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# The relationship between dysphoria and proneness to hallucination and delusions among young adults

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**Abstract**

Previous research suggests that measures of dysphoria relate to positive schizophrenic symptoms. These relationships have rarely been studied within the dimensionality of psychopathology framework. The present study examined the relationship between 3 distinct aspects of dysphoria (depression and state and trait anxiety) and delusion and hallucination proneness in a nonclinical sample of young adults. A total of 472 participants were assessed on measures of dysphoria and delusion and hallucination proneness. Correlation analyses revealed significant associations between both anxiety and depression and hallucination and delusion proneness, suggesting that the association between dysphoria and positive symptoms is also present at a nonclinical level. Partial correlations, and hierarchical regression models, suggest an independent contribution of depression, over anxiety, in influencing hallucination and delusional proneness. The results are discussed in the framework of the cognitive account of schizophrenia and the dimensional model of psychopathology.


## 1. Introduction

Andreasen and Olsen [1] characterized 2 different schizophrenic subtypes: those with positive and negative symptoms. Positive symptoms are characterized by prominent delusions, hallucinations, formal thought disorders, and bizarre behaviors; negative symptoms, by affective flattening, alogia, avolition, anhedonia, and attentional impairment. Following this, the development of rating scales using factor analytic techniques has created considerable interest in the development of characteristic subtypes of schizophrenia. Liddle [2] proposed a model with 3 factors: psychomotor poverty (poverty of speech, lack of spontaneous movement, and various aspects of blunting of affect), disorganization (inappropriate affect, poverty of content of speech, and disturbances of the form of thought), and reality distortion (particular types of delusions and hallucinations). Although some studies supported the 3 factors proposed by Liddle [2,3], other studies only partially replicated this structure. These studies confirmed the negative dimension but suggested that the positive dimension presented a more complex structure, with at least 2 independent factors [4]. Other factor analytic studies [5-8], as well as clinical observations [9], supported the possible independence of delusions and hallucinations as separate dimensions within the previously identified unitary category of positive symptoms. Delusion and hallucination proneness are thus seen as key facets within the framework of the positive symptoms of schizophrenia.

A recent review considering the link between emotion and delusion and hallucination proneness highlighted the extent to which emotion and emotion regulation can influence the onset, development, and content of delusional and hallucinatory symptoms [10]. In particular, the role of dysphoric features seems to have an impact on delusions and hallucinations [11-13]. Starcevic [14] defines dysphoria as negative (unpleasant) and complex emotional states characterized by intense discontent and/or unhappiness and accompanied by an inner tension or a "driven" feeling to resort to some action to alleviate discontent or unhappiness. In the psychiatric literature, the term *dysphoria* is often used to refer to a feeling of unpleasantness or discomfort, a mood of general dissatisfaction and restlessness occurring in

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depression and anxiety [15]. Despite being a common and a widely used concept, dysphoria is still operationalized using a diverse array of measurement tools, although it is usually conceived as a combination of anxious and depressive features [11,16]. Dysphoric features have been increasingly recognized as important contributors to the psychopathology of schizophrenia, with an average of 25% comorbidity with depression [17,18] and 11% with anxiety disorders [19,20]. The comorbidity of dysphoria and schizophrenia is known to influence clinical course of relapse [21], hospitalization [22], and social and cognitive functioning [23,24]. In addition to dysphoria, other factors related to both depression and anxiety, such as neuroticism and low self-esteem, have been proposed as risk factors for psychosis [25].

Research has often associated depression with negative symptoms [26] and anxiety with positive symptoms [27]. However, a study specifically designed to investigate the effects of dysphoria on negative symptoms [28] reported positive correlations in the change over time between dysphoria and positive symptoms, rather than with negative symptoms. This finding has been further replicated, suggesting that dysphoria in schizophrenia tends to be more frequently associated with positive, rather than with negative, symptoms, regardless of diagnostic subtype or symptom type [29,30]. This provides evidence of the independence of negative symptoms and dysphoria and suggests that the level of positive symptoms and level of dysphoria mutually influence one another [30,31].

There are a growing number of studies that consider psychosis as a continuum from normal functioning to abnormal functioning or psychosis [32-34]. There is a consistent body of evidence indicating that psychotic signs are present in healthy people to a certain extent [33]. Verdoux and coworkers [35] found that 16% of a nonclinical population reported that they had experienced hallucinations during their lifetime, whereas Tien [36] reported a percentage between 4% and 25% of the total population having hallucinations at some life stage. In a younger sample, Pulton et al [37] observed up to 20% of subjects endorsing positive items on a screening tool for delusional ideation.

Investigating psychosis-like experiences in nonclinical populations may provide a fruitful approach to elucidate psychological mechanisms underlying the psychosis phenotype in a large-scale sample [38]. This approach may help in the formation of a wider theoretical framework to be tested in smaller and more specific samples. Several recent studies have begun to examine how either delusion or hallucination proneness relate to dysphoria in nonclinical samples. For example, Allen et al [16] found that anxiety, but not depression, was strongly and positively associated with hallucination proneness. Paulik et al [39] found that both anxiety and depression were significantly and positively related to hallucination proneness when examining bivariate relationships; however, when examining partial correlations, anxiety retained significant relationships with hallucination proneness, whereas depression did not. Thus, it would seem that anxiety has tended to have a stronger positive relationship with both nonclinical and clinical positive symptoms than depression.

The aim of the current study was to examine relationships between both anxiety and depression and delusion and hallucination proneness in a nonclinical population. Although a number of studies have advanced our understanding of how dysphoria relates to positive schizophrenic symptoms, almost all the research in this area has focused on restricted clinical samples. Moreover, the heterogeneity of the results provided from clinical samples might be influenced by drug treatments, history of mental illness, and variability in age and sex. As highlighted in the review by Freeman and Garety [10], the predisposition to dysphoric symptoms may play an important role in the development of specific delusional content and predispose susceptible individuals to particular forms of hallucination. As such, it is particularly important to examine nonclinical samples before the development of clinical schizophrenic symptoms and how depression and anxiety may interact to predict hallucination and delusion proneness.

Based on the previous research, it was expected that anxiety and depression will have positive relationships with hallucination and delusion proneness. In particular, the role of emotional context has been found to be of primary importance in predicting the persistence of positive symptoms [40]. Whereas other studies have already provided some evidence of the positive relationship between hallucination proneness and dysphoria in nonclinical samples, the relation between dysphoria and delusion proneness is new to this study. In addition, the use of different assessment instruments to previous research will contribute to establishing the reliability and the consistency of the findings, as well as highlighting the importance of specific subdimensions. Although previous studies have shown that different measures of dysphoria independently relate to hallucination and delusion, it might be expected that these measures of dysphoria also interact to predict hallucination and delusion proneness. In this study, we will test for interactions between measures of anxiety and depression in predicting hallucination and delusion proneness. We expect that participants highest on both anxiety and depression measures will show greater levels of hallucination and delusion proneness, relative to participants who are high on depression or anxiety only.

## 2. Method

### 2.1. Participants

Four hundred seventy two individuals participated in this study, 165 men (35%) and 307 women (65%). The mean age of the participants was 19.91 years (SD, 1.85) for women and 21.22 years (SD, 2.30) for men. All participants were