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Violent Thoughts and Violent Behavior Following Hospitalization for Mental Disorder

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Using a standardized schedule of questions, this study examined (a) the prevalence of self-report of violent thoughts by patients hospitalized for mental disorders compared with nonpatients, (b) the persistence of violent thoughts after discharge, and (c) the relation between patients' violent thoughts while hospitalized and violent acts within 20 weeks after hospital discharge. About 1/3 of the patients reported thoughts of violence while hospitalized, more than twice the proportion found among nonpatients. Reporting violent thoughts in hospital was significantly related to engaging in violent acts within 20 weeks after discharge for non-White patients, patients without major mental disorder but with substance abuse diagnoses, patients with high symptom severity, and patients whose reports of violent thoughts persisted after discharge. Reporting violent thoughts was significantly related to measures of psychopathy, anger, and impulsiveness.

Asking patients whether they have had thoughts about harming others has long been a standard part of mental status examinations (Appelbaum & Gutheil, 1991). The underlying assumption, of course, is that a positive self-report about harming someone may foreshadow aggressive behavior and that a denial of such thoughts mitigates the risk of harm to others within the near future.

Research has examined the relationship between self-reports of thoughts of harming others and actual aggression among sexual psychopaths (e.g., Dean & Malamuth, 1997; Malamuth, 1998), as well as nonclinical samples such as schoolchildren (e.g., Rosenfeld, Huesmann, Eron, & Torney-Purta, 1982), adolescent delinquents (e.g., Silver, 1996), and college students (e.g., Greenwald & Harder, 1997; Kenrick & Sheets, 1993). The application of these findings to individuals with mental illness, however, and the predictive power of self-reports of violent thoughts by patients hospitalized for mental disorders have not been examined empirically.

A social–cognitive model of aggression offers a theoretical perspective for considering the relation between imagined violence and violent behavior on the basis of assumptions pertaining to social information processing (Huesmann, 1998). When individuals encounter and appraise social situations, they seek a match between the cues in that situation and cognitive schemas, or stored memories, that have been learned as templates for making sense of social events. Schemas not only attribute meaning to the event ("He bumped me—he meant to harm me") but also are instrumental in leading to the retrieval of cognitive "scripts" that act as learned guides for one's response to the social situation as interpreted (e.g., "Hit him in retaliation"). Individual differences among people in their social development result in differences in the schemas and scripts that are available to them, as well as the relative readiness with which certain scripts will be cued. Once cued, scripts do not always result in behavioral responses consistent with the script. Individuals often are capable of appraising the probable consequences of a script when it is cued and rejecting it if the outcome is undesired (e.g., if aggression appears too risky).

Of particular importance in this model is the notion that frequent imagined violence serves as an elaborative rehearsal that increases the risk of future violent behavior through a series of cognitive transformations. Rehearsing an aggressive act reinforces the schemas through which the individual evaluates and interprets social cues in later situations and increases the likelihood that aggressive scripts will be reactivated (Huesmann, 1998). This likelihood is

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even greater under physiological arousal that often accompanies a perceived threatening situation. The individual's narrowed attention under such circumstances restricts the accessibility of infrequently rehearsed cognitive scripts, leaving any frequently rehearsed scripts involving harm to others to serve as the template for response to the situation. Some studies have found that script rehearsal in the form of imagined behaviors increases the likelihood that one will engage in them (e.g., Anderson, 1983; Carver, Ganellen, Froming, & Chambers, 1983) and that cognitive rehearsal of violent behavior plays a role in some types of criminal behavior (e.g., Deu & Edelmann, 1997).

What would this social–cognitive model of aggression predict about (a) the prevalence of imagined harm to others among patients hospitalized for mental illness and (b) patients' hospital-based reports of imagined violence as a factor in estimating the risk of later violence after community reentry?

First, it would anticipate a higher prevalence of imagined violence for hospitalized patients with mental illness than for persons in general in the community. Patients hospitalized with mental illnesses are likely to include a disproportionate number of individuals who were hospitalized because of threatened or actual aggression, and the theory presumes a relation between aggression and frequent rehearsal of aggressive scripts.

Second, a social–cognitive perspective would suggest that patients who report imagining doing harm to others are at higher risk of violent behavior when they reenter the community than are patients who do not report imagined violence. The relationship would be explained in terms of the effects of script rehearsal on individuals' reactions to social situations.

Third, the model would predict that among persons with mental disorders who have violent thoughts, those with greater symptom severity would be more likely to engage in actual violence. Construing greater symptom severity as a form of increased stress, social–cognitive theory would see this as restricting one's access to infrequently rehearsed cognitive scripts, leaving frequently rehearsed scripts involving harm to others to serve as the template for responses to threatening situations.

Fourth, the theory suggests that patients who report imagined violence not only when hospitalized but also while in the community are more likely to manifest violent behavior in the community than are patients reporting imagined violence only in the hospital. Repeated reports of imagined harm to others across different social settings suggests that scripts related to these images, rather than to a particular social setting (in this case, hospitalization), are better rehearsed and transcend social circumstances.

Finally, apart from specific theoretical expectancies, it would be worthwhile to know whether patients who imagine doing harm to others more often manifest other personality factors that are known to be associated with violence. Knowing the relation of such factors (anger, impulsiveness, psychopathy) to imagined violence would assist in interpreting the significance of any relation between imagined violence and actual violence.

The present study sought to clarify the relationship between patients' reports of thoughts or fantasies about harming others (hereinafter, *imagined violence*) and actual future violent behaviors. Specifically, the study's aims were (a) to describe the nature and prevalence of imagined harm to others for persons hospitalized with mental illnesses; (b) in that population, to describe the relation of imagined harm to demographic variables and to personality variables theoretically related to imagined violence (anger, impulsiveness, psychopathy); (c) to compare the prevalence of imagined violence among persons hospitalized with mental illnesses with persons in the general population in the community; and (d) to examine the relation between patients' reports of imagined violence and violent behavior when they reentered the community after hospitalization.

Method

The results reported in this study were obtained in a project known as the MacArthur Violence Risk Assessment Study (Steadman et al., 1994, 1998). The purpose of that project was to identify the prevalence of, and risk factors for, community violence in a sample of people discharged from acute psychiatric facilities.

Participants

Hospitalized patient samples. The MacArthur Violence Risk Assessment Study enrolled 1,136 patients hospitalized with mental disorders, recruited at the time of their admissions to acute inpatient facilities at three sites (Worcester, Massachusetts; Pittsburgh, Pennsylvania; and Kansas City, Missouri). Selection criteria were (a) civil admissions; (b) between the ages of 18 and 40 years; (c) English speaking; (d) of White, Hispanic, or African American ethnicity; and (e) a medical record diagnosis of schizophrenia, schizophreniform disorder, schizoaffective disorder, depression, dysthymia, mania, brief reactive psychosis, delusional disorder, alcohol or other drug abuse or dependence, or a personality disorder.

A detailed description of the sample is provided by Steadman et al. (1998). About three fifths of the participants were male, and 69% were White (29% African American and 2% Hispanic, grouped together in this report as non-White). About 25% were between 18 and 24 years of age, and 75% were between 25 and 40 years of age. Primary diagnoses established by research criteria (see *Data Collection Procedures* below) included schizophrenia or schizoaffective disorder (17%), depression (40%), bipolar disorder (13%), other psychotic disorder (4%), alcohol or drug abuse or dependence (24%), and personality disorder only (2%). About 36% of the patients had diagnoses of substance abuse disorder together with another diagnosis. About 40% of the patients were hospitalized on involuntary commitments.

As described later, patients were contacted five times at 10-week intervals following their hospital discharge. The greatest attrition was at the first follow-up (26%), with additional attrition being 2% (second follow-up), 4% (third follow-up), and 2% (fourth and fifth follow-ups) of the total baseline sample. Compared with enrolled patients who were lost to follow-up, patients in the follow-up samples were significantly more likely to have a medical record diagnosis of bipolar disorder, less likely to have a medical record diagnosis or history of alcohol or other drug abuse, less likely to have a legal status of gravely disabled, and less likely to have a documented history of violence toward family members or others.

Some analyses involved calculations for three diagnostic groups. The first group consisted of patients with a research diagnosis of major mental disorder (schizophrenia, schizophreniform disorder, schizoaffective disorder, depression, dysthymia, mania, cyclothymia, or other psychotic disorder [including delusional disorder, atypical psychosis, and brief reactive psychosis]) who did not also have a diagnosis of substance abuse or dependence (the major mental disorder and no substance abuse [MMD–NSA] group). The second group consisted of patients with a diagnosis of major mental disorder and a co-occurring diagnosis of substance abuse or dependence (the major mental disorder and substance abuse [MMD–SA] group). A third group consisted of patients with a diagnosis of an "other" mental disorder (e.g., a personality or an adjustment disorder and several cases of "suicidality") and a co-occurring diagnosis of substance abuse or

dependence (the other mental disorder and substance abuse [OMD–SA] group).

Community nonpatient sample. In one site (Pittsburgh), a community nonpatient sample (n = 519) was identified for which the distribution of the census tracts in which that sample resided was the same as the distribution of the census tracts in which the patients resided during the year following discharge. The community nonpatients had to have lived at the current address for at least 3 months, be between the ages of 18 and 40 years, and be of either White or African American ethnicity. This sample was weighted using the iterative proportional fit process (Bishop, Fienberg, & Holland, 1975) to conform to the 1990 U.S. Census distributions on gender, ethnicity, age, and education for the census tracts in which the patients resided during the 1-year follow-up described later (see *Data Collection Procedures*).

Measures Theoretically Related to Violence

In the MacArthur Violence Risk Assessment Study, more than 130 variables were collected on each participant during hospitalization, including a large number of psychological tests and clinical observations. One of the instruments was the Schedule of Imagined Violence (SIV), which was developed specifically for the study. Others related to the results of the present article were the Barratt Impulsiveness Scale (11th version; BIS–11; Barratt, 1994), the Novaco Anger Scale (NAS; Novaco, 1994), the Hare Psychopathy Checklist—Screening Version (PCL–SV; Hart, Hare, & Forth, 1994), the Brief Psychiatric Rating Scale (BPRS; Overall, 1988; Overall & Gorman, 1962), and a series of questions to assess for presence and nature of delusions.

SIV. The SIV is a structured set of eight questions with coded response categories (see Appendix). Only participants answering the first question positively (whether the respondent has ever had daydreams or thoughts about physically hurting or injuring some other persons) are asked the remaining seven questions, which inquire about the nature of the respondent's injurious ideas. Each question inquires about a different quality of such images: recency (Question 2), frequency (Question 3), chronicity (Question 4), similarity/diversity in type of harm (Question 5), target focus versus generalized (Question 6), change in seriousness of harm (Question 7), and proximity to target (Question 8). Responses do not contribute to a total score; each question is examined separately.

BIS–11. The BIS–11, a paper-and-pencil instrument, uses 29 items to identify individuals' status regarding motor, cognitive, and nonplanning impulsiveness. In its 11th version, the instrument has a substantial history of psychometric refinement and research relating BIS scores to aggression (Barratt, 1994).

NAS. The NAS is a paper-and-pencil instrument based on Novaco's theoretical construction of the relation between anger and aggression. The instrument has three subscales in the cognitive, arousal, and behavioral domains, as well as a separate component that assesses anger intensity and generality across a range of provocations. There is substantial empirical evidence that NAS scores are related to aggressive behaviors (Novaco, 1994).

PCL–SV. The PCL–SV was developed by Hart et al. (1994) as a shorter version of the Hare PCL–Revised (PCL–R; Hare, 1991). It uses a clinical interview to produce information with which people can be rated on 12 items that are theoretically related to Cleckley's (1976) concept of psychopathy. A significant body of research supports a strong relation between scores on the PCL–R and violent behavior (Hart et al., 1994).

To determine the presence and nature of delusions, the study used a series of interview questions drawn primarily from the Diagnostic Interview Schedule (Robbins, Helzer, Croughan, Williams, & Spitzer, 1981), presented in a procedure at hospital baseline as described by Appelbaum, Robbins, and Roth (1999). In addition, the BPRS was administered to patients at hospital baseline. The BPRS (Overall & Gorman, 1962) is a method for rating the presence and severity of psychiatric symptoms/signs manifested by a patient on the basis of a clinical interview during which inquiry and observation provide data for the ratings. Severity is rated on a 7-point scale on each of 19 symptom items, the sum of which produce the BPRS total score.

Data Collection Procedures

All the data were obtained by extensively trained research assistants for whom reliability of scoring of instruments was established (Steadman et al., 1998). The study design included data collection with patients during their hospitalization and during community recontacts at 10-week intervals from the date of their discharges (five times in a year). Mean time between hospital admission and approach by the research interviewer to obtain informed consent was 4.5 days. Among the data obtained during participants' baseline interviews in the hospital were demographic and historical information, the SIV, and the five other measures noted above.

In addition, to establish the research diagnoses reported in this study, research clinicians interviewed patients using the *DSM–III–R* Checklist (Hudziak et al., 1993; Janca & Helzer, 1990)—or to confirm a personality disorder, the Structured Interview for *DSM–III–R* Personality when no eligible Axis I diagnosis was present. Interviewers underwent training in the use of these tools, and clinician pairs rating 22 videotaped diagnostic interviews had an overall agreement rate of 83% (Cohen's κ = .59). Interviewers' diagnostic classification of the participants corresponded to the participants' chart diagnoses in 86% of the cases. A consulting psychiatrist was available at each site to assist the interviewers in problematic cases.

Patient follow-up interviews in the community after discharge were conducted by research interviewers in person (89%) or by telephone (11%). The SIV was part of that interview at each follow-up. A collateral informant for each participant was also interviewed during each follow-up. At follow-up, a participant was asked to nominate as a collateral informant the person who was most familiar with his or her behavior in the community. Collateral informants were most often family members (47%) but were also friends (24%), professionals (14%), significant others (12%), or others (3%). Arrest and rehospitalization records were also obtained during the follow-up period.

For the community nonpatients, interviews were conducted only once. They and their collateral informants were questioned about the participant's behavior in the past 10 weeks and were administered the SIV in the context of an interview collecting other data for the study. Official arrest records were also obtained.

Index of Violent Behavior

At the hospital interview and at each 10-week community follow-up, patients and collateral informants (as well as community nonpatients and their collaterals at the time of their single interview) were asked whether the participant had engaged in several categories of aggressive behavior in the past 10 weeks. If a positive response was given, the participant or informant was asked to list the number of times the behavior occurred. Detailed, standardized information was obtained about each act, including the target and location. Violence was defined as battery that resulted in physical injury, sexual assaults, assaultive acts that involved the use of a weapon, or threats made with a weapon in hand. Acts reported by any information source were reviewed by two independent coders concerning whether they met the study's specified criteria for violence, with disagreements resolved through team consensus while applying the study's standard criteria (available from the authors). When an incident was described by more than one source, team consensus was also used to obtain a single reconciled report of violence. Only the most serious act for each incident was included. (See Steadman et al., 1998, for a more detailed description of this process.)

Although the MacArthur Violence Risk Assessment Study (Steadman et al., 1998) involved five follow-ups during a year, analyses for the present

study focused primarily on violent acts during the first two follow-up periods (the first 20 weeks after discharge) because rates of violence were highest during this period.[1] In addition, one would expect that the ability of patient characteristics during hospitalization to predict violent acts after hospital discharge would diminish as time from discharge increases.

Statistical Analyses

Questions 1 and 2 of the SIV were used to make a dichotomous split of the hospitalized patient sample, at baseline and then at each follow-up in the community, and of the Pittsburgh community nonpatient sample based on the single measurement point for that group. They were considered SIV positive (SIV+) at a given interview if they answered Question 1 positively (that they sometimes have daydreams or thoughts about physically hurting other people) and indicated on Question 2 that the last time this had happened had been at least within the past 2 months. They were classified SIV negative (SIV−) if they failed to meet either criterion.

SIV+ prevalence was examined for patients at hospital baseline and for community nonpatients—by gender, age, ethnicity, and (for patients) diagnostic category and symptom severity—as well as the relations between patients' SIV status at hospital baseline and at various follow-up interviews in the community. Comparisons between hospitalized patients and community nonpatients used the Pittsburgh hospitalized patient sample only because all of the community nonpatients were obtained from that study site.

The presence of violent behavior reported at the first or second follow-up interview (i.e., violence within the first 20 weeks after discharge from the hospital) was examined for SIV+ and SIV− patients. In addition, violence prevalence rates were calculated for two classes of patients: (a) SIV+ persistent, defined as SIV+ at hospital baseline and at both the first and second follow-ups, and (b) SIV+ nonpersistent, defined as SIV+ at hospital baseline but at none of the five community follow-up interviews.

Finally, we compared patients' NAS, BIS–11, PCL–SV, and delusion scores at hospital baseline with their SIV status at hospital baseline. We performed a logistic regression analysis to determine whether SIV status at baseline would account for variance in violent incidents in the community not already accounted for by the other variables. On the first stage, we entered the demographic characteristics (age, gender, ethnicity, and years of education); on the second stage, the patients' scores on the NAS, the BIS–11, the PCL–SV, and delusion; on the third stage, the SIV; and on the fourth stage, the interaction terms between variables from Stages 2 and 3.

Results

Prevalence and Description of Imagined Violence

At baseline, 339 of the 1,136 patients were SIV+. The percentage of patients who were SIV+ at baseline (hospital interview) and at each follow-up in the community (identified as F1–F5) was 30% at baseline, 27% at F1, 28% at F2, 24% at F3, 22% at F4, and 21% at F5. Among patients for whom SIV data were available across all of the follow-ups, the percentage of patients reporting violent thoughts during at least one interview was 42% through F1, 49% through F2, 52% through F3, 55% through F4, and 57% through F5.

Table 1 shows the percentage of patients in the total sample in each demographic, diagnostic, and symptom severity group who were SIV+ at baseline. The percentage of SIV+ participants in various gender, age, and diagnostic categories remained fairly close to the SIV+ percentage for the total patient group, although statistically significant differences in SIV+ prevalence were found among categories within all of these variables except gender (see Table 1). Specifically, SIV+ prevalence among patients was significantly higher for non-Whites than for Whites, for younger than for older age groups, for patients with diagnoses involving substance abuse or dependence, and for patients with greater symptom severity. Similar age and ethnicity differences were found for the community nonpatients, as well as a higher SIV+ rate for men than for women.

Table 2 summarizes SIV+ patients' responses to the remaining SIV items at baseline as percentages of the total SIV+ sample and as percentages of White and non-White men and women in the SIV+ patient sample. Violent ideation occurred more frequently than once a week for about one half of the SIV+ patients (Question 3), and most of them reported having such ideas longer than just the past 3 months (Question 4). About one third expressed stability in the type of harm they imagined doing to others, whereas the remainder claimed that their images of violence were more varied in content (Question 5). About two fifths indicated consistency regarding the person they imagined harming, whereas the images of the remainder were more generalized, focusing on no particular person consistently (Question 6). About one fourth said that the injuries they imagined inflicting had recently escalated in seriousness (Question 7), and 60% said that recently they had imagined harming people while they were with or watching them (Question 8).

Nine of the 21 possible item pairs (when Question 2 was included) manifested correlations beyond the .01 level of statistical significance, but only 3 were above $r = .20$ and only one "cluster" of interrelated items emerged. If patients reported that their violent fantasies were about a particular person (Question 6), the thoughts tended to have begun fairly recently (Question 4, $r = .33$, $p < .001$) and to have remained relatively constant with regard to the type of harm that was being imagined (Question 5, $r = .26$, $p < .001$).

Table 2 also shows that in general the above results were similar across ethnic groups and gender classifications, with a few notable exceptions. Compared with SIV+ patients overall, the violent ideation of women tended somewhat more often to have begun relatively recently (Question 4) and to be focused on a particular person (Question 6). In addition, the violent ideation of non-White men tended more often to be frequent (Question 3) and to be escalating in seriousness of the type of harm imagined (Question 7).

[1] The decline in prevalence of violent behaviors after the second follow-up was primarily for patients with co-occurring substance abuse. See Steadman et al. (1998) for a description of analyses that were performed to test three artifactual explanations for the decrease in violence across the 1-year follow-up. Analyses did not support the notions that the downward trend across the year could be explained by greater attrition for patients who were violent or by less time at risk for committing violence in the community owing to more time spent in hospitals or jails in the later follow-up periods. Similarly, we wondered whether patients might have developed a "response set" to report fewer violent behaviors in later follow-ups, motivated by a potential desire to shorten the interview by reducing examiners' inquiries that followed each report of violence. Analyses showed, however, that patients did not shorten their reports of other events (e.g., social contacts between follow-ups) that also elicited lengthy examiner inquiries.

Table 1
Significance of Differences Between Demographic Groups in Percentage of SIV+ Status for Patients (Hospital Baseline) and Community Nonpatients (Percentage of Samples)

	Hospitalized patients (n = 1,136)				Community nonpatients (n = 519)			
Variable	%	χ^2	df	$p<$	%	χ^2	df	$p<$
Total sample (N = 1,655)	30				14			
Gender				*ns*		5.40	1	.05
Male	31				18			
Female	28				11			
Race		10.90	1	.01		6.50	1	.05
White	27				12			
Non-White	37				20			
Age (years)		8.50	3	.05		11.20	3	.05
18–24	33				21			
25–29	34				15			
30–34	30				10			
35–40	24				9			
Diagnosis		7.80	2	.05				
MMD–NSA	25				NA			
MMD–SA	34				NA			
OMD–SA	32				NA			
Symptom severity (BPRS)		37.80	2	.001				
Low (18–29)	17				NA			
Medium (30–39)	27				NA			
High (40+)	40				NA			

Note. Community nonpatient rates are not directly comparable with hospitalized patient rates because community nonpatients were obtained from only one of the three study sites (see Table 3 for that comparison). SIV+ = Schedule of Imagined Violence positive; MMD–NSA = major mental disorder and no substance abuse; MMD–SA = major mental disorder and substance abuse; OMD–SA = other mental disorder and substance abuse; BPRS = Brief Psychiatric Rating Scale; NA = not applicable.

Comparison With Community Nonpatient Sample

Because community nonpatient data were obtained in only one study site (Pittsburgh), the comparison of patients to community nonpatients involved only participants from that site. As seen in Table 3, the proportion of SIV+ participants in the hospitalized patient sample was about two times greater at baseline than in the community nonpatient sample and was significantly greater for every gender, ethnicity, and age.

As seen in Table 2, SIV+ patients differed markedly at hospital baseline from SIV+ community nonpatients on several of the

Table 2
For SIV+ Participants, Percentage Who Answered "Yes" to SIV Questions 3–8

	Patient/nonpatient subsamples		Patients by race and gender					
SIV no. and question	Hospitalized SIV+ patients (all sites) (n = 339)	Community SIV+ nonpatients (Pittsburgh only) (n = 75)	White male (n = 127)	Non-White male (n = 80)	White female (n = 84)	Non-White female (n = 48)	$\chi^2(3)$	p
3. In past 2 months, fantasies more than once a week	49	35	48	60	45	42		*ns*
4. Started having fantasies only in past 3 months	27	33	20	28	33	38		*ns*
5. Same type of harm imagined each time	36	55	33	35	46	27		*ns*
6. Fantasies about same person (vs. many people)	42	58	36	31	54	52	12.60	.01
7. Injuries imagined have escalated in seriousness	25	16	25	35	12	31	12.90	.01
8. In past 2 months, ever had fantasies while with/watching person who one imagines harming	60	46	57	65	59	63		*ns*

Note. Community nonpatient rates are not directly comparable with hospitalized patient rates because community nonpatients were obtained from only one of the three study sites. SIV+ = Schedule of Imagined Violence positive.

Table 3
Comparison of Pittsburgh Hospitalized Patients (Hospital Baseline) With Pittsburgh Community Nonpatients in SIV+ Rates by Demographic Variables

Variable	% hospitalized patients (n = 391)	% community nonpatients (n = 519)	$\chi^2(1)$	$p<$
Total sample (N = 910)	33	14	43.00	.0001
Gender				
Male	35	18	17.90	.0001
Female	29	11	23.10	.0001
Race				
White	30	12	31.40	.0001
Non-White	38	20	11.50	.001
Age (years)				
18–24	36	21	6.90	.01
25–29	37	15	12.40	.0001
30–34	36	10	21.80	.0001
35–40	24	9	10.20	.001

Note. SIV+ = Schedule of Imagined Violence positive.

remaining items in the SIV. (Note, however, that these are not directly comparable because the community sample was obtained in Pittsburgh only.) Compared with the community SIV+ participants, the SIV+ patients were more likely to be having more frequent violent ideas (Question 3) and experiencing escalation in the type of harm imagined (Question 7) and somewhat more likely to be imagining harm to people while they were with or watching them (Question 8).

Continuity of Violent Ideation

We examined the relation between SIV+ status at baseline and at various community follow-up points for the hospitalized patients. These relationships are presented in several ways in Table 4.

First, at each community follow-up, the percentage of patients who were SIV+ and had been identified as SIV+ at baseline remained about the same (in the vicinity of 50%) at each of the five follow-ups. Second, at each 10-week follow-up, about one half of the patients who were SIV+ at that point were also SIV+ at the previous follow-up 10 weeks earlier. Third, it is not surprising that at each follow-up point a decreasing percentage of patients identified as SIV+ had never been identified as SIV+ at some earlier point. Almost everyone who had ever been identified as SIV+ during the year had been identified at some point during the first half of the year after hospital discharge (i.e., about 80% by F3). Fourth, about 20% of SIV+ patients (see the F4 and F5 columns in Table 4) were consistently SIV+ at baseline and throughout each subsequent community follow-up during the year following their discharge.

Violent Thoughts and Violent Behavior

Table 5 shows for hospitalized patients the relation between SIV status at baseline and violent behavior at F1 or F2 (i.e., at least one incident of violent behavior within 20 weeks after returning to the community). The base rate of violent behavior for the total hospitalized patient sample during that time was 19%. The base rate was 16% for those who were SIV− and 26% (1.6 times greater) for those who were SIV+. The difference was statistically significant (see Table 5). The effect, however, was not found for White men and women. It derived primarily from non-White men and

Table 4
Patterns of SIV+ Status for Patients While Hospitalized (Baseline) and at the Five Follow-Ups

Pattern	Follow-up 1 (n = 846)	2 (n = 830)	3 (n = 772)	4 (n = 755)	5 (n = 754)
% SIV+ at each follow-up who had been SIV+ at baseline	56	54	58	54	51
% SIV+ at each follow-up who had been SIV+ in immediately preceding interview	56	60	62	56	61
% SIV+ at each follow-up who had never been SIV+ in any previous interview	44	23	12	10	8
At each follow-up, % who had been SIV+ at baseline and all preceding follow-ups	56	36	28	21	17

Note. SIV+ = Schedule of Imagined Violence positive.

Table 5
Percentage of Baseline SIV+ and SIV− Patients With Violent Incidents Within 20 Weeks After Hospital Discharge (by Follow-Up 2)

Variable	*n*	% total sample	% SIV+	% SIV−	$\chi^2(1)$	*p*
All participants	939	19	26	16	14.88	.001
Race and gender						
White male	360	18	22	17		*ns*
Non-White male	178	28	46	17	16.74	.001
White female	285	12	11	13		*ns*
Non-White female	116	22	35	15	6.34	.05
Diagnosis						
MMD–NSA	395	10	13	9		*ns*
MMD–SA	386	22	28	20		*ns*
OMD–SA[a]	138	33	51	24	9.79	.01
Symptom severity (BPRS)						
Low (18–29)	188	18	23	16	*ns*	
Medium (30–39)	396	21	30	18	7.44	.01
High (40+)	350	17	24	12	8.67	.01

Note. SIV = Schedule of Imagined Violence (+ = positive, − = negative); MMD–NSA = major mental disorder and no substance abuse; MMD–SA = major mental disorder and substance abuse; OMD–SA = other mental disorder and substance abuse; BPRS = Brief Psychiatric Rating Scale.
[a] Excludes patients with personality disorder only (n = 20).

women, among whom those with SIV+ status were about 2.5 times more likely than SIV− patients to have engaged in a violent act after returning to the community.

Concerning diagnostic groups (see Table 5), Steadman et al. (1998) reported that MMD–NSA patients manifested a lower prevalence of violent incidents at F1 or F2 than did MMD–SA patients, whereas OMD–SA patients manifested the highest prevalence of violent incidents. Table 5 shows that SIV+ versus SIV− status at hospital baseline was not significantly related to violent behavior in the community for MMD patients with or without alcohol/substance abuse. Among the OMD–SA patients, however, those with SIV+ status were twice as likely to engage in violent behavior in the community.

For patients with low BPRS scores (18–29) at baseline, there was no significant relation between baseline SIV and violent behavior in the community. But SIV+ patients in the medium (scores of 30–39) and high (40+) symptom severity groups on the BPRS had higher rates of violence in the community than did SIV− patients in those groups.

Finally, 41 patients were classifiable as SIV+ nonpersistent (reported SIV+ at hospital baseline but at no community follow-up), and 83 patients were classified as SIV+ persistent (reported SIV+ at baseline and at both F1 and F2). Violent behaviors occurred at F1 or F2 for 37% of the SIV+ persistent patients, about twice as great as the 17% rate at F1 or F2 for SIV+ nonpersistent patients and the 15% rate for patients not classified as persistent, $\chi^2(1, N = 735) = 25.34, p < .01$.

In exploratory fashion, we examined the relation between SIV+ patients' responses to SIV Questions 3–8 at baseline and violent behavior at F1 and F2 after discharge for individual items as well as for various combinations of items (e.g., violent images both frequent and escalating). This exploration identified no items or combinations of items that were related any more strongly to violence after hospital discharge than the base rate of violence for SIV+ patients in general.

Relation of Violent Ideation to Other Risk Measures

Table 6 shows the relation of patients' SIV status to the NAS, the BIS–11, and the PCL–SV at hospital baseline. For both men and women, mean scores in all domains of the NAS were significantly higher for SIV+ patients than for SIV− patients. Results were very similar for the relation between SIV+ status and scores on both the BIS–11and the PCL–SV.

In addition, SIV+ patients were more likely to manifest delusions than SIV− patients (33% and 26%, respectively), $\chi^2(1, N = 1{,}121) = 5.73, p < .05$. Among patients with delusions, SIV+ patients were more likely than SIV− patients to have delusions involving violence toward others (18% and 5%, respectively), $\chi^2(1, N = 324) = 12.93, p < .001$.

Finally, on the logistic regression (with violence yes/no at either of the first two follow-ups as the dependent variable), the demographic characteristics entered in the first stage produced a statistically significant finding, $\chi^2(4, N = 817) = 32.80, p < .001$. Entering the measures of delusions, anger, impulsiveness, and psychopathy on the second stage improved the model significantly, $\chi^2(9, N = 817) = 83.10, p < .001$, and entering the SIV on the third stage produced a further significant improvement, $\chi^2(1, N = 817) = 4.30, p < .05$. (The fourth stage entry of the interaction terms between Stage 2 and 3 variables produced no additional improvement.) Thus baseline SIV accounted for a significant amount of variance in patients' violent behavior in the community even after controlling for these other variables that were related to violent behavior.

Discussion

This study reports the prevalence of thoughts of harm to others among persons hospitalized with mental illnesses, as well as the relation of violent images of patients while hospitalized to violent behavior soon after hospital discharge. During hospitalization,

Table 6
Mean Scores and Standard Deviations on Psychological Measures for Patients With SIV+ and SIV− Status at Hospital Baseline Interview

	SIV+		SIV−				
Measure and gender	*M*	*SD*	*M*	*SD*	*F*	*df*	*p*<
NAS							
Part A: Cognitive							
Men	35.1	5.0	30.7	5.0	113.10	1, 662	.001
Women	34.0	4.5	30.9	5.0	38.20	1, 463	.001
Part A: Arousal							
Men	35.5	6.0	31.0	6.3	77.80	1, 662	.001
Women	36.6	5.8	32.4	6.2	45.10	1, 463	.001
Part A: Behavior							
Men	33.9	6.9	28.5	6.3	97.10	1, 662	.001
Women	33.5	6.9	28.9	6.6	43.30	1, 463	.001
Part B							
Men	74.0	13.2	66.0	14.5	45.60	1, 662	.001
Women	75.2	12.2	69.2	13.6	19.50	1, 463	.001
BIS–11							
Cognitive							
Men	17.1	6.2	15.2	5.8	14.70	1, 649	.01
Women	18.4	5.5	15.8	6.0	18.30	1, 450	.001
Motor							
Men	21.4	7.5	18.6	7.5	20.00	1, 649	.001
Women	22.3	7.9	19.0	7.8	17.50	1, 450	.001
Non-Planning							
Men	27.5	8.4	24.3	7.7	22.10	1, 649	.001
Women	26.5	8.4	23.6	7.8	11.80	1, 450	.01
PCL–SV							
Men	11.3	6.0	8.6	5.4	25.10	1, 649	.001
Women	8.2	5.5	7.0	5.1	4.20	1, 450	.05

Note. n = 1,136. SIV = Schedule of Imagined Violence (+ = positive, − = negative); NAS = Novaco Anger Scale; BIS–11 = Barratt Impulsiveness Scale (11th version); PCL–SV = Hare Psychopathy Checklist—Screening Version.

about one third of the patients with mental disorders reported experiencing recent thoughts of violence toward others, which was about twice as great as among people in the community used in this study. This increased prevalence was apparent for both men and women, various age groups, and ethnicity (White and non-White). Among patients who reported violent thoughts while in the hospital, about one half or more did not report such thoughts during postdischarge follow-ups, whereas about 20% to 30% reported such thoughts rather consistently across time (identified in our results as persistent).

Compared with White patients, non-White patients more often reported having violent thoughts. In addition, non-White patients who reported imagined violence during hospitalization were more likely to engage in violent behaviors during the first 20 weeks following discharge, and this effect increased if the imagined violence was persistent (defined as reporting violent thoughts both in hospital and during either the first or second 10-week follow-up). A relationship between violent thoughts and violent behavior was not found for White patients. Patients with greater severity of symptoms were more likely to have been imagining violence than were patients with low symptom severity. Moreover, compared with patients who did not report violent thoughts in hospital, those who did were significantly more likely to engage in violent behaviors after discharge only if they were in the medium and high symptom severity groups. Finally, violent thoughts bore little relation to violent acts among MMD patients.

The results with regard to symptom severity are particularly interesting from a theoretical perspective. Whereas the patient group as a whole was more likely to report thoughts of violence toward others as compared with the community sample (as hypothesized), patients with greater severity of symptoms were more likely to have been imagining violence than were patients with low symptom severity. Moreover, non-White SIV+ patients were significantly more likely than SIV− patients to engage in violent behaviors after discharge only if they were in the medium and high symptom severity groups. In social–cognitive terms, greater stress associated with higher symptom severity restricts one's access to infrequently rehearsed cognitive scripts, leaving frequently rehearsed scripts involving harm to others to serve as the templates for responses to threatening situations.

The fact that SIV+ status was more closely related to future violence when SIV+ status was typical of the patient (i.e., persistent) is consistent with the social–cognitive model, which suggests that social situations are more likely to trigger aggressive schemas and scripts among people for whom their rehearsal is more frequent. The model would predict that individuals under stress would be more likely to use highly rehearsed, elaborated, and accessible schemas to interpret events in their environment and to formulate a response to those events.

The relation between SIV status and other variables that are associated with violent behavior (anger, impulsiveness, and psychopathy) is not surprising. Anger, for example, should covary

with violent imagery, whether it is a function of violent thoughts or an affective antecedent. More interesting is the fact that imagined violence accounted for additional variance in violent behaviors not explained by these other factors. Speculations to account for this finding would begin by examining content similarities between the SIV and those other variables. The NAS, for example, measures not only arousal and behavioral components of anger but also a cognitive component composed of items operationalizing four NAS cognitive subscales: attentional focus to provocative cues, suspiciousness, rumination, and a hostile mental set (Novaco, 1994). Although SIV+ status was highly related to the NAS cognitive component, its ability to account for additional variance in future violent behavior could suggest that there is a subset of persons with violent predispositions (or with successful inhibitory mechanisms) who do not conform to the theoretical model on which the NAS cognitive component was based. But the nature of any such hypothesized subset is not discernible from the present results.

The study indicated that non-White patients more often report having violent thoughts and that among patients who do report violent thoughts, those who are non-White are more likely to engage in violent acts after hospital discharge than are Whites. The reason that the relation between violent thoughts and violent acts was found for non-Whites but not for Whites is not clear. Additional analyses indicated that the effect was not due to a disproportionate number of non-White participants in diagnostic groups with the highest incidence of violent behavior (MMD–SA and OMD–SA). In addition, when we performed a post hoc logistic regression analysis to account for violent incidents, entering all of the NAS subscales first, $\chi^2(4, N = 911) = 27.50, p < .001$, then the variable White/non-White, $\chi^2(1, N = 911) = 6.40, p < .05$, the results suggested that an ethnicity effect remains when variance due to anger is partialed out.

Possible explanations may be found in differences between Whites and non-Whites in their social–environmental circumstances. For example, Swartz et al. (1998) found that among persons hospitalized for mental disorders, African Americans had a higher rate of subsequent violent acts than did Whites. In that sample, however, increased rates of violence were also related to having been a victim of criminal behavior, and African American patients were more likely to have been crime victims in the past. Moreover, they were no more likely than White patients to commit violent acts unless they also reported recent victimization. The potential relevance of these findings for the present study lies in the theoretical relation between victimization and violent thoughts. People who are victimized are more likely to feel threatened and, from the perspective of a social–cognitive theory of aggression, would be more likely to manifest cognitive scripts related to violence (violent thoughts). This would augment the risk that social conflicts would be interpreted as threatening and lead to a violent reaction. Similar hypothetical explanations involving violent thoughts as a mediator for violence might be offered for the past finding that child abuse victimization is related to violence in adulthood among African Americans but not among Whites (Maxfield & Widom, 1996; Rivera & Widom, 1990).

The results provide base rates that can assist clinicians in using patients' self-reports of violent imagery to estimate future risks and offer a set of standardized questions to screen for violent imagery in clinical interviews and research. This study, however, provides no way for clinicians to determine which of the patients who report violent thoughts in hospital are more or less likely to persist in imagined violence. Clinicians might wish to consider "repeated measures," identifying patients empirically as persistent in violent thoughts (and therefore more likely to continue having such thoughts after discharge) if they consistently report violent thoughts not only early in their hospitalization but also as discharge draws near.

Clinicians using the SIV should recognize certain limits in applying the present results to clinical situations. Patients in this study were told that the researchers would not have a role in decisions about their treatment or discharge. This may have encouraged some patients to be more open about their violent thoughts than they might otherwise have been in clinical circumstances, in which they might fear that such disclosures would have negative consequences for their return to the community.

Applications of the data should also take into consideration limits in generalizing the results to narrower or broader populations of persons with mental disorders than those used in this study. For example, the base rates of violent thoughts and violent acts reported here might not generalize to forensic psychiatric patients, who were excluded from participation in this research. They also may not generalize to the general population of persons with mental disorders. Patients in this study, having been hospitalized for treatment of mental disorder, may well represent a subsample of persons with mental disorders who present an elevated risk of violent behaviors in that the decision to hospitalize is often based on incidents or threats of harm to others.

Future research might profitably examine reasons for the greater relation between violent thoughts and future violent acts for ethnic minority patients than for White patients, including the victimization hypothesis we described earlier. Repeated administrations of the SIV during hospitalization might be used in research to determine whether more persistence in reported thoughts of violence to others can improve estimates of future violence beyond the capacity of a single administration soon after hospitalization, as was the case in this study. Finally, because reports of violent thoughts accounted for additional variance in later violent behaviors after entering measures of anger and impulsiveness, researchers are encouraged to include reported violent thoughts among variables they examine when developing multivariate schemes for assessing future violence.

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(Appendix follows)

Appendix

Schedule of Imagined Violence

1. REPORTS VIOLENT THOUGHTS Do you ever have daydreams or thoughts about physically hurting or injuring some other persons?
   ____ Yes ____ No (Discontinue)

2. RECENCY When was the last time you had such a daydream or thought?
   ____ Today ____ In the past two months
   ____ In the past 2 days ____ Longer than two months ago (Discontinue)
   ____ In the past 3–7 days ____ Don't know
   ____ In the past month

3. FREQUENCY How often have you had these daydreams or thoughts in the past two months?
   ____ Several times a day ____ A few times a month (less than once a week)
   ____ Once a day ____ Two or three times in the past month
   ____ Several times a week ____ About once in the past two months
   ____ Once a week ____ Don't know

4. CHRONICITY When did you start having these daydreams or thoughts?
   ____ During the past month ____ During the past 6–12 months
   ____ During the past 1–3 months ____ Before the past year
   ____ During the past 3–6 months ____ Don't know

5. SIMILARITY/DIVERSITY IN TYPE OF HARM When you have these daydreams or thoughts, are they usually about the same each time you have them, or do you imagine all kinds of different ways of hurting someone?
   ____ Same ____ Different ____ Don't know

6. FOCUS—TARGET VS. GENERAL Are they usually about the same person, or might they be about many different people?
   ____ Same person ____ Different people ____ Don't know

7. ESCALATING/DIMINISHING Since the time you first started having these thoughts, have the injuries that you think about gotten more serious, less serious, or have they been about the same?
   ____ Less serious ____ More serious
   ____ Same ____ Don't know

8. PROXIMITY TO TARGET In the past two months, have you ever had these thoughts while actually being with or watching the person whom you imagine hurting?
   ____ Yes ____ No ____ Don't know

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