

## HALLUCINATIONS IN A NORMAL POPULATION: IMAGERY AND PERSONALITY INFLUENCES

Ana María López Rodrigo, María Mercedes Paíno Piñeiro, Pedro C. Martínez Suárez,  
Mercedes Inda Caro and Serafín Lemos Giráldez\*  
*University of Oviedo*

*The present study was designed to gather data related to the continuum hypothesis of hallucinations. According to this hypothesis, hallucinations can be considered to be one end of a continuum of normal conscious experience that include vivid imagery, daydreams and thoughts. Subjects were 222 college students who anonymously completed the Hallucination Questionnaire (Barrett and Etheridge, 1994), the Betts QMI Vividness of Imagery Scale (Richardson, 1969), and Millon's Clinical Multiaxial Inventory (MCMI-II) (Millon, 1983). The results suggest that hallucinators have more vivid imagery and higher scores on most Millon's Inventory scales compared to non-hallucinators. Nevertheless, a normal distribution of the hallucinatory experiences was not found, which casts doubt on their dimensional nature.*

*Se pretende valorar en este estudio la hipótesis de las alucinaciones como fenómeno continuo. Dicha hipótesis considera a las alucinaciones como un extremo del continuo de la experiencia consciente normal, que incluye la imaginación vívida, las ensoñaciones y los pensamientos. La muestra estaba formada por 222 estudiantes universitarios que contestaron anónimamente al Cuestionario de Alucinaciones (Barrett y Etheridge, 1994), la escala QMI de Imaginación Vívida de Betts (Richardson, 1969), y el Inventario Clínico Multiaxial de Millon (MCM-II) (Millon, 1983). Los resultados indican que los sujetos con experiencias alucinatorias presentan una mayor imaginación vívida y puntúan más alto en la mayoría de las escalas del Inventario de Millon, comparados con los no alucinadores. No se ha obtenido, sin embargo, una distribución normal de los fenómenos alucinatorios, lo que arroja dudas sobre la naturaleza dimensional de dichas experiencias.*

A number of studies seem to support the existence of a continuum between mental disorders and normal personality and show that personality disorders would represent the extreme part within the continuum of normal personality traits (Livesley, Jackson and Schroeder, 1992; Trull, 1992). Those studies fall within a dimensional model of classification which contrasts with traditional distinctions between clinic syndromes and personality disorders made by traditional categorising systems, since the former considers that such differences are not so obvious among the population with mental disorders when it is considered as a whole. It is from this point of

view from where criticisms arise of the distinction made by DSM latest versions between axis I and axis II, since the dissociation of behaviour disorders is not at all clear (Millon, 1981; Rutter, 1987; Livesley and Schroeder, 1990). From the dimensionality perspective and, hence, from the defence of an existing continuum between normal and abnormal behaviour, the formulation of different diagnostic categories based on symptoms is debatable if we consider that many symptoms are common to various clinical syndromes (Slade and Bentall, 1988). Yet, the fact that, in existing categorial systems like DSM-IV, hallucinations are primarily included within the syndromes of the functional psychoses cannot be ignored.

Without disregarding the dimensional framework, it can be expected that certain phenomena such as hallucinations can occur not only in individuals with mental disorders but also in the normal population. However, they have frequently been associated with psychopathology and they are usually seen as dysfunctional perceptual

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\*Correspondence concerning this article should be addressed to Serafín Lemos-Giráldez. Faculty of Psychology, University of Oviedo. Plaza Feijóo, s/n. 33003 Oviedo. Spain. E-mail: slemos@sci.cpd.uniovi.es

experiences. Hence, the conditions and pathological processes usually associated with hallucinations are of different kinds: sensory systems disturbance (basically age-related ones), physiological disorders (fever, sensory deprivation, etc.), medical conditions and treatments, central nervous system disorders (brain injuries, encephalopathies, etc.) and, most of all, schizophrenia and affective psychoses.

Considering the concept of hallucination, in DSM-IV the phenomenon is defined as a "sensory perception that has the compelling sense of reality of a true perception but that occurs without external stimulation of the relevant sensory organ" (American Psychiatric Association, 1994, p. 767). It is important to stress the cognitive point of view supported by Slade and Bentall, which is specified in the following working definition of hallucination: *any percept-like experience which (a) occurs in the absence of an appropriate stimulus, (b) has the full force or impact of the corresponding actual (real) perception, and (c) is not amenable to direct and voluntary control by the experimenter* (Slade and Bentall, 1988, p. 23).

Starting from this definition, it is possible to distinguish hallucinations from other similar experiences such as illusions. While illusory experiences involve a perceptual error based on context, in the hallucinatory phenomenon there exists a perceptual error based on internal stimuli, which leads to more serious consequences. Secondly, another typical aspect is the strength or impact of the experience, which is used as a criterion to distinguish hallucinations from pseudo-hallucinations, since in hallucinations one is convinced that the phenomenon occurs outside oneself, that is, it is happening in the real world. The third point for the definition, the lack of control by the individual, tries to make a distinction between hallucinations and other kinds of vivid mental images. In contrast to what happens in imagery, in hallucination there exists the impossibility, or at least the difficulty, to willingly alter or diminish the experience.

In any case, there are studies, mostly correlational, that tried to analyse the differences among those subjects who experience hallucinations and those we could call normal "imagers". Contrary to what might be posited, Seith and Molholm (1947) demonstrated that people with hallucinations have very weak mental images. However, another group of authors support the idea that hallucination and vivid imagery are somehow related, and they talk as if these kind of experiences were merely extremely exaggerated mental images. For instance, Minz and Alpert (1972), argue that individuals who hallucinate are characterised by having abnormally vivid

images and a weak ability for distinguishing the real from the imaginary. Horowitz (1975), the main defender of such a position, suggested that hallucinatory experiences are mental images derived from internal sources of information which are incorrectly evaluated, as if they arose from external sources, and which appear as intrusions in the perceptual process. Nonetheless, definite results for determining the existence of particular relationships between hallucinatory experiences and high levels of imagery ability have not been found.

The presence of hallucinations in normal population -not only in schizophrenics- has raised the interest of some authors to seek those variables which may be contributing to the occurrence of hallucinations. More recent studies on the incidence of hallucination in the non-clinical population have been carried out by Barrett (1993) and Barrett and Etheridge (1992, 1994), who found that nearly half of their subjects had hallucinatory experiences once a month, a fact which is not related to social conformity. They also reached the conclusion that "hallucinators" had a more vivid imagery, but no better control of images, than "non-hallucinators". Barrett and Etheridge (1994) linked hallucinations with different types of dysfunctional personalities and their results indicated that "hallucinators" differed from "non-hallucinators" in social and emotional dimensions. However, they did not find relationships between hallucinatory experiences and a particular underlying pathology.

Concerning the mechanism responsible for the occurrence of hallucinations, Slade and Bentall (1988) and Bentall (1990) concluded that these phenomena had a common origin in normal people and psychiatric patients. Their hypothesis states that the hallucinatory phenomenon represents a failure in what they call *discrimination reality process*, which implies that an internally generated experience would be attributed to an external source. A different trend in the explanation of hallucinatory processes comes from those authors who consider that hallucinations have a close relationship with functional personality disorders, which Millon (1986) considers to be within the normal-abnormal continuum. Barrett and Etheridge's (1994) work is framed within this line of research.

There are many theories that have tried to explain the phenomenon of hallucination, such as those of a biologicistic style which intend to explain them in terms of central nervous system disorders, by focusing on various influences, such as the genetic component (Kety, 1974), neuropsychological-type variables (Scheibel and Scheibel, 1962; West, 1962, 1975) or specific neurochemical mechanisms (dopamine, 5-HT and certain endogenous opiates).

The other group of explanation theories are the *psychological* theories, from which we emphasise the following approaches: a) *Conditioning* theories, that explain hallucinations in terms of suggestibility (Hefferline, Bruno and Camp, 1972); b) *Seepage* theories, that explain hallucinations in terms of a kind of “seepage” or distillation where mental activity which is typically pre-conscious becomes conscious -experiments on sensory deprivation by West (1962) and Frith (1979) are highlighted; c) *Mental Imagery* theories, which view hallucinations as mental images which individuals mistakenly ascribe to external sources, and d) *sub-vocalisation* theories, which suggest the existence of some relationship between auditory hallucinations and subjects’ *inner speech* (Gould, 1950; Green and Preston, 1981).

However, there is no integrative model gathering, from all the different approaches, those ideas that have enough converging empirical evidence to explain why, under normal circumstances, most people are able to correctly distinguish real facts from imaginary ones. Slade and Bentall (1988) made an attempt in this direction.

The purpose of the present study is to test whether hallucinatory experiences respond to the dimensionality principle and whether they occur in non-psychotic psychological disorders. Hence, we will try to detect potential differences (if they were so) between a group of “hallucinators” and a group of “non-hallucinators” with regard to imagery and several types of personality disorders as described by Millon, also analysing neurotic and psychotic traits.

## METHOD

### Subjects

The sample is comprised of 222 university students, who were not paid for their collaboration; 71 were males and 151 were females, with ages between 17 and 26 years from the first and third years of Psychology and Computing degree courses.

### Instruments

The following instruments were used in the study:

- a) Betts QMI Vividness of Imagery Scale (Richardson, 1969), in its Spanish version by S. Lemos and P.C. Martínez (University of Oviedo). This test contains 35 short descriptions, from which subjects must try to image, and corresponding to seven different sensory modalities: visual (e.g. “the sun as it is sinking below the horizon”), auditory (“the mewing of a cat”), cutaneous (“the feel of sand”), kinetic (“reaching up to high shelf”), gustatory (“taste of oran-

ges”), olfactory (“the smell of new leather”) and organic (“the feeling of a sore throat”). The vividness of each of the was were to be rated on a scale from 1 (maximum) to 7 (minimum).

- b) Barrett’s Hallucinations Questionnaire -form C- (Barrett and Etheridge, 1994), translated by S. Lemos and P.C. Martínez. This questionnaire collects 22 different types of hallucinatory experiences, such as hearing one’s own name when nobody is present, hearing one’s own thoughts aloud, hearing voices coming from a place where there is nobody, or hearing voices belonging to dead friends or relatives. The frequency with which these phenomena are experienced are rated on a scale from 1 (never) to 5 (very often). In its original version, a Likert-type scale was used, from 1 (“just once or twice ever”) to 7 (“at least once a day”).
- c) Millon’s Clinical Multiaxial Inventory II (MCMI-II), (Millon, 1983) in its Spanish version by A. Avila and F. Jiménez (University of Salamanca). This inventory consists of 175 “true-false” items. It has 25 scales classified into 5 groups: 3 validation scales, 10 basic personalities scales, 3 abnormal personalities scales, 6 moderated clinical syndromes and 3 severe clinical syndromes.

### Procedure

Subjects received fuzzy information about the aim of this research, and were asked to voluntarily and anonymously participate by completing the tests in a single session, during classes previously arranged with their teachers. The order in which tests were given was: Vividness of Imagery Scale (QMI), Barrett’s Hallucinations Questionnaire and MCMI-II. Seven scores were obtained from the Vividness of Imagery Scale, corresponding to 7 different types of content (visual, auditory, cutaneous, kinetic, gustatory, olfactory, and organic). From Barrett’s Questionnaire, 5 scores were obtained, corresponding to different types of hallucinatory experience (auditory, visual, gustatory, cutaneous, and olfactory), and the major Hallucination Scale score was obtained by adding together the frequency of occurrence ratings for seven descriptions of hallucinations.

### RESULTS

Based on the scores from Barrett’s Hallucination Questionnaire, two groups were formed with those subjects in the top and bottom 20% of the major Verbal Hallucination Scale, which make up the two levels for our first independent variable. Thus, 46 “hallucinators”

and “52 “non-hallucinators” were selected for further analysis. Seven sensory modalities composing the QMI Vividness of Imagery Scale and a compound addition of all of them were used as the dependent variable. A “t” test for two independent samples was applied in order to allow the corresponding mean comparisons, since the different levels of the Imagery dependent variable were normally distributed. Results show that the hallucinators group had vivid imagery which was significantly greater in every subscale except the auditory and kinetic ones (see Table 1); this seems to indicate that people reporting hallucinatory experiences have a greater general capacity for imaging, except for sounds and kinetic sensations.

In order to verify the potential double directionality of causality an inverse analysis was made, this time taking the total scores in the Vividness of Imagery Scale as the independent variable, and setting up two groups of 44 “imagers” and 43 “non-imagers”, as previously done. Since a non-parametric test was required, and given that total scores did not distribute normally in the hallucinations scale, a Mann-Whitney “U” test was applied. The fact that no clear differences were obtained (see Table 2) does not allow us to conclude that such a relationship is bi-directional. Thus, having a high imagery capacity did not consistently imply the existence of hallucinatory-like experiences.

For a further analysis all clinical subscales from MCMI-II were chosen and a “t” test for two independent measures was selected, since these variables are normally distributed. High statistical significance was found for most of the variables, which shows that “hallucinators” obtain higher scores on the majority of the abnormal personality and clinical syndromes scales, although some exceptions exist (Table 3).

In order to verify the potential relationship between imagery and abnormal personality patterns, a complementary analysis was made by selecting all previous psychopathological variables and the “imagers” and “non-imagers” groups as the independent variable. Again, a “t” test for two independent measures was applied, given

<b>Table 2</b> Scores on total scale of Barrett’s Hallucinations Questionnaire for “hallucinators” and “non-hallucinators”. Mann-Whitney’s U and statistical significance.						
<b>Groups</b>						
<b>Scale</b>	<b>Imagers</b>		<b>Non-imagers</b>		<b>U</b>	<b>P</b>
	<b>Mean</b>	<b>SD</b>	<b>Mean</b>	<b>SD</b>		
Total Hallucinations	35.96	9.97	31.12	7.12	717.0	0.05

<b>Table 1</b> Scores on Vividness of Imagery Scales obtained by “hallucinators” and “non-hallucinators”. Student’s “t” values and statistical significance.						
<b>Groups</b>						
<b>Scales</b>	<b>Hallucinators</b>		<b>Non-hallucinators</b>		<b>t</b>	<b>p</b>
	<b>Mean</b>	<b>SD</b>	<b>Mean</b>	<b>SD</b>		
Visual	10.60	3.33	12.96	4.72	2.74	**
Auditory	11.83	4.75	14.69	6.01	0.78	NS
Cutaneous	10.96	3.67	14.06	5.90	3.15	**
Kinetic	11.35	3.93	12.13	5.12	0.84	NS
Gustatory	13.27	4.93	16.69	6.14	3.00	**
Olfactory	12.09	4.21	15.23	5.96	2.98	**
Organic	10.85	3.67	13.18	5.48	2.43	*
Total	83.02	20.64	99.14	27.04	3.21	**

The relationship between imagery ability and scores in scales is inverse. Lower means reflect higher imagery.  
\* = p ≤ .05. \*\* = p ≤ .01. \*\*\* = p ≤ .0001. NS = Non Significant

<b>Table 3</b> Scores on MCMI-II scales for “hallucinators” and “non-hallucinators”. Student’s “t” values and statistical significance.						
<b>Groups</b>						
<b>Scales</b>	<b>Hallucinators</b>		<b>Non-hallucinators</b>		<b>t</b>	<b>p</b>
	<b>Mean</b>	<b>SD</b>	<b>Mean</b>	<b>SD</b>		
Schizoid Pers.	19.46	7.41	17.90	6.02	-1.14	NS
Avoidant Pers.	25.54	11.94	18.71	9.70	-3.12	**
Submissive Pers.	29.00	8.33	28.36	8.87	-0.36	NS
Histrionic Pers.	36.26	11.01	30.93	9.86	-2.66	**
Narcissistic Pers.	38.76	10.33	33.56	10.82	-2.43	*
Antisocial Pers.	33.93	11.52	27.42	10.98	-2.86	**
Aggressive (sadistic) Pers.	36.63	12.66	30.69	10.54	-2.53	*
Compulsive Pers.	31.04	8.56	32.04	8.85	0.56	NS
Negativistic Pers.	38.83	12.86	31.10	12.34	-3.03	**
Self-defeating (masochistic) Pers.	25.28	11.90	17.12	10.36	-3.63	***
Schizotypal Pers.	21.93	11.55	15.10	9.24	-3.21	**
Borderline Pers.	38.48	15.67	26.90	14.96	-3.74	***
Paranoid Pers.	32.04	9.35	24.86	10.66	-3.52	***
Anxiety	14.00	10.74	7.00	6.74	-3.81	***
Somatoform	18.87	9.18	11.94	7.04	-4.22	***
Hypomanic	35.98	43.87	22.30	8.84	-2.20	*
Dysthymic	22.11	15.97	11.98	11.10	-3.60	***
Alcohol Abuse	21.26	8.28	14.79	6.94	-4.21	***
Drugs Abuse	34.74	11.43	24.96	11.05	-4.30	***
Psychotic						
Thinking Psychotic	17.61	8.51	10.96	8.72	-3.81	***
Depression Psychotic	16.83	12.14	9.13	9.10	-3.51	***
Delusion	15.72	5.33	10.92	6.12	4.11	***

\* = p ≤ .05; \* = p ≤ .05; \*\*\* = p ≤ .001; NS = Non Significant

that the two variables were normally distributed. Results (see Table 4) appear to indicate that imagery capacity is not related to the fact that an individual scores highly in one or more abnormal personality and clinical syndrome, except *schizoid, histrionic, aggressive, negativistic*, and *paranoid* personalities, as well as *somatoform, hypomanic, substance abuse*, and *psychotic delusion* syndromes, and so it is not possible to come up with definite conclusions about the relationship between imagery and abnormal personalities or syndromes.

Finally, multiple regression analyses were made to evaluate to what extent the pathologies described by MCMI-II explain the presence of hallucinatory experiences or else a high imagery capacity. Four analyses were run with all the subjects in the study in order to relate hallucinatory experiences and vividness of imagery to abnormal personalities and clinical syndromes described by Millon (Table 5). Total scores on Barrett's Hallucination Scale and totals from QMI Scale were used as the criterion variable in both analysis, while the scores obtained in personality disorders and clinical

syndromes from MCMI-II were used as predictors in all analyses. Based on these results it might be suggested that, in general, higher scores on some personality disorders or clinical syndromes hardly explain the variance in hallucinatory-like experiences, nor in imagery capacity; only *borderline personality* and *psychotic delusions* and *alcohol abuse* syndromes can explain respectively over 10% and 16% of the obtained variance in hallucinatory experience. The amount of explained variance for imagery capacity from the same predictors was notably lower.

## DISCUSSION

From the data presented in this study it can be concluded, firstly, that people with more hallucinatory experiences have a higher vividness of imagery. However, it must be noted that in these experiences, where a normal population is concerned, it is likely that they do not lead to a loss of sense of reality, as happens with a clinic population; thus, it could be considered that these experiences correspond rather to the notion of pseudo-hallucinations. However, we will continue to use the term "hallucination" in order to be consistent with the term used in our instruments and in other similar works.

**Table 4**  
Scores on MCMI-II scales for "imagers" and "non-imagers".  
Student's "t" values and statistical significance.

Groups						
Scales	Imagers		Non-imagers		t	p
	Mean	SD	Mean	SD		
Schizoid Pers.	17.29	7.15	20.91	7.36	-2.32	*
Avoidant Pers.	22.09	13.69	23.14	10.63	-0.40	NS
Submissive Pers.	28.57	9.84	28.70	7.38	-0.07	NS
Histrionic Pers.	38.95	7.24	29.70	10.09	4.91	***
Narcissistic	41.23	10.29	34.88	10.96	2.78	NS
Antisocial	34.80	11.43	28.51	10.26	2.70	NS
Aggressive (sadistic)	37.41	11.19	31.33	9.09	2.68	**
Compulsive Pers.	31.91	8.58	33.02	8.06	-0.62	NS
Negativistic	38.50	11.83	33.16	10.84	2.19	*
Self-defeating (masochistic) Pers.	22.66	13.83	19.42	9.07	1.30	NS
Schizotypal Pers.	19.00	12.80	17.88	8.63	0.48	NS
Borderline Pers.	35.09	16.65	29.58	12.40	1.73	NS
Paranoid Pers.	32.75	9.18	26.88	9.24	2.97	**
Anxiety	11.36	11.11	7.67	7.24	1.84	NS
Somatoform	16.48	9.07	12.30	7.71	2.31	*
Hypomanic	30.95	6.24	23.42	8.97	4.56	***
Dysthymic	17.64	17.55	14.00	11.05	1.16	NS
Alcohol Abuse	20.02	7.43	16.81	7.09	2.06	*
Drugs Abuse	34.34	9.38	26.45	10.49	3.46	***
Psychotic Thinking	15.48	9.71	13.09	6.99	1.32	NS
Psychotic Depression	13.30	13.10	10.05	8.56	1.37	NS
Psychotic Delusion	15.09	5.33	12.02	5.47	2.65	**

\* = p ≤ .05; \*\* = p ≤ .05; \*\*\* = p ≤ .001; NS = Non Significant

**Table 5**  
Results of Multiple Regression Analysis

Criterion Variable: TOTAL HALLUCINATIONS				
R <sup>2</sup> = 0.109				
<b>Predictors</b>	<b>r</b>	<b>beta</b>	<b>t</b>	<b>p</b>
Borderline Personality	.3301	.3301	5.16	.000
Durbin-Watson = 1.81				
Criterion Variable: TOTAL HALLUCINATIONS				
R <sup>2</sup> = 0.162				
<b>Predictors</b>	<b>r</b>	<b>beta</b>	<b>t</b>	<b>p</b>
Alcohol Abuse	.3707	.2847	4.01	.000
Psychotic Delusion	.3156	.1782	2.51	.01
Durbin-Watson Test = 1.80				
Criterion Variable: TOTAL QMI				
R <sup>2</sup> = 0.053				
<b>Predictors</b>	<b>r</b>	<b>beta</b>	<b>t</b>	<b>p</b>
Histrionic Personal.	-.2311	-.2311	-3.44	.000
Durbin-Watson Test = 1.79				
Criterion Variable: TOTAL QMI				
R <sup>2</sup> = 0.028				
<b>Predictors</b>	<b>r</b>	<b>beta</b>	<b>t</b>	<b>p</b>
Drugs Abuse	-.1675	-.1675	-2.46	.01
Durbin-Watson Test = 1.77				

If we take into account separately the different vividness of imagery subscales, we verify that differences between "hallucinators" and "non-hallucinators" groups always exist, although in auditory and kinetic contents the data were not significant. These differences may be due to chance or they may lack explanatory value, or they may be due to the fact that these two sensory modalities could, in general, be more difficult to imagine than the rest, given their scarce mental representation. It should not be forgotten that scores obtained in the Vividness of Imagery Questionnaire largely depend on personal characteristics of each individual and on his/her self-scheme in relation to imagery capacity.

An explanatory hypothesis about the relation between hallucination and imagery is that it is due to the fact that people with a greater number of hallucinatory-type experiences may store information in a different way from those individuals who do not tend to hallucinate. Since imaginary experiences are built upon information stored in memory, we could assume that this sensory information is richer in detail in those persons with more hallucinatory experiences, or simply that those different memory processes prime a better access to the sensory information stored. It seems likely that one type of information used by the reality discrimination process in making its decisions might be the amount of sensory detail present in consciousness (Barrett, 1993).

If "hallucinators" have a high vividness of imagery, it could also be expected that the opposite may hold, that is, that individuals with a higher imagery capacity would also experience frequent hallucinatory-type phenomena. However a clear bi-directionality in causality has not been found, and so we could deduce a first double conclusion: a) the person who frequently experiences hallucinatory-type experiences possesses a high level of imagery; and b) the fact that an individual has high vividness of imagery does not imply that he/she will hallucinate or, at least, such a relationship is in any case weaker. As results show, it does not seem as though hallucinatory phenomena were something detached from individual's imagery, although it must be kept in mind that perhaps this is not the only variable which has some influence, and so, it would be recommendable to study other factors beyond imagery that may be intervening in the hallucinatory phenomena.

However, what are these other factors which differentiate individuals with a higher frequency of hallucinatory experiences from the rest of the subjects? Could they be variables of a psychopathological character? Focusing our attention towards psychopathological characteristics configuring the MCMI-II inventory, a higher

presence of these types of disorder has been found in individuals with more hallucinatory experiences. Traditionally, hallucinations have been related to psychotic disorders; however, the present results show that so-called "hallucinators" score higher in virtually every syndrome, including those of a neurotic type.

It is noticeable that the relationship between the group of persons having hallucinations and personalities in the psychotic spectrum was highly significant in all the cases except in *schizoid*, *submissive* and *compulsive personality*. Individuals with a schizoid personality are characterised by their absence of desires or inability to deeply experience hurt or pleasure; they are apathetic, uninterested and have very few emotional and affective needs. These features could somehow explain the results. It could also be possible that this type of person does not pay too much attention to their hallucinatory experiences if they have them. In fact, one of the features of a compulsive personality may be poor imagery.

In the light of the results, it could be assumed that personality disorders or certain clinical syndromes will constitute an added factor that could explain the presence of hallucinatory-type phenomena.

Results of the multiple regression analyses, however, indicate that personality disorders make little contribution to the explanation of hallucinations and imagery ability, with the exception, in the first case, of people with *borderline personality*. This exception could perhaps be explained by their characteristic deep ambivalence, cognitive and affective, which may lead to their having a peculiar sensory representational system.

Results also indicate that only *psychotic delusion* (a factor that -as we previously noted- discriminates between "hallucinators" and "non-hallucinators") and *alcohol abuse* (alcoholic encephalopathies and, among them, alcohol hallucinosis are well known cases) have a moderate weight in the explanation of hallucinations -something that could be expected.

As a conclusion we can say that our results in some way imply a criticism of the dimensional perspective of hallucinatory experiences. Firstly, the fact that hallucinatory experiences do not normally distribute in the studied sample should not be disregarded. In addition, it is obvious that those people with more hallucinatory experiences are further than the rest along the continuum representing one of the abnormal personality types. If the data stopped here, one could still defend some dimensionality in the hallucinatory phenomena; however, these factors are not sufficient to explain the presence of hallucinations in a given subject, a fact that forces us to hypothesise the existence of some other characteristic in individuals with such expe-

riences. Apparently, there are added factors for persons located in the higher part of the hallucination continuum which imply a qualitative jump in comparison with those subjects in the middle and lower part of the continuum; thus, it does not seem to make much sense to defend the existence of an *absence-presence* continuum of hallucinations, since these results call into question the dimensionality psychological approach. However, they do not completely settle the matter and, thus, further studies are needed to exactly determine what are the moderating factors necessary to generate hallucinatory-type experiences -perhaps variables of a psychopathological or cognitive nature, or some others. In any case, an interesting field of research is opening up.

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