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AUDITORY HALLUCINATIONS IN BORDERLINE PERSONALITY DISORDER AND SCHIZOPHRENIA: A QUANTITATIVE COMPARISON USING PATIENT RECORDS

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The phenomenological differences in auditory hallucinations between schizophrenia and borderline personality disorder (BPD) are unclear in the existing literature, in part due to underpowered studies and heterogeneous research populations that do not represent those in the acute clinical setting. This study addresses this by using patient records to compare auditory hallucinations at the point of clinical psychiatric assessment for 341 unique patients, 165 with BPD and 176 with schizophrenia. Patients with BPD were found to have more subjectively distressing and objectively negative hallucinations, as well as more command hallucinations. Furthermore, they possessed more insight and were less likely to incorporate hallucinations into delusions. These results support the hypothesis that, while descriptively similar, auditory hallucinations are interpreted differently between the two groups. This study also supports that electronic records of patient assessments are a feasible way to assess large numbers of reports of auditory hallucinations.

Keywords: auditory hallucinations, phenomenology, schizophrenia, borderline personality disorder, patient database

INTRODUCTION

Differentiating between borderline personality disorder (BPD) with auditory hallucinations (AH) and schizophrenia is a difficult, though common, challenge experienced in psychiatric practice. While just over half of all patients with BPD report transient hallucinations or delusions (Zanarini et al., 2007), there is little evidence on how to differentiate them from those reported by schizophrenia spectrum psychoses patients.

Historically, AH in BPD were considered pseudo-hallucinations, and usually distinguished by the location of the AH being inside the head and by level of insight (van der Zwaard & Polak, 2001); however, this approach was

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found to have little conceptual validity (van der Zwaard & Polak, 2001) and did not explain the findings that conversely 34–38% of AH in schizophrenia are solely described as located inside the head (Copolov et al., 2004; Nayani & David., 1996).

The emerging view is that AH in BPD and schizophrenia are descriptively broadly similar, but the interpretation of those AH is different (Tseng & Georgiades, 2024), although results have been somewhat inconsistent. In research comparing AH in schizophrenia and BPD directly, no differences were found in frequency, location, or duration of symptoms (Barrera et al., 2021, Cavelti et al., 2019; Slotema et al., 2012; Tschoeke et al., 2014) or their relationship to first rank symptoms of schizophrenia (Tschoeke et al., 2014). Consistent with this view, all bar one study (Merrett et al., 2022) have found that AH in schizophrenia are more likely to be incorporated into delusions than in BPD (Barrera et al., 2021; Cavelti et al., 2019; Kingdon et al., 2010; Tschoeke et al., 2014). However, differences in the timing of the AH (Merrett et al., 2022) and if they have a specific gender or age (Barrera et al., 2021) have been suggested, although not replicated.

Evidence around AH related distress has also been mixed. Three studies found more AH related distress in BPD than schizophrenia (Barrera et al., 2021; Kingdon et al., 2010, Morrice et al., 2022), but two did not (Cavelti et al., 2019; Slotema et al., 2012). Similarly, while Kingdon and colleagues (2010) found that there was significantly more objectively negative content in AH in BPD, three other studies found no difference (Barrera et al., 2021; Cavelti et al., 2019; Slotema et al., 2012).

One reason for these mixed results may be that studies comparing AH in schizophrenia and BPD have been universally of small sample size, with especially low numbers of BPD patients with AH; these range from 10 to 46 for the BPD participant arm (Barrera et al., 2021; Cavelti et al., 2019; Hepworth et al., 2013; Kingdon et al., 2010; Merrett et al., 2022; Morrice et al., 2022; Slotema et al., 2012; Tschoeke et al., 2014). This leads to a risk that these studies are underpowered to reliably detect any but very large difference between schizophrenia and BPD.

Our study used a pseudo-anonymized database of patient records to try and circumvent this problem. By taking assessments performed in clinical practice where the AH were described, this allowed a far larger sample of each group to be compared than is typical for this type of study. Moreover, these patients were being seen at the point of acute crisis where they presented to services needing a full assessment, and therefore should be more representative of what is seen in clinical practice. Our initial hypothesis was that in this larger sample the AH would be descriptively similar, but the interpretation would differ across diagnosis, with increased insight and distress in the BPD sample.

METHODS

Data were taken from the Oxford Health Clinical Record Interactive Search (CRIS) database, which is a pseudo-anonymized database of all "progress notes" in the electronic health record Carenotes across Oxford Health NHS Foundation

Trust, from 2015 to 2022. This includes patients seen by psychiatric services across Oxfordshire and Buckinghamshire (counties of the United Kingdom). Access to this database was approved by the CRIS ethics committee, who have a preexisting Health Research Authority (HRA) approval for studies they approve. Individual patient consent was not necessary as at no point were the authors able to identify individual patients. The Oxford Health Foundation Trust uses the *ICD-10* (World Health Organization, 2016) diagnostic criteria.

From CRIS, the following note types were searched: "Admission Clerkings" (to an acute mental health unit), "Emergency Department Psychiatric Service Assessments," "Community Psychiatry Assessments," and all notes in the "MH assessment" tab. Relevant records (see Table 1) were searched for using inclusion and exclusion criteria as set out below. This search was done initially using the automated search function in the Carenotes database, and then each record was manually assessed by the authors to ensure they met the inclusion and exclusion criteria (see Table 1).

The records extracted are of single assessments in the electronic patient health record, such as an admission clerking when a patient was admitted to an acute mental health unit. Patient identifying information was removed prior to review by the authors, but otherwise the record remained intact. The patient's diagnosis and unique CRIS identifier were marked alongside this record. The CRIS database records diagnoses coded by clinical teams to a patient, which were confirmed manually against those described in the extracted patient assessment.

When multiple results from a single patient were extracted, the first assessment encountered where AH were mentioned was used, and all other results were discarded to avoid bias. These results were identified by the presence of the same CRIS pseudo-identifier.

The descriptive features of AH were subdivided into several categories (see Table 2) to enable quantitative analysis. The categories used were those that previous studies had suggested differentiated between BPD and schizophrenia, and those which were considered likely to be assessable by review of typical assessment notes. The aim of these categories was to minimize subjectivity in interpreting the descriptions of AH in patient notes.

Records were then reviewed manually by authors JP or TW, both to see if they met inclusion or exclusion criteria, and to assess the AH as per the categories above. JP, TW, and AB are medical doctors with significant experience in psychiatry.

A priori power analysis was conducted using G*Power, with the aim to capture effect sizes of 0.2 with a power of 0.8 and alpha of .05. The effect size of 0.2 was used as this is the minimum value for a small effect size and is traditionally considered the minimum size of clinical relevance (Cohen, 1988). For these parameters and for any variable with 2 degrees of freedom, a sample size of 241 was required, increasing to 299 for the largest variable with 4 degrees of freedom. We therefore settled on 350 participants as the a priori sample size, with the assumption that some variables would not be filled in from any given assessment.

Results were analyzed by means of chi squared tests of independence, with Bonferroni correction calculated for any initially significant results. In

TABLE 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Preexisting diagnosis of BPD or schizophrenia	Dual diagnosis of BPD and any psychotic condition
Presence of AH*	Dual diagnosis of schizophrenia and a personality disorder
Patient aged over 18 years of age	Dual diagnosis of schizophrenia and post-traumatic stress disorder
	Diagnosis of bipolar or schizoaffective disorder
	Organic cause of psychosis
	No meaningful information on auditory hallucination included in patient record
	Duplicate record from patient already used for data collection

*The presence of AH was searched for in CRIS by presence of the following: "hears voices," "hears the voice," "hears auditory hallucinations," or "suffers from auditory hallucinations."

any variable where over 20% of the expected values were below 5 or any were below 1, categories were combined to preserve the statistical validity of the test. Individual changes and their rationale are described in Appendix Table A1.

Further exploratory analyses were then carried out, using the same criteria, but comparing clerked patients to those seen in the community (Accident and Emergency or outpatient) setting, to see if there were differences in the AH reported by patients deemed unwell enough to require admission for both BPD and schizophrenia. This was considered a potential proxy for severity.

Inter-rater reliability scores were calculated on a small sample of patients assessed independently by both TW and JP. In the cases of conflicting opinion, consensus was agreed by discussion between TW and JP, with final decision resting with AB should agreement not be reached.

RESULTS

A total of 3,115 results were extracted following the automated search. Following manual review, this was reduced to 341 total results, comprising 176 patients with schizophrenia and 165 patients with BPD meeting inclusion criteria. Manually removed results were due to repetitions of the same patient, records not being of an assessment, absence of any AH, and more infrequently due to the presence of a secondary bipolar or schizoaffective disorder or patients under the age of 18. Each individual variable was somewhat smaller (see Table 3), based on the number of patients where that variable was described in their notes.

There was a significant gender discrepancy between patients, with 72% of patients with schizophrenia being male, as compared to 27% of those with BPD ($N = 338$, $df = 1$, $\chi^2 = 68.380$, $p < .00001$).

Following analysis, there were several significant results after correcting for multiple comparisons. People with BPD tended to experience more negative AH, both objectively and subjectively (see Table 3). They also were more

TABLE 2. Data Collected From Each Record, When This Information Was Available in the Record

Variable	Category	Comment
Location of the AH	Inside the head Outside the head Changeable/Both	
Number of AH	1 voice 2 voices ≥3 voices	
Command hallucinations	Present Absent	
Person of the AH	1st person 2nd person 3rd person	
Type of hallucinations	Sounds Single words Comments Continuous voices	Typically, to be classified as continuous this required a clear report that the AH were constant or similar.
Objective emotional content	Positive Neutral/Mixed Negative	Only recorded if there was a direct quote from the AH.
Patient's subjective emotional response	Positive Neutral/Mixed Negative	
Difference between objective AH and subjective response	Subjective 2 stages lower than objective (e.g., negative to positive) Subjective 1 stage lower than objective (e.g., negative to neutral) Subjective equal to objective Subjective 1 stage higher than objective (e.g., neutral to negative) Subjective 2 stages higher than objective (e.g., positive to negative)	Calculated by difference between objective emotional content and subjective emotional response.
Insight	Present Absent Patient unsure	Insight was defined as the expressed understanding that the auditory hallucination was due to a mental health condition.
Identity of the AH	Person/People Entity/Group/Object Changeable Patient is unsure Patient's own thoughts	A perceived collection of individuals was considered "people" if individual people could be identified (e.g., I hear my neighbors talking through the walls), but as a "group" if they could not (e.g., I hear the Hells Angels talking to me).
Type of person	A personally known individual Real person but not personally known (e.g., a celebrity) Unknown person	
Gender of the AH	Known Unknown	Only recorded where the AH was an unknown person
Age of the AH	Older Same age Younger	This category was removed during data collection, as it was almost never recorded.
Status of the AH	Higher Same Lower	This category was removed during data collection, as it was almost never recorded.
AH incorporated into a delusion	Not incorporated Incorporated	
Gender of patient	Female Male Other	
Diagnosis of patient	BPD Schizophrenia	

TABLE 3. Differences in Auditory Hallucinations Between Patients With Schizophrenia and Those With BPD

Variable	*n* (total)	*n* (BPD)	*n* (schizophrenia)	*df*	χ^2 value	*p* value	*p* value following Bonferroni correction	Main driver of difference
Location of the AH	170	95	75	2	11.43	.00330*	.0428*	More inside the head in BPD
Number of AH	223	114	109	2	4.229	.121		
Command hallucinations	266	135	131	1	22.523	< .00001*	.000027*	More command in BPD
Person of hallucinations	51	18	33	1	7.124	.00761*	.0989	More 2nd person in BPD. Not significant once corrected
Type of hallucinations	207	114	93	2	7.682	.0215*	.279	More comments in BPD, more continuous in schizophrenia. Not significant once corrected
Objective emotional content	254	137	117	1	10.320	.00132*	.0171*	More negative in BPD
Patient's subjective emotional response	285	147	138	2	12.644	.00180*	.0233*	More negative in BPD, more neutral or positive in schizophrenia
Difference between objective AH and subjective response	233	129	104	2	3.672	.159		
Insight	237	105	132	1	59.635	< .00001*	< .00001*	More insight in BPD
Identity of the AH	242	110	132	3	18.742	.000309*	.00402*	AH more likely to be a person in BPD and an entity in schizophrenia.
Type of person	171	84	87	1	1.527	.217		
Gender of the AH	67	43	24	1	NA	NA	NA	
AH incorporated into a delusion	300	156	144	1	86.779	< .00001*	< .00001*	AH less likely to be incorporated into delusions in BPD

Note, See Appendix Table A1 for an explanation of the degrees of freedom (*df*), which differ from what might be expected from Table 2. *Significant difference at $p < .05$.

likely to report command hallucinations than those with schizophrenia, and hallucinations within the head rather than outside (see Table 3).

Patients with schizophrenia were more likely to report AH originating from entities or groups than patients with BPD, whose AH more often originated from people. Patients with schizophrenia also were more likely to have poor insight into the nature of the AH, to incorporate them into a delusional system, and to report them as neutral or positive.

There were slightly more second person hallucinations and hallucinations consisting of comments rather than continuous speech in BPD compared

to schizophrenia (see Table 3); these were initially significant, but not once Bonferroni correction was applied.

The gender of the AH (where the AH was an unknown person) was not amenable to meaningful statistical analysis, due to the paucity of recordings of hallucinations where the lack of gender was clearly specified. This is likely due to gender only being included in patient records if mentioned by patients, rather than being asked about directly. However, there were 42 of 165 total patients with BPD who assigned a gender to the AH, as compared to 21 of 176 total with schizophrenia. These results, while not conclusive, would fit with an increased prevalence of AH in BPD having a gender, with the opposite being the case in schizophrenia.

Secondary exploratory analyses showed that when patients who were reviewed as part of an admission to a psychiatric unit were compared to those seen in the community, they had higher rates of command hallucinations in both schizophrenia and BPD, and lower levels of insight in BPD (see Table 4). There were no other significant differences seen within either schizophrenia or BPD for community as compared to admitted groups (see Appendix Table A2 for nonsignificant exploratory results).

Inter-rater reliability scores were calculated on a subsample of 26 patients. While there was some variance due to small sample size, overall interrater agreement was at 94.3%, with an average kappa statistic of 0.88 (ranging from 0.63 to 1), indicating substantial agreement.

DISCUSSION

The consensus across most sources (Tseng & Georgiades, 2024), alongside our initial hypothesis, was that the phenomenology of AH between BPD and schizophrenia is relatively similar, but that the interpretation of those hallucinations is different. Our results in part support this view, with no significant differences in number, person, or type of AH after Bonferroni correction. Moreover, there were clear differences in insight, incorporation into delusions and describing hallucinations as from entities rather than people, also in line with that view.

We found a significantly higher proportion of command hallucinations in BPD than in schizophrenia. This is different from other comparative studies, which have typically found a similar high prevalence of commanding AH in both disorders (Barrera et al., 2021). We hypothesized that this difference could be driven by two potential factors. Firstly, it is possible that clinicians preferentially enquire about negative commands, and commands in BPD are typically more negative than those in schizophrenia (Barrera et al., 2021). Secondly, the reviews in our study were taken at the point of acute crisis leading to initial psychiatric assessment, rather than during a period of relative stability like most patients recruited for research. Hallucinations in BPD increase in severity during times of stress (Glaser et al., 2010), and therefore command hallucinations might increase in intensity and frequency during these times for patients with BPD.

TABLE 4. Significant Differences Between Patients With BPD or Schizophrenia Who Were Seen in the Community (Outpatient or Accident and Emergency Assessments) as Compared to on Admission to a Psychiatric Unit

Variable	*n* (total)	*n* (community)	*n* (admitted)	*df*	X^2 value	*p* value	Main driver of difference
BPD	165	106	59				
Command Hallucinations	135	83	52	1	7.277	.00698*	More command hallucinations in admitted patients
Insight	105	70	35	1	6.696	.00966*	Less insight in admitted patients
Schizophrenia	176	83	93				
Command Hallucinations	131	59	72	1	5.279	.0216*	More command hallucinations in admitted patients

*Significant difference at $p = .05$.

We found that hallucinations in BPD were subjectively more distressing and objectively more negative than those in schizophrenia, who reported them as more neutral or positive. Greater levels of hallucination-driven subjective distress in BPD is consistent with several previous studies (Barrera et al., 2021, Kingdon et al., 2010, Morrice et al., 2022); however, the majority of studies looking at the objective negativity of hallucinations have not found a difference (Barrera et al., 2021; Cavelti et al., 2019, Slotema et al., 2012). As with command hallucinations, the increase in objective negativity might be explained by the acute crisis setting. However, it is also possible that during the briefer assessment performed in clinical practice rather than research, people with higher subjective distress are more likely to express the negative aspects of their hallucinations.

Somewhat unexpectedly, we found that AH in BPD were more likely to be inside the head, while hallucinations in schizophrenia were outside. This is not consistent with recent studies, who have all found no difference (Tseng & Georgiades, 2024). This could be explained by this being a small difference, for which other studies were underpowered to find. However, given the common received wisdom that AH in BPD are inside the head, this difference could also be due to bias in recording based on clinicians preconceived expectations of the location of the hallucination.

Secondary exploratory analysis found that, for both schizophrenia and BPD, patients admitted to an acute psychiatric unit had more command hallucinations than those seen in the community, and BPD patients were less likely to have insight into their AH. Lack of insight and command hallucinations are commonly used clinical markers of poor engagement and risk respectively, and therefore these patients are more likely to be admitted. There were no other differences in AH between patients who were being admitted and those who were not.

METHODOLOGICAL STRENGTHS AND WEAKNESSES

This is, to the authors' knowledge, the first time that AH have been examined by using patient notes during standard clinical assessments as a method to assess hallucinations recorded in a clinical setting and acts as a demonstration of the feasibility of such an approach. This method comes with both major advantages and disadvantages, over the typical method of detailed investigation using semi-structured interviews or questionnaires.

This method allowed us to examine a far larger sample size than previous studies have achieved, with just under four times the number of patients with BPD and AH than the next largest study (Morrice et al., 2022), the group that appears more challenging to recruit. Consequently, this method increases the power to differentiate smaller differences between schizophrenia and BPD.

Patients, when assessed clinically, are typically at a moment of acute crisis, which is where the patient records for this study were taken from. However, traditional studies are typically only able to access patients some period after initial assessment when they are more stable, as well as being limited to those who can consent to the research assessment. The effect of the acute crisis is likely to substantially affect the AH seen in BPD especially. Part of the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5*) (American Psychiatric Association, 2013) diagnostic criteria for BPD are "transient, stress related paranoid ideation or dissociative symptoms" (including AH); indeed, AH in BPD were found to be more severe in the context of increasing numbers of life stressors (Niemantsverdriet et al., 2017), and more reactive to acute stressors than other conditions (Glaser et al., 2010).

However, this approach has a number of weaknesses as well. Relying on patient notes limits any data collected to a categorical form, rather than being able to assess levels of severity such as in other studies. Many features of AH are also not recorded on typical patient notes, rendering them unable to be analyzed by this method; age and status of the AH are two examples we came across during this study.

There was also a significant gender disparity, which was to be expected as BPD is seen more frequently in women than men (Zlotnick et al., 2002) unlike schizophrenia, which is the inverse (Saha et al., 2005). While this is a potential confound, and gender has been noted to alter auditory hallucinations in BPD previously (Morrice et al., 2022), it also represents the gender disparity experienced in general psychiatric practice.

There is a risk of bias in the data recorded by clinicians in patient notes. Clinicians tend to document information that confirms their pre-existing hypothesis of the diagnosis (Mendel et al., 2011), which could lead to people documenting different information on the hallucinations of those with BPD and schizophrenia. Clinically, location of the AH and insight still tend to be viewed as the main differentiator between hallucinations in schizophrenia and BPD, and therefore these categories are most vulnerable to this type of bias; whereas one would expect less recorder bias in categories where any difference between schizophrenia and BPD is less widely known. Using patient notes also requires relying on the accuracy of clinician diagnosis of BPD and schizophrenia rather than more comprehensive research interviews, and raises

the risk of undiagnosed co-morbidity in some patients, which could reduce overall power.

Finally, by the nature of the data available, this study had to be unblinded. This creates a risk of bias while interpreting patient notes. The authors attempted to minimize this risk by making the categories as objective as possible, to minimize the amount of meaningful interpretation required, and not recording data if the decision was considered ambiguous. Interrater agreement was high (kappa 0.88), suggesting that no one author was especially biased. To avoid selection bias given the lack of blinding, only a single arbitrary timepoint (the first) was used for patients seen for multiple assessments; however, this does risk not incorporating any changes to the AH that occur over time in these patients.

FURTHER RESEARCH AND CLINICAL IMPLICATIONS

The clinical implications of these findings are primarily in aiding clinicians in differentiating the source of AH when the diagnosis is unclear. This is of particular significance as the management and prognosis for AH in schizophrenia and BPD are very different, especially with the recent emergence of treatments designed for distressing AH in BPD (Morrice et al., 2022). Given the methodological benefits and limitations of our approach, this work is best interpreted in conjunction with direct patient clinical studies as further clarification of the differences seen in AH between the two conditions.

This style of data interpretation creates several new avenues for the assessment of AH with far larger sample sizes. It would be useful to replicate this study with a different dataset outside of Oxford Health NHS Foundation Trust to see whether these results generalize across multiple areas. This could also be extended to include other conditions, such as schizoaffective disorder, psychotic depression and mania. In future, consideration could be made towards automated extraction and assessment of data to aid review of larger sample sizes.

Furthermore, it would be interesting to use the longitudinal aspect of having available data across multiple encounters with the health service to assess the temporal stability of hallucinations across a service user's life and how they change as someone recovers from an episode of crisis.

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Declaration of interest. The authors declare no conflicts of interest.

APPENDIX

TABLE A1. Changes to Categories When the Expected Values Were Below the Minimum Threshold for the Chi Squared Test (Over 20% of Values Below 5 or Values Below 1)

Variable	Change Made	Rationale
Person of hallucinations	Removal of 1st person hallucinations	Total of 1 case in 1st person between BPD and schizophrenia, with expected values below 1 in both cells. No way to reasonably combine this, so this was removed. Including or removing the case did not alter the final result.
Type of hallucinations	"Sound" and "Single word" categories combined	Total of 9 cases in "Sounds" between BPD and schizophrenia, with expected values below 5 in each cell. Combined "Sounds" and "Single words" into a single "Single words or less" category.
Objective content	Removal of "Positive" category	Total of 0 cases in the "Positive" category in BPD and schizophrenia. These therefore cannot be analyzed and were removed
Difference between objective AH and subjective response	Removal of the "Subjective 2 stages lower" and "Subjective 2 stages higher" categories	Total of 0 cases in the "Subjective 2 stages lower" and the "Subjective 2 stages higher" categories between BPD and schizophrenia. These therefore cannot be analyzed and were removed
Insight	Combining "Insight present" and "Patient unsure" categories	Total of 8 cases in "Patient unsure" category between BPD and schizophrenia, with expected values below 5 in both cells. This was combined with "Insight present" to create a broader "Insight present" category including partial and complete insight.
Identity of the AH	"Changeable" and "Patient unsure" categories were combined	Total of 9 cases in the "Changeable" and 9 cases in the "Patient unsure" categories between BPD and schizophrenia, with expected values below 5 in each. Given their similarity, they were combined into a single "Unclear identity" category.
Type of person	"Real person but not personally known" and "Unknown person" categories combined	Total of 2 cases in the "Real person but not personally known" category between BPD and schizophrenia, with expected values below 1. This was therefore combined with the "Unknown" category, to form a "Voice not of a known person."

Note. Changes are documented for the primary outcomes of the comparison between the auditory hallucinations of schizophrenia and BPD.

TABLE A2. Full Comparison of AH for Patients With BPD or Schizophrenia Who Were Seen in the Community (Outpatient or Accident and Emergency assessments) as Compared to on Admission to a Psychiatric Unit

Variable	*n* (total)	*n* (community)	*n* (admitted)	*df*	X^2 value	*p* value	Main driver of difference
BPD	165	106	59				
Location of the AH	95	67	28	2	2.593	.274	
Number of AH	114	73	41	2	0.0119	.994	
Command hallucinations	135	83	52	1	7.277	.00698*	More command hallucinations in admitted patients
Person of hallucination	18	12	6	1	1.125	.289	
Type of hallucinations	114	78	36	2	4.411	.220	
Objective emotional content	137	87	50	1	3.793	.0514	
Patient's subjective emotional response	147	95	52	1	0.292	.589	
Difference between objective AH and subjective response	129	83	46	1	1.814	.178	
Insight	105	70	35	1	6.696	.00966*	Less insight in admitted patients
Identity of the AH	110	70	40	2	3.258	.196	
Type of person	84	53	31	1	1.910	.170	
Gender of the AH	43	28	15	1	NA	NA	Too few "Gender unknown" cases for statistical analysis
AH incorporated into a delusion	156	102	54	1	1.608	.205	
Schizophrenia	176	83	93				
Location of the AH	75	43	32	2	0.0312	.984	
Number of AH	109	61	48	2	3.091	.213	
Command hallucinations	131	59	72	1	5.279	.0216*	More command hallucinations in admitted patients
Person of hallucination	33	16	17	1	0.279	.598	
Type of hallucinations	93	57	36	2	4.665	.0971	
Objective emotional content	117	61	56	1	1.096	.295	
Patient's subjective emotional response	138	70	68	2	0.772	.680	
Difference between objective AH and subjective response	104	56	48	2	2.247	.325	
Insight	132	63	69	1	2.807	.0939	
Identity of the AH	132	64	68	2	0.760	.684	
Type of person	85	46	39	1	0.685	.408	
Gender of the AH	24	11	13	1	NA	NA	Too few "Gender unknown" cases for statistical analysis
AH incorporated into a delusion	144	71	73	1	2.441	.118	

*Significant difference at $p = .05$.

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