Psychotic Motivation and the Paradox of Current Research on Serious Mental Illness and Rates of Violence

by John Junginger and Lynanne McGuire

Abstract

Persuasive empirical support exists for a positive association between serious mental illness (SMI) and rates of violence; a great deal of support is also present for the clinical impression that psychotic symptoms sometimes motivate "symptom-consistent" violence. We propose that the issue of the motivation for violence in the SMI population can be considered independently of the issue of the association between SMI and violence rates. We review much of the current literature on the association between SMI and violence in a framework that emphasizes motivational influences unique to the SMI population. We conclude that the contribution of psychotic motivation to rates of violence in the SMI population is a major research issue. Furthermore, we believe that recognition of the independence of motivational influences and violence rates, and consideration of the impact of treatment on violence, may help explain the paradox of current research: Delusions and hallucinations may motivate violent behavior, but this psychotic motivation may not be reflected in the actual rate of violence.

Keywords: Serious mental illness, psychosis, violence, motivation.


The association between SMI and violence continues to attract the attention of researchers, whose findings may vary depending on the time period assessed and various characteristics of the sample studied, such as diagnosis and treatment status. To date, most studies have assessed only the temporal association between SMI and violence rates, with little attention paid to motivational influences. This strategy may imply by default that the motives for violence of those with SMI are conventional in nature and are not themselves indicative of the influence of SMI.

The motivation for violence is a complicated issue that we will not completely resolve here. We focus on violence that appears to have a psychotic motivation. For the purposes of our argument, we consider all other motives to be conventional. The distinction between psychotic and conventional motives for violence is based primarily on a judgment of the degree to which violence is consistent with the content or theme of concurrent psychotic symptoms—that is, delusions and hallucinations. Although this judgment might seem difficult, it is one we have made reliably in several previous studies (Junginger 1995; Junginger et al. 1998).

The clinical relevance of "symptom-consistent" violence is that it allows us to identify not only those at risk for violence but also those at risk for becoming targets of violence. For example, under certain conditions (currently ill defined), a person with the delusional belief that his neighbors are plotting to kill him may act to "defend" himself and so put his neighbors at risk. This psychotic form of "self-defense" would have a type of logic if the belief on which it was based were true—it is rational behavior based on irrational beliefs and perceptions (Junginger 1996). This potential to respond violently to a reality different from objective or consensual reality, sensationalized by the popular media, probably lies at the heart of the public's well-documented fear of people with SMI (Link et al. 1999). Most current research on the association between SMI and rates of violence ignores the unique and important characteristic of the violence committed by people with SMI: It often seems to have a psychotic or "unconventional" motivation. From this perspective, the issue becomes not only whether SMI increases the rate of violence but also whether it changes the motivation for violence.

The issue of the motivation for violence in people with SMI can be considered independently of the issue of the association between SMI and rates of violence. In fact, as we will see, research suggests that the status of one (e.g., evidence of delusional motivation) does not

Send reprint requests to Dr. J. Junginger, VISN 5 MIRECC, 10 N. Greene Street, Suite 6A, Baltimore, MD 21201; e-mail: john.junginger@med.va.gov.
necessarily imply the status of the other (e.g., higher rates of violence). For the sake of our argument, if we limit potential findings on these issues to two fairly distinct outcomes, four possibilities emerge.

1. **No association exists between SMI and rates of violence.** People with SMI do not exhibit violent behavior at a higher rate than the general population. Their motives for violence are conventional or unknown.

   Until at least the late 1980s, this possibility was the de facto position of most mental health professionals and researchers. Before then the prevailing belief was that occasional findings of a link between SMI and rates of violence, such as those reported by Giovannoni and Gurel (1967) and Sosowsky (1978), could be attributed to failing to control for demographic variables. For example, Monahan and Steadman (1983) reviewed more than 200 studies on crime and mental illness and concluded that the association between the two tends to disappear when variables such as age, sex, race, and social class are statistically controlled. They did not assess motive, so they could not identify psychotic influences.

   However, early indications showed that the apparent link between SMI and rates of violence could not be attributed entirely to demographic influences. Zitrin and colleagues (1976) compared arrest rates for the catchment area of New York's Bellevue Hospital with arrest rates for 867 psychiatric patients admitted to Bellevue from the hospital's catchment area. They found that arrests for three major crimes—rape, aggravated assault, and burglary—were higher for the patients than for the catchment area. This finding seemed to indicate an association between SMI and violent crime independent of the demographic characteristics presumably shared by persons living in the Bellevue catchment area.

2. **A reliable association exists between SMI and rates of violence.** People with SMI exhibit violent behavior at a rate consistently higher than that of the general population. Their motives for violence are conventional or unknown.

   There seems to be persuasive empirical support for this possibility, especially because motive is rarely considered, which prevents identification of psychotic influences. Most researchers probably can trace the turning point in their perception of the link between SMI and rates of violence to an analysis of a subset of the Epidemiologic Catchment Area (ECA) survey data reported by Swanson et al. (1990), with a followup clarification by Swanson and Holzer (1991). The ECA study used the Diagnostic Interview Schedule (DIS; Robins et al. 1981) to assign *DSM-III* diagnoses to more than 15,000 residents of five U.S. cities (Robins and Reiger 1991). Four items from the antisocial personality section of the DIS asking about incidents of hitting or throwing things at someone and using weapons in a fight were used as indicators of violence in approximately 10,000 residents of three cities.

   Swanson and colleagues (1990) found that when demographic variables and co-occurring substance abuse disorders were entered into a logistic regression, the presence of a major mental disorder such as schizophrenia was still a significant predictor of violence, at least as indicated by the four DIS items. This finding was relevant not only because demographic variables and co-occurring substance abuse disorders were statistically controlled, but also because the subject sample was not biased by exclusive sampling of currently or formerly hospitalized patients, or persons with criminal arrests or convictions. In that way, the ECA data more closely approximated the true rates of violence and mental illness in the general population than previous studies of persons "selected" for their psychiatric or criminal histories. Monahan (1992), for example, noted that hospitalized patients often owe their hospitalization to violent or dangerous behavior and therefore might be expected to have higher rates of violence than never-hospitalized controls.

   In the 10 years since the ECA data were published, mounting evidence of a reliable association between SMI and rates of violence has been found, but, again, with little consideration of motivational influences. As with the ECA data findings, the most convincing evidence is provided by studies of subjects "unselected" for either their mental illness or criminal justice histories.

   Tiihonen and colleagues (1997), for example, followed up on a 1966 birth cohort (n = 12,058) in northern Finland to determine the risk of criminal behavior associated with specific mental disorders. At age 26, 503 of the 5,636 (8.9%) male subjects still living had committed at least one criminal offense; 165 (2.9%) had committed a violent offense. Tiihonen and colleagues (1997) found that after controlling for socioeconomic status (SES), a diagnosis of schizophrenia increased the risk of any criminal offense 3.0 times and of a violent offense 7.2 times; mood psychosis increased the risk of any offense 6.8 times and of a violent offense 10.4 times. The influence of co-occurring substance abuse disorders was tentatively assessed, but the small number of offenders of a particular diagnosis, with and without substance abuse, prevented any firm conclusions. Consequently, these odds ratios probably overestimate the unique influence of a diagnosis of schizophrenia or mood psychosis on the risk of violent or criminal behavior.

   Arseneault and colleagues (2000) followed up on 84 percent of a 12-month, total-city birth cohort (n = 961) in Dunedin, New Zealand, with psychiatric and violence history interviews at 21 years of age. They found that those meeting the diagnostic criteria for a schizophrenia spectrum disorder were 4.6 times more likely to have been
convicted of a violent crime or to have reported violent behavior in the year before the interview. The risk decreased somewhat after controlling for sex, SES, and co-occurring disorders such as alcohol dependence, but people with schizophrenia spectrum disorders were still 2.5 times more likely to have been violent in the previous year.

A study of homicide offenders in Finland by Eronen and colleagues (1996a) is also compelling. Although the sample was unselected, the fact that Finnish police were able to solve 96.9 percent of these homicides probably eliminated any potential bias of selecting subjects based on their criminal histories (e.g., that homicide offenders with SMI were more likely to be apprehended). Between 1984 and 1991, 994 individual homicide offenders were identified. A psychiatrist evaluated all offenders and provided the courts with information on psychiatric status. Eronen and colleagues found that a diagnosis of schizophrenia increased the risk of homicide 8 times in males and 6.5 times in females. Additional analyses on a larger sample of Finnish homicide offenders arrested between 1980 and 1991 confirmed these findings and also found that the homicide risk for patients with schizophrenia decreased only moderately when the influence of co-occurring alcoholism was controlled—from 10.0 to 7.25 times for males and from 8.7 to 5.1 times for females (Eronen et al. 1996b).

In the context of these and other positive findings of an association between SMI and rates of violence (e.g., Wessely et al. 1994; Brennan et al. 2000), one study is notable for its mostly negative findings. Steadman and colleagues (1998) reported the initial findings of the MacArthur Violence Risk Assessment Study, which followed 1,136 psychiatric patients for 1 year after discharge from acute inpatient facilities in three U.S. cities and assessed their rate of violence every 10 weeks. One important comparison was between the rate of violence and other aggressive acts for patients discharged from the Pittsburgh, PA, facility (n = 266 to 314) and the rate reported by a sample of residents (n = 519) in the Pittsburgh community where the patients were discharged.

Unlike the improvised indicators of violence adopted for use in the analysis of the ECA data, a comprehensive violence interview was developed for the MacArthur Study. Subjects and informants were asked whether the subject had engaged in several categories of aggressive behavior in the past 10 weeks. "Violence" was defined as battery resulting in physical injury, sexual assault, assaults involving the use of a weapon, and threats made with a weapon in hand; "other aggressive acts" involved battery not resulting in physical injury. Motive was not assessed.

Steadman and colleagues (1998) found that the violence rate for the patients (11.5%) was significantly greater than that of the community residents (4.6%) only in the first 10-week period following discharge from the hospital. The patients' rate of aggressive acts (25.1%) was significantly greater than that of the community sample (15.1%) only in the second 10-week followup period. Furthermore, the rate increase for both violence and aggressive acts was evident only in patients with alcohol or drug abuse symptoms; no significant differences in rates of violence or aggressive acts existed between the community sample and the patients when neither had symptoms of substance abuse.

Researchers who thought a consensus was finally forming on the association between SMI and rates of violence may be puzzled by Steadman and colleagues' (1998) initial findings on the MacArthur Study. Of the various interpretations of these findings to date, the one offered by Link and Stueve (1998) seems to be the most informative. They speculated that the risk of violence for psychiatric patients is highest in the period before, during, and immediately after hospitalization, when symptoms supposedly are most acute. As symptoms begin to wane with continued treatment during the year following hospitalization, the risk of violence decreases until it is no different from the risk of the community where the patients reside.

Our own analysis of the MacArthur data supports Link and Stueve's (1998) interpretation. We found that the total number of violent acts by patients in the 2-month period before hospitalization was significantly greater than the total number of violent acts by the same patients in each of the five 10-week followup periods. Furthermore, to the extent that criminal offending reflects violent offending, the pattern of violence hypothesized by Link and Stueve (1998) has been observed in another study with an even longer evaluation period. Mullen and colleagues (2000) assessed the pattern of criminal offending in two groups of patients with schizophrenia in Australia; one group was first hospitalized in 1975, the other in 1985. They found that the total number of criminal offenses for the two groups was much greater in the 2-year period 3 to 4 years and 2 years before the first hospitalization (274 and 232 offenses, respectively) than in the 2-year period after (123 offenses).

Consistent with Link and Stueve (1998), our interpretation of the findings reported by Steadman and colleagues (1998) and Mullen and colleagues (2000) is that they demonstrate a treatment effect. This effect was probably first "applied" during the initial hospitalization and then reapplied with each subsequent hospitalization and, with varying degrees of success, in the community during long-term followup care (cf. Swanson et al. 1997; Swartz et al. 1998). In fact, based on our current understanding of the positive effects of antipsychotic medications on violence and criminal behavior (Dorevitch et al. 1999;
Frankle et al. 2001; Steinert et al. 2000), we would not be surprised to find that violence among people with SMI in the community mostly covaries with medication status. Schizophrenia patients would show the lowest violence rates—another finding of the MacArthur Study (Monahan et al. 2001)—presumably because they would be more likely to be taking antipsychotic medications.

A study by Swartz and colleagues (2001) seems to confirm that medication is an important factor in the management of outpatient violence. These researchers followed 331 involuntarily hospitalized patients for 1 year following discharge from the hospital. Patients were randomly assigned to an outpatient commitment or standard release group, both of which received case management services and outpatient treatment. Swartz and colleagues (2001) found that patients on sustained outpatient commitment (longer than 90 days) who regularly used services and who concurrently showed improvement on substance abuse and medication adherence had especially low rates of violence (13%). In contrast, patients not on sustained outpatient commitment who did not use services regularly and who did not take medications as prescribed had particularly high rates of violence (53%). Monahan and colleagues (2001) found a similar, significant effect of service use on violence in the MacArthur Study, although the specific effect of medication was not assessed. Of the patients who attended seven or more treatment sessions during the first 10-week followup period, only 2.8 percent committed a violent act during the second 10-week followup period compared with 12.0 percent of the patients who attended six or fewer treatment sessions. A significant effect was also found for service use during the second 10-week followup period on violence committed during the third 10-week followup period: 3.5 percent of the patients who attended seven or more treatment sessions committed at least one violent act compared with 8.5 percent of the patients who attended six or fewer treatment sessions. Interestingly, Skeem, Monahan, and Mulvey (2002) also found a service-use effect on violence for psychopathic patients in the MacArthur Study. For example, psychopathic patients who attended six or fewer treatment sessions during a given followup period were, on average, 3.5 times more likely to commit a violent act during the subsequent followup period than psychopathic patients who attended seven or more treatment sessions.

Monahan and colleagues (2001) claimed that the findings of the MacArthur Study “underscore the inappropriateness of referring to ‘discharged mental patients’ as a homogeneous class regarding violence in the community” (p. 65). We agree, but we would add the important qualifier that treatment, especially antipsychotic medication, may be a major determining factor of violence rates among the diagnostic subgroups of patients with SMI, especially those with schizophrenia.

Thus, an irony of the study by Steadman and colleagues (1998) is that even though treatment regimens were not reported, their findings could be interpreted as having more to say about the potential to effectively treat violence in patients with SMI than about the association between SMI and violence per se. In this interpretation, the association between SMI and violence is assumed based on convincing findings such as those reported for the birth cohort studies by Arseneault and colleagues (2000) and Tiihonen and colleagues (1997). Following from that assumption, the findings of Steadman and colleagues (1998) indicate that this association can be broken with treatment (cf. Link and Stueve 1998).

3. A reliable association between SMI and rates of violence exists. People with SMI exhibit violent behavior at a rate consistently higher than that of the general population. Their motives for violence are, to some extent, psychotic.

This possibility is the first that incorporates the concept of psychotic motivation, with the added condition that this type of motivation leads to an increase in the actual rate of violence. To date, no study has assessed both conditions of this possibility directly, but several studies have reported findings that hint at the unique motivational influences on violence in the SMI population.

Link et al. (1992) compared arrest rates and self-reported violence in three patient groups and a sample of 386 community residents who had never received psychiatric services. They did not assess motive. After controlling for a number of demographic variables and the homicide rate of the local community, they found that the patient groups were almost always more violent than the never-treated community sample. Potentially more informative was the finding that every difference in the rate of recent violence between the patient groups and the never-treated community sample became nonsignificant when current psychotic symptoms were statistically controlled. Furthermore, current psychotic symptoms were associated with violence not only in the patient groups but also in the never-treated community sample. After controlling for co-occurring substance abuse disorders, the association between psychosis and weapon use was no longer significant, but the association with fighting and hitting remained.

Link and colleagues (1992) was the first major study to find that the association between SMI and rates of violence was “mediated” by psychotic symptoms. (See Baron and Kenny [1986] for a discussion of conditions that must be met to establish a variable as a “mediator.”) However, they were careful to avoid claiming that psychotic symptoms actually cause violence. What their study did provide was a preliminary indication that delusions and hallucinations may be a major factor in the increase in violence rates in the SMI population. This preliminary
indication has been bolstered by several studies finding that patients sometimes act violently in a manner consistent with the content or theme of their psychotic symptoms—findings that are as close as we may come to establishing that psychotic symptoms actually cause violence.

Taylor (1985) was among the first to assess the motivational influences of delusions and hallucinations on criminal behavior. She interviewed 121 psychotic prisoners and found that 112 (93%) had acute psychotic symptoms at the time of their offense. Of these 112, 52 (46%) described motives judged to be "definitely" or "probably" influenced by concurrent psychotic symptoms; 47 (90%) were influenced by delusions, 5 (10%) by hallucinations. Taylor concluded that psychotic persons who commit criminal offenses tend to do so because of their psychotic symptoms. She also speculated that violent or criminal behavior was more likely to be motivated by delusions than by hallucinations.

We have found that the extent to which delusions motivate violence depends on perspective. In one study (Junginger et al. 1998), we assessed the history of violence and delusions since the age of 18 in 54 delusional inpatients. We found that delusional motivation of violence was rare when considered in the context of all delusions. However, of the 40 subjects who reported violent incidents coinciding with a delusion, 16 (40%) reported at least one incident that was rated as "probably" or "definitely" motivated by a delusion. Even more unsettling was that seven of the violent subjects (17.5%) reported at least one act of "extreme" violence that was "definitely" motivated by a concurrent delusion. We concluded that there was a moderate risk that delusions would motivate violence at some time during the course of a violent patient's illness.

Taylor's (1985) speculation that violent or criminal behavior was more likely to be motivated by delusions than by hallucinations has gained some support in the years since her original study. For example, Taylor and colleagues (1998) reviewed the hospital and criminal records of 1,740 patients in residence at any time during a 6-month period in 1993 at three special "high security" hospitals in England. They found that 75 percent of those patients with psychosis were recorded as being driven to offend by their delusions. Hallucinations in the absence of delusions had no obvious effect on the patients' criminal behavior. Swanson and colleagues (1996) analyzed the ECA data for associations between violence and delusions, hallucinations, and schizophrenia. They found that neither hallucinations nor schizophrenia had an independent association with violence in the past year. However, the presence of delusions increased the risk of violence 2.6 times, and the simultaneous presence of both delusions and hallucinations increased the risk of violence 4.1 times.

One of us (J.J.) has looked at the association between command hallucinations and violence and found consistent evidence that hallucinations may influence behavior through aspects of delusional beliefs. A study of 51 psychiatric inpatients and outpatients (Junginger 1990) found that assigning an identity to the hallucinated voice and the presence of a hallucination-related delusion were independently associated with patients' reports of compliance with both dangerous and harmless commands. A follow-up study of 93 psychiatric inpatients (Junginger 1995) again found that being able to assign an identity to the hallucinated voice was associated with compliance with both dangerous and harmless commands.

The presence of hallucination-related delusions and being able to provide an identity to a hallucinated voice probably indicate a more systematized or consistent distortion of reality in which compliance with command hallucinations is more likely to fit. Junginger (1990) noted that compliance may be "easier," in some sense, as questions about a person's own psychotic experience (e.g., "Who's talking to me and why?") are resolved. This interpretation is consistent with the findings just reviewed in which hallucinations did not have an association with violence independent of an association with some aspect of delusions (Swanson et al. 1996; Taylor et al. 1998). In other words, just as psychosis seems to mediate the association between SMI and violence (Link et al. 1992), delusions may mediate the association between hallucinations and violence (see Baron and Kenny 1986). A reliable indicator of a delusional context for a particular hallucination may be the assignment of an identity to the hallucinated voice. In keeping with the perspective of the influence of hallucinations on violence, the more appropriate term signifying the mediating role of delusions would be "hallucination-related hallucination."

Figure 1 is the simplest representation of the motivational influences of violence on the general and SMI populations based on the research reviewed so far. In this representation, conventionally motivated violence rates are assumed to be equal. However, psychotic motivation in the SMI population adds to conventional motivation and results in an overall rate of violence significantly greater than in the general population.

Our intention was to depict the potential, unique influence of SMI on violence represented by the violence rates of untreated patients. Although certainly arguable, we took as a conservative measure of this potential the 2.5 odds ratio for violence among patients with schizophrenia spectrum disorders found by Arsenault and colleagues (2000) after controlling for sex, SES, alcohol dependence, and other disorders. Thus, in figure 1, the violence rate for the SMI population is 2.5 times that of the general population—a 150 percent increase. In the cut out, delusions
are assumed to account for most psychotic motivation, with a smaller proportion attributed to delusion-related hallucinations. The remnant represents the possibility that hallucinations may influence violence independent of delusions. McNiel (1994), for example, reviewed several “quantitative” studies of the association between hallucinations and violence and concluded that there was, in fact, an association between the two. However, he did not consider the mediating role of delusions.

4. No association exists between SMI and rates of violence. People with SMI do not exhibit violent behavior at a rate higher than that of the general population. However, their motives for violence are, to some extent, psychotic.

This is the last of the four possibilities and potentially the most intriguing. Can a convincing argument be made that persons with SMI are motivated to commit violent acts by delusions and hallucinations, but that this psychotic motivation does not lead to an increase in the actual rate of violence? In other words, a very real association between SMI and violence exists but is not reflected in violence rates. In reference to figure 1, the bar for the SMI population would be compressed so that the general and SMI populations have roughly the same rate of violence, but some portion of the motivational influences on the SMI population would remain psychotic. This possibility could help explain the seemingly contradictory evidence on the risk posed by command hallucinations.

Several studies have found that compliance with dangerous command hallucinations is not uncommon. Hersh and Borum (1998) reviewed the empirical literature for compliance rates and came up with seven studies with reasonable sample sizes that reported rates between 0 and 91.7 percent for at least partial compliance with dangerous commands; most of the studies reported rates between the two extremes (median = 43%). However, to our knowledge, only McNiel and colleagues (2000) have found an increase in the actual rate of violence for people experiencing command hallucinations, and those researchers did not assess whether the violence was actually the result of compliance with the commands. Cheung and colleagues (1997) assessed the association among delusions, hallucinations, and violence in 31 violent, long-term psychiatric inpatients with chronic schizophrenia and a matched sample of nonviolent patients. Although they found differences between the violent and nonviolent groups in several aspects of delusions, no increased risk of violence associated with command hallucinations was present. Zisook and colleagues (1995) reviewed the clinical and research records of 93 psychiatric patients with auditory hallucinations and a diagnosis of schizophrenia and compared those with \( n = 46 \) and without \( n = 47 \) command hallucinations on a number of clinical and outcome variables. They found that the group with command
hallucinations did not differ from the group without command hallucinations in global symptom severity or in severity of positive or negative symptoms, and there were no differences between the groups in the number of violent or impulsive acts. Rudnick (1999) identified seven "controlled studies" between 1987 and 1997 of the association between command hallucinations and violence and concluded that all seven supported the absence of any relationship.

What seems contradictory about these findings is the following: Although there is compelling evidence that persons experiencing command hallucinations occasionally comply with dangerous commands, only McNiel and colleagues (2000) have found an increase in the actual rate of violence, and this increase may not have been specifically related to compliance. Although the ultimate explanation for this paradox may be one of effect size and statistical power (e.g., base rates for compliance may be too low and sample sizes too small to find a statistically significant effect on the overall rate of violence), we would argue that negative findings on the association between command hallucinations and rates of violence should not be taken to imply anything about the level of compliance. Considering only violence rates may overlook other, very real associations between SMI and violence in the form of motivational influences—in this case, violent compliance with dangerous commands.

We must also consider the "noise" introduced into these and other findings by the probable inclusion of treated and untreated patients. One presumed effect of antipsychotic medication on violence rates is the effective reduction of psychotic symptoms as motivators of violence. If figure 1 were redrawn to represent the violence rate of medicated patients, a great deal of the violence motivated by psychotic symptoms would be removed, resulting in a rate roughly equivalent to that of the general population.

Furthermore, indirect effects of the reduction of psychosis on violence may exist. To the extent that reducing psychosis results in a reduction of other risk factors for violence such as substance abuse, violence rates may be reduced beyond the direct effect of delusions and hallucinations. In fact, given the sedating effects of some antipsychotic medications and common side effects such as fatigue, it is conceivable that the violence rate of medicated patients could actually be less than that found in the general population because action on conventional motivators also would be dampened. Studies that fail to account for the effects of treatment may find violence rates in the SMI population ranging from much higher to somewhat lower than those of the general population, with the contribution of psychotic motivation more or less evident depending on the respective percentages of treated and untreated patients in the sample.

As we discussed earlier, the association between delusions and violence seems more firmly established than that between hallucinations and violence. However, in the context of numerous positive findings of an association between delusions and violence, findings from the MacArthur Study seem to call this apparent association into question. Appelbaum and colleagues (2000) assessed the association between delusions and violence rates in the 1,136 psychiatric patients in the MacArthur Study. A set of questions taken mostly from the DIS was used to identify delusional patients at baseline and at each of the five 10-week followup periods. Patients rated as "definitely" or "possibly" delusional were assessed further with an adaptation of the Maudsley Assessment of Delusions Schedule (Taylor et al. 1994). Motive was not assessed. Appelbaum and colleagues (2000) found that no significant differences in rates of violence were present between delusional and nondelusional patients at any of the followup periods. In fact, the only significant findings came at the first and second followup periods, when there was a negative association between violence and "body/mind control" delusions—types of delusions that have had a positive association with violence rates in two previous studies (Link and Stueve 1994; Link et al. 1998).

As with the study by Steadman and colleagues (1998), the findings reported by Appelbaum and colleagues (2000) could be interpreted as having more to say about the potential to effectively treat delusional violence than about the association between delusions and violence per se, even though treatment regimens were not described. However, it may be a mistake not to consider the possibility that the findings reported by Appelbaum and colleagues (2000) indicate essentially what was found: that there is no association between delusions and rates of violence, or that this association is much weaker than suggested by previous research (a similar consideration should be given to the findings reported by Steadman et al.). As with command hallucinations, we would be left with the apparent paradox that the delusional motivation of violence is real, but its occurrence may not lead to an increase in the actual rate of violence (i.e., the fourth possibility). The resolution of this paradox might involve looking at how conventional and psychotic motivators are "balanced," in some sense, to keep violence rates roughly equivalent. It may be, for example, that people with SMI have fewer opportunities to commit conventional violence because they are socially isolated, but psychotic motivation compensates for this "opportunity deficit."

In any case, we would argue again that negative findings on the association between SMI (Steadman et al. 1998) or psychotic symptoms (Appelbaum et al. 2000) and rates of violence should not be taken to indicate the
absence of other clinically relevant associations between SMI and violence. Furthermore, failure to account for the respective contributions of treated and untreated patients greatly confuses any interpretation of the unique effect of SMI, and the specific effect of psychosis, on violence rates.

Conclusions

Studies of the association between SMI and violence have used different designs (e.g., cross-sectional, retrospective, and prospective) to assess diverse subject samples (e.g., discharged patients, community residents, and birth cohorts) on various violent outcomes (e.g., arrests and convictions, notations of violence in hospital records, and self-reported violence). It is difficult to know how the findings of these studies relate to one another. However, as implied by Link and Stueve (1998), a consistent finding across this assortment of studies suggests that untreated persons with certain types of SMI have an elevated risk of violence, broadly defined. This finding appears to be true even in the MacArthur Study: 14.0 percent of the patients who attended no treatment sessions during the first 10-week follow-up period committed at least one violent act during the second followup period; this rate is three times the 4.6 percent 10-week prevalence of violence among nonpatients living in the same neighborhoods as the discharged patients in Pittsburgh (Monahan et al. 2001).

The findings of Link and colleagues (1992) indicate that the elevated risk of violence in the SMI population is at least partially mediated by psychotic symptoms. Several studies finding that persons can be directly motivated to violence by delusions and hallucinations (e.g., Junginger 1995; Junginger et al. 1998; Taylor et al. 1998) suggest that psychotic motivation accounts for a significant portion of this elevated risk. A major research issue now would seem to be the specific contribution of psychotic motivation to rates of violence in the SMI population. Referring again to figure 1, four questions are relevant to this issue:

1. What portion of the violence in the SMI population has a psychotic motivation?
2. What are the respective contributions of delusions and hallucinations to psychotic motivation of violence in the SMI population?
3. Are there identifiable subgroups in the SMI population for which psychotic motivation of violence is more likely? Or, more specifically, are there identifiable subgroups that can be characterized by variations of the values of the parameters in figure 1?
4. What is the reduction in violence rates brought about by treatment, especially antipsychotic medication, and what is the respective effect of medication on psychotic and conventional motivation?

The crucial issue overlooked in studies of the association between SMI and violence is the motivation for the subjects' offenses. "Why did you ...?" should be a standard question asked of subjects in these studies. The answer to that question, and how it is interpreted, should go a long way toward finally establishing a causal link between SMI and violence. In the meantime, recognizing the independence of motivational influences and violence rates and considering the effect of treatment on violence may help explain the paradox of current research: Delusions and hallucinations may motivate violent behavior (Junginger 1995; Junginger et al. 1998; Taylor et al. 1998), but this psychotic motivation may not be reflected in the actual violence rate (Steadman et al. 1998; Appelbaum et al. 2000).

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The Authors
John Junginger, Ph.D., is Acting Coordinator, Mental Health Clinic, VA Maryland Health Care System; and Associate Professor, University of Maryland School of Medicine, Baltimore, MD. Lynanne McGuire, Ph.D., is Assistant Professor, University of Maryland-Baltimore County, Baltimore, MD.