



# Rumination and psychosis: an experimental, analogue study of the role of perseverative thought processes in voice-hearing

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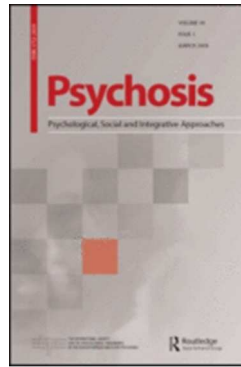
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**Rumination and psychosis: an experimental, analogue study of the role of perseverative thought processes in voice-hearing**

Journal:	<i>Psychosis</i>
Manuscript ID	RPSY-2016-0021.R2
Manuscript Type:	Brief Report
Keywords:	Hearing voices, Hallucinations, Affect, Causal explanations, Trauma
Abstract:	<p>We rigorously tested the role of rumination in the development of voice-hearing type experiences. One-hundred and two students watched a video depicting a physical assault and then either ruminated about the contents or were distracted. Participants listened to an anomalous auditory stimulus and recorded any words/ phrases along with distress. Manipulation checks confirmed that the rumination group showed greater perseveration regarding the film content than the distraction group. However, the groups did not significantly differ on number of words recorded, convergence with the video content or distress. These findings indicate that rumination might not necessarily be involved in the development of these experiences or associated distress. The current work should provide an impetus to conduct additional rigorously controlled experimental or prospective work to fully discern the key processes relevant to the experience of voice-hearing following exposure to stressful events.</p>

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**Rumination and psychosis: an experimental, analogue study of the role of perseverative thought processes in voice-hearing**

For Peer Review Only

### **Abstract**

We rigorously tested the role of rumination in the development of voice-hearing type experiences. One-hundred and two students watched a video depicting a physical assault and then either ruminated about the contents or were distracted. Participants listened to an anomalous auditory stimulus and recorded any words/ phrases along with distress. Manipulation checks confirmed that the rumination group showed greater perseveration regarding the film content than the distraction group. However, the groups did not significantly differ on number of words recorded, convergence with the video content or distress. These findings indicate that rumination might not necessarily be involved in the development of these experiences or associated distress. The current work should provide an impetus to conduct additional rigorously controlled experimental or prospective work to fully discern the key processes relevant to the experience of voice-hearing following exposure to stressful events.

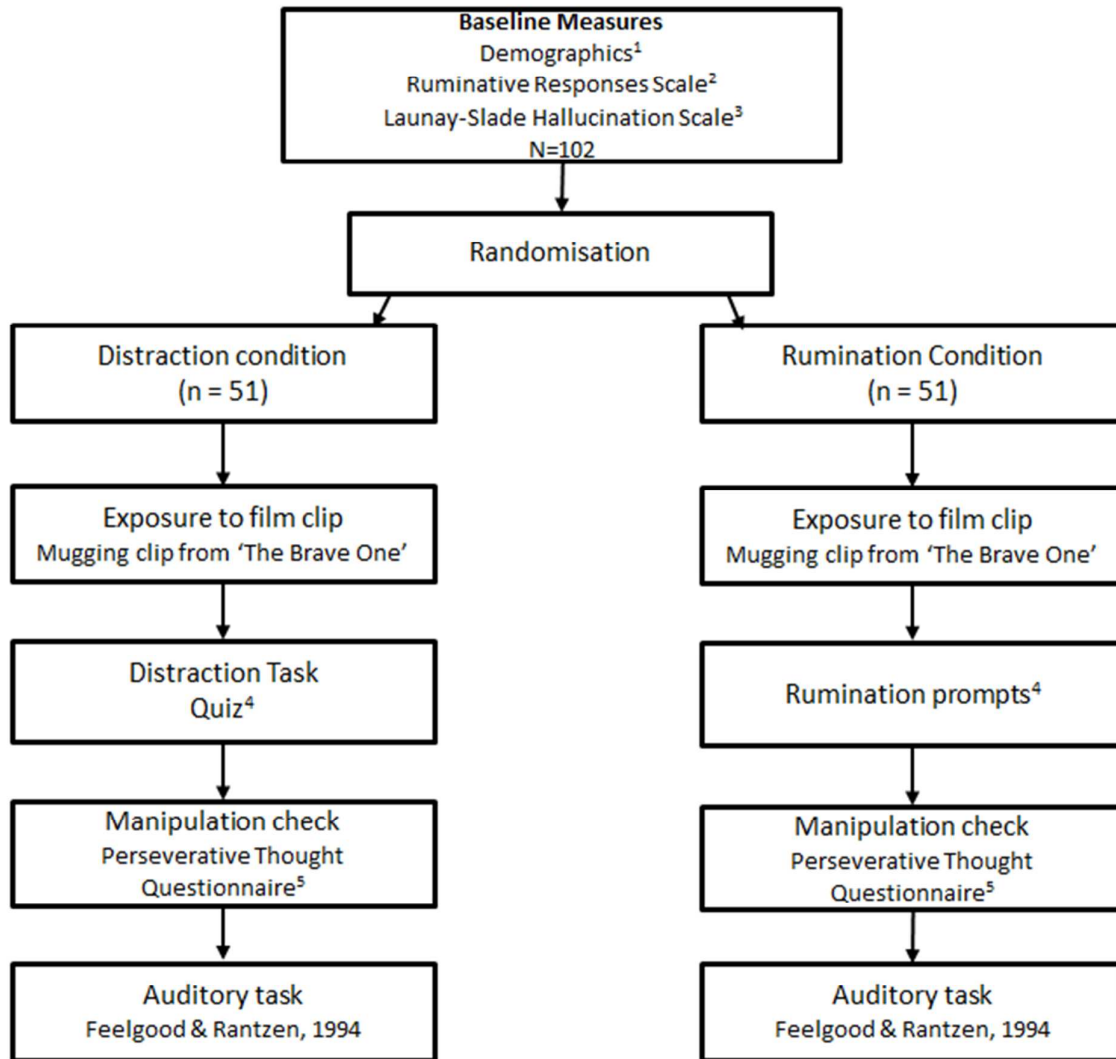
**Keywords:** hearing voices; hallucinations; affect; causal explanations; trauma

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3 Ruminative is a type of negative perseverative processing, which maintains depressed  
4 mood (Nolen-Hoeksema & Morrow, 1991). Recently, research has demonstrated high  
5 levels of rumination in groups experiencing psychosis (Vorontsova, Garety, & Freeman,  
6 2013) and has implicated rumination in delusional ideas and voice-hearing (Hartley,  
7 Haddock, Vasconcelos E Sa, Emsley, & Barrowclough, 2014) via increases in thought  
8 suppression in response to rumination and subsequent rebound intrusive thoughts that  
9 are then misinterpreted as voices (Jones & Fernyhough, 2009). Rumination also  
10 maintains post-trauma intrusions (Ehring, Frank, & Ehlers, 2008) and verbal appraisals  
11 of stressful material may be relived subsequently as a trauma-related psychotic  
12 intrusion. The current study is the first randomised, experimental study of a role for  
13 rumination in the development of voice-hearing type experiences. Our aim was to  
14 investigate whether experimentally-induced rumination following exposure to stressful  
15 video material would be related to hallucination-like experiences, their thematic  
16 content and the distress associated with these.  
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### 30 **Method**

31 An opportunity sample of 102 university staff and students who were English-speaking,  
32 18 years old or above, with normal/ corrected vision and hearing completed the full  
33 procedure described in Figure 1. Potential participants were excluded if they had  
34 secondary care psychiatric service history, experience of physical assault or had viewed  
35 the video footage previously. The mean age of the sample was 21 years (SD 4.12),  
36 comprised 78 females and 24 males, with the majority (n=87, 85%) currently engaged  
37 in a psychology-related area of study.  
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Figure 1: Study procedure



<sup>1</sup>Including a screen for trauma

<sup>2</sup>Nolen-Hoeksema & Morrow, 1991

<sup>3</sup>Bentall & Slade, 1985

<sup>4</sup>Zetsche et al., 2009

<sup>5</sup>Ehring et al., 2011

## **Results**

There were no significant differences in demographic or baseline measures between the conditions. The manipulation was successful, generating higher mean levels of perseverative thought in the rumination condition (17.14, SD 7.60) as compared to the distraction condition (14.00, SD 7.90); [ $t(100) = -2.04, p = .044$ ]. There were no significant differences in the primary outcome of number of eligible words recorded as part of the auditory task [ $t(100) = .400, p = .690$ ]. There were also no significant differences in the number of overall recordings [ $t(100) = .502, p = .616$ ], thematic matches [ $t(100) = .557, p = .579$ ] or average distress [ $t(100) = -.724, p = .471$ ]. In order to confirm that the voice-hearing task operated in the manner expected and previously demonstrated (Feelgood & Rantzen, 1994), the association between the number of recordings and proneness to hallucinate was checked, which showed that the tasks did indeed tap into similar phenomena as outlined in the original study [ $r(99) = .250; p = .013$ ], in addition to similar average levels of recordings and a broad range of total number of recordings.

## **Conclusions**

Increased ruminative processing did not result in increased levels of voice-hearing experiences, distress or thematic convergence between experiences and the film content. These divergent, non-significant findings are an important contribution to the hitherto cross-sectional literature, which may imply that rumination is engaged in as a reaction to psychotic phenomena that subsequently exacerbates their severity and distress-inducing qualities, rather than being active in their development.

Distraction might not be the most divergent comparator for ruminative processing; an alternative might be to engage in mindful awareness of intrusions. The voice-hearing paradigm is valid and levels of recordings comparable (Feelgood & Rantzen, 1994). Nevertheless, future work might utilise 'high-risk' samples, although this would present ethical issues. The study also rests on the assumption that a continuum model of psychosis is valid.

The current work does not negate a role for rumination in the maintenance of voice-hearing and should rather serve as an impetus for further research, with rigorous

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3 experimental and prospective methods, alongside consideration of the interpersonal  
4 experiences so intrinsic to this kind of event.  
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