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Psychiatric Symptoms and Community Violence Among High-Risk Patients: A Test of the Relationship at the Weekly Level

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Given the availability of violence risk assessment tools, clinicians are now better able to identify high-risk patients. Once these patients have been identified, clinicians must monitor risk state and intervene when necessary to prevent harm. Clinical practice is dominated by the assumption that increases in psychiatric symptoms elevate risk of imminent violence. This intensive study of patients ($N = 132$) at high risk for community violence is the first to evaluate prospectively the temporal relation between symptoms and violence. Symptoms were assessed with the Brief Symptom Inventory and threat/control override (TCO) scales. Results indicate that a high-risk patient with increased anger in 1 week is significantly more likely to be involved in serious violence in the following week. This was not true of other symptom constellations (anxiety, depression, TCO) or general psychological distress. The authors found no evidence that increases in the latter symptoms during 1 week provide an independent foundation for expecting violence during the following week.

Keywords: mental illness, symptoms, violence, risk, anger

Over the past few decades, researchers have grappled with the complex relationship between mental disorder and violence. Many studies that differ methodologically converge on the message that the two constructs are positively related, although "the relative contribution of mental illness to the overall rate of violence in society is quite small" (Norko & Baranoski, 2005, p. 21). Two large community-based studies have indicated that mental disorders are particularly likely to increase violence risk when they co-occur with substance abuse disorders (Monahan, Steadman, et al., 2001; F. Swanson, Holzer, Ganju, & Jono, 1990). Nevertheless, the nuances of the relationship between mental disorder and violence remain elusive.

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First, it is unclear whether mental disorders, specific symptom constellations, or both contribute to violence. Most researchers have addressed only whether psychiatric diagnoses predict violence (Hodgins, 1992; F. Swanson et al., 1990), despite suggestions that psychiatric symptoms more strongly predict violence (Link & Stueve, 1994; cf. Appelbaum, Robbins, & Monahan, 2000). This distinction matters because many diagnoses have similar symptoms and because symptoms may be easier to accurately assess and monitor than diagnoses. Second, and more important, the temporal relationship between mental disorder and violence has yet to be firmly established. Most researchers have examined how well an assessment of mental disorder at a particular point in time (e.g., during hospitalization) predicts whether violence occurs during a relatively long follow-up period (e.g., a year after release). A few researchers have demonstrated that snapshots of active psychiatric symptoms (e.g., delusions) predict violence more strongly than static diagnostic variables (e.g., schizophrenia; Link, Andrews, & Cullen, 1992). However, longitudinal research has yet to show that increases in psychiatric symptoms precede and increase the likelihood of proximate violence (see Kraemer, Kazdin, Offord, & Kessler, 1997).

Risk Status, Risk State, and Symptom Acuity

Greater clarity regarding the timing and specificity of the relationship between mental illness and violence is needed to advance theoretical and practical understanding of this issue. Such clarity

would have implications for assessing risk for violence. Currently, psychiatric variables contribute very little in assessing long-term risk of violence compared with the contribution of such variables as past violence (Bonta, Law, & Hanson, 1998). However, psychiatric measures show promise for assessing imminent risk of violence, given the relationship between active symptoms and violence (Norko & Baranoski, 2005). A patient's psychiatric symptoms vary in their level of acuteness over time or movement away from his or her baseline. Similarly, violence risk ebbs and flows over time, even in high-risk patients (see Douglas & Skeem, 2005; Skeem & Mulvey, 2002). Nevertheless, no researchers have examined directly the dynamic interplay between psychiatric state and violence risk state.

Most research to date has advanced our understanding of risk status. Clinicians are in a relatively good position to identify high-risk patients through the use of increasingly sophisticated violence risk assessment tools that incorporate historical variables (Gardner, Lidz, Mulvey, & Shaw, 1996; Harris, Rice, & Quinsey, 1993; Monahan, Steadman, Appelbaum, et al., 2005; Webster, Douglas, Eaves, & Hart, 1997). Once these high-risk patients are identified, however, clinicians must determine how to monitor risk state and intervene when necessary to prevent harm. In doing so, clinicians are most likely to focus on psychiatric variables, given their mental health training, setting, and resources. This might be an appropriate focus. Although psychiatric variables do not contribute greatly to assessing patients' violence risk status, they may offer important insights into violence risk state. Thus, there should be substantial practical interest in determining whether and how changes in mental health (general distress or particular symptom constellations) increase risk of proximate violence among individuals who are deemed high risk.

To date, the assumption that deterioration in psychiatric symptoms increases patients' risk of imminent violence has dominated legal standards and clinical practice. A chief criterion for involuntary hospitalization is a judgment that mental disorder creates a "danger to self or others" (Monahan, 1996). Several standards for outpatient commitment require patients to accept treatment if decision makers believe there is a potential for psychiatric deterioration that will lead to violence in the future (Appelbaum, 2001; Monahan, Bonnie, et al., 2001). In practice, patients at high risk for violence are provided with standard psychotropic and psychosocial treatment, perhaps at a more intensive level than usual; treatment rarely targets violence risk per se (Skeem, 2003). The assumption is that provision of standard treatment will reduce symptoms, which will reduce violence risk. Although involvement in standard treatment relates to reduced violence potential (Monahan, Steadman, et al., 2001), it is wholly unclear whether treatment involvement reduces symptoms, which reduces violence potential. Clearly, there is a need to test the assumption on which so much policy and practice rests.

Symptom Type

In determining the relationship between psychiatric state and violence risk state, one must assess not only the *acuity* of an individual's symptoms (the level of the reported symptom), but also the symptom *type*. Particular types of symptoms (e.g., depressed mood) are included in multiple diagnostic categories (e.g., major depressive and schizoaffective disorder). Given polythetic criteria for diagnostic categories, patients who manifest different symptom constellations can qualify for the same diagnostic category (e.g., schizophrenia). Moreover, symptom clusters within an individual in a particular diagnostic category can change dramatically over time (e.g., during an acute vs. residual phase). Thus, two individuals with bipolar disorder may appear quite different from one another on the basis of their individual symptom constellations and their clusters of "currently active" symptoms. To account for these factors, researchers need to focus on the smaller units on which a diagnostic category is built and recognize that these units may change over time within an individual.

A small body of research is responsive to this need. Some investigators have included symptom type and acuity in their studies of violence risk. That work suggests that both of these symptom dimensions are more predictive of violence than diagnostic status: Patients who were high in thinking disturbance, hostility–suspiciousness, and agitation–excitement at hospital admission were more likely to be assaultive during their hospital stay (Lowenstein, Binder, & McNiel, 1990; McNeil & Binder, 1994).

Other investigators have focused more narrowly on specific types of symptoms (Link et al., 1992; Taylor, 1998), the most common of which are threat/control-override (TCO) symptoms (Link & Stueve, 1994). TCO symptoms ostensibly are delusional beliefs that someone is seeking to do one harm (threat) or that outside forces are controlling one's mind (control override). Traditionally, these symptoms are measured on the basis of a small set of self-report questions. Using such measures, Link, Stueve, and Phelan (1998) found that both threat and control override symptoms were independently related to an increased risk for violence. Similarly, J. Swanson and colleagues (1997) found that patients who endorsed TCO symptoms were twice as likely to become violent during a 1-year posthospitalization period than those who did not.

Nevertheless, the link between TCO symptoms and violence is far from settled. Appelbaum et al. (2000) attempted to replicate the association previously found between TCO delusions and violence on the basis of a large prospective study of psychiatric patients. Despite multiple modes of analysis, the authors found that the presence of delusions in general and TCO delusions in particular was not associated with future violence. They were able to replicate previous findings only when the methodological limitations of earlier studies were mimicked (i.e., when self-report responses to TCO questions were considered without an independent assessment of whether such beliefs were actually delusional; when past rather than future violence was considered). Further analyses suggested that increased violence risk was attributable not to TCO delusions but perhaps to a hostile, suspicious personality style tapped by the TCO self-report questions. Similarly, Estroff (cited in Swanson et al., 1997) found an inverse association, and J. Swanson, Borum, Swartz, and Hiday (1999) found no association between TCO symptoms and violence.

Together, these studies indicate that symptom acuity is more important in predicting violence than diagnostic status. They provide only limited support for the notion that particular types of symptom constellations predict community violence. Although these studies looked beyond broad diagnostic categories to focus on symptom type and acuity, they were unable to assess the crucial

relationship between psychiatric state and violence risk state. Such an assessment of within-person effects requires a longitudinal design with repeated observations.

The Present Study

In this article, we report results from an intensive longitudinal study of individuals selected because of their high potential for repeated involvement in violence after visiting a psychiatric emergency room. We refer to these participants as *high-risk patients* because this label best conveys the group to whom the sample may generalize. The vast majority (93%) of participants received psychiatric treatment after their visit to the emergency room, and the majority were still involved in treatment 6 months later (Skeem, Mulvey, Lidz, Gardner, & Schubert, 2002). We focus on this small group of patients at high risk for violence because the group accounts for the majority of violence among individuals with mental illness (see Skeem et al., 2004). Even for these high-risk patients, however, proximate violence is not a foregone conclusion. For example, sophisticated analyses of data from the MacArthur Violence Risk Assessment Study yielded an actuarial tool that predicts proximate violence well (Monahan, Steadman, Appelbaum, et al., 2005). Nevertheless, of patients identified as high risk by this tool, at least 24% (derivation sample) and up to 65% (cross-validation sample) were not violent during the 20 weeks after release from the hospital (Banks et al., 2004; Monahan, Steadman, Robbins, et al., 2005). Our goal in the present study was to assess whether and how symptom fluctuations may help explain why only a fraction of high-risk patients engage in proximate violence.

In this study, a group of individuals identified by an actuarial tool as high risk during a psychiatric emergency room visit was followed into the community. These patients and collateral informants completed interviews every week for 6 months to assess their psychiatric state and involvement in violence. This design permits a specific examination of the relationship between symptom acuity and type on the one hand and violence on the other at the weekly level. To date, this type of intensive temporal measurement has been absent from the debate regarding the nature of the relationship between symptoms and violence. The debate has instead been based on static snapshots of symptoms in relation to violence over relatively long periods.

We examined the relationship between symptoms and violence in three ways. First, we examined the data in a "static" manner like that used in past research; that is, we assessed the association between general symptom acuity and violence across the full follow-up period. Second, we assessed the concurrent relationship between symptoms and violence during the same week. Then, we assessed the time-ordered relationship between symptoms during 1 week and violence during the next week. This time-ordered relationship is the primary relation of interest for policy and practice. A secondary focus of the current investigation was to inform the ongoing debate about the utility of the TCO items by assessing (a) whether TCO symptoms fluctuate over time (like symptoms of psychosis) or remain static (like personality traits), and (b) how strongly TCO state relates to violence risk state.

Method

Participants

In this study, we focused on the relationship between symptoms and violence within individuals over time. This approach requires a group of individuals whose symptoms and involvement in violence vary over time. This means that we needed to identify individuals who were likely to engage in multiple violent incidents over a relatively short period of time. Using a two-stage screening process that involved a medical record review and a subsequent screening interview, potential participants for this study were identified from among psychiatric emergency room patients in a large, university-based psychiatric hospital in an urban area. Enrollment criteria were adapted from an actuarial prediction model developed by Gardner et al. (1996) and included (a) young age (14–30 years), (b) a history of violence and recent violence in the 2 months prior to the emergency room visit, (c) recent and heavy substance use, (d) a score of 7 or higher on the Brief Symptom Inventory (BSI; Derogatis & Melisaratos, 1983) Hostility subscale, and (e) absence of current thought disorder (i.e., current diagnosis of schizophrenia or current report of delusions). The latter criterion, which was empirically derived (Gardner et al., 1996), is consistent with other research indicating that symptoms of psychosis, although often clinically relevant for understanding violence in a small proportion of individuals, are generally weak predictors of violence when applied to broad samples of mentally ill individuals (e.g., Monahan, Steadman, et al., 2001; Wessely, Castle, Douglas, & Taylor, 1994; for a review, see Douglas & Skeem, 2005). Those patients meeting these criteria were invited to participate in weekly interviews in the community for 26 weeks after their baseline interview.

Hospital records for a pool of 3,356 patients were reviewed to complete the first of two stages of screening in the emergency room. Of those individuals, 1,004 were deemed eligible in Stage 1, and attempts were made to invite them to the second stage of screening. Among the individuals eligible to participate in Stage 2, 20% refused to participate and 31% could not be located. The remaining 517 individuals completed the second stage of screening, and 171 of those were deemed eligible for study participation. Of those individuals, 89% enrolled in the study.

Our final sample comprised 132 individuals who completed 92% of their weekly follow-up interviews. Details concerning the enrollment process and sample characteristics as well as the methods involved in conducting weekly interviews are presented elsewhere (Schubert, Mulvey, Lidz, Gardner, & Skeem, 2005; Skeem et al., 2002). Briefly, the sample comprised young (M = 21 years, SD = 6) men (48%) and women (52%) who were equally likely to be White or African American (49%; "other" = 2%). Of the 83 research participants aged 18 and older, 65% had attained at least a high school diploma, and one third lived with their parents. Research participants had (nonprimary) hospital chart diagnoses of affective disorders (76%; chiefly major depression and bipolar disorders), psychotic disorders (11%; chiefly schizoaffective and psychosis not otherwise specified [NOS]), and other Axis I disorders (57%; chiefly anxiety disorders). Of participants, 45% had comorbid Axis I and substance abuse disorders. They had an average of 1.7 prior psychiatric hospitalizations (SD = 2.5), and 60% had a recorded history of attempted suicide.

Measures

Symptoms

BSI (Derogatis & Melisaratos, 1983). Information regarding symptoms was obtained each week using the BSI, a 53-item self-report inventory in which participants rate on a 5-point scale ranging from 0 (*not at all*) to 4 (*extremely*) the extent to which they have been bothered during the past week by various symptoms. The BSI includes three scales that capture global psychological distress, including the General Severity Index (GSI). The BSI is designed to include nine subscales that assess individual

symptom constellations: Somatization, Obsessive–Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. An individual's score on each subscale is his or her average for items included in that subscale.

The scales and subscales of the BSI demonstrated good internal consistency ($\alpha = .71–.85$), and test–retest reliability ($r = .68–.91$) in the normative study (Derogatis & Melisaratos, 1983) and good internal consistency in the present research (subscale αs = .76–.91; GSI $\alpha = .97$). With respect to validity, the BSI generally manifests a theoretically coherent pattern of association with the scales of the Minnesota Multiphasic Personality Inventory (Derogatis & Melisaratos, 1983). Several studies have indicated that the BSI is sensitive to change (Benishek, Hayes, Bieschke, & Stoffelmayr, 1998; Carscaddon, George, & Wells, 1990; Holden, Starzyk, McLeod, & Edwards, 2000; Pekarik, 1983; Piersma, Boes, & Reaume, 1994; Piersma, Reaume, & Boes, 1994).

Given such positive psychometric properties, most researchers view the BSI as an appropriate measure of general psychopathology and psychological distress (Benishek et al., 1998; Bonynge, 1993; Boulet & Boss, 1991; Brophy, Norvell, & Kiluk, 1988; Hafkenscheid, 1993; Hayes, 1997; Heinrich & Tate, 1996; Piersma, Boes, & Reaume, 1994; Ruiperez, Ibanez, Lorente, Moro, & Ortet, 2001). Nevertheless, the utility of the BSI at the discrete symptom or item level is questionable (cf. Benishek et al., 1998). Multiple factor analytic and other studies have suggested that the discriminant validity of several BSI subscales is poor. Although researchers have identified anywhere from one to seven factors for the BSI, four factors repeatedly emerge across most factor analytic studies: depression, anxiety, somatization, and hostility (Brophy et al., 1988; Gavazzi, Julian, & McKenry, 1996; Hafkenscheid, 1993; Hayes, 1997; Ruiperez et al., 2001; summary table is available from the authors).

Exploratory factor analysis of data collected from all patients screened in the present study indicated a highly similar four-factor solution. Confirmatory factor analyses indicated an adequate fit for this four-factor solution, $\chi^2(248, N = 532) = 786$, $p < .001$, comparative fit index (CFI) = .92, root mean square error of approximation (RMSEA) = .06, on this sample. This four-factor solution fit better than a single-factor solution using the same items, $\chi^2(263, N = 532) = 1{,}732$, $p < .001$, CFI= .78, RMSEA = .11.

In the present study, we operationalized symptoms at two levels: symptom constellations and general distress. First, we used scores on three of the four scales identified to reflect patients' depression, anxiety, and hostility symptom constellations each week. Negative affectivity and hostility have been clearly linked with violence in past research (for a review, see Douglas & Skeem, 2005; see also Gardner et al., 1996). This is not the case with somatization, and we excluded this symptom constellation from the study as a result. Second, we used the GSI to reflect patients' psychological distress each week. The GSI is the average score on all 53 items of the BSI.

TCO symptoms (Link & Stueve, 1994; Link et al., 1998). TCO symptoms were assessed by asking patients to rate the following three questions: "How often you have felt that (a) your mind was dominated by forces beyond your control; (b) thoughts were put into your head that were not your own; and (c) there were people who wished to do you harm?" Each item was rated for the time frame of the past week on a 5-point scale ranging from 0 (*never*) to 4 (*very often*). TCO scores were computed as the average of these three items. Unlike Appelbaum et al. (2000), our measure of TCO does not include a clinical assessment of the extent of the delusional quality of these self-reported symptoms.

Violence

The nature, frequency, and severity of the participant's involvement in violent incidents was explored at each weekly interview. Each participant was asked whether he or she had engaged in any of nine categories of aggressive acts (e.g., pushing, hitting, using a weapon) on the basis of the adaptation (Lidz, Mulvey, & Gardner, 1993) of the Conflict Tactic Scale (CTS; Straus & Gelles, 1990). For each category endorsed, respondents were asked to list the number of times the act had occurred. Contextual information (date, location, coparticipants, injury level, outcomes) for each incident was also recorded. On the basis of this information, we coded violence into two levels of severity. *Serious violence* was defined as an incident that resulted in a physical injury, a sexual assault, a threat made with a weapon in hand, or an aggressive act that involved the use of a weapon (see Steadman et al., 1998). *Minor violence* included aggressive acts that did not result in injury. For the purposes of this article, we focus on serious violence and comment when results differ for any violence. Each week was coded to indicate whether or not a "serious" incident or "any" incident had occurred.

Violence was converted to the weekly level (i.e., whether at least one event occurred in the past week) from data originally assessed at the daily level (i.e., events on particular days in the past week). This conversion was necessary to produce a time frame consistent with that of the symptom data. To capture the context of the violence, participants' place of residence during the majority of each week was coded. If more than half of the days in the recall week were spent in the community (as opposed to jail, hospital, or other institution), the week was considered a "community week." Using this classification, the majority of participants (59%) were in the community for more than 24 weeks of the 26-week follow-up period ($M = 22.7$ weeks, $SD = 5.3$). In this study, only community weeks were included. Although the relation between symptoms and violence within institutional contexts is also of interest to researchers and policy makers, these settings are arguably qualitatively different from community life. Institutional contexts vary from time in the community in the type of individuals with whom one interacts; external constraints placed on one's behavior; medications and interventions to which one is subject; and availability of substances, weapons, and other violence-relevant materials. Therefore, the two settings are likely to yield a different set of relationships between the two behaviors.[1]

Procedure

Participants were screened for eligibility in the psychiatric emergency room, using a two-stage record review and screening interview process. Eligible patients identified as high risk were recruited for the study and followed into the community. We attempted to interview recruited participants every week for 6 months after their enrollment in the study, totally to a baseline interview and 26 weekly interviews. When 2 or fewer interviews were missed, research associates extended the recall period for violence in the next interview to include the time period that was missed. Thus, in a small number of instances, the violence recall period was 14 days instead of 7 days. When 5 or more consecutive interviews were missed, the participant was dropped from the study and replaced by a new participant. Approximately 20 participants were dropped for this reason. Interviews covered involvement in violence and changeable risk factors for violence, including the participant's living situation, employment or school activities, positive and negative social support, relationship quality, treatment involvement, contacts with the legal system, drug and alcohol use and symptoms, and mental health symptomatology. Interviews required approximately 1 hr to complete, and participants were paid $10.

[1] Weekly violence data were coded as missing when the week was classified as a community week but the violence that occurred during that week occurred within an institution. This affected less than 1% of the total weeks represented in this study. The fact that violence in institutions was so rare counters concern that excluding institutional violence would weaken the apparent relation between psychiatric deterioration and violence. Indeed, we found that patients were rarely placed in an institution even after a violent incident had occurred; this happened after only 2% of incidents (Lidz et al., 2006).

A collateral informant for each participant was interviewed on the same schedule. These informants were chosen on the basis of the participant's nomination of individuals who knew him or her well, and information was obtained weekly on each individual's frequency and duration of contact with, and judged closeness to, the participant. If a collateral informant had no contact with the participant or had no new knowledge about him or her during a given week, he or she did not complete an interview that week. When a collateral had no contact with, or new information about, a participant for 3 consecutive weeks, a new collateral who was more familiar with the individual's current activities was chosen to replace the old one. On the basis of application of these rules and the ability of the interviewers to engage collateral involvement, 73% of the follow-up interviews completed with participants had an accompanying collateral informant interview.

Although providing a complete picture, the use of multiple sources of information can also produce conflicting reports. When the conflict concerns whether a violent incident occurred, the most likely sources of error are arguably that the event is unknown to a source (collaterals) or a source does not wish to acknowledge the event (participants or collaterals). Therefore, any report of the occurrence of a violent incident was assumed to be a correct report. When the conflicts were about the details of a violent incident (e.g., the identity of a cocombatant), a system relying on group consensus was used to devise a "most plausible account" of the incident.

Results

We first provide general descriptive information for psychiatric symptoms (i.e., general psychological distress, specific symptom clusters, and TCO symptoms) and violence. Then, we examine the relations between these two domains in three ways. First, we assess the relation between symptom status and violence status, averaging (symptoms) and summing (violence) the data from each participant's time series. Second, we assess the concurrent relation between symptoms and violence during the same week. Third, we assess the time-ordered relation between symptoms during 1 week and violence during the next week. This third examination addresses the primary aim of the study, that is, to assess the temporal relation between symptom type and acuity on the one hand and violence on the other at the weekly level.

Symptoms

To characterize the general level of distress in the sample, summary scores were computed for each participant by averaging his or her GSI scores across the 26-week series. We call these *person mean GSI scores*. We then averaged these person mean GSI scores across participants. The average person mean GSI score was 1.17 ($SD = 0.8$). This mean score is significantly lower, $t(1, 132) = 2.2$, $p < .05$, than normative data provided for adult psychiatric outpatients ($M = 1.32$, $SD = 0.72$; Derogatis & Melisaratos, 1983). However, outpatients may not be an ideal comparison group, given that 60% of the participants were not regularly active in outpatient treatment by the time of their final study interview. At the time of their screening interview, these individuals obtained an average GSI score ($M = 2.15$, $SD = 0.8$) that fell above the range expected for psychiatric inpatients (see Skeem et al., 2002). Also at the beginning of the study, participants' subscale scores generally were within the range expected of psychiatric inpatients, although their Hostility subscale scores were higher given that hostility was a criterion for study inclusion.

The latter finding suggests that specific symptom constellations may be particularly characteristic of this sample. To examine the sample's profile across specific symptoms, the same procedures described for GSI scores were applied to BSI symptom constellation and TCO scores. Table 1 presents the descriptive information for these variables. To interpret the data in the table, it is important to recall that the BSI assesses the degree to which a participant is bothered by a particular symptom, whereas the TCO score reflects the frequency of the presence of certain beliefs. As shown in Table 1, hostility (and perhaps TCO) symptoms appear particularly characteristic of the sample.

Violence

The majority of participants (61%) had at least 1 week throughout the observation period when they engaged in serious violence, and 87% of participants had at least 1 week when they engaged in any violence. The sample had an average of 2 ($SD = 2.5$) community weeks with serious violence and 4.9 ($SD = 4.4$) community weeks with any violence. To simplify the presentation of results, we focus on results for serious violence, which arguably is of greater interest to researchers and policy makers. In the rare event that the pattern of results for any violence was different from that for serious violence, we note the discrepancy in the following findings.

Symptom Status and Violence Status (Across the Series)

The first set of analyses focused on risk status. These analyses tested the static relationship between symptoms and violence on the basis of summary data from the entire 26-week series. Specifically, we assessed the relation between a participant's symptom level (mean across the series) and the number of serious violent weeks in the community. As before, we examined symptoms at both general (psychological distress) and specific (symptom constellation) levels of resolution.

A Poisson regression model with block entry was applied to assess the degree of variance in the number of serious violent weeks that could be explained by general distress (average GSI score), after controlling for time at risk (i.e., the number of weeks in the community). A Poisson model was used to correct for the skewed nature of the dependent variable and to obtain more accurate estimates of the state-level relationships between symptoms and involvement in violent events (Gardner, Mulvey, & Shaw, 1995).

The results indicate that participants' average GSI score was unrelated to the number of weeks with incidents of serious violence ($\beta = .04$, *ns*). Parallel analyses were conducted to test each

Table 1
Descriptive Data for Symptom Clusters

Symptom	*M*	*SD*
Depression	1.21	1.00
Anxiety	1.03	0.89
Hostility	1.42	0.90
TCO	2.48	2.64

Note. TCO = threat and control override.

of the symptom constellations. As was the case for general distress, after controlling for time at risk, average anxiety ($\beta = .00$, *ns*), depression ($\beta = .05$, *ns*), and TCO ($\beta = .01$, *ns*) scores were not related to the number of serious violent incidents. However, after controlling for time at risk in the community ($\beta = .81$, $p < .001$), participants' average hostility score was strongly related to the number of serious violent incidents ($\beta = .56$, $p < .001$).

Thus, during the 6 months after visiting the emergency room, participants' average levels of hostility, but not their general distress or other symptoms, related to their number of serious violent incidents. Because these analyses do not indicate how symptoms and violence relate to one another across time, we next examined the concurrent and serial relationships between symptoms and violence at the weekly level.

Symptoms and Violence Within Weeks (Concurrent Relationship)

We examined the concurrent relation between symptom levels and violence by testing whether weeks that individuals reported higher symptom levels were also more likely to be characterized by serious violence. Results from fixed-effects logistic regression analyses are presented in Table 2.

Fixed-effects regression methods focus on the within-person variation and control for unmeasured stable characteristics of participants. Allison (2005) argued that fixed-effects models provide some of the advantages of randomized experiments because they control for unmeasured individual differences by using each individual as his or her own control. The odds ratios (ORs) reported in Table 2 were derived from fixed-effects models and can be interpreted as the expected increase in the odds that a participant will engage in violence during a given week if his or her symptom score is 1 unit (i.e., 1 *SD*) above the series mean during that same week. For example, the odds of engaging in serious violence increased by 2 times during a week when a patient obtained a score of 3 versus 2 on the GSI scale.

Significant associations were found for general distress and all symptom clusters. These analyses indicate that both general psychological distress and specific symptom constellations relate moderately to violence during a given 1-week period. Because the fixed-effects model uses participants as their own controls, these results show that there was an increased likelihood of violence during weeks when an individual's symptoms were above his or her series average.

Table 2
Concurrent (Within-Week) Relationship Between Symptoms and Serious Violence

	Serious violence	
Symptom	OR	CI
GSI (general distress)	2.0	1.5, 2.7
Depression	1.4	1.1, 1.8
Anxiety	1.8	1.4, 2.3
Hostility	2.0	1.6, 2.3
TCO	1.2	1.1, 1.3

Note. OR = odds ratio; CI = confidence interval; GSI = general severity index; TCO = threat and control override.

Symptoms and Violence Across Weeks (Time-Ordered Relationship)

Although these findings provide support for the co-occurrence between elevated symptoms and engagement in violence within the same week, they do not tell us what comes first. Do increasing symptoms lead to violence? Are symptoms elevated following a violent incident? Or, is there a reciprocal relationship between symptoms and violence? We examined the temporal ordering of symptom levels and violence by testing whether symptom levels in 1 week were predictive of violence in the following week, and vice versa.

The time-ordered relationship between symptoms and violence was examined using a structural cross-lagged longitudinal model. This structural equation model (SEM) allowed for an examination of the direction of the relationship between symptoms and violence over time (the cross-lagged regression) while controlling the relation of symptoms and violence on themselves from 1 week to the next (autoregression). This model is based on the early work of Joreskog and colleagues (Joreskog, 1970; Joreskog & Sorbom, 1979) and has been applied within the psychological literature to examine time-ordered data (Ferrer & McArdle, 2003; McArdle & Bell, 2000). Given our use of Full Information Maximum Likelihood to deal with missing data across occasions, the *N* for each of the models was 132.

The models were fit in Mplus (Version 3.12; Muthén & Muthén, 2003) using the categorical and multilevel data options. These options allowed for the integration of binary (violence) and continuous measures (BSI scores) into the SEM and took into account the multilevel structure of the data (the nesting of occasions within persons).[2] Separate models were estimated for each symptom type (e.g., GSI general distress and specific symptom constellations of depression, anxiety, hostility, and TCO).[3] For each symptom cluster, the full model (as depicted in Figure 1) was fit to evaluate whether symptoms and violence were related to each other over time. Next, each of the cross-lagged parameter estimates (γ_1, γ_2) was constrained to equal 0; these models tested whether a lagged relationship between symptoms the preceding week and violence this week (γ_1) or between violence the preceding week and symptoms this week (γ_2) was needed to explain the data. Comparisons between models were based on standard SEM fit indices, with particular attention paid to the weighted root mean residual (WRMR $< .90$), which is recommended for use with categorical data (Yu & Muthén, 2002).

Results indicated that there were no significant cross-lagged relationships between violence and general distress (GSI scores) across time. The full model, $\chi^2(7, N = 132) = 5.7$, $p = .58$, CFI = .99, WRMR = .47, fit as well as a model in which the cross-lagged

[2] The binary measurement of violence at each week (yes/no) was accounted for by using the categorical data specification and numerical integration capabilities.

[3] The cross-lagged regression parameters (parameter '$\tilde{a}_1$' or '$\tilde{a}_2$' in Figure 1) can be interpreted as the effect of symptoms on violence, or vice versa, from this week to next week, after controlling for the concurrent and autoregressive relationships. The advantage of using this type of structural model is that the relationship between symptoms and violence can be modeled simultaneously, while controlling for important time-dependent (read autoregressive and concurrent) relationships.

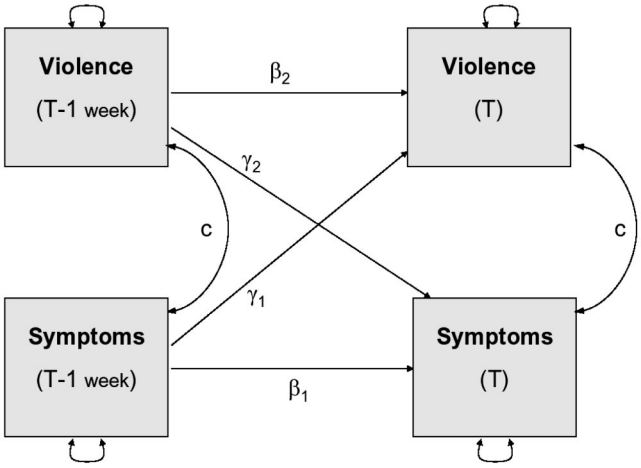

Figure 1. Cross-lagged time series structural equation model for violence and general psychological distress. T = time; β = standardized coefficient, continuous outcomes.

relationships (γ_1 and γ_2) were constrained to equal 0, $\chi^2(9, N = 132) = 9.9$, $p = .36$, CFI = .99, WRMR = .62 (Figure 1). Similar results were found for depression, anxiety, and TCO. That is, there was no evidence of a relationship between these symptom clusters and violence from week to week.

This pattern did not hold, however, when the relation between hostility and violence was examined. As shown in Figure 2, the model that demonstrated the best fit when depicting the time-ordered relation between hostility and violence allowed hostility last week ($t - 1$) to influence serious violence this week (t), $\chi^2(7, N = 132) = 6.7$, $p = .15$, CFI = .99, WRMR = .55; this model demonstrated a better fit than a model that constrained the relation between hostility last week and violence this week equal to 0, $\chi^2(5, N = 132) = 11.2$, $p = .04$, CFI = .96, WRMR = .87. It is important to note that the relationship between violence last week and hostility this week (γ_2) was not significant in any of the models.

Figure 2 conveys three main findings from the SEM analyses. First, violence was moderately related to itself from week to week (violence → violence); a violent incident increased the odds of violence occurring in the following week by 1.4 times ($p < .01$). Second, hostility was strongly related to itself from week to week (hostility → hostility; β = .79, $p < .001$). Recall from Table 1 that the concurrent relationship between hostility and violence was strong (hostility ← → violence; OR = 2.0, $p < .02$). The third and most important finding conveyed in Figure 2 is that, after conservatively taking into account these three relations, a 1-unit change in hostility was independently related to violence the following week (OR = 1.2). In summary, hostility has a moderate to strong relationship with violence during the same week. After controlling for this relation as well as controlling for the relation of violence to itself from week to week, hostility uniquely predicts violence the following week.

Discussion

This intensive longitudinal study of high-risk emergency room patients is among the first attempts to disentangle the complex relation between psychiatric symptoms and violence over time. The results indicate that it is crucial to attend to the temporal relation between mental disorder and violence. Considering the full 6-month period after a visit to the emergency room, only high-risk patients with greater average levels of hostility were more likely to be involved in serious violence. However, during a given week within that period, individuals with greater general psychological distress, hostility, anxiety, depression, and TCO symptoms tended toward co-occurring serious violence.

The temporal relation between symptoms and involvement in violence, however, is the one of most interest for practice and policy. This study is the first to indicate that a high-risk patient with an increased hostility level in 1 week is significantly more likely to be involved in serious violence in the next week. Hostility is a dynamic risk factor for proximate violence. This is not true of the other symptoms examined here, including general psychological distress and specific symptom constellations other than hostility (TCO symptoms, anxiety, and depression).

Anger as a Dynamic Risk Factor for High-Risk Patients

Because hostility emerged as the only leading indicator of violence in this study, it is important to examine how it was assessed. The BSI Hostility subscale reflects how bothered an individual has been over the past week by five problems: feeling easily annoyed or irritated; temper outbursts that he or she could not control; having urges to beat, injure, or harm someone; having urges to smash things; and getting into frequent arguments (Derogatis & Melisaratos, 1983). A review of these items raises two issues.

First, the item content raises questions regarding criterion contamination: Is it simply the case that the BSI Hostility subscale assesses violence this week, which predicts violence next week? That is, do the present results merely express Meehl's maxim that past behavior is the best predictor of the same behavior in the future? Our results suggest this is not the case (Figure 2). Even after controlling for the effects of whether an individual was

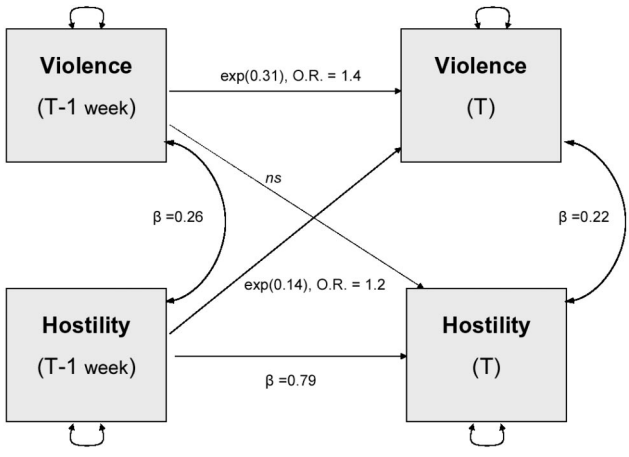

Figure 2. Cross-lagged time series structural equation model for violence and hostility. T = time; O.R. = odds ratio for binary outcomes, estimates are significant at $p < .05$ level; β = standardized coefficient, continuous outcomes.

violent during 1 week (past behavior predicts future, like behavior) and concurrent levels of hostility, hostility scores this week independently predicted whether violence would occur next week. BSI hostility scores, then, tap something unique—that is, not just "like behavior"—that significantly predicts proximate violence.

Second, an examination of the BSI hostility items indicates that this subscale may be assessing something more closely related to anger than hostility. Although *anger* and *hostility* often are used as interchangeable terms in the literature, there are important distinctions between them (see Eckhardt, Norlander, & Deffenbacher, 2004). Hostility is an attitudinal disposition that involves "a devaluation of the worth and motives of others, an expectation that others are likely sources of wrongdoing, a relational view of being in opposition toward others, and a desire to inflict harm or see others harmed" (Smith, 1994, p. 26). In contrast, anger may be defined as "an unpleasant emotion ranging in intensity from irritation or annoyance to fury or rage" (Smith, 1994, p. 25). More broadly, anger involves "a constellation of specific uncomfortable subjective experiences and associated cognitions (i.e., thoughts, beliefs, images, etc.) that have various associated verbal, facial, bodily, and autonomic reactions" (Kassinove & Sukhodolsky, 1995, p. 11). Models of anger include both angry emotions and the manner in which they are controlled and expressed (e.g., Novaco, 1994; Siegel, 1986). For example, Spielberger's (1999) measure is designed to assess feeling angry, feeling like expressing anger verbally, and feeling like expressing anger physically.

This construal of anger closely approximates the dynamic risk factor for violence identified in the present study for high-risk patients. The BSI Hostility subscale assesses feelings of annoyance and irritation, a tendency to argue, urges to destroy property or hurt others, and uncontrollable temper outbursts. Because this subscale addresses emotional reactivity more than an attitudinal disposition, Jarvis and Novaco (2006) concluded that it assessed anger rather than hostility. This conclusion enjoys some empirical support. Although there is no evidence that the BSI Hostility subscale relates strongly to other measures of hostility, there is evidence that this subscale correlates moderately strongly ($r \geq .40$) with well-validated anger scales, particularly those that assess trait anger and expressions of anger (Conger, Conger, Edmondson, Tescher, & Smolin, 2003; see also Suris et al., 2004). The BSI Hostility subscale also shares its violence-predictive variance with anger scales (Vanni et al., 2004). Although future research should examine the relations among the BSI Hostility subscale, traditional anger scales, and violence in this high-risk group, extant theory and research suggest that anger is the construct tapped in this study.

This study indicates that high-risk patients who experience an increase in angry reactivity this week are at greater risk for violence next week. Given the relatively tight conceptual connections between anger and aggression (see Novaco, 1994), this finding makes sense. Nevertheless, this study is the first to suggest that anger functions as both a status and a state in elevating violence risk. Although anger is an emotional state, people who experience anger frequently and intensely are high in status, or "trait," anger (Spielberger, 1999). As a group, the high-risk patients studied here are characterized by high levels of ongoing anger. Indeed, the actuarial formula used to screen participants into the study included elevated BSI hostility scores and violence (Gardner et al., 1996; Skeem et al., 2002). These high-risk patients often experience angry arousal and are prone to expressing it in maladaptive ways (see Blackburn, 1993). Past risk status research has indicated that anger (Gardner et al., 1996; McNiel, Eisner, & Binder, 2003; Monahan, Steadman, et al., 2001; Novaco, 1994) and antagonistic traits involving proneness to anger and temper outbursts (see Skeem, Miller, Mulvey, Tiemann, & Monahan, 2005) are strong risk factors for violence, even among general psychiatric patients. One retrospective study even suggested that increases in anger predict sexual aggression among offenders (Hanson & Harris, 2000).

The present findings are the first to point to a more dynamic linkage in which both trait and state levels of anger contribute to violence potential among high-risk patients. Anger is strongly related to itself over time, suggesting that it is trait-like. Within a given week, however, anger is also related to violence, reflecting the moderate overlap between anger and aggression. Nevertheless, even taking these considerable trait effects into account in a high-risk and "highly angry" group, a patient's anger this week predicts violence next week.

General Psychological Distress and Specific Symptom Constellations as Risk Markers

In contrast to the results for anger, general psychological distress and specific symptoms (depression, anxiety, and TCO beliefs) did not predict proximate violence. Prior research has produced mixed results on whether and how psychiatric symptoms elevate risk of violence (see Douglas & Skeem, 2005). Several well-designed risk status studies have suggested that mental disorder alone is not a particularly strong risk factor for violence (Lidz et al., 1993), although mental disorder combined with substance abuse moderately increases risk (Monahan, Steadman, et al., 2001; F. Swanson et al., 1990). Substance abuse was not examined in the current analyses, but the present results are in keeping with this past research.

The present results suggest that anger is more important in predicting proximate violence than are general psychological distress and such specific symptom constellations as anxiety and depression. These results are consistent with past indications from risk status studies that symptoms that are more intuitively related to violence (e.g., hostile suspiciousness; excitement) are, in fact, more strongly related to violence than those that are not (e.g., depression, anxiety; see Link & Stueve, 1994; Lowenstein et al., 1990; McNeil & Binder, 1994; McNiel et al., 2003). Becoming more generally distressed, depressed, or anxious may indirectly place one at greater risk for violence by leading to interpersonal problems with family and friends, reducing one's coping capacity for stressors, and the like (Douglas & Skeem, 2005). In fact, in contrast to the results of this intensive longitudinal study, early results of a multinational study suggested that increases in anxiety and depressive symptoms measured at one time point are strongly predictive of later community violence (Freese, Miotto, & Reback, 2002). However, becoming more angry and irritable may directly lead to violence given that aggression can be an expression of anger. It seems that the more directly related a symptom is to aggression conceptually, the stronger its empirical connection.

Despite the lack of a time-ordered relationship between symptoms other than anger and violence, both general psychological distress and all specific symptom constellations assessed in this study were likely to co-occur with violence during a given week.

This suggests that in a group of high-risk patients, these symptoms other than anger are risk markers for violence during short time periods, even if they are not risk factors for proximate violence (see Kraemer et al., 1997). During tumultuous periods of patients' lives, various forms of psychiatric symptoms and violence are more likely to occur. This co-occurrence is not particularly informative, given that an increase in symptoms may precede, follow, or have nothing to do with the occurrence of violence during that week. Other factors, including relationship problems and substance abuse or the cumulative effect of multiple factors, may be responsible for both the increase in symptoms and risk of violence.

The TCO Debate

In this study, on the basis of past research, we focused on psychiatric symptoms that were most likely related to violence. Some past research has indicated that negative affect (i.e., anger, anxiety, depression) and particular features of psychosis (i.e., TCO beliefs) hold the most promise as predictors of proximate violence (for a review, see Douglas & Skeem, 2005). As noted earlier, this may be particularly true of active symptoms.

Recall that the patients screened into the present study as at high risk for violence by our actuarial tool were not actively thought-disordered at the time of recruitment. Patients with active delusions or a current diagnosis of schizophrenia (but not active hallucinations) were excluded. This raises a concern about whether the sample manifested significant variability in psychosis over time to detect a relationship between TCO delusions and violence. Several points help ameliorate this concern. First, psychotic symptoms (including TCO) are not limited to patients with schizophrenia and could have occurred with sufficient regularity in this sample because patients in the present sample suffered from disorders that include features of psychosis. One patient in 10 (11%) had an emergency room diagnosis of a psychotic disorder (e.g., schizoaffective disorder; psychotic disorder NOS), and 3 in 4 (76%) were diagnosed with affective disorders that can include psychotic symptoms. Recent studies have indicated that one in five major depressive episodes includes psychotic features (Ohayon & Schatzberg, 2002), and 2 of 3 patients with bipolar disorder experience psychotic symptoms (including Schneiderian first-rank symptoms) during affective episodes (Keck et al., 2003). Second, symptoms of psychosis ebb and flow across episodes of a patient's illness. Although patients in the present sample did not manifest active delusions at the time of recruitment, there is evidence that they were often acutely ill during the 6 months that they were followed in the community. Nearly half (46%) became so ill that they were hospitalized during this period. As a group, they averaged 7 inpatient days (Lidz et al., 2006). Third, our TCO data suggest that there was variability in the scale both across individuals (see Table 1) and within individuals over time ($M\ ISD = 1.5$, $SD = 1.2$).[4] Although our findings may not generalize to "more psychotic" patient groups, our sample is still capable of representing the relation between TCO symptoms and violence in this group of repeatedly violent patients.

The primary measure of psychosis included in the present study was the TCO scale. Although the extent to which this scale measures the delusional quality of an individual's perceptions per se is questionable (Appelbaum et al., 2000), we did not include a clinical assessment of whether TCO beliefs were actually psychotic. On the basis of past research (Appelbaum et al., 2000), such an addition would weaken any observed relationship between apparent TCO delusions and violence. In the present study, TCO symptoms did not predict proximate violence, suggesting that there was little need for such an adjustment. These results are consistent with past major studies indicating that delusions and hallucinations are not predictive of violence (Appelbaum et al., 2000; Lidz et al., 1993; Monahan, Steadman, et al., 2001; cf. J. W. Swanson, Borum, Swartz, & Monahan, 1996), with the possible exception of hallucinations that specifically command violence (Monahan, Steadman, et al., 2001).

It is somewhat surprising that the generally hostile, suspicious cognitive style that the TCO questions may tap (Appelbaum et al., 2000) was not predictive of violence in the present study. Theoretically, this cognitive style would overlap with the anger tapped by the BSI Hostility subscale, which was predictive of proximate violence. Although patients' average scores on the two scales were strongly correlated ($r = .74$), only anger (BSI Hostility) significantly increased the risk of proximate violence in this study. Feeling angry and feeling like smashing things or injuring others are more relevant to proximate violence than feeling threatened or controlled by other people or forces.

Limitations and Future Directions

Testing Generalizability

Because we deliberately focused on a small subgroup of participants at high risk for repeated violence in this study, we cannot assume that the findings apply to all psychiatric patients. Changes in symptoms (other than anger) may be relevant to violence risk for the general psychiatric population. We cannot underscore this point heavily enough.

At the same time, we believe that focusing on the high-risk subgroup studied here has the greatest potential to inform systematic violence risk management efforts. Given that the likelihood of violence in the general psychiatric population is relatively low, it makes sense from a policy perspective to focus on the small group of patients who account for the majority of violent incidents. This raises two questions.

First, are psychiatric patients at high risk for violence a homogeneous group that is well represented in the present sample? Preliminary evidence suggests that high-risk patients are not a homogeneous group, but the bulk of these patients share characteristics with those of the present sample. In the MacArthur Violence Risk Assessment Study, investigators applied the actuarial tool described earlier (Monahan, Steadman, Appelbaum, et al.,

[4] An *ISD*, or individual standard deviation, captures intraindividual variability in TCO scores. Each individual has a mean TCO score over the observation period (*M*) and value that characterizes how much they varied around their mean (*ISD*). The *ISD* values demonstrate that people did in fact vary in their TCO scores over the observation period. Only 11 people had an *ISD* score of 0, indicating that they did not deviate from their average TCO score. Notably, the *ISD* values for TCO scores were twice those of hostility scores ($M\ ISD = 0.7$, $SD = 0.3$), which manifested a significant relation to violence over time.

2005) to data on more than 1,000 patients to identify 165 patients as at high risk for violence (Monahan, Steadman, et al., 2001). These high-risk patients were found to form three theoretically coherent subgroups (Skeem et al., 2005). Although two of the subgroups share significant features with those of the present sample (e.g., negative affect, anger, and substance abuse problems), the third subgroup was characterized by thought disorder, including active delusions and command hallucinations. This thought-disordered subgroup accounted for only 14% of high-risk patients and 2% of the full patient sample. Despite the small size of this subgroup, there may be a relationship between such symptoms as TCO and violence in this subgroup. This question is open for future research.

Second, will the present results replicate with patients identified as high risk using tools other than the one applied here? This too is a question open for future research. Given the overlap among brief violence risk assessment tools in classifying individuals as high risk (Skeem, 2005), however, the sample studied here should represent a significant proportion of high-risk patients identified with other tools. The sample may also better represent patients at risk for repeated involvement in violence given that tools other than the one used in this study were not designed to predict this criterion.

Assessing Symptoms Differently

In this study of what might be the "most common" type of high-risk psychiatric patient, we observed no relation between general distress and most symptoms on the one hand and violence on the other. These findings do not mean that "symptoms fail to predict proximate violence" for the typical high-risk patient for two reasons. First, research cannot prove the null hypothesis. Second, in this study, we focused on general psychological distress and a limited number of specific symptom constellations (e.g., negative affect, TCO beliefs, and anger) that held promise in predicting proximate violence. We did so using a measure that would be feasible for use on a weekly basis. It is possible that symptom constellations other than those measured here (e.g., mania, agitation) and measured by means other than those applied here (e.g., clinician ratings) would produce different results. Because this is the first study of its kind, it is important to replicate the results with other measures.

On a related note, it is possible that this study's weekly measurement was too molar to capture a time-ordered relationship between changes in symptoms and changes in violence. Recall that there was a concurrent (within-week) relationship between all forms of symptoms and violence, whereas only hostility predicted violence in lagged (across-weeks) analyses. Although this is a possibility to explore in future research with even more frequent measurement of symptoms, this explanation seems unlikely. Most psychiatric symptoms (e.g., a depressive episode) do not "come and go" on a daily basis. For example, negative affect (Harmon-Jones, 2000) and mood (Benedict, Dobraski, & Goldstein, 1999) change over periods of weeks. Moreover, for practical purposes, this unit of measurement is perhaps the most meaningful as it mirrors the observation period that a clinical relationship affords. It is unlikely that clinicians and patients would regularly meet at shorter intervals.

A second potential explanation for the observation of a concurrent, but not lagged, relationship between most symptoms and violence is reporting bias. Each week, patients reported how bothered they had been by a variety of symptoms during the previous week. Patients and collateral informants also reported whether the patient had been violent during the previous week. It is possible that some patients endorsed having experienced more symptoms during the previous week because they had been violent the previous week. We were unable to test this explanation, given the present data. Nevertheless, if this explanation were accurate, it would suggest only that concurrent relationships that we identified between symptoms and violence within a week were artifactual. This would not affect the study's principal finding that only increases in anger this week predict violence the following week.

Testing Interaction Effects

In this study, we focused intensively on psychiatric symptoms. It is possible that these symptoms interact with environmental (Silver, Mulvey, & Monahan, 1999) and individual (Monahan & Steadman, 1994) risk factors in more complex patterns that yield violence. This is particularly important when it comes to substance abuse. Past risk status studies have indicated that mental disorder affects risk chiefly when it is combined with substance abuse disorders (Steadman et al., 1998; F. Swanson et al., 1990). Although the present analyses provide no evidence that psychiatric symptoms other than anger alone increase risk of proximate violence, future work should determine whether this finding holds when symptoms, substance abuse, and other factors are examined simultaneously.

Implications for Research and Practice

These results have important implications for research and practice. For both professional domains, important lessons have been learned here about attending to and adequately assessing the time-ordered relationship between symptoms and violence. When examined concurrently (during the same week), all forms of symptoms are likely to co-occur with violence. This is infinitely less useful than knowing that a symptom precedes and increases the risk of proximate violence (Kraemer et al., 1997). When examined over time (from 1 week to the next), only anger predicted proximate violence. Thus, with the important exception of anger, this study suggests that in a sample of high-risk patients, knowing about increased symptoms studied here during 1 week does not provide a solid foundation for expecting violence the following week.

Speaking in practical terms, a clinician who is monitoring an identified high-risk patient in the community probably would be incorrect if she assumed that her patient's increasing general distress (or depression, or anxiety, or TCO symptoms) this week signified increased risk of imminent violence. For high-risk patients (not necessarily actively psychotic patients), the results of this study challenge the prevailing assumption that deterioration in psychiatric symptoms increases patients' risk of imminent violence. This assumption dominates legal standards for involuntary inpatient and outpatient treatment as much as it dominates inter-

vention strategies for patients viewed as high risk (Mulvey & Lidz, 1998).[5]

The present results suggest that merely providing high-risk patients with "more" or "different" medication or therapy focused on general psychiatric symptoms is unlikely to reduce violence risk. Interventions for high-risk patients would do better to focus on anger reduction and management. Anger, unlike other symptoms, is a changeable risk factor for violence for these patients. Meta-analytic (Beck & Fernandez, 1998; Edmondson & Conger, 1996) and other reviews (Deffenbacher, Oetting, & DiGiuseppe, 2002) have suggested that anger declines as a result of such anger management and related treatment. The next step is to determine the extent to which reducing high-risk patients' anger or changing its typical mode of expression reduces their involvement in violence.

These results also inform dynamic risk assessment efforts by indicating what symptoms to monitor over time after patients have been identified as high risk. When clinicians are treating a high-risk patient in the community, they should monitor changes in his or her degree of anger. Training programs for violence risk assessment and management may need to shift emphasis from general psychiatric symptoms to anger, violence, and other constructs that relate more directly to risk of proximate violence.

More generally, the results of this study challenge researchers and practitioners to examine closely the assumption that psychiatric deterioration leads directly to patient violence. We are unaware of compelling evidence that this is the case, and the findings presented here cast doubt on the assumption of a strong link. Given the amount of mental health policy and practice that rests on this assumption, further thought and rigorous research are needed to resolve this issue.

[5] Although one might argue that our sample was not prototypic of those eligible for civil commitment, civil committees are a heterogeneous group. Our sample suffered from serious mental disorder and was at high risk for violence, which goes to the heart of the "dangerousness" language in most civil commitment statutes. At the same time, our sample excluded patients with active psychosis at the time of their emergency room visit, and these patients also were eligible for civil commitment. Comparing our sample (17% committed) with the larger sample of general psychiatric patients from which they were drawn (18% committed), we found no significant difference in the likelihood of involuntary commitment at the time of the index visit to the emergency room, $\chi^2(1, N = 3{,}297) = 0.7$, *ns.* Our sample was as eligible for civil commitment as the larger group from which it was drawn.

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