



# The role of schizotypy, mental imagery, and fantasy proneness in hallucinatory reports of undergraduate students

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## Abstract

Using the White Christmas task, we examined in a sample of undergraduate students ( $N = 111$ ) individual differences between participants who reported “hallucinatory experiences” and those who did not. For this purpose, we used individual difference measures tapping the following constructs: schizotypy, predisposition to hallucinate, mental imagery, and fantasy proneness. Participants who reported hallucinatory experiences during the White Christmas task scored higher on mental imagery and fantasy proneness as compared to those who did not report such experiences. Furthermore, self-reported imagery ability and fantasy proneness were strongly related. However, logistic regression analysis indicated that fantasy proneness was the best predictor of hallucinatory reports. Implications of these findings for the study of hallucinatory reports in non-clinical populations are discussed.

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## 1. Introduction

A number of authors have suggested that hallucinations exist on a continuum ranging from relatively benign forms to pathological manifestations as seen in schizophrenia (see review by Bentall, 1990). Indeed, several studies have indicated that a non-trivial minority of the normal population reports having had hallucinatory experiences at some point in their lives (e.g. Barrett & Etheridge, 1992). However, it remains unclear as to how these individuals differ from those who say they have never had hallucination-like experiences. In line with the continuum-hypothesis, one

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approach to this issue aims at identifying schizophrenia-like traits in the normal population. These traits are often referred to as “schizotypy” (e.g. Claridge & Broks, 1984). Some studies suggest that schizotypal characteristics comprise several distinct classes of phenomena (e.g. positive schizotypy; negative schizotypy; cognitive disorganization), which correspond to clinical subdivisions seen in schizophrenia (Bentall, Claridge, & Slade, 1989; Claridge & Broks, 1984; Loughland & Williams, 1997). Hallucinatory experiences are commonly assigned to positive schizotypy, a category that comprises unusual cognitive and perceptual experiences. Schizotypy in normal participants has often been investigated as a trait that bears strong relevance to schizophrenia research, as its study would offer potential insights into schizophrenia without the confounding effects of medication or institutionalization. However, the precise contribution of schizotypy to hallucinatory experiences in normals has not been thoroughly addressed.

A simple experimental test to elicit hallucinatory reports in non-clinical groups is the White Christmas task (Barber & Calverey, 1964; Mintz & Alpert, 1972; Young, Bentall, Slade, & Dewey, 1987). In this task, participants are asked to close their eyes and imagine Bing Crosby’s White Christmas song being played. After 30 s, participants are interrupted and asked to rate the quality of their imagination. With this task, it has consistently been found that a non-trivial minority of normal participants report having heard the song clearly, although most of them also indicate that they do not believe the record has actually been played. When hallucinating psychiatric patients undergo the White Christmas task, they not only report more often having heard the song than healthy controls, but they also show a firm belief that the song has actually been played (Mintz & Alpert, 1972; Young et al., 1987). This led Mintz and Alpert (1972) to conclude that the quality of an individual’s mental imagery ability is a necessary, but not sufficient condition for genuine hallucinations to occur. According to these authors, only the combination of strong mental imagery ability and poor reality testing would produce pathological hallucinations.

Although there is some consensus among authors about the role of deficient reality monitoring in pathological hallucinations (e.g. Bentall, 1990; Cahill & Frith, 1996), the involvement of mental imagery in hallucinations has proven to be a controversial issue. Using a signal-detection version of the White Christmas task, Bentall and Slade (1985a) investigated to what extent unusual vivid imagery may influence performance during an auditory detection task. They reasoned that if hallucinatory experiences were related to vivid mental imagery, participants reporting such experiences would perform poorly on signal-detection tasks due to a lowered sensitivity for external signals. Participants were assigned to a hallucination or control group on the basis of their scores on an instrument measuring the predisposition to hallucinate (Launay & Slade, 1981). However, the authors found no difference in perceptual sensitivity between both groups. Yet, those who scored high on the hallucination measure displayed a heightened willingness to believe that an auditory signal was present. Several studies relying on various experimental paradigms support this finding, suggesting that vivid imagery per se does not account for reports of hallucinatory experiences (e.g. Aleman, Böcker, & De Haan, 1999). Likewise, interrogative suggestibility (Young et al., 1987) and sensitivity to demand characteristics (Merckelbach & Van de Ven, 2001) do not seem to predict performance on the White Christmas task.

Another individual difference measure that may be involved in normal individuals’ reports of hallucinatory experiences is fantasy proneness. Fantasy proneness refers to a non-pathological trait defined by a deep and profound involvement in fantasy and imagination (Lynn & Rhue, 1986). Individuals scoring high on fantasy proneness exhibit a general tendency to endorse odd or

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