Insight Into Illness and Adherence to Psychotropic Medications are Separately Associated With Violence Severity in a Forensic Sample

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Violence towards others by a minority of psychotic individuals is a significant public health concern. The severity of this other-directed violence (ODV) in the community may be influenced by insight into illness and adherence to psychotropic medications; however, few studies have tested these associations. Sixty male psychotic inpatients, legally detained at a forensic unit in New York City, were assessed with semi-structured interviews, supplemented with information from hospital and official records, family members and the treating clinician. Results indicated that in this unique sample of detained persons with psychotic disorders; (1) increase in the severity of community violence is associated with medication non-adherence, all dimensions of poor insight into illness, and several previously reported covariates such as substance use comorbidity; (2) no relationship was found between insight and adherence in this particular sample; (3) multivariate analyses showed that select covariates, along with medication adherence, and select insight domains predicted a total of 73% of the magnitude of ODV behavior in this sample. Overall, medication non-adherence explained a large amount of how violently participants behaved toward others. Since non-adherence was independent of poor insight, it may be more worthwhile for clinicians to develop treatment strategies to target medication adherence without directly addressing an elusive target such as insight into illness. Treatment addressing medication adherence needs to concomitantly target substance use behaviors since the latter was responsible for a substantial increase in ODV. Aggr. Behav. 33:86–96, 2007. © 2006 Wiley-Liss, Inc.

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INTRODUCTION

Recent epidemiological studies have re-fueled the debate on the relationship between Schizophrenia and violent behavior [Swanson et al., 1990]. In these studies, it was psychotic symptoms accompanying schizophrenia that accounted for enhanced violence potential [Link and Stueve, 1994]. Indeed, other research reviewed by Bonta et al. [1998] has revealed a negative relationship between severe mental disorder and violence. However, contrasting findings assert that having a severe mental disorder raises the risk of engaging in other-directed violent (ODV) behavior in the community [Steadman et al., 1998]. In the United States, people with mental illness make up about 16% of the inmate population in federal and state prisons; Of this group vs. other prisoners, a higher proportion is incarcerated for having committed violent crimes [Ditton, 1999; Teplin, 1990]. Due to these contra-dictory findings, it is not conclusive that schizophrenia, as a diagnosis, relates to violence. Nevertheless, of those suffering from psychotic disorders, perpetrators of ODV form a minority subgroup [Swanson et al., 2002], that present a significant public health concern. Furthermore, in the growing efforts to reduce stigma and to integrate individuals with psychotic disorders into the community, it is essential to identify this subgroup and provide them with targeted treatment [Buckley et al., 2003].

Patients with psychosis, especially schizophrenia spectrum disorders, may display varying degrees of awareness and affective responsiveness to the reality of having a severe mental illness [David, 1990]. Even patients who identify their disorder with the appropriate label often show some degree of lacking acceptance/acknowledgment of its signs and symptoms, the need for treatment and/or the social consequences that invariably accompany such illness [Amador et al., 1991]. Investigators suggest that poor insight into illness may share some of the neurophysiological mechanisms of anosagnosia [Laroi et al., 2000], which is defined as a failure to recognize one's own disease. Thus, insight into illness may have an important role in the phenomenology, pathophysiology, and treatment of psychotic disorders [Amador et al., 1994].

Patients with psychosis who lack insight into their illness and thus, may lack a perceived need for treatment, are presumed to exhibit less medication adherence than other patients [Lacro et al., 2002]. This issue is particularly salient for violent patients, since a number of studies have found that medication non-adherence can increase the risk of engaging in ODV [Soyka, 2000; Swanson et al., 2004]. However, studies that have examined medication adherence and violent episodes have not addressed insight [Swanson et al., 1999]; hence, it remains unclear whether greater insight may increase medication adherence to reduce violence.

Torrey hypothesized that poor insight may precede non-adherence and result in violent behavior and that research was needed to explore this putative causal pathway [Torrey, 1998]. Using the Insight and Treatment Attitudes Questionnaire (ITAQ) [McEvoy et al., 1993], one study did not find a main effect of insight on violent behavior, although the authors warned that the sample may have lacked sufficient power to detect such an association [Swartz et al., 1998a] and the ITAQ is too categorical to capture the complexity of insight [Amador and Strauss, 1993]. Insight assessed with a more psychometrically flexible measure, the SUMD (Scale to Assess Unawareness of Mental Disorders; [Amador et al., 1993]) was found to predict inpatient [Arango et al., 1999] ODV. The SUMD was also used to find poorer indices of insight in patients with schizophrenia who were violent as compared to non-violent patients [Buckley et al., 2004] ODV.

Other factors that may contribute to ODV in individuals with psychosis have been studied. Unfailingly, comorbid substance use diagnoses are pervasive [Swanson et al., 1990]. Additional factors are (1) a diagnosis of Paranoid Schizophrenia [Modestin and Ammann, 1996]; (2) symptoms [Link et al., 1998] although not as yet firmly established [see Appelbaum et al., 2000b; Stompe et al., 2004], threat control/over-ride; (3) young age [Hodgins et al., 1996]; (4) a history of exposure to childhood abuse [Monahan et al., 2000]; (5) sustaining traumatic brain injury [Tateno et al., 2003]; and (6) involuntary admission which could occur for many different reasons (e.g., suicide risk, poor self-care) one of which could be violent behavior [Foley et al., 2005]; we therefore decided to ascertain the lifetime number of voluntary and involuntary psychiatric hospitalizations to test as a potential contributing factor.

Despite the impressive resurgence of research to test various predictors, more than half of the link between severe mental illness and violence remains unexplained, suggesting that other contributing factors need to be explored [Arseneault et al., 2000].

We hypothesized that domains of poor insight into illness and poor adherence to psychotropic medication regiments interact to increase severity of ODV. Our assessment of ODV elaborates continuous degrees of severity (as opposed to examining the presence vs. absence of ODV). Data were collected by interviews of participants supplemented by review of hospital charts with a collateral informant.

METHOD

Recruitment and Data Collection

The sample ($N = 60$) was drawn from the forensic psychiatric inpatient unit at Kings County Hospital Center in New York City. Inclusion was based on consecutive admission to the unit during a period of 6 months. These were individuals who were in detention awaiting trial for charges ranging in severity from disturbing the peace to murder. They were transferred to the unit due to symptoms that necessitated psychiatric hospitalization. Seventy-five percent of participants had engaged in physical assault in the community (Table I). Inclusion criteria were: (1) stay of at least 5 working days since admission; (2) DSM-IV diagnosis of psychotic disorders or major affective disorder with psychotic features or a comorbid diagnosis of alcohol/substance use/abuse identified by the treating clinician. (3) Ability to give informed consent as indicated by the treating clinician following a mental status evaluation and (4) a willingness to give informed consent. The mean length of stay on the unit was 3 weeks ± 5 days.

TABLE I. Other-Directed Violence and the Effects of Socio-Demographic and Clinical Variables on Violence Severity ($N = 60$)

Violence variables	n	%	M[a]	SD
Severity of violence (VAS)	60	100	61.43	28.48
Threat behavior[b]	15	25	22.07	19.53
Physical assault[c]	45	75	74.56	16.17

Other variables	n	M	SD	t-test (58)
Paranoid schizophrenia/all other diagnoses	28/32	73.0/51.2	20.8/30.5	−3.08**
TCO[d] symptoms/no TCO	27/33	70.4/54.0	21.6/31.4	−2.36*
Substance use/no substance use[e]	32/28	71.6/49.8	21.7/31.1	−3.00**
≥6 hospitalizations/<6[f]	26/34	78.7/48.2	18.1/28.0	−4.83***
Childhood abuse/no abuse	35/25	71.5/47.4	24.8/27.6	−3.52***
TBI/no TBI	21/39	73.0/55.2	25.3/28/2	−2.50*

[a]VAS: The Violence Assessment Scale from 0—no violence to 100—extremely severe violence (range, 95). Means, standard deviations, and t-tests are expressed in terms of VAS scores.
[b]Threat behavior: proportion of verbal and physical threat with and without a weapon.
[c]Physical assault: proportion (including murder) with and without a weapon.
[d]TCO: threat/control-/override symptoms.
[e]Comorbid diagnosis of substance use.
[f]The distribution of lifetime psychiatric hospitalizations was found to be bimodal at six hospitalizations, which is the reason it was split to two groups.
*$P<.05$.
**$P<.01$.
***$P<.001$.

Approval was obtained by full review from the appropriate Institutional Review Boards. After a complete description of the study, written informed consent was obtained. Three patients were unable and four were unwilling to give informed consent. Additionally, four patients were transferred out of the unit midway into data collection and were not included in the analyses.

By using several independent sources during data collection, other researchers were able to extract up to six times more violent incidents with more detailed information than if they had relied on records alone [Steadman et al., 1998]. For this reason, we designed the current study to ensure at least three data sources for all participants. Thus, for all participants data collection entailed (1) face-to-face interviews, (2) review of hospital records, and (3) interview with an informant (identified by participants as "someone who knows you well" and/or the treating clinician). For 75% of the sample, we were able to obtain a phone interview with the participants' identified informant whereas for the remaining participants the treating clinician was interviewed. Using independent samples t-tests (or categorical χ^2, where appropriate), we did not find significant differences on violence or on any of the variables studied between those who had the treating clinician as informant and those who had identified their own informant ($P<0.74$–0.27).

Four researchers were cross-trained to undertake most aspects of data collection in a counterbalanced manner so that to a given participant different researchers handled the different sources of data collection. The only exception pertained to the insight and violence interviews that were always conducted by two different researchers blind to the respondent's status on ODV and insight.

Except for ODV, data were obtained for lifetime indices and were coded by the interviewer and were independently re-coded by another interviewer based on the written interview materials. Discrepancies among data sources and coders were relatively few (discussed further below) and were reconciled by re-questioning the sources and/or by consultation with the treating clinician.

Assessment of Other-Directed Violence

The Violence Assessment Scale (VAS) [Alia-Klein, 2000]; see Appendix A) was used in this study to rate the severity of ODV incidents. The VAS was developed by the authors to ascertain indices that are sensitive to degrees of specific ODV severity. The VAS is a 0–100 point scale, analogous to the DSM-IV, GAF [Jones et al., 1995], with 10 anchor points that contain descriptions of overt violence toward others. The descriptions encompass physical or sexual assault (e.g., murder, rape, stabbing, punching, molesting, etc.) as well as threatening behavior (e.g., raising a fist, pointing a weapon, chasing or stalking, verbal threats, etc.) and damage to property (e.g., setting fire, breaking, slamming

things). The VAS also contains severity indications such as degree of damage and use of weapons which are embedded in the scale where appropriate.

A pilot study of reliability and face validity was performed on this early version of the VAS using 19 raters (17 graduate students and two mental health professionals) to rate 16 vignettes with Alpha of .78 ($P<.01$). The scale was validated with the Mac-Arthur Community Violence Instrument [Appelbaum et al., 2000a] with Kappa of within rater and between scale agreement of .52–.89. Following these pilot tests, several wording changes were made within the VAS [Alia-Klein, 2000]. Additionally, generic descriptors were modified to include five anchored categories of severity (bolded in the VAS) as follows: *damage to property* ≥ 21, *physical assault without a weapon* ≥ 41, *threat with knife or other object* ≥ 51, *threat with a loaded firearm* ≥ 71, and *homicide* ≥ 81. Note that each of the ODV categories has a minimum boundary but a large quantitative upper range within which to rate the categories. For example, physical assault (scores of 41–100) and homicide (score of 81–100) have wide ranges depending on such factors of severity as weapon use, extent of damage to the victim and repetition of the behavior (e.g., stabbing multiple times).

Using the improved VAS and the Modified Overt Aggression Scale, the latter for the validity testing [Endicott et al., 2002; Silver and Yudofsky, 1991], an experienced Ph.D. clinician and an inexperienced Masters-level research assistant (RA) were trained to independently rate 86 ODV incidents from charts and interviews. The OAS-M is a widely used instrument that was developed to record aggression on several categories within which are four descriptive levels of severity. Rater training consisted of having the raters read the scales carefully and rate seven sample ODV vignettes which were later reviewed and discussed.

Inter-rater reliability for the VAS was, ICC = .98 and .97 for the OAS-M, which is comparable to previously published results for both scales [Alia-Klein, 2000b; Endicott et al., 2002]. Pearson correlation yielded 52%–55% agreement ($r = .74$, $P<.01$ by clinician and $r = .72$, $P<.01$ by RA) between the VAS and the OAS-M.

In order to optimize extraction of VAS indices from qualitative ODV information, hospital charts were reviewed and a semi-structured interview was used. The interview was adapted from a previous violence study [Borum, 1996] with additional administrative instructions from Otto [2000]. The information derived from the chart and interview was rated by the interviewer and re-rated independently to ensure that violence-related information is sufficient for severity ratings using the VAS. To test reliability of violence information and ratings, a third of the 60 cases were randomly selected and rated by an additional rater (ICC = .96, $P<.001$).

Of the ODV events that were compiled and rated, only the most severe violent event was used in this study. An ODV incident was not used in analyses in cases of discrepancy where participants did not endorse an ODV incident reported in the chart ($n = 4$).

Insight Into Illness

The SUMD-R [Amador et al., 1999] is an expansion of the SUMD for the assessment of levels of insight on additional theorized domains: *Awareness of the perception of others* was added to reflect the patient's degree of awareness that others perceive him as having an illness; and two measures of *Affective indifference*, to assess the lack of affective concern with having an illness. The original SUMD has undergone extensive reliability and validity testing [Amador and Strauss, 1993]. ICCs for general awareness ranged from .68 to .89 with $P<.01$. The scale was validated against the insight item on the Hamilton Depression Scale and the insight rating on the Mental Status Examination and yielded Pearson correlations ranging from .43 to .89 with $P<.01$. In this study, we used a general, lifetime assessment of insight without reference to the particular time of the violent event.

Other Factors

Diagnosis of schizophrenia and substance use. The Diagnostic Interview for Genetic Studies (DIGS) was used in this study as a diagnostic battery. The DIGS was developed and tested through team effort of multiple investigators. Multi-site test–retest reliabilities were reported by its developers (.73–.95) [Nurnberger et al., 1994].

To validate diagnosis in the current sample, *probable* or *definite* DSM-IV criteria were used with resulting k coefficients (SEs) of .84 (.08). "Best Estimate" (BE) procedures [Leckman et al., 1982] were used in this study to determine final diagnoses. An experienced clinician independently reviewed all available information and assigned a DSM-IV diagnosis for a random sample of 10 cases. The resulting two discrepancies were rectified by rechecking the information and arriving at a joint decision.

Traumatic brain injury. A history of traumatic brain injury included the endorsement of all three

of the following criteria (from the DIGS): (1) a serious head injury, (2) accompanied by loss of consciousness, and (3) consequent medical treatment [Malaspina et al., 2001].

History of childhood abuse.   This information was collected from questions relating to post-traumatic stress disorder criteria. Participants who described any type of abuse during their childhood years (0–18 years) were included in this category.

Threat/control-override [Link and Stueve, 1994].   The DIGS's psychosis section was used to evaluate the presence of TCO symptom patterns. Through personal communication with Dr. Bruce Link, items 5 (persecutory delusions), item 13 (being controlled), item 16 (thought insertion), and item 24 (threatening voices) were selected to probe the presence of TCO.

Medication Adherence

The DIGS was used to gather information about medications from participants. At that time, participants were asked to describe their medication taking habits and their responses were recorded. In addition, a card was supplied with the following options from which to choose: *outside of the hospital, do you take your psychiatric medications?* (1) *Generally, I always do* (2) *sometimes I do and sometimes I don't* (3) *I generally do not.* This procedure was then repeated with the informants. Subsequently, the interviewer and an additional rater independently assigned an adherence status (from 1 to 3, as above) based on the adherence-level ratings and the written materials obtained from participants and informants. Any discrepancies between the rater and interviewer were rectified through further inquiry and discussion.

Thus, adherence was defined as agreement between interviewer and independent rater based on (1) the subject generally adheres to medication regiments, or (2) the subject is inconsistent, having periods of adherence and periods of non-adherence, or (3) the subject generally does not adhere to medication regiments.

Statistical Analysis

Throughout data analyses, adjustments for multiple comparisons were made and homogeneity of variance was inspected. Analyses were conducted in the following steps: (1) An intercorrelation matrix of insight domains was derived by Spearman's ρ. The domains were then correlated with ODV and subjected to linear regression analysis using the Stepwise procedure. This was done to exclude superfluous variables to reduce effects of colinearity that would compromise predictive power [Stevens, 1992]. Insight domains that were retained were used in subsequent analyses. (2) One-way ANOVA was conducted to examine the effects of adherence by insight domains. (3) *t*-tests were performed to examine the effects of covariates, all of which were then subjected to Stepwise, as in step 1, in order to use the retained covariates in subsequent analyses. (4) A multiple linear regression was run with covariates entered in model 1 and the select insight domains along with medication adherence in the second model. Using Stein's Formula [Stevens, 1992] for an estimate of cross-validation prediction of other samples from the same population, we produced a fairly small expected estimate of shrinkage (Predictive Power = .56). Adjusted R^2 are reported below to account for the shrinkage in predictive power.

RESULTS

Participants were males between the ages of 18 and 58 (Mean $\pm$ SD: 30.85 $\pm$ 9.35; 23 Blacks, 25 Caucasians, nine Hispanic, and three of other ethnicity) with mean education of 10th grade $\pm$ 2, suffering from psychotic disorders (forty-four with schizophrenia and schizoaffective disorders, six with unipolar, and 10 with bipolar disorder). Seventy-five percent of the participants have engaged in physical assault and 22% have engaged in threat behaviors without physical harm. Table I lists significant sociodemographic and clinical characteristics associated with ODV. All the factors listed were next entered into stepwise linear regression analysis with VAS scores as dependent variables. Of these factors, the following have provided a unique contribution to the model: age, *psychiatric recidivism*, *history of childhood abuse*, and *comorbid substance use diagnosis*, explaining 53% of the variance in ODV (Model 1 in Table III). Factors excluded by the stepwise model due to redundant contribution were: *a history of TBI, a primary diagnosis of paranoid schizophrenia, and TCO symptom patterns.*

Insight Into Illness and Adherence to Medications

Moderate correlations with severity of violence were observed across all insight domains. Intercorrelations were also apparent among the four insight domains. Participants' awareness that others perceive them as having an illness was associated with their general awareness of having the illness.

The latter, however, did not relate to their degree of affective concern of having an illness whether self-reported or judged by the interviewer (Table II).

Among the four Insight domains, *awareness of the perception of others* was removed by Stepwise Regression analysis. The remaining three domains explained 35% of the OVD variance. Of note, in correlation analysis (see Table II), the affective dimensions of insight had the strongest association with ODV. However, when simultaneously evaluated with *awareness of having an illness*, the affective dimensions' relative contribution to ODV declined ($\beta = .26$ for the externally judged and $\beta = .27$ for self-reported affective concern) as compared to *awareness of having a mental illness* that became a relatively stronger ($\beta = .30$) predictor of ODV severity.

There was a significant main effect of medication adherence on violence severity ($F = 4.75$, df = 2,57, $P = .012$). Participants who did not generally take their medications ($n = 25$) engaged in significantly more severe violence (Mean $\pm$ SD: 70.52 ± 24.96) than the ones who adhered ($N = 13$; 42.31 ± 31.14). Inconsistent adherence ($n = 22$) yielded rates of ODV severity (Mean $\pm$ SD: 62.41 ± 26.21) toward the midpoint between full adherence and non-adherence to show a trend toward a "dose effect" of violence severity (Fig. 1a). Further analysis revealed significance only between the adherent and non-adherent groups (post-hoc with Bonferroni at $P < .01$). An observed graded effect was also apparent in terms of the proportion of participants who engaged in physical assault vs. threat behavior; a larger proportion of the non-adherents have assaulted and this proportion was attenuated in a graded manner so that a much smaller proportion of the adherent group have assaulted. In contrast, the

subjects from the latter group were more often engaged in threat behavior (Fig. 1b).

ANOVA for the effect of insight into illness on adherence with medication was not significant in this sample. For the four insight domains, F values ranged from .83 to 1.72 (DF = 2, 57, $P = .95$—.18). Post-hoc analyses confirmed the lack of relationship across all insight domains and levels of medication adherence.

The Combined Impact

Regression coefficients for the final analysis (Table III) evaluated the incremental effect of adherence and select insight domains after accounting for the covariates. This comprehensive model predicted 73% of the variance of ODV severity in this sample.

DISCUSSION

Results showed that poor insight into illness and non-adherence to mediations had independent associations with severity of ODV in this sample of individuals with psychotic disorders. Other factors such as younger age, comorbid substance use disorders, a childhood history of abuse, and a lifetime history of considerable psychiatric recidivism combined to provide a multifaceted matrix of contributions to severity of ODV behavior in this sample (Table III). This investigation provides further support to the recent assertion in the literature that violent behavior of severely mentally ill patients is a heterogeneous phenomenon that is driven by multiple inter-related and independent factors [Swanson et al., 2002].

TABLE II. Intercorrelations for Severity of Violence Scores with Dimensions of Insight Into Illness ($N = 60$)

Variable	1	2	3	4
VAS[a]	.38**	.37**	.46**	.44**
SUMD-R[b]				
1. Awareness-MI[c]	—	.37**	.21	.20
2. Awareness-PO[d]		—	.31*	.30*
3. Affective concern-EJ[e]			—	.45**
4. Affective concern-SR[f]				—

[a]VAS: The Violence Assessment Scale.
[b]SUMD-R: scale to assess unawareness of mental disorders—revised.
[c]Awareness of having mental illness.
[d]Awareness of the perception of others.
[e]Affective concern to having mental illness—externally judged (by interviewer) or
[f]Affective concern to having mental illness—self-reported.
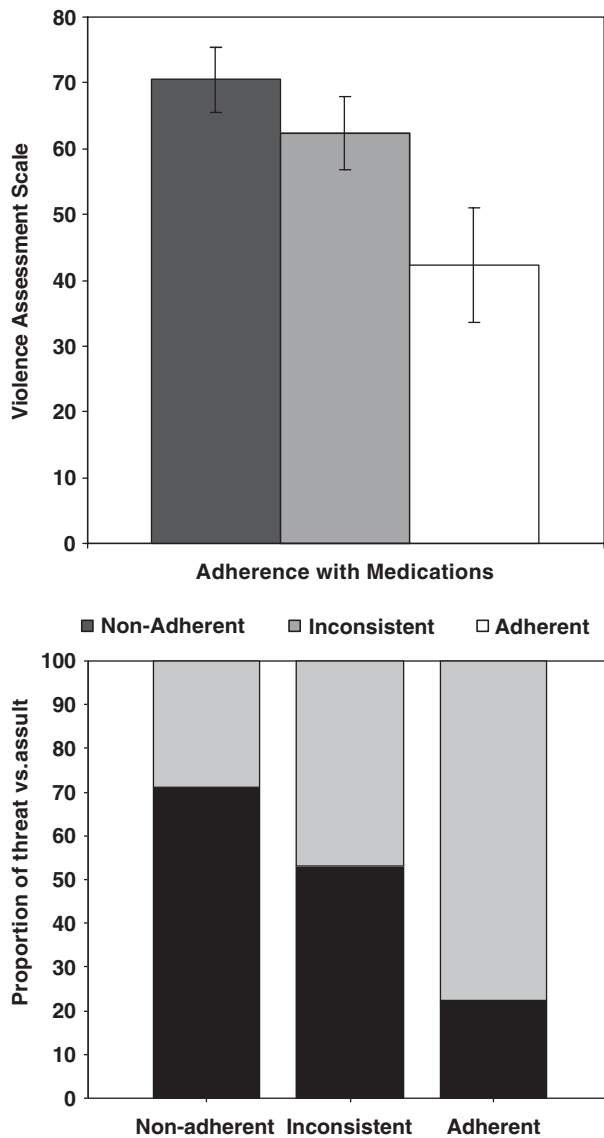*$P < .05$.
**$P < .01$ (2-tailed).

Fig. 1. (a) Other-directed violence among three medication adherence groups. (b) The proportion of physical assaults (black) and threat behavior (gray) among the three adherence groups ($N = 60$). *Note:* Number of subjects in each adherence group: Non-adherent ($n = 25$), Inconsistent ($n = 22$), Adherent ($n = 13$). Error bars in (a) represent standard error of the mean. In (b), physical assaults (black) were defined as bodily harm with or without a weapon; threat behavior (gray) is defined as verbal or physical threat behavior not resulting in bodily harm.

Insight Into Illness and Medication Adherence

Individuals in this sample were, by and large, unsure that they have any emotional or psychological problems and those with the poorest awareness also exhibited greater severity of violence. In addition to lacking awareness that they have an illness, participants did not realize that others perceive them

as ill. The most violent in the sample tended to be those who concomitantly evidenced a degree of emotional indifference about their condition.

Results of this study provide initial empirical support for the assessment of affect as part of the assessment of insight into illness. The lack of a significant relationship between *awareness of illness* and *affective concern* about illness in this study suggests that the two constructs are tapping dissociable processes: cognition and emotion, respectively. Albeit, the two domains were not entirely distinct: patients who were aware that others perceive them as ill (a more cognitive capacity), were those who also showed more affective concern about their own illness. While awareness that they have an illness may be a cognitive capacity, the realization that others perceive them as ill may be a cognitive capacity that is moderated by the emotional aspects of insight into illness. Theory of mind may be reflected in the capacity to be aware of the perceptions of others and the concurrence of an ability to emote [Herold et al., 2002]. Apparently, in this study, *awareness of the perception of others* was redundant in the prediction of ODV severity while *awareness of having mental illness* and *affective concern* provided more unique incremental prediction of ODV severity.

Our study revealed that the difference between threat behavior and physical assault was mediated by adherence to pharmacological treatment. The vast majority of participants who were non-adherent have engaged in physical assault while only about a third of the adherent group had engaged in physical assault. The latter group may have been better able to activate inhibitory control systems in the face of a salient perceived opportunity to assault. Note that in the current sample, 78% of participants were either inconsistent or generally non-adherent to psychotropic medications when outside of the hospital. Since taking psychotropic medications ameliorates psychotic conditions and may reduce ODV [Swartz et al., 1998b], educating, monitoring, and facilitating adherence may substantially reduce such occurrences.

In the present sample of aggressive participants, levels of insight domains did not drive adherence behavior. Hence, medication non-adherence and poor insight appeared to take separate paths to the severity of ODV behavior. The lack of association between insight and adherence came as a surprise in this study which hypothesized the two would interact with each other to predict violence severity. Currently, it is difficult to assess the extent of generalizability of this finding. For example, the lack

TABLE III. Summary of Multiple Regression Analysis for Insight and Adherence Predictors, Controlling for the Combined Effect of the Covariates, on Severity of Violence ($N = 60$)

Predictors	B	SEB	β	R^2	Adj R^{2a}	ΔR^2
Model 1				.53[†]	.50	
Age	−.66	.31	−.21*			
Psychiatric recidivism	25.28	5.83	.42[†]			
Childhood abuse	15.66	5.85	.26**			
Substance use	15.65	5.58	.26**			
Model 2				.77	.73	.24[†]
Age	−.83	.22	−.26***			
Psychiatric recidivism	19.97	4.50	.34[†]			
Childhood abuse	10.92	4.38	.18**			
Substance use	9.66	4.37	.16*			
Medication adherence	23.84	5.46	.40[†]			
Awareness-MI[b]	5.49	1.98	.20**			
Affective concern-EJ[b]	4.44	2.08	.17*			
Affective concern-SR[c]	5.75	2.54	.18*			

[a]R^2 adjusted due to shrinkage in predictive power, due to Wherry formula [Stevens, 1992].
[b]Awareness of having mental illness. Affective concern to having mental illness—externally judged or.
[c]Awareness of having mental illness. Affective concern to having mental illness—self-reported.
*$P < .05$.
**$P < .01$.
***$P < .001$.
[†]$P < 0001$.

of association between adherence and insight may be specific to this population of violent individuals and may not generalize to non-violent individuals with psychotic disorders. Unfortunately, the recent literature does not offer investigations concerning the nature of the relationship between adherence and insight in forensic violent samples. At the very least, this finding suggests that future studies should reassess this lack of relationship and explore some of the motivating factors that may drive non-adherence (such as beliefs about medications, degree of social support) and the relationship of these factors to insight into illness.

Caveats and Limitations

First, this study did not include a comparison group of non-violent criminals with psychotic disorders. Instead, it focused on examining severity gradations within a sample of participants who exhibited a wide range of ODV severity. Recent evidence suggests that indeed insight is particularly poorer in violent forensic patients. A study that compared violent and non-violent groups within a forensic population similar to ours, found the violent individuals to have significantly poorer insight (using the SUMD), thus supporting the specificity and generalizability of our results [Buckley et al., 2004].

Second, the outcome variable of ODV in this study is a continuous one whereas in other studies, categorical instruments were often used. This fact may present a difficulty to place our results within the context of other reports. Indeed, this investigation focused on gradations of ODV severity by a sample that was never empirically studied before. For this reason and since we did not cross-validate the results of this study, it is not possible to reject the possibility that the statistical models used here could be affected by sample specific variance thus compromising external validity.

Third, this is a retrospective study that is largely dependent on self-report and is constrained to a small sample. Although different sources of information were used in order to address this problem, prospective studies would meaningfully contribute to the validation of these preliminary findings. An important note is that data were obtained without temporal linkage of the violence to the contributing factors. For example, insight into illness was not specific to the time of violent behavior. Similarly, medication adherence was assessed in general and not temporally specific to the time of offense. Since this is a retrospective study, it was not possible to ascertain with confidence the insight and medication adherence at the point in time when the violence occurred. This is an important limitation that impacts the strength of our conclusions.

CONCLUSIONS

Participants were pre-trial detainees diagnosed as psychotic and treated on a hospital ward. Having poor insight into illness contributed to higher degrees of other directed violence (ODV) behavior in this sample. Insight, however, did not relate to medication non-adherence; the latter presented a more salient contribution to increase the severity of ODV.

Some ODV factors are static but most lend themselves to much needed change via clinical and of interventions by a research-informed mental health system and criminal justice systems. Poor insight was postulated as a cognitive deficit that has direct implications to impaired ability to adhere to psychosocial approaches [David et al., 1995]. Our results suggest that it may be worthwhile to target patients' attitudes and beliefs about psychosocial treatment that will provide supportive strategies to increase adherence to psychiatric medications and to develop strategies to reinforce medication taking and treatment-seeking behavior without necessarily addressing insight directly. Finally, results second previously reported studies in underscoring the salient contribution of substance use disorders in ODV. Taken together, these results indicate that effective treatment agenda aimed to reduce ODV in this sample needs to address medication adherence and substance use behaviors.

ACKNOWLEDGMENTS

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APPENDIX: A

See Table A1.

TABLE A1.

The Violence Assessment Scale (VAS)

100	Murder or disabling injuries that involved repeated clubbing, stabbing, shooting, or mutilating over an extended period of time to one or more victims as in mass murders and elaborated torture and/or disfigurement. Setting up of explosives where people reside and/or work. Kidnapping a group of people as in hijacking an aircraft.
90	Murder or severe injury that involved stabbing, shooting, running over, or strangling. Disabling injuries that require extensive, long-term medical treatment and hospitalization such as multiple broken bones, internal injuries, head injury with loss of consciousness. Causing permanent damage to victim.
80	Violent behavior toward others that likely requires a short hospital stay. Causing first or second degree burns, deep cuts, broken bones, concussion, or other head injury. Slamming against the wall or shaking hard (when victim is young). Threat with a loaded firearm in hand as in armed robbery. Rape and/or extensive, physically injurious sexual assault.
70	Violent behavior toward others that likely requires emergency medical attention. Causing broken jaw, teeth, wounds requiring stitches. Sexual assault (no penetration), molestation, endangering, and/or harming vulnerable persons (children, elderly, disabled, etc.). Setting a fire where and when people are presumed to be present.
60	Threatening with a knife or other sharp or hard instrument. Throwing things at victim and causing harm. Punching, kicking, and leaving bruises, bites, minor cuts, and scratches. Assault resulting in medical attention. Killing and/or torture of animals. Breaking and entering where persons are presumed to be present.
50	Physical assault without use of weapon of any kind. Hitting, slapping, and pushing around. Verbal threats of murder or severe injury within a threatening context. Setting of fire or breaking and entering at inhabited locations but not when anyone is presumed to be present. Unwanted sexual contact such as brushing against or grabbing sexually.
40	Clear potential for physical harm. Physical threat including raising a fist, or making assault contact a near miss. Purposefully driving into things, throwing things without aiming at persons. Invading personal space and grabbing of arm or hair. Lewd gestures. Ignoring a restraining order. Stalking with a progressively threatening pursuit.
30	No physical harm. Damage to property, bullying by using extremely loud voice and/or sudden outward gestures. Following with unwanted indirect contact (by third party, phone, or mail), trespassing, and invading privacy (consider repetition of stalking and/or harassing—more intense than below).
20	Clear aggression toward others. Isolated following, charging but not making physical contact. Threatening/intense eye contact, screaming, banging on a door, disturbing the peace. Cursing at and/or spitting on someone (when no infection can be established). Behavior does not change and/or escalate with redirection.
10	Mild aggression toward others. Approaching repeatedly without foul language, raising voice, slamming a door. Disrupting ongoing activity by barging in and/or grabbing things away to instigate. Noticeable psychomotor agitation. Not responding to requests to cease the behavior. Not responding to redirection.