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Prosody abilities in a large sample of affective and non-affective first episode psychosis patients

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ABSTRACT

Objective: Prosody comprehension deficits have been reported in major psychoses. It is still not clear whether these deficits occur at early psychosis stages.
The aims of our study were to investigate a) linguistic and emotional prosody comprehension abilities in First Episode Psychosis (FEP) patients compared to healthy controls (HC); b) performance differences between non-affective (FEP-NA) and affective (FEP-A) patients, and c) association between symptoms severity and prosodic features.
Methods: A total of 208 FEP (156 FEP-NA and 52 FEP-A) patients and 77 HC were enrolled and assessed with the Italian version of the "Protocole Montréal d'Evaluation de la Communication" to evaluate linguistic and emotional prosody comprehension. Clinical variables were assessed with a comprehensive set of standardized measures.
Results: FEP patients displayed significant linguistic and emotional prosody deficits compared to HC, with FEP-NA showing greater impairment than FEP-A. Also, significant correlations between symptom severity and prosodic features in FEP patients were found.
Conclusions: Our results suggest that prosodic impairments occur at the onset of psychosis being more prominent in FEP-NA and in those with severe psychopathology. These findings further support the hypothesis that aprosodia is a core feature of psychosis.

1. Introduction

The diagnoses of major psychoses, including Schizophrenia (SZ) and Bipolar Disorder (BD) with psychotic features, have been progressively overcome by a transdiagnostic phenotype encompassing affective and non-affective psychosis [1,2]. Indeed, psychotic symptoms are present in psychotic disorders (e.g. SZ) but they may also

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characterize affective disorders (e.g. BD) during a specific mood episode [3]. Interestingly, the transdiagnostic nature of psychosis has also been confirmed by genetic studies showing that SZ and BD share some genetic etiology, which may determine a similar susceptibility of developing psychosis [4,5].

Notably, although it has been consistently suggested that non-affective psychotic patients showed verbal communication deficits [6] and a general worse cognitive functioning than the affective ones [7,8], language deficits have frequently been observed in both patient populations in syntactic comprehension [9] and even in the paralinguistic prosodic dimensions [10,11].

Prosody refers to the vocal system of non-verbal communication and consists of transient acoustic properties that accompany the utterance of a sentence [12], such as pitch (i.e. the tone of voice), intensity and time, which determine the speech's sequences and pauses. Prosody has grammatical, pragmatic and emotional functions [13]. The first function refers to the intonational contour that codifies question-mark features and affirmative or imperative utterances. Among the prosodic pragmatic indicators, pitch emphasizes new information in a message. Moreover, emotional prosody refers to the ability to convey a speaker's emotional state through modulations among various vocal parameters [14, 15]. Finally, expressive and receptive prosody refer respectively to the ability to convey and decode the prosodic information of a statement [16,17].

Although several studies suggested that aprosody (i.e., the inability to express or comprehend affective or non-affective tonal aspects of speech) is part of the symptomatology of both SZ [18–20] and BD [21, 22], it is still not clear whether it may be considered a trait marker of major psychoses in general, with particular regards to the early phases of the illness. An accurate comprehension of prosodic information is essential in maintaining successful social interactions and relational well-being [23]; therefore, investigating whether prosody is altered in both affective and non-affective psychosis is paramount.

Interestingly, receptive emotional prosody deficiency has been consistently observed in SZ, showing difficulties in identifying emotions based upon the tone of voice [24]. Furthermore, aprosody seems to precede the full expression of psychotic symptoms and to be present in first-episode psychosis (FEP) patients [10,25] in ultra-high risk population [26] and in children with early-onset of SZ [27], suggesting that there might be emotion recognition trait deficits in SZ.

Some studies reported impaired receptive syntactic domain [9] and emotional prosody processing also in affective disorders [28,29] albeit other investigations did not reveal abnormalities neither in pitch perception nor in semantic and linguistic comprehension [30–32]. Furthermore, Hoertnagl and colleagues [21] explored emotional prosody perception in symptomatically remitted SZ and BD patients and found similar anger identification impairments, although only patients with SZ confused sadness with other emotions. However, most of these studies suffer from some important methodological limitations, which may have limited the generalizability of their findings, such as the small sample size, the age or IQ differences between healthy controls (HC) and patients as well as the inclusion of patients at different illness severity.

1.1. Aims of the study

This study should be seen within the framework of the continuum model of psychosis, which highlights similarities across different psychotic diagnostic categories as well as differences between affective and non-affective psychoses [33,34]. In this context, the aim of this study was to bring a new contribution to the differentiation between psychotic disorders through the exploration of language abilities as well as through the investigation of the impact of symptoms severity on prosodic features in a very large sample of FEP patients, considering separately affective and non-affective subjects.

2. Materials and methods

2.1. The GET UP

Subjects were recruited from the GET UP (Genetics, Endophenotypes, Treatment: Understanding early Psychosis) (see Ruggeri and colleagues [35] for a more detailed description of subjects enrollment), a large multicentre randomised controlled trial involving 117 community mental health centres (CMHCs) located in the Italian regions of Veneto and Emilia-Romagna and in the urban areas of Florence, Milan and Bolzano [36].

The GET UP inclusion criteria [37] were: age 18–54 years, residence in the catchment regions of the CMHCs and first lifetime contact, presence of at least one of the following symptoms: hallucinations, delusions, qualitative speech disorder, qualitative psychomotor disorder, bizarre, or grossly inappropriate behavior, or two of the following: loss of interest, initiative, and drive; social withdrawal; episodic severe excitement; purposeless destructiveness; overwhelming fear; or marked self-neglect. Exclusion criteria were: (1) antipsychotic treatment (>3 months) prescribed for an identical or similar mental disorder; (2) mental disorders caused by a general medical condition; (3) moderate or severe mental disability evaluated by a clinical functional assessment; and (4) psychiatric diagnosis other than International Classification of Diseases (ICD)-10 for psychosis [39]. The specific ICD-10 codes for psychosis (F1x.4; F1x.5; F1x.7; F20–29; F30.2, F31.2, F31.5, F31.6, F32.3, F33.3) were assigned at 9 months. Diagnoses were made by using the Item Group Checklist (IGC) of the Schedule for Clinical Assessment in Neuropsychiatry (SCAN) [38] and were confirmed by the clinical consensus of two staff psychiatrists, according to the ICD-10 criteria.

Participants were Italian native speakers. Information about years of education and age of onset of illness were retrieved from specific interviews. Eligible participants signed an informed consent form prior to participating in the study.

The study was approved by the Ethics Committee of the Azienda Ospedaliera of Verona and by the local ethics committees of participating sites and was registered with ClinicalTrials.gov (NCT01436331).

2.2. Ethical standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

2.3. Clinical assessment

The Global Assessment of Functioning (GAF) was used to assess global functioning (social, psychological and occupational functioning) [39]. Clinical symptoms were assessed using the Positive and Negative Syndrome Scale (PANSS) [40], composed by one total score (PANSS-Total) and three sub-tests: positive symptoms (PANSS-Positive), negative symptoms (PANSS-Negative), and general psychopathology (PANSS-Psychopathology). The Hamilton Depression Rating Scale (HDRS) [41] and the Bech–Rafaelsen Mania Rating Scale (BRMRS) [42] were administered to assess depressive and manic symptoms. The Brief Intelligence Test (TIB) was used to measure Intelligence Quotient (IQ). The absence of other DSM-IV axis I disorders in HC was assessed using the SCID-IV non-patient version (SCID-NP). HC had also no history of psychiatric disorders among relatives.

2.4. Prosody assessment and procedure

Two subtests of the Italian version of the *"Protocole Montréal d'Evaluation de la Comunication – MEC"* [43] were administered to the