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Bizarreness in dream reports and waking fantasies of psychotic schizophrenic and manic patients: Empirical evidences and theoretical consequences

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ABSTRACT

Several overlapping features have frequently been described between psychosis and the subjective experience of dreaming from the neurobiological to the phenomenological level, but whether this similarity reflects the cognitive organization of schizophrenic thought or rather that of psychotic mentation independent of diagnostic categories is still unclear. In this study, 40 actively psychotic inpatients were equally divided in two age- and education-matched groups according to their diagnosis (Schizophrenia and Bipolar Disorder). Participants were asked to report their dreams upon awakening and the Thematic Apperception Test (TAT) was administered to elicit waking fantasies; the same procedure was used in a control group of 20 non-psychiatric subjects. Two highly trained judges scored the collected material according to a Dream Bizarreness scale. The same level of cognitive bizarreness was found in TAT and dream reports of schizophrenic and manic subjects but was almost completely absent in the TAT stories of the control group. Two-way analysis of variance for repeated measures assessed the effect of diagnosis and experimental conditions (TAT stories and dream reports) on bizarreness yielding a significant interaction. Cognitive bizarreness seems to be a shared feature of dreaming and psychotic mentation, beyond diagnostic categorizations. Although these findings must be considered preliminary, this experimental measure of the cognitive architecture of thought processes seems to support the view that dreaming could be a useful model for the psychoses.

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1. Introduction

Several advances in the field of sleep research, most prominently in the understanding of neuromodulatory mechanisms and functional brain modifications, have led to the development of hypotheses on the neurobiological mechanisms underlying dream mentation that may prove useful to our understanding of psychosis (Hobson, 2004; Gottesmann, 2006). Although current knowledge of the neurobiological underpinnings of psychosis remains partial, this condition has been conceptualized as a distinct clinical phenotype with a unique neurophysiology and genetic background (Kroll, 2007; Ivleva et al., 2010). Whether dreaming may be considered a useful model of schizophrenia or rather of an acute psychosis, independent of the disorder within which it is expressed, remains to be understood. Indeed, a constellation of symptoms including disorganized and delusional thought processes, hallucinations and lack of insight, all of which contribute to the current definition of schizophrenic psychosis and are strikingly similar to several aspects of dream mentation, can be found in other psychiatric and neurological conditions. One such condition of the brain/mind which clinically responds to the same antipsychotic molecules used for schizophrenia, suggesting some common underlying neurochemical mechanism, is psychotic mania (Berk et al., 2007; Scherk et al., 2007).

On a purely phenomenological level, several overlapping features have frequently been described between psychosis and the subjective experience of dreaming (Jung, 1936; Bleuler, 1966), an internal experience characterized by a florid hallucinatory component within which complex events and interactions occur. Subjectively, the dreamer is not aware of the wholly internal origin of the experience, despite the often incongruous juxtaposition of events occurring within the dream itself, over which judgment is only retained upon awakening (for a review, see Nir and Tononi, 2010). Psychotic patients' lack of awareness over the internal origin of their so-called positive symptoms contributes to the definition of the symptoms themselves, but dream cognition has not yet been clearly shown to be similar to psychosis in experimental settings. Dream bizarreness has often been analyzed in schizophrenic patients given its implicit relationship to their bizarre and incongruous waking experience, but published results appear contradictory. When compared to the dreams of a normal control population, bizarreness has been found to be lower (Dement, 1955; Okuma et al., 1970; Carrington, 1972), higher (Noreika et al., 2010) or statistically equivalent (Scarone et al.,

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2008; Lusignan et al., 2009) to that found in the dreams of schizophrenic patients. Other groups have reported on higher levels of bizarreness in the dreams of schizophrenic patients when compared to other psychopathological patient groups (Schredl and Engelhardt, 2001). Several reasons may account for these divergent findings, including the use of different bizarreness scales, different methods of dream collection and possibly the enrolment of different patient samples. In our view, dreaming is phenomenologically similar to the positive symptoms exacerbated by an acute psychotic mental state, so such similarity should be experimentally evaluated in both the dream and waking mentation found in affective and non-affective psychoses. Most of the mentioned studies only addressed the dream cognition of schizophrenic patients, independent of their phase of illness. The positive symptoms of schizophrenia can wax and wane within the patient's lifetime and a diagnosis of schizophrenia can be maintained in the absence of such symptoms. Cognitive bizarreness, defined by discontinuities and incongruities in dream plot, thoughts and emotions, has been shown to be equally high in waking fantasies and dream reports of actively psychotic schizophrenic subjects and in the dream mentation of a normal control population (Scarone et al., 2008). If psychosis indeed is similar to dreaming from a phenomenological perspective and if cognitive bizarreness represents a reliable method to quantify formal peculiarities of dream and waking mentation, it should be possible to obtain similar results in a sample of acutely psychotic patients belonging to another diagnostic category, such as bipolar disorder. The aim of the present study was to determine whether cognitive bizarreness may be used to confirm the phenomenological similarity of dreams and psychosis, by quantifying this formal aspect of mentation across dreaming and wakefulness in two acutely psychotic patient samples belonging to these distinct diagnostic categories. To experimentally confirm this similarity on a phenomenological level may contribute to the development of future lines of neurobiological enquiry binding sleep and dream research with research in psychotic disorders within the same experimental framework.

2. Methods

2.1. Participants

Table 1 shows the demographic and clinical characteristics of the three experimental groups. All actively psychotic patients with a clinical diagnosis of Schizophrenia — Paranoid Type or Bipolar Disorder I — Manic Episode, Severe With Psychotic Features according to DSM-IV-TR criteria (APA, 2000) admitted to the psychiatric ward of the San Paolo Hospital in Milan, Italy, over a period of 12 months, were screened for inclusion in this study. Exclusion criteria were alcohol and psychoactive substance abuse and a present or past history of a serious medical or neurological condition, including perinatal injury, cranial trauma, mental retardation and parasomnias.

Two clinical groups of 20 age- and education-matched subjects participated in the study, and 20 age- and education-matched subjects were chosen from the general population as control sample. Exclusion criteria for this group were the presence of a psychiatric disorder in the past or present medical history.

2.2. Clinical assessment and therapeutic regimen

Clinical assessment was performed using the Brief Psychiatric Rating Scale in both patient samples (BPRS, Overall and Gorham, 1962) and the Mania Rating Scale in the manic patient population (MRS, Young et al., 1978). The scales were carried out before significant remission of the positive symptoms, during the week in which patients were asked to keep a dream diary (see next section), which usually began 3 to 5 days after admission. Available reference values indicate that both samples were between the moderately and markedly ill cut-offs in both scales (Leucht et al., 2005; Berk et al., 2008).

None of the patients included in the study were drug-naïve but most had discontinued treatment prior to relapse. Various combinations of mood stabilizers and antipsychotic agents were administered to all patients during the week in which the experimental material was collected.

2.3. Dream and fantasy reports

The Thematic Apperception Test (TAT) consists of a broad set of figures, differentiated into groups of 20 according to sex and age (Murray, 1938). 7 figures chosen progressively from the full set were used in this study according to a previously published scheme (Scarone et al., 2008). All participants were asked to create a fantasy story that clearly contained a beginning, a plot development and an end based on the visualized figure after having eliminated the stimulus; the narratives created in response to the fixed stimulus were tape-recorded and then transcribed. During the same week in which the TAT was administered, the subjects were instructed to keep a dream diary where they could report each morning the dream they had had the night before. As instruction, participants were asked to report the whole development of the dream plot whenever possible. In the patient populations, the material was usually collected during the first week of hospitalization, before significant remission of the psychotic symptoms, whereas the control population completed dream diaries in their home setting.

A total of 228 dream reports (82 belonging to schizophrenic patients and 73 belonging to each group for manic patients and normal controls) and 420 waking fantasy reports (140 for each group) was collected for analysis.

Table 1
Demographic and clinical characteristics of subjects[a].

	Schizophrenic subjects	Manic subjects	Normal controls
Demographic characteristics			
Age — yr	43.4 ± 13.7	43.6 ± 12.1	45.9 ± 13.2
Sex — no. (%)			
Male	10 (50%)	6 (30%)	7 (35%)
Female	10 (50%)	14 (70%)	13 (65%)
Education — yr	13.7 ± 4.7	13 ± 3.3	13.2 ± 3.3
Marital status — no. (%)			
Married	3 (15%)	8 (40%)	8 (40%)
Previously married	1 (5%)	0 (0%)	2 (10%)
Never married	16 (80%)	12 (60%)	10 (50%)
Occupation — no. (%)			
Employed	5 (25%)	10 (50%)	12 (60%)
Unemployed	13 (65%)	9 (45%)	0
Previously employed	2 (10%)	1 (5%)	8 (40%)
Psychiatric assessment			
Brief Psychiatric Rating Scale			
Total score	51.8 ± 9	44.8 ± 7	–
Hallucinations Item	4.1 ± 2	2.3 ± 1.4	–
Young-Mania Rating Scale	–		–
Total score	–	24.7 ± 3.8	–
Language–thought disorder item	–	2 ± 0.6	
Content item		3.25 ± 0.4	

[a] Plus–minus values are means ± S.D.

2.4. Analysis

The material was scored according to the Dream Bizarreness scale developed by Hobson et al. (1987). In brief, two highly trained judges with an interrater reliability coefficient of 0.92 for the TAT reports and 0.89 for the dream reports, scored the narrative material by identifying physically impossible or improbable aspects of the plot, characters, objects, or action, of the thoughts and of the emotions of the subject or of characters within the dream or fantasy. Both judges were blind to the diagnosis and to the origin of the narrative transcripts. The following indices were calculated for each dream and TAT response: Bizarreness Intensity (BI) calculated as the number of bizarre events in the domains of plot, cognition and affect. Bizarreness Density (BD) calculated by dividing BI by the report word count. The following indices were then calculated for each subject: Bizarreness Density Index for dreams (BDI) calculated as the mean of the dream BD indices and Bizarreness Density Index for TAT tables (BDI) calculated as the mean of the TAT table BD indices. The square root of the BDI was then calculated in order to normalize data distribution. SPSS version 17.0 was used for the data analyses reported in the following section (SPSS, 2008).

3. Results

3.1. Major findings

Fig. 1 shows the means of the dream and TAT BDI values in schizophrenic, manic and normal subjects. Two-way analysis of variance (ANOVA) for repeated measures was applied to assess the effect of diagnosis and experimental conditions (TAT stories and dream reports) on bizarreness. Analysis of the data revealed that the effect of the Experimental Conditions (i.e. TAT and dream reports) was significant [$F(1,57) = 6.27$; $P < 0.015$]. The effect of Diagnosis was

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