

## Interpretation, emotional reactions and daily life implications of hallucination-like experiences in clinical and nonclinical populations

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### Abstract

**Background:** Research on Hallucination-Like Experiences (HLEs) has not yet explored whether people without psychosis who have HLEs attribute the same level of significance to them. This significance includes whether or not the HLEs elicit similar emotional reactions in people with and without psychosis, or if the HLEs occur in same context between the two groups. The objective of this study was to compare the characteristics of these experiences in a non-clinical group and a clinical group of patients with schizophrenia and schizophrenia spectrum disorders. **Method:** Both groups were evaluated to determine the prevalence of HLEs. After the evaluation, they were interviewed about the characteristics of these experiences. **Results:** Both groups sought to actively eliminate the HLEs, could identify the presence of a trigger factor, and experienced little perceived control. However, HLEs elicited more anxiety, discomfort and interference in daily life in the clinical group than in the non-clinical group. Furthermore, the clinical group members defined their hallucinations more negatively and were reported to have experienced them under stressful events. **Conclusions:** These findings suggest that the two experiences are not entirely equivalent, especially when taking into account the emotional reaction produced by these experiences and the meaning people attach to them.

**Keywords:** Hallucination, hallucination-like experiences, psychotic-like experiences, schizophrenia, vulnerability model.

### Resumen

*Interpretación, reacción emocional e implicaciones en la vida diaria de experiencias de tipo alucinatorias en población clínica y no clínica.*

**Antecedentes:** la investigación en Experiencias de Tipo Alucinatorias (HLEs en inglés) aún no ha explorado si las personas sin psicosis que las experimentan les atribuyen el mismo significado, si estas provocan las mismas reacciones emocionales o si ocurren en los mismos contextos que en la psicosis. El objetivo de este estudio fue comparar las características de estas experiencias entre un grupo no clínico y un grupo clínico de pacientes con esquizofrenia y trastornos del espectro esquizofrénico.

**Método:** ambos grupos fueron evaluados para determinar la prevalencia de las HLEs, después de lo cual fueron entrevistados sobre las características de estas experiencias. **Resultados:** ambos grupos buscan activamente eliminar estas experiencias; pueden identificar la presencia de un factor desencadenante, y poco control percibido. Sin embargo, las HLEs provocaron más ansiedad, malestar e interferencia en la vida diaria en el grupo clínico que en el grupo no clínico. Además, el grupo clínico definió sus HLEs como más negativas y experimentadas bajo situaciones estresantes. **Conclusiones:** estos resultados sugieren que las experiencias de ambos grupos no son completamente equivalentes, especialmente cuando se toman en cuenta las reacciones emocionales producidas por estas experiencias y el significado que las personas les atribuyen.

**Palabras clave:** alucinaciones, experiencias de tipo alucinatorias, experiencias de tipo psicóticas, esquizofrenia, modelo de vulnerabilidad.

Recent research has challenged the traditional dichotomous model that separates psychotic symptoms from non-psychotic experiences, suggesting that hallucinations and delusions are a relatively common phenomenon in the general population (van Os, Linscott, Myin-Germeys, Delespaul, & Krabbendam, 2009; Yung et al., 2009). Yet, a recent review of 17 studies from nine countries has shown inconsistent findings, as the prevalence of

hallucinatory experiences fluctuates from 0.6% to 84%, with a median of 13.2% (Beavan, Read, & Cartwright, 2011). Among the reasons for these differences were the methodology (e.g., definition of hallucinations, characteristics of the participants) and cultural aspects related to hallucinations and delusions.

In order to characterise the different types of hallucinatory experiences that individuals in the nonclinical population reported, Larøi (2012) suggested at least two types of distinguishing features. In the first subgroup (non-patient type i), hallucinations were rare and probably emerged under specific situations (e.g., sleep-related conditions, mourning, etc., see Cangas, Langer, & Moriana, 2011). In these people, hallucinations differed considerably from the experiences reported by patients.

The non-patient type ii group included subjects whose experiences were more similar to the patients' experiences, including the characteristics of occurring relatively frequently and with an early onset. Nevertheless, in these persons, the hallucinations did not interfere with their daily life or their personal scopes. Therefore, these experiences represented different positions across a continuum of risk, from mild hallucinations to full-blown psychotic hallucinations.

Further differences between the type ii group experiences and the patients' experiences included the following: (a) the content of the voices (more negative and destructive in patients), (b) the age of onset for hearing voices (earlier in non-patients), (c) frequency (higher in patients), (d) the impact of voices in daily life (more negative in patients), and (e) the perception of controllability (higher in non-patients) (Daalman et al., 2011; Honig et al., 1999).

A comparison between patients affected by schizophrenia and healthy university students reporting HLEs suggested that there is a difference in the personal quality of these experiences between the two groups (Stanghellini, Langer, Ambrosini, & Cangas, 2012). Focusing on the personal level of experience and on personal narratives could help researchers to obtain a clear picture of the differences and similarities between hallucination-like phenomena in clinical and nonclinical samples (David, 2010).

Nevertheless, other characteristics that have, in part, been explored in the above-mentioned studies have not been analysed with these types of participant groups (Larøi, 2012). Some of the characteristics include the following: whether or not the people who experience HLEs attribute the same level of significance to them, the HLEs occur in similar contexts between the two groups, elicit similar emotional reactions between the two groups, and have the same impact on the lives of people in both groups.

The scope of this study involves delving into these questions. Our specific objectives include the following: (a) to confirm that frequency of HLEs are intermittent within the nonclinical group and more persistent in the clinical group and (b) to describe the differences and similarities of HLEs between the clinical and nonclinical group concerning: the level of distress (e.g., anxiety, discomfort and negative definition), the attempts to eliminate the experiences, and the degree of both the interference in daily life and the perceived control over HLEs.

## Method

### Participants

The clinical group was made up of 60 outpatients diagnosed with schizophrenia ( $n= 48$ ), schizoaffective disorder ( $N= 9$ ) or schizophreniform disorder ( $N= 3$ ), according to the DSM-IV-TR (American Psychiatric Association, 2000). The patients' diagnoses were established by observing their clinical records and confirmed, for the purposes of this research, by the clinician in charge of each patient's case.

Patients in this group were recruited from the Spanish National Mental Health Services, as well as from the Santa Ana Hospital (Motril), the Hospital of Córdoba (Córdoba) and the Torrecárdenas and Poniente Hospitals (Almería) (southern Spain). The participants of the group had a mean age of 37.60 years ( $SD= 10.12$ ), with 79% of males and 21% of females. The mean number

of years of education received by the participants was 9.70 ( $SD= 2.44$ ). Three patients were Romany and three were immigrants (two from Morocco, and one from Lithuania).

The nonclinical group consisted of 68 people from the general adult population, matched for age, sex and education level with respect to the clinical group. The participants were recruited from the province of Almería and Córdoba (Spain). Their mean age was 35.90 years old ( $SD= 9.78$ ), and 72% of the participants were male and 28% were female. The average of years of education was 9.98 ( $SD= 2.61$ ). As a part of the protocol for this research, the participants were assessed for the absence of psychological disorders, with psychosis specifically being sought at the beginning of the interview. Following this assessment, the records of two participants were excluded from the analysis.

### Instruments

*Revised Hallucination Scale* (RHS; Morrison, Wells, & Nothard, 2000). This scale was designed based on the Launay-Slade Hallucination Scale (LSHS; Launay & Slade, 1981), which measures predisposition to hallucinations within the normal population. It consists of 13 Likert-type items rated on a four-point scale, ranging from 1 (*never*) to 4 (*almost always*). Two factors were extracted from the original version, with one encompassing predisposition to auditory hallucinations, and the other encompassing the predisposition to visual hallucinations.

This questionnaire was translated into Spanish in accordance with the recommendations of Muñiz and Hambleton (1996). Cangas et al. (2011), who published the psychometric properties of the adapted version, found a four-factor structure with principal component analysis (PCA). The first factor measured visual and auditory hallucinatory experiences; the second contained items reflecting vivid daydreams; the third factor was related to visual perceptual distortions, and the fourth factor encompassed intrusive thoughts and distortions of auditory perception. These four factors together accounted for 52.8% of the variance (24.4%, 11.5%, 9.7% and 8.3%, respectively).

*Structured Interview Assessment of Psychotic Experience* (SIAPE). This interview was designed for the purposes of this study. Specifically, we followed two phases. First, according to literature evidence, we selected relevant dimensions of hallucination development and maintenance. Second, we carried out a pilot test with patients and non-patients to ensure the correct understanding of the questions. SIAPE offers a follow-up with participants regarding the items on the RHS to which they had responded affirmatively, and explores the characteristics of those experiences. The interviews were structured with dichotomous yes/no answers for the following variables:

- Do you define this experience as negative?
- Did some situation precipitate, or trigger, the experience?
- Did you try to eliminate it?
- Were you undergoing a stressful situation at the time it happened?

The next set of questions evaluates the following variables, using a 1-4 Likert-type scale: (a) degree of control, (b) degree of discomfort, (c) degree of anxiety and (d) degree of interference with daily life (e.g., 1 = *does not bother me or interfere*, 4 = *bothers me or interferes a lot*).

## Procedure

The participants completed the RHS self-questionnaire, after which those who had responded affirmatively to at least one item were interviewed. In the nonclinical sample, the RHS was administered to groups of participants. In the clinical sample, the procedure was carried out individually in both analyses (questionnaire and interview) by clinical psychologists with training in severe mental disorders. In both groups, participants provided their informed consent in writing and received no type of reward or payment for their involvement in the study.

The research protocol used in this study was approved by the different hospitals where the research was developed.

## Data analysis

All analyses were performed using SPSS version 15.0 for Windows. To determine the prevalence of HLEs in each sample, we analysed the average scores for each item and factor. Next, we determined the average difference between groups using a Student's *t*-statistic. To examine the frequency, the response options "often" and "almost always" were grouped together into a single variable for each sample, and the percentages were compared. Additionally, the effect size in the scores for each item between the clinical and nonclinical samples was analysed by performing a Cohen's *d* analysis.

Subsequently, to determine the characteristics of HLEs, eight features per item were analysed in the interviews, as described in the instruments section. The first four variables analysed were dichotomous and between-groups differences were computed by means of the  $\chi^2$  statistic. In these variables, Cramer's *v* versus Student's *t*-statistic comparison was used to assess the effect size in order to measure the average differences between the groups. The quantitative variables below were assessed on a Likert-type scale and the effect size was assessed by Cohen's *d*.

## Results

### Prevalence of Hallucination-like Experiences

The clinical group exhibited higher mean scores on a great majority of the experiences registered by the RHS. The mean differences with a large effect size were found on Item 8 and in the RHS total score. Upon comparing whether or not these experiences occurred with high frequency (*often or almost always*) in the two groups, it became clear that in the nonclinical group, these experiences were uncommon, except when they relate to intrusive thoughts (IT) (Item 2: "No matter how hard I try to concentrate, unrelated thoughts always creep into my mind.") or auditory distortion (AD) (Item 6: "In my daydreams, I can hear the sound of a tune almost as clearly as if I were actually listening to it.").

In the clinical group, on the other hand, certain experiences were not reported to occur very frequently. For example, no more than 9% of this group responded affirmatively to two items included in the Visual and Auditory Hallucination (VAH) dimension, specifically, items 9 ("I have seen a person's face in front of me when no one was there."), and 12 ("When I look at things, they look unreal to me.") (see Table 1).

## Characteristics of HLEs

A higher percentage of the clinical group, as compared to the nonclinical group, defined these phenomena as negative experiences across all items. In 9 of the 13 items described in the RHS, the difference between the groups was statistically significant. The effect size for these scores fluctuated between medium (on six items) and large (on three items). The experiences that the clinical group did not report to be significantly more negative than the nonclinical group mostly pertained to the VAH and VD dimensions (e.g. Item 9: "I have seen a person's face in front of me when no one was there." was markedly negative for both groups).

With regards to the incidence of situations identified as precipitating or triggering experiences, there were significant differences between the groups observed in only 3 of the total 13 instances. As with the previous variable, it was found that both groups generally made attempts to eliminate the experience. A higher percentage of the clinical group reported attempts to eliminate the experience on only six items, and many of these six items focused on the VD and IT&AD dimensions.

The two groups exhibited greater significant differences when it came to whether or not the experience had occurred in the context of a stressful situation. In other words, participants identified that these experiences had occurred in the presence of stress (on 10 of the 13 items, the clinical group scored significantly higher on this than did the nonclinical group). The effect size for these scores was mostly medium (on eight items).

The nonclinical group reported a greater degree of perceived control over these experiences that did the clinical group. Nevertheless, in few items (in 5 out of 13) these differences were statistically significant as compared with the clinical group. In contrast, numerous significant differences occurred between the groups in the following three variables: discomfort, anxiety and interference in daily life.

In terms of degree of discomfort, 10 of the experiences were reported to be significantly more uncomfortable for the clinical group than for the nonclinical group. As for degree of anxiety, this was markedly greater for the clinical group than for the nonclinical group in 11 of the experiences. Similarly, the degree of interference that these experiences produced in participants' everyday lives was significantly greater in 10 of the items for the clinical group. Indeed, in the majority of these variables, the effect size of the scores between the groups was large.

In all of the experiences described, excluding items 11 ("I see shadows and shapes when there is nothing there.") and 9 ("I have seen a person's face in front of me when no one was there."), neither of which yielded significant differences, the clinical group reported their lives had been impacted to a greater extent than did the nonclinical group (see Table 3).

## Discussion

In this study, we compared the characteristics of HLEs in individuals with and without schizophrenia spectrum disorders. To meet this objective, two specific criteria were examined. First, the purpose was to explore the HLEs frequency and to confirm if HLEs would occur intermittently within the nonclinical group and more persistently in the clinical group. This was partially confirmed. On the one hand, as in previous studies, the results indicate that these experiences are infrequent in the nonclinical

group (Armando et al., 2010; Yung et al., 2009) and more common in the population of individuals with psychosis (Levitan, Ward, Catts, & Hemsley, 1996).

On the other hand, it appears that some of the HLEs also occur frequently in the nonclinical population, whereas others occur frequently only in a low percentage of participants in either group. Likewise, recent studies have confirmed that it is advisable to measure the frequency of psychotic experiences by breaking them down into dimensions, and not just using overall scores. This is

because there are crucial differences in how they are distributed and how they relate to distress, depression and other clinical symptoms (Langer, Cangas, & Serper, 2011; Yung et al., 2009).

Concerning our second criterion, we discovered that HLEs were associated with more anxiety, discomfort and interference with daily life in the clinical group than in the nonclinical group. Furthermore, persons in the clinical group defined their hallucinations more negatively and experienced them as more stressful events. Both groups actively sought to eliminate the

*Table 1*  
Mean score and percentage of often/almost always by groups

Item no.	Item	N.C.	C	T	d
<b>AUDITORY AND VISUAL HALLUCINATIONS</b>					
8	I have been troubled by hearing voices in my head	M= 1.07 SD=.26 0%	M= 2.50 SD= 1.10 50%	-10.40***	-1.78
9	I have seen a person's face in front of me when no one was there	M= 1.09 SD=.29 0%	M= 1.37 SD= .74 8.3%	-2.89*	-0.50
12	When I look at things they look unreal to me	M= 1.07 SD= .27 0%	M= 1.36 SD= .64 8.5%	-3.34*	-0.59
<b>VIVID DAYDREAMS</b>					
1	My thoughts seem as real as actual events in my life	M= 1.75 SD= .84 16.2%	M= 2.05 SD= 1.01 28.8%	-1.84	-0.32
4	The sounds I hear in my daydreams are usually clear and distinct	M= 1.60 SD= .78 11.7%	M= 1.90 SD= 1.13 23.7%	-1.74	-0.31
5	The people in my daydreams seem so true to life that I think they are real	M= 1.19 SD= .61 7.4%	M= 1.86 SD= 1.15 25.4%	-4.20**	-0.73
<b>VISUAL PERCEPTIVE DISTORTIONS</b>					
10	When I look at things they appear strange to me	M= 1.25 SD= .58 4.4%	M= 1.43 SD= .70 8.4%	-1.62	-0.28
11	I see shadows and shapes when there is nothing there	M= 1.18 SD= .49 1.5%	M= 1.43 SD= .79 11.6%	-2.49*	-0.38
13	When I look at myself in the mirror I look different	M= 1.32 SD= .58 5.9%	M= 1.77 SD= 1.03 23.3%	-3.04**	-0.54
<b>INTRUSIVE THOUGHTS AND AUDITORY DISTORTIONS</b>					
2	No matter how hard I try to concentrate, unrelated thoughts always creep into my mind	M= 2.16 SD= .81 20.6%	M= 2.18 SD= .93 33.3%	-.16	-0.02
3	I have had the experience of hearing a person's voice and then found that there was no one there	M= 1.38 SD= .57 1.5%	M= 1.90 SD= .86 21.7%	-4.06***	-0.71
6	In my daydreams I can hear the sound of a tune almost as clearly as if I were actually listening to it	M= 2.19 SD= .89 29.4%	M= 2.07 SD= 1.18 38.4%	.68	0.11
7	I hear a voice speaking my thoughts aloud	M= 1.37 SD= .69 5.8%	M= 1.92 SD= 1.18 31.7%	-3.25**	-0.57
<b>TOTAL SCORE</b>					
		M= 18.52 SD= 3.38	M= 23.79 SD= 6.34	-5.90***	-1.03

N.C.= nonclinical sample; C= clinical sample; \*= p<.05; \*\*= p<.01; \*\*\*= p<.001

*Table 2*  
Percentages of the characteristics of HLEs by group (dichotomy variables)

Items	Negative definition				Precipitate				Try to eliminate				Under stress			
	N.C.	C	X <sup>2</sup>	V	N.C.	C	X <sup>2</sup>	V	N.C.	C	X <sup>2</sup>	V	N.C.	C	X <sup>2</sup>	V
AAV																
8	40	84	5.19*	.329	20	72	5.47*	.338	40	79	3.65	.276	20	76	6.50*	.376
9	50	64	.36	.134	33	29	.05	.048	50	50	.00	.000	17	43	1.27	.252
12	0	50	3.00	.500	0	29	1.40	.356	25	63	1.50	.354	0	57	3.59	.571
VD																
1	17	46	6.86**	.309	39	57	2.11	.173	31	73	12.01**	.417	21	68	15.10***	.465
4	0	74	33.42***	.772	24	48	3.26	.251	18	48	5.73*	.323	0	58	19.78***	.629
5	0	50	6.87**	.487	13	58	4.70*	.417	11	37	1.98	.266	0	39	4.26**	.405
DV																
10	7.7	50	5.99*	.455	42	53	.36	.116	23	63	4.51*	.394	8	56	6.85**	.495
11	50	33	244	.149	31	33	.04	.027	63	33	.75	.261	24	66	6.06*	.348
13	43	65	1.64	.219	50	60	.33	.099	60	70	.38	.104	7.1	45	5.68*	.409
IT&AD																
2	51	83	11.43**	.330	59	49	.94	.100	78	77	.80	.025	39	51	1.54	.127
3	8	79	29.37***	.668	30	68	8.33**	.369	22	78	18.53***	.556	17.4	71	16.21***	.529
6	2	25	10.19**	.362	28	43	1.82	.156	6.4	33	9.17**	.352	2	20	8.99**	.346
7	0	79	26.02**	.787	35	63	2.95	.268	5.3	71	18.73***	.660	22.4	61	6.12*	.386

*Table 3*  
Mean score (SD) of the characteristics of HLEs by group

Items	Degree of control				Degree of discomfort				Degree of anxiety				Degree of interference			
	N.C.	C	T	d	N.C.	C	T	d	N.C.	C	T	d	N.C.	C	T	d
AAV																
8.	2.60 (1.34)	1.52 (0.77)	2.71**	.98	1.20 (0.45)	3.16 (1.00)	-4.31***	-2.53	2.00 (0.70)	3.11 (1.07)	-2.25*	-1.22	1.40 (.55)	3.35 (.90)	-4.73***	-2.61
9.	1.50 (0.54)	1.42 (0.64)	0.24	.13	2.33 (1.21)	2.64 (1.01)	-.59	-.28	2.66 (1.03)	2.71 (1.06)	-0.09	-.05	2.00 (1.41)	3.00 (.96)	-1.77	-.83
12.	1.75 (0.96)	1.86 (1.06)	-0.16	-.10	1.25 (.50)	2.43 (.98)	-2.22	-1.52	2.00 (.00)	2.85 (0.89)	-1.86*	-1.35	1.25 (.50)	2.43 (1.13)	-1.94	-1.40
VD																
1.	2.30 (0.66)	2.22 (1.03)	0.37	.09	1.22 (.54)	2.65 (1.11)	-6.95***	-1.63	1.51 (0.79)	2.54 (1.04)	-4.65***	-1.11	1.39 (.61)	2.54 (1.02)	-5.64***	-1.36
4.	2.48 (1.12)	1.61 (0.85)	3.24**	.87	1.24 (.79)	2.37 (.93)	-4.93***	-1.30	1.33 (0.70)	2.77 (1.12)	-5.58***	-1.54	1.24 (.60)	2.44 (1.01)	-5.17***	-1.44
5.	1.88 (1.05)	2.57 (1.21)	0.93	.61	1.11 (.33)	2.21 (1.23)	-2.62*	-1.22	1.37 (0.51)	2.57 (1.21)	-3.60**	-1.29	1.13 (.35)	2.58 (1.07)	-3.72**	-1.82
DV																
10	3.23 (0.72)	1.87 (1.02)	4.02***	1.54	1.15 (.38)	2.56 (1.21)	-4.03***	-1.57	1.25 (0.62)	2.56 (1.09)	-4.01***	-1.47	1.17 (.39)	2.56 (1.03)	-4.44***	-1.78
11.	1.75 (0.70)	2.00 (1.41)	0.38	-.22	1.87 (.64)	1.00 (.00)	1.85	1.92	2.17 (0.62)	2.00 (1.09)	0.60	.191	1.56 (.66)	2.06 (1.18)	-1.94	-.52
13.	2.20 (0.77)	1.70 (0.92)	1.69	.59	1.80 (.86)	2.90 (1.12)	-3.16**	-1.10	1.57 (0.75)	2.50 (1.05)	-2.82**	-1.01	1.38 (.51)	2.50 (1.24)	-3.08*	-1.18
IT&AD																
2.	2.43 (0.75)	2.02 (0.89)	2.46**	.50	1.93 (.74)	2.69 (.98)	-4.44***	-.87	1.94 (0.79)	2.85 (0.96)	-5.02***	-1.03	1.92 (.58)	2.62 (1.01)	-4.20***	-.85
3	2.04 (0.99)	1.88 (1.00)	.57	.16	1.38 (.50)	2.97 (1.04)	-7.01***	-1.95	1.59 (0.66)	3.08 (0.98)	-6.29***	-1.78	1.09 (0.29)	2.78 (1.04)	-7.89***	-2.21
6	2.75 (0.90)	2.44 (1.25)	1.13	.28	1.02 (.25)	1.29 (.60)	-2.75**	-.59	1.04 (0.20)	1.53 (0.74)	-3.42**	-.90	1.04 (.21)	1.32 (.48)	-3.47**	-.75
7.	2.68 (1.05)	1.59 (0.85)	3.66**	1.14	1.26 (.45)	2.96 (1.11)	-6.24***	-2.00	1.33 (0.48)	3.17 (1.02)	-7.57***	-2.30	1.39 (.70)	3.09 (1.08)	-5.77***	-1.86



experience, experienced little perceived control and could identify the presence of a precipitating factor. In previous studies, these characteristics have not been analysed entirely with these types of participant groups (Larøi, 2012).

In the light of these findings, it seems essential to explore the possible reasons for the differences between the two groups, especially in the area of emotional response and interpretation of HLEs. The association between HLEs and negative emotions can be interpreted in two ways. First, HLEs may cause negative emotions. Second, they may be responses to negative emotions, or ways to cope with and make sense of them.

Previous studies established the fact that people undergo psychotic experiences in response to deep interpersonal stress, like threat to self-esteem (Erickson & Lysaker, 2012) or social isolation (Thewissen et al., 2011). This may be the case with both the clinical group and the nonclinical sample (see, for example, Cangas et al., 2011). Also, social withdrawal, active reduction of emotional stress and avoidance of stressful interpersonal contexts have been shown to be common psychological mechanisms in both the clinical and nonclinical populations (Hayes, Luoma, Bond, Masuda, & Lillis, 2006).

Given the cross-sectional nature of this study, it is not possible to establish whether or not HLEs cause negative emotions or are caused by negative emotions arising, especially in situations involving social distress. We suggest, however, that the way people face HLEs is a crucial factor in determining the pathological or non-pathological nature of these experiences. This has obvious clinical implications, as strengthening these people's capacity for metacognition, as well as helping them to recapture a sense of agency (Stanghellini & Lysaker, 2007) could assist them with making an alternative sense of their internal states and needs (e.g. Lysaker, Glynn, Wilkness, & Silverstein, 2010).

One limitation of this study is that in the clinical sample, the average number of years in treatment and the number of hospitalizations were not controlled for. This could result in differences among the patients. In addition yes-or-no questions about negative attribution of HLEs did not allow having a precise picture of the contents and meaning of them. Thereby future research, through qualitative analyses, could help to elucidate the personal background and cultural context present in both the similarities and differences between the experiences of non-patients (Type i and ii) and patients. This may help us to understand the connection between experiences and backgrounds, as well as to determine whether or not there is a trigger for patients who report that their experiences with HLEs disturb their daily life functioning. This would help us to know how these elements may be linked in the risk continuum from mild HLEs to full-blown psychotic hallucinations.

To further our understanding of these experiences in the general and clinical populations, research should focus more on the different ways people who and who are not vulnerable to psychosis cope with disturbing experiences. Research should also focus on the mediating role of the person in interacting with these experiences (David, 2010). Therefore, an essential task for future researchers is to determine how individuals interpret these situations and what sort of emotional reactions the experiences elicit (Stanghellini et al., 2012).

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