Auditory Pseudohallucinations in United Kingdom War Veterans and Civilians With Posttraumatic Stress Disorder

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Objective: Hearing voices is a little-known feature of posttraumatic stress disorder (PTSD), mainly reported in US war veterans; it may be better conceived of as a dissociative than as a psychotic phenomenon. We investigated this feature in a pair of studies: Study 1 tested whether hearing voices was also reported by United Kingdom war veterans and whether it was associated with other dissociative reactions. Study 2 tested whether reports of hearing voices would generalize to a civilian sample, evaluated whether it was specific to PTSD or could be explained by trauma exposure alone, and investigated its phenomenological characteristics in more detail.

Method: Study 1, which was conducted from 2005 to 2008 at numerous sites in the United Kingdom, contrasted male war veterans with current PTSD, past PTSD, and no PTSD on measures of dissociation and hearing voices. Study 2, which was conducted from 2004 to 2008 in London, United Kingdom, compared hearing voices in civilian patients with PTSD, healthy controls exposed to trauma, and depressed patients.

Results: Study 1 showed that more veterans with current or past PTSD than no PTSD described hearing voices, which was related to other dissociative reactions. Study 2 confirmed that hearing voices was also present in a civilian sample, that it was specific to PTSD, and that it had the characteristics of a pseudohallucination.

Conclusions: The results emphasize the dissociative nature of PTSD, identify a little-known symptom that causes considerable distress, and suggest new directions for the assessment and treatment of PTSD in military and civilian populations.

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Hearing voices is most commonly associated with psychotic conditions, but it has also been reported in some cases of combat-related posttraumatic stress disorder (PTSD) in the US armed forces.[1–3] It has also been identified as a dissociative symptom,[4–6] and dissociation is frequently considered both a response to trauma and a component of PTSD.[7,8] These observations suggest that hearing voices could be an aspect of increased dissociation in PTSD. If hearing voices is associated with other dissociative symptoms and is found to be present also in nonmilitary samples, this finding would have significant implications for the diagnostic classification of PTSD in the upcoming revision of the *Diagnostic and Statistical Manual of Mental Disorders*, as well as for the theoretical understanding of PTSD and for clinical practice. We therefore carried out 2 investigations. The first was designed to establish whether hearing voices was commonly reported by ex-members of the United Kingdom armed forces with current or past PTSD and whether hearing voices correlated with other dissociative symptoms. The second study was a phenomenological investigation of hearing voices in a non-military PTSD sample, a depressed sample, and a sample of healthy individuals exposed to trauma.

STUDY 1

As part of a larger study of delayed-onset PTSD in United Kingdom war pensioners conducted from 2005 to 2008 at sites throughout the United Kingdom, the Dissociative Experiences Questionnaire-Taxon (DES-T) was administered in order to assess current symptoms of pathological dissociation. The hypotheses were that pensioners with current PTSD would score higher on the DES-T overall than those who had never experienced PTSD, that they would more often endorse the item concerning hearing voices, and that scores on this item would be strongly correlated with the total score on the remaining items of the DES-T. No specific predictions were made in respect of veterans who had previously met criteria for PTSD but had now recovered. In order to further validate the dissociative nature of hearing voices, scores on this item were correlated with a measure of peritraumatic dissociation during an earlier traumatic event.

METHOD

Participants

All participants gave written informed consent, and the study was conducted with the approval of the University College London Committee for the Ethics

of Non–National Health Service Human Research. Recruitment of veterans took place from 2 sources, the Service Personnel and Veterans Agency (SPVA, the United Kingdom Government agency responsible for payments and pensions to ex-servicemen) and the ex-servicemen's mental welfare charity Combat Stress. Ex-servicemen and women receiving pensions for PTSD on the basis of claims made soon after leaving the forces or after an interval of at least 1 year were identified by the medical staff of the SPVA. Of these, 102 (54% of those with confirmed addresses) agreed to an interview. SPVA staff also identified a control group of servicemen and women receiving a pension for physical disabilities, of whom 97 (48% of those with confirmed addresses) agreed to an interview. The Combat Stress sample was recruited from ex-servicemen during 2-week residential placements at one of the charity's treatment centers, where interviews took place. As recruitment was initiated by the charity's staff, no estimate of refusal rates was possible. Of 192 interviews achieved within the time available, 34 were excluded for various reasons, leaving an eventual sample of 158 veterans. Further details concerning recruitment are reported elsewhere.[9]

Measures

Diagnoses. Lifetime and current diagnoses of PTSD were obtained by trained interviewers using the Structured Clinical Interview for *DSM-IV* (SCID-IV).[10] In addition to the SCID-IV, an interview covered a number of topics, including service history and exposure to trauma. The entire interviews were audiotaped and transcribed verbatim. An experienced diagnostic assessor independently extracted all information from the transcripts that was relevant to the presence and timing of each of the 17 individual PTSD symptoms plus impairment to confirm interviewers' lifetime and current diagnoses. The cumulative number of PTSD symptoms experienced was also recorded. This process was conducted for all participants' interviews and was blind to scores on measures of hearing voices and dissociative symptoms. Disagreements were resolved by discussion or in consultation with a second trained assessor.

Hearing voices. Although hearing voices has usually been considered a symptom of psychosis, it is also believed to be a symptom of dissociation. The symptom was included in the widely used Dissociative Experiences Scale (DES).[4] Item 27 asks: "Some people sometimes find that they hear voices inside their head that tell them to do things or comment on things they are doing. Circle a number to show what percentage of the time this happens to you." Responses are on a scale ranging from 1 to 100.

Dissociative symptoms. Item 27 of the DES has been identified as belonging to a subset of DES items (the DES-Taxon or DES-T) that differentiate individuals with pathological dissociation from those showing normal trait-like variation in dissociative experiences.[11] This brief 8-item measure consists of those items from the DES that, following taxometric analysis, were shown to best assess pathological dissociation. All item scores range from 1 to 100 and an overall score is obtained by dividing the total sum by 8.

Those participants reporting traumatic events during their military service that met *DSM-IV-TR* Criterion A1 also completed the Peritraumatic Dissociative Experiences Questionnaire-Rater Version (PDEQ)[12] in respect of the event they nominated as having had the strongest negative effect on them. The PDEQ is a widely-used 10-item measure that inquires about reactions at the time of a traumatic event (sample item: "My sense of time changed—things seemed to be happening in slow motion"). Responses are rated either as 1 (*Absent or False*), 2 (*Subthreshold*), or 3 (*Threshold*). Items rated as above threshold were summed to give an overall score (possible range, 0–10).

RESULTS AND DISCUSSION

At interview, the mean sample age was 36.27 years, and 152 out of 158 participants were men. All but 4 participants were white. Mean age at enlistment was 17.70 years, and mean duration of time served was 8.38 years. Seventy-five percent of participants had served in the Army, 22% in the Royal Navy, and 3% in the Royal Air Force. At discharge, 70% had the rank of private, 25% noncommissioned officer, and 5% officer. As shown in Table 1, 44 of the sample had never met criteria for PTSD (No PTSD group), 21 had previously met diagnostic criteria for PTSD but no longer did so (Past PTSD group), and 93 met PTSD criteria at interview (Current PTSD group). These 3 groups were similar in sex, age at interview, and age at enlistment. The cumulative number of PTSD symptoms experienced was significantly lower in the No PTSD group than in the Past PTSD and Current PTSD groups, who did not differ from each other.

Of the sample, 48.4% answered positively to the item of the DES-T concerned with hearing voices. Scores on this item were strongly correlated with the sum of the remaining DES-T items, $r_{153} = .68$, $P < .001$ and also correlated positively with the total PDEQ score, $r_{131} = .24$, $P < .01$. Positive endorsement of this item was unequally distributed among the groups, with 21% of the No PTSD group, 65% of the Past PTSD group, and 58% of the Current PTSD group saying that they heard voices, $\chi^2_2 = 18.08$, $P < .001$. As shown in Table 1, mean scores on this item indicated that the Current PTSD and No PTSD groups differed significantly, while the Past PTSD group did not differ from either of the others in the frequency with which voices were heard. Scores on the PDEQ showed a similar pattern.

Hearing voices was common in this PTSD sample. In the National Institute of Mental Health Epidemiologic Catchment Area study, by contrast, the lifetime prevalence of hallucinations was 10% for men and 15% for women.[13] Our results did, however, replicate previous reports in US combat veterans. Approximately 20%–50% of individuals with combat-related PTSD report symptoms commonly

Table 1. War Pensioners' Demographic and Clinical Characteristics (Study 1)[a]

Characteristic	Current PTSD, n = 93	Past PTSD, n = 21	No PTSD, n = 44	$F_{2,155}$
Sex, male, %	96	90	100	…
Age, mean (SD), y	36.89 (5.97)	35.00 (2.59)	35.57 (3.91)	1.74
Age at enlistment, mean (SD), y	17.52 (1.70)	17.57 (1.69)	18.14 (2.16)	1.76
Cumulative no. of PTSD symptoms experienced, mean (SD)	13.43_a (1.77)	12.52_a (1.89)	2.27_b (2.35)	471.44*
DES item 27 score, mean (SD)	34.40_a (37.09)	$25.00_{a,b}$ (28.38)	9.30_b (21.65)	8.78*
DES-T total score, mean (SD)	40.33_a (23.46)	22.62_b (11.92)	9.36_c (11.19)	38.11*
PDEQ score, mean (SD)	5.22_a (2.42)	$4.40_{a,b}$ (1.76)	3.37_b (2.06)	7.16*[b]

[a]Means with different subscripts (a, b, c) differ significantly ($P < .05$).
[b]$df = 2,133$.
*$P < .001$.
Abbreviations: DES = Dissociative Experiences Questionnaire, DES-T = Dissociative Experiences Questionnaire-Taxon, PDEQ = Peritraumatic Dissociative Experiences Questionnaire, PTSD = posttraumatic stress disorder.

associated with psychosis, particularly auditory hallucinations or pseudohallucinations.[1–3] A number of early case reports[14,15] identified PTSD cases with auditory hallucinations that did not respond to neuroleptic medication. Hamner and colleagues[2,16] also identified psychotic features that did not appear to reflect a primary psychotic disorder among combat veterans. Between 36% and 49% of samples of combat veterans with PTSD reported psychotic symptoms (rates almost identical to those found in this study), and this group additionally tended to meet criteria for major depression.

Butler et al[17] found that combat veterans with PTSD, compared to veterans without PTSD, had increased hallucinations, delusions, and bizarre behavior in the absence of formal thought disorder. Similarly, they showed increased anhedonia but not other negative symptoms of schizophrenia. These authors suggested that the presentation corresponded to a new, low base-rate subtype of PTSD with psychotic symptoms and warned against what they believed would be a misdiagnosis of schizophrenia.

We additionally showed, for the first time, that many veterans who had recovered from PTSD still reported voices, albeit at a lower rate. The data indicated that hearing voices was highly correlated with reporting other current dissociative experiences, both currently and at the time a traumatic event occurred. This finding is consistent with the argument that hearing voices in this group may be better conceptualized as a dissociative rather than as a psychotic symptom. Similarly, of individuals in the general population reporting a hallucinatory experience in a given year, only a very small percentage meet diagnostic criteria for a psychotic disorder.[18]

The extent to which DES item 27 accurately captures the subjective experience of hearing voices is, however, unknown, and validation would be desirable. The term *hallucination* is often used to describe the experience of hearing voices when they are perceived as real, and *pseudohallucination* when they are identified as a production of the person's own mind.[19] Therefore, without a more detailed phenomenological investigation, it is not possible to say whether people endorsing this item are reporting true hallucinations, pseudohallucinations, or some other experience nor what impact hearing voices may have on them.

STUDY 2

The aim of this study, conducted from 2004 to 2008 in London, United Kingdom, was to establish whether hearing voices was also typical of a civilian sample with *DSM-IV* PTSD and to rule out the possibility that trauma exposure or depression, rather than PTSD itself, might be responsible. Hamner and colleagues[2,16] produced findings suggesting that hearing voices in PTSD might be explained by comorbid depression. Since depression is not typically associated with high levels of dissociation,[7] finding high levels of auditory hallucinations in a depressed sample would argue against their being a dissociative phenomenon. We therefore collected an additional depressed sample without a primary diagnosis of PTSD and assessed hallucinations and dissociative phenomena.

In Study 1, assessment of hearing voices depended on a single item from the DES. We sought to validate this item in Study 2 by administering a semistructured interview that sought to establish independently whether or not individuals had repetitive thoughts that they experienced as a voice speaking to them. The interview allowed more detailed phenomenological information to be collected on the voices, including whether they sounded like specific people, what characteristics they had, how controllable and believable they were, and what their impact was on the person hearing them. The major predictions were that, compared with trauma-exposed and depressed controls, the PTSD sample would score higher on the DES overall and on the item about hearing voices and would more often describe hearing their thoughts as voices in the semistructured interview. We also expected that the majority of voices would be negative or critical, that their content would tend to be believed, and that they would be rated as having an impact on how the person felt about themselves.

METHOD

Participants

All participants gave written informed consent and the study was conducted with the approval of the National Health Service Local Research Ethics Committee.

PTSD patients. Recruitment of patients was from a specialist psychological trauma service that only accepted patients meeting diagnostic criteria for PTSD arising primarily from a trauma in adulthood. Exposure to childhood and adult trauma was assessed, and patients with childhood trauma were not excluded so long as the main focus of treatment was their adult trauma. In this sample, 50% reported childhood trauma prior to age 17 years. The clinic provided free treatment under the National Health Service to all residents of the local area, and travel costs were reimbursed to patients able to demonstrate financial hardship. Inclusion criteria were that participants should currently meet *DSM-IV* PTSD diagnostic criteria and have sufficiently good command of English to participate. Patients were invited to participate by their treating clinician in a study of thought processes experienced by PTSD patients. No mention was made of the focus on hearing voices at this stage. Patients completed the Posttraumatic Stress Scale (PSS),[20] which confirmed that they met diagnostic criteria. The mean score on the PSS was well in excess of scores obtained in previous studies by participants meeting diagnostic criteria for PTSD.[21] Details of the PTSD and other samples are shown in Table 2. No patients were taking antipsychotic medication.

Trauma controls. A sample of individuals who had all experienced a traumatic event meeting *Diagnostic and Statistical Manual of Mental Disorders,* Fourth Edition, Text Revision criterion A1 and A2 was solicited through advertisements and word of mouth. Clinical status was checked by having participants complete the PSS and the Beck Depression Inventory (BDI).[22] None met diagnostic criteria for PTSD on the PSS, and their mean scores on the BDI and PSS (reported in Table 2) fell in the nonclinical range.[20,23]

Depressed patients. The sample consisted of patients recruited for a trial of imagery rescripting in depression and have been described elsewhere.[24] Once again, treatment was free, travel costs were reimbursed, and no mention was made initially of the assessment of voices. Patients were assessed by trained raters using the SCID-IV.[10] The main exclusion criteria were (1) borderline personality disorder, (2) a psychiatric history suggesting manic-depressive psychosis, or (3) current or long-term drug and/or alcohol problems. No patients were taking antipsychotic medication.

Thirty-nine patients had a primary diagnosis of major depressive disorder that, on average, fell in the severe range according to the BDI.[23] Twenty patients had at least 1 comorbid anxiety disorder (8 reported panic disorder with or without agoraphobia, 3 obsessive-compulsive disorder, 3 PTSD, 9 social phobia, 9 generalized anxiety disorder, and 7 specific phobia). Patients completed the semistructured interview concerning hearing voices as part of a more extensive assessment that included detailed questioning about intrusive memories and images.[24]

Measures

Dissociative Experiences Scale. The Dissociative Experiences Scale (DES)[4] is a 28-item self-report questionnaire, measuring the frequency of dissociative experiences. Patients were asked to quantify their experiences on a visual analog scale from 0% (never happens to you) to 100% (always happens to you) for each item. Extensive reliability and validity data are available for the DES (Carlson and Putnam[7]). Following usual practice, analyses used the mean of the 28 items. Separate mean scores were calculated for the DES-Taxon and for item 27 concerning hearing voices.

Semistructured interview. Respondents were initially asked: "Have you been aware in the past week of a stream of thoughts that repeats a very similar message over and over again inside your head? Sometimes the thoughts may just comment, or give instructions, or say if something is good or bad." If they said "yes," they were asked: "Do you experience this as a voice or just as a stream of thoughts?" Respondents specifically identifying this experience as a voice were asked how many separate voices they heard, and details of up to 3 separate voices were recorded. Respondents identifying voices were asked about the gender of each voice, whether it was a voice they recognized, how the voice referred to them, how often they currently heard the voice, and when they had first noticed the voice. They described what the voice typically said to them and then rated the effect of hearing the voice on a 5-point scale: 5 (*felt much more positive*), 4 (*felt somewhat more positive*), 3 (*felt no effect either way*), 2 (*felt somewhat more negative*), 1 (*felt much more negative*). Respondents rated each voice on the extent to which they believed the content, the extent to which they could disagree with the voice, and the extent to which they could control the voice, using scales ranging from 0 (*not at all*) to 100 (*very much so*). Finally, using the same scales, they were asked to rate the extent to which various emotions (*encouraging*, *critical*, *happy*, *angry*, *rational*, *intimidating*, *supportive*, and *strong*) described each voice.

RESULTS AND DISCUSSION

Demographic and clinical characteristics of the groups are shown in Table 2. The 3 groups were comparable in gender and age and, additionally, the PTSD group and trauma controls did not differ in the age at which their main adult trauma occurred. The PTSD group scored significantly higher on the Posttraumatic Stress Scale than the trauma controls. Both patient groups scored significantly higher than the trauma controls on the BDI but did not differ from each other. The PTSD group scored significantly higher on

Table 2. Demographic and Clinical Characteristics of PTSD Patients and Controls (Study 2)[a]

	PTSD Patients, n = 30	Trauma Controls, n = 13	Depressed Patients, n = 39	Statistical Test[b]
Sex, male, %	47	62	33	$\chi^2_2 = 3.48$
Age, mean (SD), y	40.67 (11.16)	34.69 (13.11)	38.36 (8.13)	$F_{2,79} = 1.59$
Age at adult trauma, mean (SD), y	33.00 (10.72)	27.23 (12.88)	…	$F_{1,40} = 2.29$
Posttraumatic Stress Scale score, mean (SD)	38.96_a (8.37)	7.61_b (7.39)	…	$F_{1,34} = 126.19$*
Beck Depression Inventory score, mean (SD)	31.67_a (9.43)	8.69_b (7.62)	33.82_a (7.88)	$F_{2,76} = 45.72$*
Dissociative Experiences Scale (DES) score, mean (SD)	34.76_a (19.72)	13.11_b (7.34)	16.55_b (9.10)	$F_{2,70} = 15.33$*
DES item 27 score, mean (SD)	48.10_a (40.72)	2.86_b (4.88)	8.95_b (20.51)	$F_{2,71} = 16.33$*
DES-T score, mean (SD)	27.89_a (22.98)	5.36_b (3.44)	10.23_b (10.03)	$F_{2,71} = 11.69$*

[a]Means with different subscripts (a, b) differ significantly ($P < .05$).
[b]*df*s vary owing to missing data.
*$P < .001$.
Abbreviations: DES-T = Dissociative Experiences Questionnaire-Taxon, PTSD = postraumatic stress disorder.

Table 3. Characteristics of Positive and Negative Voices in 30 Patients With PTSD[a]

Characteristic	Positive Voices	Negative Voices
Hearer believes in message	82	80
Hearer is able to disagree	51	42
Hearer is able to control	42	25
Encouraging	81	10
Critical	47	77
Happy	46	3
Angry	22	75
Rational	76	34
Intimidating	39	79
Supportive	75	7
Strong	87	76

[a]All scale scores range from 0 to 100.
Abbreviation: PTSD = postraumatic stress disorder.

the Dissociative Experiences Scale than the other 2 groups, who did not differ from each other.

There was a highly significant difference on DES item 27, indicating that PTSD patients reported hearing voices much more often than either of the other groups, which did not differ from each other. Scores on this item were strongly correlated with the sum of the remaining DES-T items, $r_{74} = 0.65$, $P < .001$. During the semistructured interview, 67% of the PTSD patients, none of the trauma controls, and 10% of the depressed patients reported hearing repetitive thoughts in the form of a voice speaking to them. This difference was also highly significant, $\chi^2_2 = 32.44$, $P < .001$. Those who reported hearing voices during the interview had higher scores on DES item 27 (heard voices, mean = 55.43, SD = 37.44; did not hear voices, mean = 9.41, SD = 22.93; $t_{72} = 6.50$, $P < .001$).

As hearing voices was very rarely reported by the other groups, subsequent analyses focus entirely on the experience of hearing voices reported by the PTSD patients. The occurrence of childhood trauma prior to age 17 was unrelated to hearing voices, $\chi^2_1 = 1.00$, $P > .10$. All the patients who heard voices regarded them as manifestations of their own thoughts (ie, as pseudohallucinations). Nine reported hearing 1 voice, 6 heard 2 voices, 3 heard 3 voices, 1 heard 4 voices, and 1 heard at least 10 voices. Each patient was asked about up to 3 voices, giving data on a total of 36 voices. Of these, 17 were described as male, 7 as female, and gender was indeterminate in the remaining 12 cases. In 22 cases, patients said they knew the voice, and identified it as *me* in 8 cases, a parent in 3 cases, a colleague in 4 cases, a friend in 2 cases, and as *other* in 5 cases. The voice referred to the patient by their name in 8 cases, as *I* in 4 cases, as *you* in 14 cases, as *he*, *she*, or *it* in 4 cases, and otherwise in 6 cases. Voices were heard once or twice a week in 5 cases, several times a week in 8 cases, every day in 5 cases, and many times a day in 18 cases. Voices lasted for hours in 5 cases, minutes in 21 cases, and seconds in 10 cases.

In 32 out of 36 cases, patients said that hearing the voice made them feel different as a person. The effect of the voice was described as positive in 8 cases, as neutral in 1 case, and as negative in 27 cases. Only 1 patient did not report at least 1 negative voice. Patients were asked when they first heard the voice. The majority (70% of negative voices and 62% of positive voices) were heard for the first time after the trauma in adulthood. Four negative voices and 2 positive voices were described as having been present from childhood.

Table 3 presents the characteristics of the positive and negative voices in the PTSD group. This analysis was an exploratory one, and statistical comparison was not possible, as the data were, for the most part, nonindependent. Nevertheless, the data suggest that patients believed strongly in both positive and negative messages and found the negative voices harder to control. Negative voices tended to be described as more critical, intimidating, and angry, whereas positive voices tended to be described as more encouraging, rational, and supportive. Both types of voice tended to be perceived as strong.

Study 2 replicates the finding that DES item 27 is highly correlated with scores on other DES-T items. The content of item 27 has now been independently validated by our finding that those endorsing it also report hearing voices in response to a semistructured interview and identify them as their own thoughts. Whereas the majority of PTSD patients reported auditory pseudohallucinations and registered high scores on the DES, very few depressed patients and no healthy controls exposed to trauma did so. The fact

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that individuals were able to discriminate among multiple voices and to describe their gender implies that hearing voices had a sensory dimension that was additional to normal thought processes. These data strongly suggest that, in samples suffering primarily from PTSD, item 27 reflects the experience of auditory pseudohallucinations. The correlation of this item with the overall DES, and the difference in overall DES scores between samples more and less likely to report hearing voices, lead to the conclusion that hearing voices is not a function of comorbid depression but is likely to be an aspect of dissociation.

GENERAL DISCUSSION

Studies 1 and 2 have confirmed that hearing voices is not only associated with PTSD in the US military but is also common in United Kingdom war pensioners and survivors of civilian trauma. Consistent with previous doubts about whether this phenomenon is best conceptualized as a psychotic process,[1,16,17] our data have shown that these experiences are likely to be pseudohallucinations and related to other dissociative symptoms found in this disorder. The fact that hearing voices was noted in between one-half and two-thirds of our PTSD samples, added to the many previous observations of this phenomenon, suggests that hearing voices is a candidate for identification as an associated feature of PTSD in *DSM-V*.

Clinical samples tend to be characterized by the existence of repeated intrusions, particularly voicing the same basic message, coupled with strong emotional reactions. Compared to voices in nonclinical samples, voices in clinical samples are more likely to be critical, disturbing, hard to control, and interfering with daily life.[5] Many observations of patients with psychosis have emphasized the importance of the relationship with the voice and the tendency for some voices to be perceived as powerful and intimidating, and have explicitly drawn a parallel with normal patterns of interpersonal relating.[25,26] In the cognitive approach to auditory hallucinations in psychosis,[27] it is suggested that the emotional impact of voices is related to beliefs about their power and authority. The presumption is that voices perceived as self-generated should have less impact than voices believed to emanate from powerful external sources. It is therefore of considerable interest that, in the current study, voices still elicited powerful emotional reactions even though they were recognized as aspects of the person's own thoughts. This reaction is consistent with the possibility that voice impact is mediated by nondelusional beliefs but also with the idea that the relationship with the voice may be important independently of beliefs.[28]

Previous work in psychosis has included the observation that, as in our sample, voices may be perceived as malevolent or benevolent.[27,28] Malevolent voices were more common in a sample with schizophrenia or dissociative disorders than in a nonclinical sample.[5] "Voices" have also featured within psychotherapy research on the assimilation model.[29] The model assumes that people's experiences leave traces that can be reactivated, and it uses the metaphor of *voice* to emphasize the active agency of these traces within a dialogical model of the self. It should be noted, however, that in the assimilation model voices are not necessarily accompanied by a perception of sound, although they may be. Stiles[30] noted a benevolent voice in a depressed woman treated with process-experiential psychotherapy and suggested that the effect of depression was normally to suppress such voices, leaving the person more vulnerable to critical, malevolent ones.

In our study, the majority of both benevolent and malevolent voices were reported only as beginning after a traumatic event in adulthood. Similarly, Honig et al[5] found that only a minority of voices began prior to age 12. Their dissociative sample, more often than their schizophrenia and nonpatient samples, tended to date onset from a serious life event. A recent review[31] concluded that, although there was evidence for a relationship between childhood abuse and a variety of psychotic symptoms, this association was particularly strong for hallucinations. A target for future research is to replicate our finding that onset of auditory pseudohallucinations was equally likely in PTSD patients with adult trauma only as in those with childhood and adult trauma and to investigate whether there is a dose-response effect with exposure to multiple traumas.

The reported impact of hearing voices on emotions and sense of self suggests the value of attempts to address auditory pseudohallucinations in treatment for PTSD.[32] Not only may the patient be worried that he or she is going mad, but the voices are likely to comment, not necessarily favorably, on the process of therapy for PTSD and on the therapist's interventions.[32] In psychotic populations, cognitive therapy methods have been adapted to challenge beliefs about voices and the content of the voices,[33,34] and alternative approaches involve attempting to explore and change voice hearers' relationships with their voices.[35,36]

Among the limitations of the current study was the fact that other symptoms usually associated with psychosis were not investigated. Although the data appear to be particularly strong for auditory hallucinations, several articles and reviews[3,17,31] suggest that trauma may be linked to the onset of a variety of forms of hallucination and delusion, as well as negative symptoms. Another limitation of the current study was the fact that, due to low power, the relationship between pseudohallucinations and exposure to childhood versus adult trauma or to single versus multiple trauma could not be adequately tested. Low power also precluded systematic comparison of positive and negative voices. Our data did, however, suggest hypotheses for future study, for example that negative voices elicited more fear and more compliance and were seen as more difficult to control. The relationship between positive and negative voices would also be an illuminating topic for study.

Nevertheless, our findings suggest that auditory pseudohallucinations deserve far greater recognition as an associated feature of PTSD than they have received hitherto. These observations speak to a number of important current theoretical controversies concerning the relationship between psychosis, dissociation, and trauma and encourage PTSD researchers to take a broader approach to understanding the phenomenology of the disorder. From a clinical perspective, it is likely that the routine assessment of pseudohallucinations will greatly aid case formulation, will open the door to novel therapeutic approaches, and will help to ensure that PTSD patients receive an empathic response to what are likely to be highly distressing experiences.

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