Hallucinations predict delusional ideation over time in young adults.

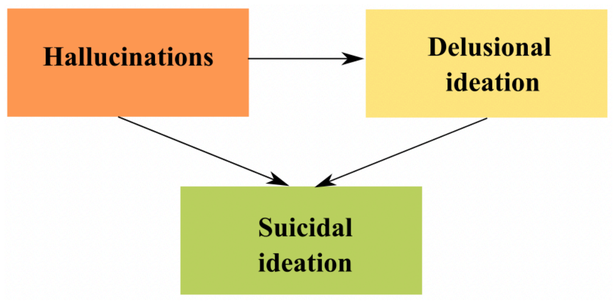
Abigail C Wright[1,2], Corinne Cather[1,2], Amy Farabaugh[1,2], Olga Terechina[1,2], Maurizio Fava[1,2], Daphne J Holt[1,2,3]

[1] Department of Psychiatry, Massachusetts General Hospital, Boston, MA, USA.
[2] Harvard Medical School, Boston, MA, USA.
[3] Athinoula A. Martinos Center for Biomedical Imaging, Massachusetts General Hospital, Boston, MA, USA.

Introduction

Psychotic experiences include hallucinations, a false sensory experience that occurs without an environmental stimulus, and delusional ideation, false beliefs that are inconsistent with cultural norms. These experiences are **common in the general population**[1,2] and often benign. However, those that are distressing and persistent[3] may predict the onset of a psychotic disorder.

Cognitive models have proposed that the unusual experience of hallucinations requires an appraisal by the individual, which could be negative or threatening, and this can lead to the development of delusional beliefs[4]. Furthermore, hallucinations and delusions may predict later suicidal ideation in young adults.



However, this proposed sequential relationship between hallucinations, delusions, and suicidal ideation across time has not been empirically confirmed.

Hypotheses

Hypothesis 1: Baseline hallucinations predict increases in delusional ideation.
Hypothesis 2: Baseline delusions and hallucinations predict an increase in suicidal ideation, over time.

Methods

1047 college students completed questionnaires to assess:
Delusional ideations (Peters Delusions Inventory[5])
Hallucinations (Launay-Slade Hallucinations Scale-Revised[6]).
Depression (Beck Depression Inventory[7])

Assessment of delusional ideation and hallucinations was repeated in a subset of those screened at:

- Month 7 (N=187)
- Month 13 (N=173)
- Month 19 (N=144)
- Month 25 (N=124)

Results

Table 1: Sample characteristics and descriptive and change statistics.

	Baseline (N=1048)	Month 7 (N=187)	Month 13 (N=173)	Month 19 (N=144)	Month 25 (N=124)
Age	19.5 (1.32)				
Gender	70.5%, F				
GPA	3.34 (0.43)				
LSHS total	10.4 (10.2)	10.15 (8.6)	9.98 (11.0)	8.59 (9.5)	10.95 (11.1)
Δ		p=.17	p=.57	p=.19	p=.88
PDI total endorsed	5.21 (3.53)	4.65 (3.18)	4.10 (3.15)	3.8 (3.35)	3.74 (3.3)
Δ		**p<.001**	**p<.001**	**p<.001**	**p<.001**
BDI total	7.03 (7.11)	8.48 (8.1)	8.92 (7.59)	7.89 (8.41)	8.18 (8.15)
Δ		**p=.004**	**p=.014**	**p=.001**	**p=.01**

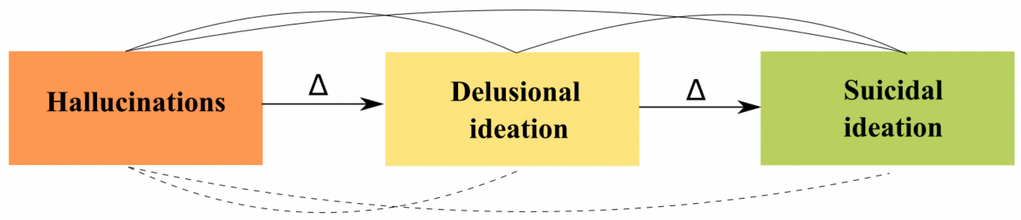
Hallucinations: Even when controlling for depression and gender, baseline delusional ideation predicted hallucinations at month 7, ΔR^2=.1, p<.001, month 13, ΔR^2=.09, p=.003, and month 25, ΔR^2=.1, p=.01.
No variable predicted a change in hallucinations.

Delusional ideation: Even when controlling for depression, baseline hallucinations predicted delusional ideation at month 7, ΔR^2=.15, p<.001, month 13, ΔR^2=.3, p<.001, month 19, ΔR^2=.08, p=.004, and month 25, ΔR^2=.04, p=.046. **Hallucinations predicted *a change* in delusional ideation from baseline to month 7, ΔR^2=.04, p=.02 and month 13, ΔR^2=.07, p<.001.**

Suicidal ideation: Even when controlling for depression, baseline hallucinations predicted suicidal ideation at month 19, ΔR^2=.07, p=.01. **Delusional ideation predicted *a change* in suicidal ideation at month 13, ΔR^2=.03, p=.01 and month 19, ΔR^2=.03, p=.04**

Main takeaways

Hallucinations, delusions, and suicidal ideation were correlated across the course of the study but **only hallucinations predicted a change in delusional ideation and only delusional ideation predicted a change in suicidal ideation over time**. This key role of hallucinations provides **evidence for a causal relationship.**



This finding represents important information regarding the underlying mechanisms of delusion and suicidal ideation.

References

1. Linscott RJ, Van Os J. An updated and conservative systematic review and meta-analysis of epidemiological evidence on psychotic experiences in children and adults: On the pathway from proneness to persistence to dimensional expression across mental disorders. *Psychol Med*. 2013;43(6):1133-1149. doi:10.1017/S0033291712001626
2. Pechey R, Halligan P. Prevalence and correlates of anomalous experiences in a large non-clinical sample. *Psychol Psychother Theory, Res Pract*. 2012;85(2):150-162. doi:10.1111/j.2044-8341.2011.02024.x
3. Schürhoff F, Szöke A, Méary A, et al. Familial aggregation of delusional proneness in schizophrenia and bipolar pedigrees. *Am J Psychiatry*. 2003;160(7):1313-1319. doi:10.1176/appi.ajp.160.7.1313
4. Corlett PR, Frith CD, Fletcher PC. From drugs to deprivation: A Bayesian framework for understanding models of psychosis. *Psychopharmacology (Berl)*. 2009;206:515-530. doi:10.1007/s00213-009-1561-0
5. Peters E, Joseph S, Day S, Garety P. Measuring delusional ideation: the 21-item Peters et al. Delusions Inventory (PDI). *Schizophr Bull*. 2004;30(4):1005-1022.
6. Larøi F, Van Der Linden M. Nonclinical participants' reports of hallucinatory experiences. *Can J Behav Sci*. 2005;37(1):33-43. doi:10.1037/h0087243
doi:10.1016/0191-8869(81)90027-1
7. Beck AT, Ward CH, Mendelson M, Mock J, Erbaugh J. Inventory for Measuring Depression. *Arch Gen Psychiatry*. 1961;4:561-571.