoretical relevance for anger and aggression, as well as its implications concerning assessment and treatment.

Epidemiological studies on three continents concerning people with development disabilities have found high rates of "challenging behaviour", in which aggression features prominently (Harris , 1993; Hill & Bruininks, 1984; Sigafoos, Elkins, Kerr, & Attwood, 1994; Smith, Branford, Collacott, Cooper, & McGrother, 1996). The prevalence of physical aggression in these studies is 35% or higher for persons in institutional settings, and, for the male patients in the predominantly forensic facility involved in the present study, Novaco and Taylor (2004) found physically assaultive behavior post-admission to be 46.5%. Importantly, the latter study found that the number of assaults was significantly related to anger, controlling for age, length of stay, IQ, violent offense history, and personality variables. The relevance of anger and aggression for persons with developmental disabilities is reviewed in Taylor and Novaco (2005). Here, we examine family background variables that might account for anger disposition and aggressive behavior among those in this clinical population.

Interparental Volatility and Child Adjustment

The witnessing of interparental anger or interadult domestic violence has consistently been found to be detrimental to children's well-being. Cummings and his colleagues have shown repeatedly in lab experimental studies that children display heightened sensitivity and emotional distress to angry adult interactions, especially when there is interadult physical aggression (e.g., Cummings, Ballard, & El-Sheikh, 1991; Cummings, Zahn-Waxler, & Radke-Yarrow, 1981; Davies, Myers, Cummings, & Heindel, 1999; El-Sheikh, Cummings, & Goetsch, 1989). In a home-based diary study, Cummings, Goeke-Morey, Papp, and Dukewich (2002) found that, in response to marital conflict episodes, child anger was significantly related to both mothers' and fathers' anger, particularly that of fathers. Substantial field research concerning children who have witnessed family violence has identified associated psychological maladjustment, including posttraumatic stress symptoms (Fantuzzo et al., 1991; Kilpatrick & Williams, 1998; Jarvis, Gordon, & Novaco, 2005; McCloskey & Walker, 2000; O'Keefe, 1994; Rossman & Ho, 2000; Silva et al., 2000) and behavior problems (Grych et al., 2000; Jarvis et al., 2005; Jarvis & Novaco, 2006; Litrownik, Newton, Hunter, English, & Everson, 2003; Mathias, Merton, & Murray, 1995). Witnessing adult angry conflict itself (separate from witnessing violence toward a family member) presents risk for child adjustment problems, as shown in a large sample study concerning toddlers (McDonald, Jouriles, Briggs-Gowan, Rosenfield, & Carter, 2007).

Interparental aggression and parental aggression toward children often co-occur in families (cf. O'Leary, Slep, & O'Leary, 2000). The Kitzmann, Gaylord, Holt, and Kenny (2003) meta-analysis found no differences in effect sizes for overall psychological adjustment between witness-only children, abused-only children, and abused-witnesses, but several studies have reported that children who are both witnesses to and direct targets of abuse fare significantly

worse than children who are solely witnesses (e.g., Grych et al., 2000; Mathias et al., 1995; McCloskey & Walker, 2000). In addition, exposure to more severe interadult abuse has been associated with higher levels of child behavioral problems and trauma symptoms (Fantuzzo et al., 1991; Jarvis, et al., 2005; O'Keefe, 1994; Rossman & Ho, 2000). In a longitudinal study with multiple informants that controlled for child abuse and neglect (as well as child IQ, household SES, and family life stress), Yates, Dodds, Sroufe, and Egeland (2003) found that exposure to partner violence during preschool years was associated with externalizing problems for boys in adolescence.

Strickler (2001) asserted that persons with intellectual disability have higher risk for child abuse and domestic violence exposure. Compared to persons with average general intellectual functioning, their higher dependency, frequent denial of rights, more isolated living conditions, communication problems, lack of knowledge about appropriate behavior, physical impairments, and lack of economic independence heightens their vulnerability. Epidemiological research on twin pairs (sampled from 1994 and 1995 birth cohorts in England) by Koenen, Moffitt, Caspi, Taylor, and Purcell (2003) demonstrated that domestic violence was uniquely associated with IQ suppression in dose-response relationship. Thus, domestic violence exposure may exacerbate cognitive functioning impairment present at birth. Huesmann and Eron (1984), in work that presaged the social information processing construct we discuss later, found that diminished intellectual competence was associated with the early adoption of aggressive strategies as a child that persist over time and are predictive of lower intellectual functioning as an adult.

The family environment roots of anger and aggressive behavior have been a research psychology topic since the classic work of Goodenough (1931), Sears, Maccoby, and Levin (1957), and McCord, McCord, and Howard (1961, 1963). The latter authors concluded that

aggressive boys were raised by parents who were rejecting and punitive, were models of deviant, aggressive behavior, and were often involved in intense interparental conflict. Similarly, in Farrington's (1989) longitudinal research, adult males convicted of violent offenses had, at age 8, parents characterized by cruel attitudes, harsh discipline, and interparental conflict. Parental disharmony during adolescence was also predictive of convictions for violence, as was low IQ.

Taken together, this body of research indicates that children's exposure to interparental anger and aggression can be expected to increase their risk of having adjustment difficulties.

Acquisition of a Disposition for Anger and Aggression

Social learning models from Bandura (1973) to those of Dodge and his colleagues (e.g., Crick & Dodge, 1994, 1996; Dodge & Coie, 1987; Dodge, Pettit, Bates, & Valente, 1995) and of Huesmann (1988, 1998) provide for the conjecture that displays of anger and aggression by parents would inculcate anger and aggression among their offspring. Prospective intergeneration studies of the "cycle of violence" are indeed rare. However, Conger, Neppl, Kim, and Scaramella (2003) found intergenerational continuities from angry, aggressive parenting to the angry, aggressive behavior of children and adolescents. Those continuities were discovered in directly observed behavior and were not explained by disadvantaged social conditions. Parents' hostility, angry coercion, and antisocial behavior toward a child were linked to that child's angry and aggressive behavior toward a sibling and to the next generation's aggressiveness toward their parents. This is consistent with Patterson's (1998) view that child rearing approaches shape continuities in aggressive behavior across generations, with complementary contributions from biology. "Once the process is underway, the individuals select settings, persons, and behaviors that maintain a limited set of social skills and an overwhelming pattern of deviant behaviors" (Patterson, 1998, p. 1266). As well, Leung and Slep's (2006) found that parental anger was

directly associated with overreactive parenting: "The more frequently parents act out their anger in general, the more overreactive they tend to be when they discipline their children" (p. 531).

The intergenerational continuity found by Conger et al. (2003), who did not offer explanatory mechanisms, can be accounted for by social learning theory and social information processing (SIP) models. Bandura (1973, 1983) emphasized observational learning in the acquisition of aggressive behavior, and identified attention, memory representation, and the symbolization of experience as important cognitive components. For Bandura, a prominent origin of aggression and of its activation by anger is through modeling and reinforcement in the family. Various SIP models have been put forward to account for aggressive behavior, including Holtzworth-Munroe's (1992) conception of marital violence -- influenced by McFall's (1982) approach to social skills, as was Dodge and Coie (1987). The advent of formal SIP models of the development of habitual aggressive behavior occurred in parallel by Huesmann's (1988) and by Dodge and his colleagues (cf. Crick & Dodge, 1994). Huesmann emphasized cognitive scripts, acquired and maintained through observational and enactive learning, that are stored in memory, serve as guides for social behavior, and are resistant to change. The perspective of Dodge and colleagues sprang from the identification of hostile attributional bias in aggressive boys (Dodge & Coie, 1987; Dodge & Frame, 1982). Both models include the interpretation and encoding of situational cues, memory search for behavioral guides, the interplay of emotion, evaluation and selection of responses, and behavioral enactment. Huesmann's (1988, 1998) model features aggressive scripts, normative beliefs, and rehearsal, while Dodge's model highlights hostile attributional bias in cue interpretation and peer responses that influence decision heuristics. Huesmann (1998) provides a summary of both perspectives and offers a unified model. As the present study does not test such models, this encapsulation must suffice.

Present Study Context

Anger has enormous relevance to the welfare of hospitalized patients, not the least of which pertains to its association with violence. Anger has been found to be predictive of physical aggression by psychiatric hospital patients prior to admission (McNeil, Eisner, & Binder, 2003), during hospitalization (Doyle & Dolan, 2006a; Novaco, 1994; Novaco & Taylor, 2004; Wang & Diamond, 1999) and in the community after discharge (Doyle & Dolan, 2006b; Monahan et al., 2001). Within a psychiatric hospital, anger and aggression incur a great cost both in terms of staff injuries and operational management (e.g., Bensley et al., 1997; Carmel & Hunter, 1989; National Audit Office, 2003). In forensic facilities entrusted with providing both security and rehabilitation, patient anger and aggression requires therapeutic intervention enlightened by knowledge of sources of anger dysregulation in the backgrounds of patients.

Regarding the context of the present study, conducted in a forensic hospital for persons having developmental disabilities, our previous research has demonstrated that patients' anger can be reliably and validly assessed and that cognitive-behavioral anger treatment produces significant gains in patient care (Novaco & Taylor, 2004; Taylor & Novaco, 2005; Taylor, Novaco, Gillmer, Robertson, & Thorne, 2005; Taylor, Novaco, Gillmer, & Thorne, 2002; Taylor, Novaco, Guinan, & Street, 2004). We here seek to ascertain whether reported exposure to parental anger and aggression is related to the patients' anger and aggression dispositions, as that could inform clinical assessment and treatment procedures. In examining that hypothetical linkage, our analyses will control for patients' age, IQ, violence offense history, length of stay in hospital, and for the patient having been physically abused at home as a child. Given various study results discussed earlier (e.g., Conger et al, 2003; Yates et al. 2003), we hypothesized that patients' childhood physical abuse would be significantly related to their anger and aggressive

behavior in the hospital. After testing for that prediction, we then test for the incremental effect of exposure to parental anger and aggression.

Method

Setting

The study was conducted in the hospital forensic service of the National Health Service (NHS) Trust in England that provides specialist services to people with developmental disabilities. The hospital provides inpatient services on a local, regional and national basis to patients referred to its forensic services via statutory Health Authorities, the court, and prison services. The forensic service has seven units providing medium secure, low secure, and rehabilitation facilities for 159 patients, 22 (14%) of whom are women; all units are single sex.

Participants

All female patients were excluded from the study, as there was no routine psychological services available to the women's unit at the time. Male patients who were about to be discharged or transferred were not included. This left 129 patients, all Caucasian, who participated in the study representing 94% of the total population (N = 137) of the men's forensic service in the hospital at the time. The average age of the participants was 33.2 years (Mdn = 30.1; SD = 11.6), their average length of stay was 3.7 years (Mdn = 3.0; SD = 3.5), and average WAIS-R Full Scale IQ was 67.5 (Mdn = 69.0; SD = 8.0). Further information about their background, cognitive, personality, and anger psychometric characteristics is given in Novaco and Taylor (2004).

One hundred and twenty-one patients (94%) were formally detained under sections of the England and Wales Mental Health Act 1983, and eight (6%) were 'informal' or voluntary patients not detained under any statutory act. Approximately 36% of the patients had previous

convictions for violent offenses, and a further 38% had no convictions for violence but had a documented history of violence or aggressive behavior. The remaining 26% had no documented history of aggression or violence. In addition to mental impairment[2], the majority of participants were noted in hospital records as having co-morbid diagnoses, including psychosis (10.9%), major affective disorder (15.5%), personality disorder (18.6%), chromosomal abnormality (3.9%), Asperger syndrome (1.6%), and Tourette syndrome (1.6%).

It was not possible to assess all patients on every anger measure. For a number of reasons (patient's declining the assessment, cognitive function difficulties -- e.g., mental state instability, poor concentration and attention, sensory deficits -- and unexpected early discharge), full anger assessments could not be completed for 24 (18.6%) patients. These patients who were not fully assessed differed from the 105 (81.4%) who were in a number of ways. Assessment non-completers were significantly older (M = 43.8 years; SD = 14.9) than completers (M = 30.7 years; SD = 9.2), t (127) = 4.10, $p < .001$. Non-completers had spent more time in hospital (M = 5.2 years; SD = 4.3) than completers (M= 3.3 years; SD = 4.3), but this difference was not significant. Completers had significantly higher full WAIS-R IQ scores (M = 69.0; SD = 7.3) than non-completers (M = 60.2; SD = 7.3), t (121) = 4.91, $p < .001$. Staff-ratings of patient anger, using the "anger attributes" index of the Ward Anger Rating Scale (WARS; see Measures), were significantly higher for non-completers (M = 11.4; SD = 7.5) than for the completers (M = 7.0; SD = 6.5), t (125) = 2.77, $p < .01$. Thus, non-completers were older, of lower intelligence, viewed by staff as more angry, and tended to have been in the hospital longer.

Consent and Ethics Procedures

The study was approved by the Local Research Ethics Committee. Given the nature of the client group and setting, a conservative approach to recruitment and consent taking was

adopted. With the approval of the relevant Responsible Medical Officer, research assistant psychologists, accompanied by a member of direct care staff well known to the patient, introduced themselves to each patient and described the purpose of the anger assessments and the study. Patients were told that they did not have to complete the assessments, and, if they chose not to take part in the study, then their treatment would be unaffected. They were also told that that they could pause, stop, or discontinue the assessments at any time without prejudice and without needing to give a reason. After carefully checking that the patient understood the nature of the study and his right to refuse to take part, his consent was solicited. When his consent was obtained, the assessments proceeded.

Procedure

Research assistant psychologists, supervised by experienced clinical psychologists, conducted the testing. These assistants were blind to the study hypotheses. Patients were tested individually in private rooms. For most patients, two or three sessions of up to one hour each were required to complete the anger assessments. Due to patients' literacy problems, the scales were read to everybody. To control for any sequencing bias, the order in which the anger measures were administered was counterbalanced. A sub-sample of 44 patients, tested a second time, provided a 2- to 6-months test-retest, the coefficients for which are given in Table 1.

Qualified 'named nurses' who knew the patient well and had significant contact with him during the period covered by the measures completed rating scales concerning his anger and aggressive behavior. These staff-rated measures were completed within the same time frame as the patient self-report measures. Completion and collation of staff ratings was organized and supervised by the research assistant psychologists, who also obtained from hospital file records demographic and diagnostic data, as well as the number and type of previous convictions and the

number of physical assaults on staff or other patients since admission. In addition, they collated routine clinical assessment data from files, including results of intellectual/cognitive functioning, literacy, and personality psychometrics administered during first 12 weeks following admission. Intellectual/cognitive functioning was assessed using the Wechsler Adult Intelligence Scale – Revised UK version (*WAIS-R UK*; Lea, 1986), a well-established and standardized measure of global intelligence with 11 tests that yield a Full Scale IQ score.

Administration of all patient self-report and staff-rated measures, and the collation of clinical, assault and collateral information from files, was completed by research assistant psychologists for each particular patient within a 3-4 week period.

Anger and Aggression Measures

Anger was assessed by three self-report instruments and one staff-rated measure, which are described below. The self-report measures were modified for use with developmentally disabled persons and administered by structured interview, rather than as self-completed tests. Example modifications for these adapted measures are given in Novaco and Taylor (2004), and a full account of the conversions can be obtained from the authors. Central tendency, internal consistency and test-retest statistics for these modified assessments with the study sample are provided in Table 1. Aggressive behavior was assessed by a staff-rated measure and by the independent archival records of post-admission physical assaults.

Spielberger State-Trait Anger Expression Inventory (STAXI). The STAXI (Spielberger, 1996) is perhaps the most widely used anger measure in clinical and research settings. It was originally designed to assess those components of anger associated with different personality variables and to measure the impact of anger components on a variety of medical conditions. The STAXI is composed of 44 items organized into scales that give measures of *State Anger*, *Trait*

Anger, and *Anger Expression*. The *Anger Expression* scale has sub-scales of *Anger-in*, *Anger-out*, and *Anger Control*. The STAXI has had extensive development and validation with normal, forensic, and medical populations. The reliability of our modified version with the study sample was previously established (Novaco & Taylor, 2004).

Novaco Anger Scale (NAS). The NAS (Novaco, 1994, 2003) is a self-report instrument with *Cognitive*, *Arousal*, and *Behavioral* subscales, following from a view of anger as having dispositional domains linked to environmental contexts (Novaco, 1994). The sum of the 48 items (with 3-point ratings) contained in these subscales, comprises the *NAS Total* score for anger disposition. Developed and validated for use with mentally disordered and normal populations, it has received independent validation with clinical and forensic samples (e.g., Doyle & Dolan, 2006b; Grisso, Davis, Vesselinov, Appelbaum, & Monahan, 2000; Lindqvist, Daderman, & Hellstrom 2005; McNeil et al., 2003; Mills, Kroner, & Forth, 1998; Monahan et al., 2001). The reliability of the modification for the present sample was established (Novaco & Taylor, 2004).

Provocation Inventory (PI). The *PI* (Novaco, 2003) is an anger inventory developed to accompany the NAS. Its 25 items provide an index of anger reaction intensity and generality for a range of potentially provocative situations. In research with California State Hospital patients, it had high internal consistency and test-retest reliability (Novaco, 1994). Independent validation has been found (Grisso et al., 2000; Mills et al. 1998), and its modification for the present sample has established reliability (Novaco & Taylor, 2004).

These three modified self-report anger instruments (STAXI, NAS, and PI) have high convergent validity for this study sample, are modestly but significantly related to staff-rated anger, and *NAS Total* was found to be significantly associated with hospital assaults, controlling for background, aptitude, and personality variables (Novaco & Taylor, 2004).

Ward Anger Rating Scale (WARS). The *WARS* is a two-part scale completed by a member of ward staff who knows the patient well and has observed the patient's behavior during the previous week. Developed in conjunction with the original NAS validation testing, it is designed for ease of recording in busy clinical settings. *Part A* consists of 18 dichotomous ratings of verbal and physical behaviors associated with anger and aggression in the prior week. Five of the *Part A* items are summed for an "antagonistic behavior" index concerning overt verbal and physical aggression directed at a person. These items are "verbally abused someone", "verbally threatened to attack a staff member", "verbally threatened to attack a patient", "physically attacked a staff member", and "physically attacked a patient". *Part B* consists of 7 "anger attributes" items rated on a 5-point (0-4) scale (not at all, very little, sometimes, fairly often, very often). The sum of the 7 *Part B* anger attribute ratings produce a staff-rated anger index.

The WARS antagonistic behavior and anger attribute indices have been shown to have high alpha and inter-rater reliability and good concurrent validity in studies involving mentally disordered offenders in forensic hospitals, both high security (Novaco & Renwick, 2002) and medium security facilities (Doyle & Dolan, 2006a) and with older adult psychiatric inpatients (Taylor, DuQueno, & Novaco, 2004). Dolan & Dolan (2006a) found the WARS to have an intraclass correlation coefficient of .73 across six staff raters and that both *Part A* and *Part B* had predictive validity in prospective analyses of physical assaults in hospital, controlling for age, gender, length of stay, and major mental disorder.

For the present study, the descriptive statistics for the anger attributes index are given in Table 1. A log10 transformation was performed to reduce skew, which dropped from .723 to .533, with a standard error of .215. This transformation was also done for antagonistic behavior index, which dropped its skew from 2.18 to 1.33 with a standard error of .217.

Family Background and Case History Measures

Family background was obtained through structured interview, buttressed by case file information. The main instrument, the "Anger and Aggression Assessment" (*3A*; Taylor, 1999), was developed to record and collate information from patients' case file records (offense history, diagnoses, disabilities, and hospital assaults since admission). The *3A* also provides a framework to interview each patient concerning his family and school history, personal conditions (e.g., substance use, self-injury), violent incident and offense-specific factors. It also provides for interviewer observations (e.g., social skills deficits). Our parental anger and aggressive behaviour measure is derived from this instrument.

Parents' Anger/Aggression. Family history information was obtained in a set of 10 of the *3A* interview questions, most of which were scored dichotomously. Most centrally, 79.8% of the participants were raised by their natural parents. Three questions concerned parents' anger and aggression: if they ever got angry, if they fought with each other, and if they fought with anybody else. Scored 0 or 1, this set generated a summary index, "parents' anger/aggression", which ranged from 0 to 3. Descriptive statistics for this index are given in Table 1. Its distribution has very little skewness, with a coefficient of -.087.

Other Case Background Data. Other interview items concerning parents pertinent to the present study were whether the patient had been physically abused, whether his parents had an alcohol or drug abuse problem, and police involvement with parents' behavior. Other case file data were patient age, WAIS Full Scale IQ, length of stay in hospital, whether hospital admission derived from a violence offense, and the patient's number of physical assaults in hospital since admission. The latter variable[3] was transformed to log 10.

Results

Family Aggression Background

Parental anger/aggression data were available for 107 patients. Unremarkably, 81.9% reported that their parents got angry with each other. However, these patients had more turbulent family backgrounds, reflected in their parents having fought with each other (51.0%), fought with others (27.2%), had police involvement for their behavior (29.0%), and had alcohol or drug abuse problems (40.2%). Importantly, 45.8% reported having been physically abused at home. As neither parents' police involvement nor substance use problems were significantly related to our patient anger and aggression criterion measures, those background variables were dropped from further analyses.

Patients' Hospital Aggression

Hospital records data were available for the 107 patients with parental anger/aggression background data. Of those, 48.6% had been physically assaultive in the hospital since admission, and 24.3% had been so on three or more occasions. For the 1-week period of staff-rated WARS Antagonistic Behavior that was obtained on 104 of these patients, 35 (33.7%) were positive on the index.

Parents' Anger/Aggression and the Anger and Aggression of Patients

Correlations of the parents' anger/aggression index with the patient self-report anger measures, staff-rated anger and aggression measures, and hospital records data on physical assaults since admission are presented in Table 2. For the self-report anger measures, the index is significantly associated with NAS Total ($p < .001$) and each of its subscale components but not with the PI. Among STAXI subscales, a significant correlation occurs for Anger Out ($p < .01$). For the staff-rated measures, there is a significant correlation for the WARS Anger ($p < .02$) and

for WARS Antagonistic Behavior ($p < .01$). Also, records data on number of physical assaults in hospital was significantly associated ($p < .02$) with parents' anger/aggression. Thus, the exposure to parents' anger and aggression is related to the majority of the anger and aggression measures for the patients, including all of the non-self-report measures.

Physical Abuse History and Patient Anger/Aggression

Partitioning patients into subgroups of those who had been physically abused ($N = 50$) versus those who had not been physically abused ($N = 58$), group differences were tested across the patient anger and aggression measures. The means, standard deviations, and *t-test* results are given in Table 3, along with effect size (Cohen's *d*) coefficients. Those patients who were physically abused by parents or caretakers are significantly higher in self-reported anger as assessed by NAS Total and each of its subscales and by STAXI Anger Out. The other STAXI subscales and the PI are not significant. Both of the staff-rated WARS measures are significant, as is hospital assaults. For each comparison of means, the patients who had been physically abused at home are higher in anger or aggression. For both NAS Total and WARS Anger, there is a medium effect size. This physical abuse history variable, which we test in the hierarchical regressions that follow, then serves as an important covariate control in testing exposure to parents' anger/aggression.

Patients' Anger/Aggression in Hospital, Abuse History, and Parents' Anger/Aggression

To examine whether exposure to parental anger/aggression was related to patients' anger and aggression, hierarchical regressions with forced entry (recommended by Cohen, Cohen, West, & Aiken, 2003) were conducted with anger self-report (alternating STAXI Trait Anger, STAXI Anger Expression, and NAS Total), staff-rated anger (WARS), staff-rated antagonistic behavior (WARS), and hospital assaults as the dependent variables. On Step 1, age, WAIS-R

Full Scale, violence offense, and length of stay were entered as background covariates. On Step 2, patient's physical abuse status was entered, both to test its contribution and to control for its effect when testing for parents' anger/aggression, which was entered at Step 3.

Anger Self-Report. The results of the regression for anger self-report are presented in Table 4 with NAS Total as criterion, because the NAS indices had shown the strongest zero-order correlations with parents' anger/aggression (cf. Table 2). Results for the STAXI indices as alternative test variables are given in the Table 4 Note. For NAS Total, the model at Step 1 is significant (p = .044), with both age and length of stay being significant on entry. At Step 2, the entry of physical abuse is significant (p = .009), accounting for an additional 6.2% of variance. Parents' anger/aggression is then tested on Step 3, and it results in a significant change in R^2 of .092, p = .001. In that final model (see Table 4 Note), physical abuse as a child is no longer significant, but age (semi-partial r^2 = .048), IQ (semi-partial r^2 = .04), and length of stay (semi-partial r^2 = .033), are significant. When STAXI Anger Expression is substituted as the anger self-report criterion, the final model is significant, adjusted R^2 = .146, F (6,97) = 3.94, p = .001, and the change in R^2 associated with parents' anger/aggression is .041, p = .028. The model is not significant for STAXI Trait Anger, nor was it significant for the PI.

Staff-Rated Anger. Using the same hierarchical regression procedure on the staff-rated WARS Anger index, the model is significant for the covariates at Step 1 (p = .047) and at Step 2 (p = .025), but the effect for physical abuse is marginal (β = .179, p = .074). When parents' anger/aggression is tested at Step 3, there is a significant change in R^2 of .057, p = .012. For the final model, the adjusted R^2 = .128, F (6,95) = 3.48, p = .004. However, the only other variable remaining significant is IQ (semi-partial r^2 = .067). For the parental exposure variable, then, the findings for staff-rated anger converge with those for self-reported anger.

Staff-Rated Aggression. Because staff-observed overt aggression was low in the week of the ward ratings, the WARS Antagonistic Behavior scores (based on 5 abusive, threatening, or attack behaviors) were recoded to a dichotomous variable for logistic regression analysis. Of 104 patients, 35 (33.7%) exhibited one or more of the antagonistic behaviors. The results of the logistic regression are presented in Table 5. On Step 1, the four background covariates were not significant. On Step 2, physical abuse as a child is significant (p = .002), and when parents' anger/aggression enters on Step 3, it is significant (p = .046). The final model coefficients are given in Table 5. Controlling for the full set of covariates, parents' anger/aggression accounts for a 1.7 times greater increase in the odds of antagonistic behavior on the ward. Childhood physical abuse accounts for a 2.8 times greater increase.

Hospital Assaults. The hierarchical linear regression procedure used for the anger measures was conducted on the patient's total number of physical assaults (log10 transformed) during his stay in the hospital. As before, the predictor variables were forced-entered in 3 blocks. The results are provided in Table 6. The Step 1 covariate block was not significant, nor was childhood physical abuse on Step 2. However, on Step 3, parents' anger/aggression is significant, producing a change in R^2 of .037, p = .045. The final model is significant, adjusted R^2 = .070, F (6,97) = 2.29, p = .042; and IQ (semi-partial r^2 = .051) is also significant on Step 3. These results with the archival records data provide triangulation for the significance of exposure to parents' anger and aggression.

Discussion

The present study was spurred by recurrent findings in family violence research that exposure to interadult abuse -- i.e., simply witnessing violence and/or anger between adults in the household -- is associated with higher levels of child behavioral problems, as well as trauma

symptoms (for reviews, see Edelson, 1999; Kitzmann, et al. 2003). Following from our previous research on anger assessment and treatment with this client population, we examined the extent to which the anger and aggressive behavior of male forensic patients with developmental disabilities were associated with their reported witnessing of parents' anger and aggressive behavior. We controlled for other background factors, including whether the patient had been physically abused as a child, which was also tested as a contributory factor.

Childhood physical abuse was significantly related to the majority of (8 of 14) of the dependent measures in Table 3, including all 3 non-self-report measures, but only 1 self-report summary scale (NAS Total) was significant. In multivariate analyses, with age, IQ, violent offense, and length of stay controlled, childhood physical abuse remained significantly related to NAS Total, but not in the final model that included the witnessing of parents' anger/aggression. For the staff-rated and records data variables, the effect for childhood physical abuse was significant only for the antagonistic behavior ratings and remained so in the final model. Thus, our hypothesis concerning childhood physical abuse was only partially confirmed.

Parents' anger/aggression was significantly related to patients' anger and aggressive behavior in a triangulation of self-report, staff-rated, and archival measures, controlling for the set of background covariates that included childhood physical abuse. Significant multiple regression effects regarding patients' self-reported anger were obtained on NAS Total and STAXI Anger Expression, although not for the PI and STAXI Trait Anger[4]. The additional variance explained by the parental exposure variable was 9% for NAS Total and 4% for STAXI Anger Expression. The staff-rated anger measure results (5.7% additional variance explained) provide important convergent evidence, particularly as those ward staff had no access to the patients' psychometric or parental background data. The staff ratings of anger indicate that the

patients' reported childhood exposure to parental anger and aggression is associated with their outward, behavioral expression of anger. That latter inference is, in turn, supported by the logistic regression results for staff-rated antagonistic behavior in the week of observation.

The records data on physical assault in the hospital buttress the anger self-report and the staff-ratings of both anger and antagonistic behavior. The physical assault data pertain to a recorded incident judged by a qualified forensic nurse to be an act that resulted in or could have resulted in physical injury. These are clinically and managerially serious events. Among the covariates, IQ had a significant inverse relationship to the number of assaults, but parents' anger/aggression added significantly to the covariate set, including having been physically abused as a child, and accounted for an additional 4% of the variance in assaults. In summary, the hypothesis concerning parents' anger/aggression was confirmed on 2 of 4 self-report anger disposition psychometric summary indices, both staff-rated measures, and assault records data.

The study limitations must, of course, be acknowledged. Most fundamentally, the family history variables were based on patients' report in a clinical setting interview, and the parents' anger/aggression measure is a 3-item index with a limited range. However, the physical abuse measure was obtained in that same interview and served as a covariate control in testing parents' anger/aggression. Pivotal factors in shaping the anger and aggression of our participants might be family background variables not available to us, such as childhood family SES, childhood trauma, early behavior problems, temperament, parent-child relationship conflict, or parental IQ, as well as non-family factors, such as school failure or social rejection by peers. As our sample only concerned male forensic hospital patients with mild to borderline IQ, it is unclear to what extent the present findings apply to non-forensic or non-hospitalized patients with developmental disabilities, to comparable females, or to persons with more severe developmental disabilities.

How to account for the association between the parental variables and the patients' anger and aggressive behavior remains to be ascertained. One interpretation is that the patients' anger and aggression is a product of the trauma of abuse exposure. Orth and Wieland's (2006) meta-analysis showed that anger is substantial in trauma-exposed adults. Childhood physical abuse was found by Epps, Carlin, and Ward (1999) to be related to adult anger in a clinical sample, but without covariate controls. We obtained some significant results for childhood physical abuse, but most effects were overridden by the parents' anger/aggression witnessing variable. Dutton (1999) conjectured that the aggression of recurrently abusive men is derivative of childhood violence exposure along with insecure attachment to a caregiver and shaming. In that vein, Cummings and colleagues (e.g. Cummings et al. 2002) repeatedly find that insecure emotional and behavioral responding follows parental anger. It is also possible that genetic factors account for the patients' anger dispositions (e.g., Gustavsson, Pederson, Asberg, & Schalling, 1996).

Our findings do fit with a social learning theory formulation of the acquisition of aggressive behavior and aggressive scripts through angry/aggressive parental models. Research by Dodge and his colleagues (e.g., Dodge et al. 1995; Weiss, Dodge, Bates, & Pettit, 1992) has shown that early physical abuse or harsh discipline is related to subsequent childhood aggression as mediated by the child's maladaptive style of processing social information. Harsh physical treatment is thought to shape stored knowledge structures that prime hypervigilance to hostile cues and insufficient attention to non-hostile cues. Such knowledge structures dispose the child to attribute hostility in circumstances where such attribution is not warranted. Their SIP model, like that of Huesmann (1988 & 1989), stipulates that through such early childhood exposure the person acquires a repertoire of aggressive behaviors which is then readily accessed in responding to social problem situations. Huesmann's concept of aggressive scripts crystallizes this.

To be sure, the developmental mechanisms involving variables entailed in our study are more complex than aggressive script acquisition. The findings of Huesmann and Eron (1984), as well as Farrington (1989), regarding diminished intellectual competence suggest that our sample population might be especially vulnerable to adopting parentally modeled anger and aggression. From a 22-year prospective study of the relationship between intellectual functioning and aggressive behavior in non-disabled subjects, Huesmann, Eron, and Yarmel (1987) proposed that aggression interferes with intellectual functioning through a dual process. In early childhood, those with lower intellectual functioning are prone to develop aggressive behavior because of difficulties in learning more complex non-aggressive, pro-social interpersonal skills. Aggressive behavior, in turn, may result in failure to develop intellectually, due to its isolating and alienating effects, which minimize opportunities for effective education. This hypothetically applies to our participants, who are in the mild to borderline range of intellectual disabilities. As well, Koenen et al. (2003), in their study of 1116 twin pairs in England, found adult domestic violence to account for 4% of the variation in child IQ, independent of genetic influences, and that its effects increased in a dose-response fashion. "Children exposed to high levels of domestic violence had IQs that were on the average 8 points lower than children who were not exposed" (p. 305). In view of their findings, it may be that persons born with developmental disabilities become even further impaired in intellectual functioning by exposure to parental anger and aggression.

Another construct of potential value here is Huesmann and Guerra's (1997) "normative beliefs about aggression". Formed from early learning experiences and attaining stability in the elementary school years, normative beliefs about aggression incline the person to perceive hostility in others, cue the retrieval of aggressive scripts, and defeat the self-regulation of appropriate behavior in social situations. The 20-item scale that they developed for use with

children would seem to have extension to our study population for assessing anger/aggression cognitive structures and identifing cognitive restructuring treatment targets.

Beyond the acquisition of beliefs, schemas, and scripts for aggression from parental models, childhood trauma from physical abuse by parents, or the detrimental effects of other parenting inadequacies, peer relationships in both childhood and adulthood encompass important antecedents of anger and aggression. Pertinent here is the ethnographic study by Zetlin and Turner (1985) of 25 young adults with mild mental retardation living in the community. Their research, which included interviews with parents, found that adolescence is a key period when temper tantrums and violent, destructive behavior surfaced. For 84% of the sample, the antisocial behavior and emotional lability "either had not been evident before that period or had noticeably intensified during the high school years" (Zetlin &Turner, 1985, p. 575). It was during adolescence that their "differentness" became salient, along with the implications of their social identity for their life and well-being. Perceived rejection from peers and parents was a key factor for the majority of the sample.

Implications for Treatment

Anger and aggressive behavior are significant clinical problems for patients in forensic facilities, and therapeutic intervention for them should be guided by knowledge of how their anger dysregulation problems may have been formed. For patients with developmental disabilities, clinical interventions for aggression have commonly been behavioristic antecedent control and contingency management regimes (e.g. Marcus, Vollmer, Swanson, Roane, & Ringdahl, 2001) or psychotropic medication (see Tyrer et al., 2008). The all too common tendency was to attribute their emotional difficulties and challenging behavior to their disability, rather than to their emotional state or needs. The relatively recent advent of cognitive behavior

therapy for people with developmental disabilities (cf. Taylor & Novaco, 2005) has brought much needed attention to their cognitive domain. Our findings here suggest that understanding their anger dysregulation can be enhanced by inquiry into parental models -- volatile parents or caretakers that inculcate aggression-infused schemas and scripts.

Establishing such links to early origins of the encoding of anger-eruptive and aggressive behavior prototypes would then facilitate therapeutic attempts to deter the automaticity of aggressive script activation and perhaps untangle multi-level sources of anger. In view of the Congers et al. (2003) longitudinal evidence for intergenerational transmission of anger and aggression among normal functioning youth and adults, we urge further investigation into parental models for hospitalized offenders with an eye toward improving psychotherapeutic treatment. To the extent that anger is an element of emotional distress in the lives of developmentally disabled and other patients, it should be a high psychotherapeutic priority. To the extent that anger operates as a relevant antecedent variable in assaults by patients, it serves as a focus for intervention to remedy a pressing problem for both clinical care staff and hospital managers. Assaultive behavior by patients seriously impairs the treatment milieu, results in restrictions and diminished chances for discharge, constitutes very significant risk for harm among staff, and has considerable financial cost for the institution in workers' compensation claims and employee turnover.

Footnotes

[1] The term developmental disability is used throughout this paper to describe the study population. It refers to the definition given in the Developmental Disabilities Assistance and Bill of Rights Act (1978) and is a broad concept covering the equivalent terms of mental retardation (USA), learning disability (UK), and intellectual disability (Australia). In addition to mental retardation (cf. DSM-IV, American Psychiatric Association, 1994), the concept includes other conditions that do not necessarily involve significant sub-average intellectual functioning such as autism, epilepsy, and other neurological conditions. The definition of developmental disability also focuses on functional limitations and support needs.

[2] Mental impairment is a legal term defined by the Mental Health Act 1983 as "a state of arrested or incomplete development of mind which includes significant impairment of intelligence and social functioning and is associated with abnormally aggressive or severely irresponsible conduct". A "significant" impairment of intelligence is not defined within the Act. Intelligence is here defined as it is measured by the Wechsler Adult Intelligence Scale-Revised UK version (Lea, 1986).

[3] A recorded physical assault here is what a qualified nurse working in a forensic setting would judge to be an act that resulted in or could potentially have resulted in physical injury.

[4] We did not report results for the subscales of these measures, but here note that the NAS Cognitive, Arousal, and Behavioral subscales each have significant ($p < .01$) final step effects, and, for STAXI Anger Expression, it is Anger Out that produces the significant ($p < .01$) result.

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Table 1

Anger Measures Central Tendency and Reliability Statistics: Reported in Novaco & Taylor (2004)[a]

Measure	*N*	*M*	*Mdn*	*SD*	Cronbach α	Test-retest intraclass correlation[b]
STAXI						
State Anger	112	11.6	10.0	3.7	.87	-.02
Trait Anger	112	18.8	18.0	6.3	.86	.52
Anger Expression	112	30.8	32.0	11.2	-	.57
Anger In	112	17.8	17.0	4.2	.56	-
Anger Out	112	16.8	16.5	5.1	.75	-
Anger Control	112	19.8	18.0	5.9	.84	-
NAS Total	110	92.4	92.5	16.6	.92	.52
PI	114	62.9	63.0	16.2	.92	.57
WARS Anger	127	7.8	7.0	6.9	.95	-
Parents' Anger/Aggression	108	1.5	2.0	1.0	.66	-

Note. *N* varies across measures, as the psychometric testing could not be done in some cases because the patients declined, their mental state precluded testing, or they were discharged.

[a] Except for Parents' Anger/Aggression index. [b] For a subset of 44 patients in hospital with a two- to six-month interval between testings, one-way random model.

Table 2

Correlations of Parents' Anger/Aggression with Patient Anger/Aggression

Patient Self-report (*N* = 107)			
STAXI Measures		NAS-PI Measures	
State Anger	.15	NAS Cognitive	.30**
Trait Anger	.17	NAS Arousal	.34***
Anger Expression	.24*	NAS Behavioral	.37***
Anger In	.10	NAS Total	.38***
Anger Out	.27**		
Anger Control	-.16	PI	.15
Staff-Rated (*N* = 105)			
WARS Anger	.25*		
WARS Antagonistic Behavior	.31**		
Records Data			
Number of Physical Assaults in Hospital	.23*		

Note. The criterion is the 3-item parents' anger/aggression index. The coefficients for the STAXI, NAS, PI, and assaults measures are Pearson values, and those for the WARS measures are Spearman values. The assaults measure is the number of physical assaults since hospital admission [transformed to log10 (assaults + 1)].

* $p < .02$; ** $p < .01$; *** $p < .001$

Table 3

Patient's Physical Abuse History as Related to Patient's Anger and Aggression

	Physically Abused						
	No (*N* = 58)		Yes (*N* = 50)		*t-test*	*p*	*d*
STAXI State	11.5	(3.77)	11.8	(3.83)	0.39	ns	
STAXI Trait	18.3	(6.05)	19.7	(6.56)	1.16	ns	
STAXI AX	29.6	(11.42)	33.3	(10.59)	1.73	ns	
Anger In	17.6	(4.37)	18.2	(4.02)	0.82	ns	
Anger Out	16.0	(4.75)	18.0	(5.35)	2.10	.038	.395
Anger Control	19.9	(6.27)	19.0	(5.22)	0.86	ns	
NAS Total	88.4	(16.54)	97.8	(15.10)	3.09	.003	.594
NAS Cognitive	31.9	(5.33)	33.9	(4.84)	2.05	.043	.393
NAS Arousal	27.7	(6.80)	31.8	(6.22)	3.29	.001	.629
NAS Behavioral	28.9	(6.32)	32.2	(6.32)	2.70	.008	.522
PI	60.9	(16.62)	65.6	(15.75)	1.48	ns	
WARS Anger	.63	(0.46)	.83	(0.46)	2.18	.032	.424
WARS Antag Beh	.08	(0.18)	.21	(0.24)	3.03	.003	.598
Hospital Assaults	.22	(0.31)	.35	(0.34)	2.09	.039	.400

Note. The tabled values are means for the Spielberger State-Trait Anger Expression Scale (STAXI), the Novaco Anger Scale (NAS), the Provocation Inventory (PI), the staff-rated Ward Anger Rating Scale (WARS) indices, and number of physical assaults in hospital. WARS and assaults indices are log10 transformed. Standard deviations are in parentheses.

Table 4

Hierarchical Regression of Patient's Anger (NAS Total) as Associated with Patient Background and Family Variables

Predictors	*B*	*SE B*	β	*t*	*p*
Step 1					
Age	-.497	.205	-.257	2.42	.017
WAIS-R (Full Scale)	-.332	.231	-.142	1.44	*ns*
Violence Offense	2.519	3.510	.069	0.72	*ns*
Length of Stay	1.471	.584	.261	2.52	.013
Step 2					
Age	-.424	.201	-.219	2.11	.037
WAIS-R (Full Scale)	-.320	.224	-.136	1.43	*ns*
Violence Offense	.756	3.469	.021	0.22	*ns*
Length of Stay	1.214	.574	.215	2.11	.037
Physically Abused as Child	8.598	3.211	.257	2.68	.009
Step 3					
Age	-.477	.191	-.246	2.49	.014
WAIS-R (Full Scale)	-.498	.219	-.212	2.28	.025
Violence Offense	.327	3.294	.009	0.10	*ns*
Length of Stay	1.133	.546	.201	2.08	.041
Physically Abused as Child	3.481	3.391	.104	1.03	*ns*
Parents' Anger/Aggression	5.811	1.690	.349	3.44	.001

Note. Predictor variables were forced entered in blocks. R^2 change values for each step are .093 for Step 1 (p = .044), .062 for Step 2 (p = .009), and .092 for Step 3 (p = .001). For the final model, adjusted R^2 = .200, F (6,97) = 5.30, p <.001. The criterion variable is NAS Total; when STAXI Anger Expression is substituted as criterion, the R^2 change at Step 3 = .041 (p = .028); for STAXI Trait Anger as the criterion, R^2 change at Step 3 = .020 (*ns*).

Table 5

Logistic Regression of Staff-Rated Antagonistic Behavior as Associated with Patient Background and Family Variables: Final Model

Predictors	*B*	*SE B*	*Wald*	*p*	*Exp(B)*
Age	-.002	.031	.002	ns	.998
WAIS-R (Full Scale)	-.021	.035	.362	ns	.979
Violent Offense	.419	.541	.599	ns	1.520
Length of Stay	-.060	.086	.485	ns	.942
Physically Abused as a Child	1.046	.505	4.288	.038	2.857
Parent's Anger/Aggression	.542	.271	3.980	.046	1.719

Note. The dependent measure is a dichotomous scoring of whether or not the patient exhibited antagonistic behavior during the week of observation, as recorded by the ward staff member who provided level of care supervision for the patient. The predictor variables were forced entered in 3 blocks, with the last two variables on Steps 2 and 3, respectively. The results above are for the final step. The four covariates on Step 1 were not significant.

Table 6

Hierarchical Regression of Hospital Assaults as Associated with Patient Background and Family Variables

Predictors	*B*	*SE B*	β	*t*	*p*
Step 1					
Age	-.005	.004	-.139	1.29	*ns*
WAIS-R (Full Scale)	-.009	.005	-.194	1.95	.055
Violence Offense	.103	.071	.141	1.45	*ns*
Length of Stay	.011	.012	.094	0.89	*ns*
Step 2					
Age	-.004	.004	-.116	1.08	*ns*
WAIS-R (Full Scale)	-.009	.005	-.191	1.93	.057
Violence Offense	.082	.072	.113	1.14	*ns*
Length of Stay	.008	.012	.067	0.63	*ns*
Physically Abused as Child	.102	.067	.153	1.53	*ns*
Step 3					
Age	-.005	.004	-.134	1.26	*ns*
WAIS-R (Full Scale)	-.011	.005	-.239	2.38	.019
Violence Offense	.077	.071	.105	1.08	*ns*
Length of Stay	.006	.012	.058	0.55	*ns*
Physically Abused as Child	.037	.073	.055	0.51	*ns*
Parents' Anger/Aggression	.074	.036	.222	2.03	.045

Note. The dependent variable is the patient's number of physical assaults since hospital admission [transformed to log10 (assaults + 1)]. Predictor variables were forced entered in blocks. The R^2 change values are .065 for Step 1 (*ns*), .022 for Step 2 (*ns*), and .037 for Step 3 ($p < .05$). For the final model, adjusted $R^2 = .070$, F (6,97) = 2.29, $p = .042$.