

Hallucinatory Activity in Schizophrenia: The Relationship with Childhood Memories, Submissive Behavior, Social Comparison, and Depression

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Abstract—Auditory hallucinations among the most invalidating and distressing experiences reported by patients diagnosed with schizophrenia, leading to feelings of powerlessness and helplessness towards their illness. In more severe cases, these auditory hallucinations can take the form of commanding voices, which are often related to high suicidality rates in these patients. Several authors propose that the meanings attributed to the hallucinatory experience, rather than characteristics like form and content, can be determinant in patients' reactions to hallucinatory activity, particularly in the case of voice-hearing experiences. In this study, 48 patients diagnosed with paranoid schizophrenia presenting auditory hallucinations were studied. Multiple regression analyses were computed to study the influence of several developmental aspects, such as family and social dynamics, bullying, depression, and socio-cognitive variables on the auditory hallucinations, on patients' attributions and relationships with their voices, and on the resulting invalidation of hallucinatory experience. Overall, results showed how relationships with voices can mirror several aspects of interpersonal relationship with others, and how self-schemas, depression and actual social relationships help shaping the voice-hearing experience. Early experiences of victimization and submission help predict the attributions of omnipotence of the voices, and increased hostility from parents seems to increase the malevolence of the voices, suggesting that socio-cognitive factors can significantly contribute to the etiology and maintenance of auditory hallucinations. The understanding of the characteristics of auditory hallucinations and the relationships patients established with their voices can allow the development of more promising therapeutic interventions that can be more effective in decreasing invalidation caused by this devastating mental illness.

Keywords—Auditory hallucinations, beliefs, life events, schizophrenia.

I. INTRODUCTION

HALLUCINATIONS and delusions are one of the most salient features of paranoid schizophrenia. Regarding hallucinations, the most frequent kind of hallucinatory activity

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is auditory hallucinations, which often take the form of commenting or commanding voices.

In the presence of these perceptual changes, patients suffering from schizophrenia often feel controlled by their illness' symptomatology and incapable to resist the voice's orders. Research in this field points out that this inability to resist to commanding voices are among the most important factors in the explanation of high suicide rates in schizophrenia, as the voices can order the patients to commit suicide [1]–[4]. The presence of auditory hallucinations, commenting the individual's daily activity is also regarded by most patients as eliciting highly invalidating and distressing experiences. This may induce feelings of powerlessness towards the symptomatology, leading patients to let themselves be controlled by all the symptoms of schizophrenia.

Several factors that mediate the response of the patients to voice-hearing experiences have been suggested in the literature. Among them, we can find beliefs about power, identity and intent of voices [5]–[7], core beliefs about the self [8], social meaning of what the voices say [9]; social empowerment of voice-hearers (Romme & Escher, 2000, cited in [10]). A common aspect of these proposals is the attempt to determine how voice-hearing is experienced by the self, that is, in the relationship of the person who hears them. Thus, as proposed by [5], the relationship with voices can mirror actual interpersonal relationships and the relationship with voices can have common social dynamics, similar to those established in patient's social interactions.

The auditory hallucination model proposed by [7], [11] states that patient's emotional and behavioral reactions to auditory hallucinations mostly reflect the meanings attributed by patients to these experiences and the relationship between voice and patient, rather than the content and topography of these hallucinations, or any other characteristic of psychotic disorder considered separately. The authors propose that the relationship established between voice and the patient can involve involuntary submission, similar to what is observable in relationships with individuals that are regarded as powerful and omnipotent. According to social rank theory, the perception of stimulus as threatening or powerful can trigger defensive and self-protecting response that include submissive or escape behaviors [12]. Attitudes of resistance towards malevolent voices observed in patients can be a typical example of this response. Contrastingly, stimulus perceived as safe can trigger biologically prepared responses that are

adequate in friendly and non-threatening interactions. For instance, cooperation, care-eliciting and dependence are typical response to friendly interactions, and also characterizes the relationship established between patient and a voice that is regarded as kind and benevolent [10], [13].

Birchwood and colleagues [13] advocate that the perceptions of voices as malevolent, benevolent or powerful can be influenced by interpersonal cognitive schemas of the psychotic patient. These schemas are autobiographical, to the extent that they include the individual's interpersonal experiences that happened from the past or present, with a particular relevance of early experiences when caretakers that were perceived as powerful or dominant. Social subordination generally stems from processes of social comparison in terms of relative power, social attractiveness and talent, and the perceptions of belonging or fitting to a certain group that allows the development of social ranks [12]. According to the social rank theory, [14] has studied the nature of the relationships between patients and their auditory hallucinations. Results suggested that patient's submission was inherently connected to social submission in other social contexts. Thus, social and interpersonal cognitions can be more tied to the distress caused by voices than their characteristics, and the perceived power of others was also a significant predictor of the perceived power of the voices by the patients. In fact, [10] confirmed these similarities by showing how the relationship with the voices can reflect other interpersonal relationships patients establish in their social world. The author also refers that the perceptions of occupying a higher social rank relatively to the voice is associated with decreased frequencies of auditory hallucinations and, contrarily, perceived inferiority was associated with a relationship of dependence with voices appraised as benevolent, increased engagement with those voices and decreased negative content [10]. Moreover, [15] have reported the existence of feelings of intimacy between patients and voices, and that those relationships could be regarded as close and personal. Birchwood and Chadwick [7] described relationships of engagement, characterized by active listening and complicity, and resistance, characterized by avoidance or argumentation without complicity. Patients tend to resist more when voices are perceived as malevolent, and to get more engaged with voices perceived as more benevolent. Increased frequency and volume of voices were also found when voices were perceived as more powerful and in higher position in the social rank [14]. This difference in perceived rank may be responsible for patients submitting to voices and the resulting distress. In fact, the experience of hearing hostile voices and thought diffusion is often felt by the patient as an incapacity in keeping their thoughts out of reach from the others, who may become disappointed or judge them poorly [16]. These aspects can be useful in the understanding of the resulting distress from auditory hallucinations. The fact that some studies have not confirmed these hypothesis (e.g. [8]), led to the need to further explore these issues [17].

In this line of inquiry, it is fundamental to study which factors may contribute to how patients suffering from

schizophrenia position themselves regarding their auditory hallucinations, in order to determine which variables may be involved in the submission of the patients to their voices. We aim to explore the relationships between social comparison and how patients compare themselves in relation to their voices. According to the Social Mentalities theory, it is expected that patients with more favorable social comparisons in relation to others also compare themselves more favorably to their voices, and vice-versa. In addition, the extent to which the memories of family dynamics (characterized by abuse or negligence), and memories of perceived submission and threat or victimization by bullying in childhood may influence current beliefs about voices and shape the emotional and behavioral reactions to auditory hallucinations should also be explored. Current evidence has pointed out that the progress of psychotic illness is influenced by life events and trauma, such as sexual abuse or bullying [18]. In a study by Hardy and colleagues, bullying was often experienced by individuals exposed to trauma, suggesting that bullying may be associated with proneness to more hostile auditory hallucinations. Other studies have also emphasized the existence of critical and intrusive relationships [19] and authoritative and critical parenting styles on auditory hallucinations [20], suggesting that patients' voices tend to reproduce the relationship with authority figures or their abusers [21], [22].

On the other hand, the submissiveness may also depend on individual's personality traits, and it becomes pertinent to explore to what extent the patients suffering from schizophrenia present submissive behaviors in broader social context, that is, towards others, and how this will determine submissiveness towards voices.

Depressive disorders are currently acknowledged as one of the psychopathologies that contribute most to the aggravation of psychotic symptoms. If a negative view about the self and their capacities is one of the main characteristic of depressed individuals, the extent to which the presence of these disorders alters the patient's posture towards their voices should be evaluated. Also according to the Social Mentalities theory, it is expected that the ranking established with the voices is relevant to the determination of the degree of distress caused by voices, as observed by [7], [11]. Thus, we aim to replicate these findings in a sample of patients diagnosed with paranoid schizophrenia, and also to investigate the extent to which depression may aggravate hallucinatory activity in these patients (increased frequencies and more intense auditory hallucinations, with more negative content and more distressing to patients).

Similar to a previous study focusing on paranoid ideations [23], it is also important to assess the influence of negative or threatening life events in their behavior towards auditory hallucinations [18], [20], [24]. In the current study, we intend to observe the influence of adverse childhood experience, negative social comparisons, feelings of shame and submissive behaviors in the relationships that patients establish with their voices, and the resulting invalidation. Finally, it is important to understand the role of depression in the relationship between patient and their voices [14].

II. METHOD

A. Participants and Procedure

Prior to contacting the patients, the necessary authorizations to conduct the study in clinical settings were obtained from the Ethical Boards from three local institutions. A sample of patients diagnosed with Paranoid Schizophrenia was constituted with the cooperation of psychiatrists from each institution. Inclusion criteria comprised patients diagnosed for 6 or more months and currently in active psychosis. Participants' diagnosis was confirmed with the responsible psychiatric staff and by consulting the patient's files. Study goals were explained and informed consent was obtained from all participants who agreed to complete the self-report scales. A psychologist was present to aid participants filling the scales in interview format, in order to avoid interpretation difficulties or invalid responses, as patients in active phase generally have several difficulties filling self-report forms. Participation in this study was voluntary and information on the study goals and confidentiality was provided to all participants, who signed an informed consent form prior to administration of the assessment protocol.

A total of 48 patients in active phase of schizophrenic psychosis participated in this study. Participants were mostly females (62.5% females and 37.5% males), single (56.3% single, 20.8% married, 10.4% divorced, 6.3% widowed, 2.1% in a civil union) and with low socioeconomic status (80.7% low and 19.3% medium socioeconomic status). Average age was 43.30 years old (SD = 13.22) and school attendance was on average 6.37 years (SD = 3.32).

B. Measures

Beliefs About Voices Scale – Revised (BAVQ-R, [6]): The BAVQ-R assesses emotional and behavioral reactions, and beliefs about auditory hallucinations. The scale is comprised 35 items scored on a 4-point Likert-like scale. Subscales include Malevolence (statements about the voice being hostile or punishing), Benevolence (voices being protective or kind) and Omnipotence (e.g. "My voice is very powerful") of voices, and Engagement and Resistance, to assess the behavioral and emotional reactions to the voices. Engagement typically refers to more friendly emotional and behavioral interactions with voices (active listening to reassuring voices), while resistance refers to opposition to voices (telling a frightening voice to leave them alone). In [6], the BAVQ-R presented good internal consistency, ranging from $\alpha=0.74$ to .88. In the current study, alpha values ranged between $\alpha=0.67$ and 0.94.

Social Comparison Scale (SCS - [25]). The SCS was developed to assess how individuals compared themselves in relation to others across 11 items featuring individual characteristics in domains of attractiveness, ranking, and feelings of belonging or fitting to a group (feeling different or similar to others). This scale assesses the positions (social ranks) or where individuals stand when comparing themselves in terms of power, talent, social attractiveness, acceptance (e.g. inferior-superior; adjusted-disadjusted) in a 10-point

rating scale. Subscales include factors relating to social hierarchy (Rank) and evaluations of acceptance and adjustment to one's social group (Group fit). Increased scores indicate that individuals compare themselves to others more favorably and perceive themselves as occupying a higher social rank. The SCS presented good internal consistency ($\alpha=0.91$) on the original studies [26]. The Portuguese validation included a principal components analysis in which the two subscales emerged (rank and group fit), both with good internal consistencies ($\alpha=0.91$ and 0.78, respectively). In the current study, Cronbach's alpha was of $\alpha=.85$ for the total scale, $\alpha=0.84$ for the Rank and $\alpha=.78$ for the Group fit subscale.

Social Comparison Scale – Voices (SCS-V; [27], adapted from the Social Comparison Scale [26]). The SCS was adapted to assess how patients with paranoid schizophrenia compare themselves with their auditory hallucinations in the global aspects of attractiveness, status and group fit (feeling different or similar to them). Participants respond to a 10-point rating scale about how they feel in relation to their voices in the same aspects than the original SCS (e.g. Incompetent-Competent). In the current study, internal consistency was of $\alpha=0.86$ for the Rank (voices) and $\alpha=0.80$ for the Group fit (voices) subscales, and $\alpha=0.90$ for the total SCS-v scale.

Psychotic Symptom Rating Scale – voices (PSYRATS-voices, [28], [29]). This measure was devised to evaluate auditory hallucinations and is a subscale of PSYRATS. The subscale comprises 13 items referring to different dimensions of auditory hallucinations: frequency, duration, location, volume, source, number of voices, forms of voices, negative content, the ability to control the voices, frequency of distress and intensity of distress caused by voices in a scale ranging from 0 to 4. This subscale presents good validity and sensitivity to change. Cronbach's alpha found in the current sample was of $\alpha=0.77$, indicating a good reliability.

Beck's Depressive Inventory (BDI; [30], [31]). The BDI is a widely used measure to assess depressive symptomatology: affective, cognitive, motivational, delusional, physical and functional (sleep, appetite, weight and libido) symptoms. It comprises 27 sets of statements referring to depressive symptoms, ordered by degree of severity (nonexistent, mild, moderate, and severe). Validation studies in the Portuguese population propose a cutoff point of 12 to distinguish between depressed and non-depressed individuals. Internal consistency for BDI found in the current sample was of $\alpha=0.86$.

Early Life Experiences Scale (ELES; [32]), is a questionnaire designed to assess childhood memories, concerning experiences of perception of threat and subordination. The scale comprises 15 items, 6 referring to the perceptions of threat and 9 items referring to feelings of subordination and submissive behaviors, answered with a 5-point Likert scale on the frequency and veracity of statements depicting childhood memories (1 – completely false to 5 – completely true). Internal consistency was very good in the original studies by [32], ranging between .85 and .89. In the current sample, internal consistency ranged between .77 and .81 for the subscales and total scale.

Childhood Experiences of Care and Abuse Questionnaire (CECA-Q; [33]) is a questionnaire devised to collect information on family dynamics and parental abandonment during childhood, and to identify the parental figures that were most significant during development (before 17 years old). This questionnaire is composed of screening questions for sexual and physical abuse, and Neglect and Antipathy scales scored separately for each parent (e.g. Mother and father).

The Antipathy and Neglect scales comprise 8 items each, related to antipathy from the parent (e.g. He/she was critical towards me) and parental neglect (e.g. He/she was interested in my problems). All items are repeated for each parental figure, and answered in a 5 point Likert-like scale (1 = Not at all to 5 = totally). Studies by [34] suggest that the CECA-Q is a good screening tool for evaluating the relationships between adverse experiences during childhood and the development of psychopathology. In the current study, internal consistencies ranged between 0.65 (Mother's antipathy) and 0.86 (Neglect from father).

Bully/victim Questionnaire (BVQ; [35], [36]). BVQ is a questionnaire assessing the perceptions of being bullied and victimized by others during childhood. The questionnaire presents a definition of bullying, followed by questions aiming at the characteristics of bullying (e.g. where it took place, the number of perpetrators). Next, several items are presented in a 5-point Likert-like scale (1 = Never occurs; 5 = it occurs several times a week). The total score is an indicator of the bullying severity, and the main characteristics of bullying: physical, verbal or indirect.

Other as Shamer Scale (OAS – [37]). This scale measures external shame (how individuals think they appear on the eyes of others) and comprises 18 items rated on a 5-point Likert-like frequency scale (0=never; 4=always). Higher scores indicate increased external shame. The OAS showed good internal consistency in the original studies ($\alpha = 0.93$) and Portuguese version ($\alpha = 0.90$). In the current study, internal consistency had a value of $\alpha = 0.94$.

Submissive Behavior Scale (SBS – [38], [39]). The SBS is a 16-item scale assessing submissive behaviors (e.g. agreeing with others even then they are wrong). Each item is rated on a 5-point Likert-like scale ranging from 0=never to 4=always, and high scores indicate that individuals frequently adopt submissive behaviors when interacting with others. The scale presented good internal consistency in the original ($\alpha = 0.81$), and in the current study ($\alpha = 0.81$).

III. RESULTS

A. Characterization of Hallucinatory Experience

Preliminary showed significant differences between males and females regarding the endorsement in BAVQ-R dimensions, where men tended to score significantly higher than females on malevolence and resistance subscales (Malevolence $t = 4.07$, $p = 0.000$; Benevolence $t = -2.76$, $p = 0.008$; Resistance $t = 3.60$, $p = 0.001$; Engagement $t = -1.93$, $p = 0.059$; Omnipotence $t = 2.69$, $p = 0.010$, Bonferroni corrected $p < .001$).

Correlation analysis showed significant associations between PSYRATS-voices and BAVQ-R dimensions, where positive moderate correlation were found between Malevolence ($r = 0.519$, $p = 0.000$), Resistance ($r = 0.506$, $p = 0.000$), and Omnipotence ($r = 0.342$, $p = 0.019$), moderate negative correlations were found Benevolence ($r = -0.446$, $p = 0.002$) and weak negative and weak correlation with Engagement ($r = -0.308$, $p = 0.035$).

These results suggest that the malevolence and omnipotence bestowed on voices, and the increased resistance to them, is related to increased degrees of invalidation from auditory hallucinations.

TABLE I
 CORRELATION ANALYSIS BETWEEN BAVQ-R AND PSYRATS-VOICES (N=48)

PSYRATS-voices	BAVQ-R				
	Malevolence	Benevolence	Resistance	Engagement	Omnipotence
Frequency	0.325*	-0.247	0.372**	-0.263	-0.268
Duration	0.144	0.091	0.101	0.135	0.124
Location	-0.106	0.266	-0.292*	0.425**	0.131
Volume	0.034	-0.153	0.265	-0.127	-0.168
Source	0.095	-0.167	0.234	-0.046	0.258
N.C. (quantity)	0.573**	-0.624**	0.644**	-0.523**	0.317*
N.C. (degree)	0.522**	-0.520**	0.529**	-0.458**	0.345*
Distress (frequency)	0.565**	-0.510**	0.505**	-0.404**	0.261
Distress (intensity)	0.611**	-0.493**	-0.567**	-0.476**	0.257
Degree of invalidation	0.018	-0.009	-0.028	0.146	-0.019
Capacity to control	0.054	-0.055	-0.145	0.015	0.106

Note: BAVQ-R = Beliefs about Voices Questionnaire – Revised; PSYRATS-v = Psychotic Symptom Rating - voices; N.C. = Negative Content
 * $p < .05$; ** $p < .01$

To perform a finer analysis between the beliefs about voices and the characteristics and severity of invalidation caused by hallucinatory activity, correlations between the dimensions of BAVQ-R and dimensions of PSYRATS-voices were further analyzed and are presented on Table I. The frequency of voices presents significant moderate correlation with resistance and malevolence only, suggesting the greater resistance and malevolence from voices, the greater their frequency. The location of voices, or the fact that patients believe they occur in or outside their minds, show a positive correlation with the patient's engagement with voices, indicating that the more external the patients perceive the source of the voices (as coming from outside their minds), the greater the involvement with the voice. The attribution of negative content and resulting distress of auditory hallucinations are significantly related to all dimensions of BAVQ-R, where the negative correlations were found between those variables and Engagement and Benevolence. These results suggest that the greater the resistance and the more malevolent the voices are perceived, the greater the negative content and the distress resulting from auditory hallucinations. Conversely, increased attributions of benevolence and engagement with voices are associated with

less distress and less negative content.

Finally, we used PSYRATS-voices to explore whether the distress resulting from auditory hallucinations was higher in patients presenting voices of command ($n=14$) and without voices of command ($n=34$). For this purpose, our sample was divided between patients with and without command voices, and an independent sample t -test was carried out. Results indicate that patients with voices of command present significantly higher scores than patients without commanding voices in terms of duration of distress ($t=4.45$, $p=0.000$) and intensity of distress ($t=3.82$, $p=0.000$) resulting from the hallucinatory experience.

Overall, increased attributions of malevolence to voices and resistance is related to higher frequencies of auditory hallucinations, with higher frequencies of the intensity and negative content (which may occur in all auditory hallucinations and take form of commenting or commanding voices), and with the fact that voices often cause increased distress in the patient. Contrarily, regarding voices as benevolent and engaging with voices appears to be related with lower frequencies and intensity of negative contents, and decreased distress. The engagement with voices seems also to be related to voices being perceived as having a more external source of origin. Moreover, the amount of distress felt tends to increase with the existence of commanding voices.

B. Social Comparison with Others and Comparison with Voices

Curiously, the Group Fit subscales did not present a significant association ($r=0.224$; $p=0.134$). A moderate correlation was found between the total scores in the social comparison and social comparison with voices scales in patients with schizophrenia ($r=0.494$; $p=.001$), and the respective Rank subscales: $r=0.578$; $p=0.000$. Given this significant association, a linear regression was calculated to address the predictive value of social comparison with other in the social comparison with voices. Results show that total scores on social comparison with others predicts 24.4% ($R^2=0.224$) of the total variance in the total social comparison with the voices [$F_{(1,43)}=13.91$; $p=0.001$]. These results suggest that the negative comparisons patients make with others will also influence the way they compare themselves with their voices ($\beta=0.494$, $p=0.001$). The same analysis was performed to assess how the way that patients position themselves in relation to others in the social hierarchy (Rank subscale of SCS) and how they position themselves in relation to their voices (rank subscale of SCS-v). The Rank dimension of SCS was able to predict 33.4% ($R^2=0.334$) of the total variance of the Rank dimension in SCS-v: [$F_{(1,43)}=21.55$; $p=0.000$]. Standardized regression coefficient ($\beta=0.578$, $p=0.000$) allows to state that individuals who rank themselves as inferior in the social rank will more likely rank themselves as inferior to their voices.

To explore possible reasons for the lack of association between the Group fit subscales, the associations between characteristics of voices (PSYRATS-voices) and the Group fit and Rank in the comparison with voices were explored.

Results showed that the Rank subscale was only significant and negatively correlated with the number of voices that causes distress in the patients ($r=-0.313$; $p=0.032$), suggesting that the presence of more voices that causes distress in the patients were associated with patients' lower perceived rank in relation to their voices. Concerning the Group fit subscale, significant correlations were found with several dimensions of hallucinatory activity from patients with schizophrenia. Thus, the group fit is significantly correlated with the location of voices ($r=0.289$; $p=0.049$), the number and intensity of the negative content of voices ($r=-0.449$; $p=0.002$ and $r=-0.365$; $p=0.013$, respectively), with the number of voices causing distress ($r=-0.587$; $p=0.000$) and the intensity of the distress caused by voices ($r=-0.446$; $p=0.002$).

C. Auditory Hallucinations and Their Relationship with Parental Styles, Adverse Childhood Events, and Psychosocial Variables in Adult Life

In this study we aimed to observe to which extent childhood experiences aggravate the auditory activity and can modify the emotional and behavioral reactions to auditory hallucinations. To accomplish this goal, we initially explored the relationship between the memories of family dynamics characterized by situations of negligence or abuse (CECA-Q), the memories of submission and threat (ELES) and victimization by bullying (QBV) with the dimensions of BAVQ-R. In Table II, correlation coefficients showed that on CECA-Q, antipathy from father is the only factor significantly correlated to the Omnipotence ($r=0.313$; $p=0.018$) and Malevolence ($r=0.425$; $p=0.004$) factors from BAVQ-R. Concerning the memories of submissive and threat, the total scores are significantly correlated with omnipotence ($r=0.313$; $p=0.036$), and the submission subscale presented significant correlations with resistance ($r=0.294$; $p=0.043$), Malevolence ($r=0.334$; $p=0.020$) and Omnipotence ($r=0.447$; $p=0.001$). The only significant correlation observed with bullying referred to an association between Physical Bullying and Resistance ($r=0.286$; $p=0.049$).

Pearson correlation coefficients were also calculated between the BAVQ-R factors and social comparison (SCS), external shame (OAS) and submissive behaviors (SBS) in adulthood. Results showed that only the submissive behavior scale scores were significantly correlated with Omnipotence ($r=0.361$; $p=0.012$).

Similar to the prior study, we explored the influence of these psychosocial variables, in the experiences of auditory hallucination in patients with paranoid schizophrenia. For this purpose, we calculated multiple hierarchical regressions, with blocks defined according criteria based on time. This method was chosen because it allows determining the unique combination of predictors that better explains the variance in the criterion variable. In these analyses, the criterion variables were the dimensions of the BAVQ-R, and only the respective psychosocial variables significantly correlated to the BAVQ-R factors were introduced in each model. In this line of reasoning, 5 multiple hierarchical regression equations were calculated (one for each BAVQ-R factor) comprising 3

blocks: the first block included the memories of demandingness and criticisms from the father (CECA-Q Antipathy from father) and the global perceptions of submissiveness in childhood (ELES - Submission), the second block encompassed experiences of being victimized by peers in the form of physical bullying (QBV), and the total submissive behaviors in the present (SBS) was entered on the third block.

TABLE II
CORRELATION ANALYSIS BETWEEN BAVQ-R AND CECA-Q, ELES, QBV, OAS AND SBS (N=48)

	Malevolence	Benevolence	Resistance	Engagement	Omnipotence	PSYRATS-v
ELES						
Threat	0.218	-0.100	0.217	0.010	0.218	0.217
Submission	0.334*	-0.224	0.294*	-0.020	0.447**	0.256
Total	0.232	-0.053	0.213	0.120	0.316*	0.273
SBS	0.203	-0.100	0.136	-0.043	0.361*	0.061
OAS	0.091	-0.082	0.045	0.014	-0.061	-0.037
SCS	-0.187	0.262	-0.142	0.163	-0.151	0.156
CECA-Q						
Mother Antipathy	0.249	-0.257	0.284	-0.182	-0.005	0.129
Father Antipathy	0.425**	-0.292	0.233	-0.163	0.313*	0.087
Mother Negligence	0.109	-0.171	0.039	-0.234	-0.088	0.058
Father Negligence	0.170	-0.197	0.075	-0.248	0.098	-0.020
Bullying (QBV)						
Verbal	-0.122	0.022	0.169	0.043	-0.133	-0.012
Physical	0.172	0.002	0.286	0.087	0.099	-0.029
Indirect	0.145	-0.046	0.255	0.090	0.075	-0.060
Total	0.083	-0.022	0.243	0.068	0.040	-0.064

TABLE III
SUMMARY OF THE HIERARCHICAL MULTIPLE REGRESSION ON OMNIPRESENCE OF AUDITORY HALLUCINATIONS (BAVQ-R)

Model	R ²	Adjusted R ²	F	p	
1	0.200	0.162	5.246	0.009	
2	0.209	0.151	0.458	0.502	
3	0.298	0.228	5.101	0.029	
Model	B	β	t	p	
1	(Constant)	3.148	1.503	0.140	
	Antipathy Father (CECA-Q)	0.107	0.170	1.124	0.267
	Submission (ELES)	0.276	0.350	2.314	0.026
2	(Constant)	3.383	1.583	0.121	
	Antipathy Father (CECA-Q)	0.115	0.182	1.188	0.242
	Submission on childhood (ELES)	0.312	0.396	2.375	0.022
	Physical Bullying	-0.187	-0.107	-0.677	0.502
3	(Constant)	1.729	0.799	0.429	
	Antipathy Father (CECA-Q)	0.069	0.109	0.725	0.472
	Submission on childhood (ELES)	0.328	0.416	2.613	0.013
	Physical Bullying	-0.403	-0.232	-1.440	0.158
	Submission (SBS)	0.129	0.335	2.258	0.029

Results from this regression analysis on the Benevolence, Resistance and Engagement factors did not yield significant

results, showing that the variables did not present a significant predictive value on those factor ($p > 0.05$). The regression function was only significant to the Omnipotence factor. As depicted on Table III, this regression function explains 29.8% ($R^2 = .298$) the total variance [$F_{(4,40)} = 4.25$; $p = 0.006$]. On the first block, only the memories of submission is a significant predictor of the Omnipotence of voices ($\beta = 0.350$, $p = 0.026$), and the same remains true when physical bullying is entered on the second block ($\beta = 0.396$, $p = 0.022$). Memories of submission is the main predictor on block 3 ($\beta = 0.416$, $p = 0.013$), followed by submissive behavior in adult life ($\beta = 0.335$, $p = 0.029$), suggesting that submission is the more important predictor while the remaining variables do not add significant explanatory valuable to Omnipotence of voices.

Regarding Malevolence, the regression equation present significant values for the first model, which explains 22.2% ($R^2 = 0.222$) of the total variance of the Malevolence factor [$F_{(2,42)} = 6.004$; $p = 0.005$]. In the first block of this regression model, Antipathy from father is the single significant predictor of the malevolence attributed to voices ($\beta = 0.333$, $p = 0.031$).

The PSYRATS-voices can add information on the frequency and content of voices, as well as the distress and invalidation resulting from hallucinatory activity. Item 5, referring to the beliefs about the source or what provokes the voices presented a significant correlation with antipathy from mother (CECA-Q), $r = 0.338$; $p = .020$. Significant correlation between item 8 from the PSYRATS (amount of distress caused by voices) was found between the early submission in childhood (ELES): $r = 0.365$; $p = .010$ for the total scale, $r = 0.364$; $p = 0.010$ for Submission and $r = 0.322$; $p = 0.024$ for the threat subscales. Based on these results, a regression analysis was performed to assess the predictive value of the psychosocial variables on the PSYRATS ratings. A linear regression analysis yielded non-significant results regarding the Antipathy from mother being a significant predictor of the beliefs about the source or origins of the voices ($p > 0.005$).

Multiple hierarchical regression comprising three blocks were performed to assess the predictive value of the perceptions of submission in childhood on the distress caused by voices. The first block included memories of situations of submissiveness in childhood (ELES Submission), the second included the memories of perceived threat (ELES Threat) and the third block included the total of the scale (ELES Total). Model summary is presented on Table IV.

TABLE IV
SUMMARY OF THE HIERARCHICAL MULTIPLE REGRESSION (N=48)

Model	R ²	Adjusted R ²	F	p	
1	.121	.105	7.709	.007	
2	.123	.091	3.857	.027	
3	.128	.080	2.648	.058	
Model	B	β	t	p	
1	ELES submission	.103	.348	2.777	.007
2	ELES submission	.087	.293	1.474	.146
	ELES threat	.017	.070	.167	.868
3	ELES submission	.053	.179	.634	.529
	ELES threat	-.019	-.078	-.238	.813
	ELES total	.040	.258	.570	.571

Results suggests that only the first model has reached statistical significant and can explain 12.1% ($R^2=0.121$) of the total variance of the distress caused by voices [$F_{(1,56)}=7.71$; $p=0.007$]. The memories of submission in childhood is the single predictor in this model ($\beta=0.348$, $p=0.007$). The remaining variables considered in other models do not add significant predictive value to the regression equation.

D. Auditory Hallucinations and Depression

The average score on BDI of participants were 17.75 (SD = 10.91), suggesting that most patients in the sample were mildly depressed. To study the hypothesis that depression can be exacerbate the hallucinatory activity in terms of frequency, intensity, negative content and distress, the association between BDI scores and PSYRATS-voices items were examined. No significant correlations were found between the BDI scores and the frequency, content, capacity to control the voices, and invalidation, suggesting that there are no associations between depressive symptomatology and these aspects of hallucinatory activity. However, significant correlations were found between the location of voices, showing that increased perceptions of voices as having an external origin is associated with less depressive symptoms ($r=-0.421$; $p=0.003$), and a positive association between depressive symptomatology and the quantity of voices felt as distressing ($r=0.344$; $p=0.016$).

The relationship between depressive symptoms and the existence of command voices was also explored. For this purpose, patients were divided in two groups: with and without command voices, assessed by question 7 in PSYRATS-voices (which allows determining whether voices comment negatively on the patient and his/her activities, or give patients instructions or commands). Results show that, from the 48 patients with auditory hallucinations, only 15 presented command voices. These patients present significantly higher scores on BDI ($M= 18.11$; $SD=11.65$) on a Mann-Whitney U-test ($U= 207.00$, $p= 0.050$). These results suggest that patients with command voices significantly differ from others in terms of the severity of the depressive symptoms.

IV. DISCUSSION

The current study aimed to extensively explore the characteristics and factors that may be involved in the development and maintenance of auditory hallucinations, which included the role of several psychosocial factors, such as the early memories related to parental styles and victimization, submissiveness, shame, social comparison, in the beliefs, relationship and reactions to voices in patients diagnosed with paranoid schizophrenia. In addition, we aimed to explore the influence of depression in the aggravation of hallucinatory activity and the impact of hallucinatory activities on paranoid ideations.

As previously referred, [7], [11] proposed that the emotional and behavioral reactions to auditory hallucination reflect not only the content and form of the hallucination, but also the meanings the patients attribute to these experiences

(i.e. benevolent or malevolent intents), where patients beliefs are the main determinant to patients reactions to hallucinatory activity.

Our first study showed that several dimensions of auditory hallucination differed between female and male patients, but due to the small size of our sample, it was not possible to carry out each analysis by gender. However, this result suggests the importance of carrying out similar studies in this field to address the impact of gender in the characterization of hallucinatory experiences of patients with schizophrenia. The results also showed that the attribution of benevolence and greater engagement with voices were related to decreased invalidation caused by the hallucinatory experience. Conversely, the attributions of malevolence and omnipotence, as well as the incapacity to resist to the voices, were related to increased invalidation caused by auditory hallucinations. In addition, the increased malevolence and incapacity to resist to the voices was also related to increased frequencies of hallucinations, increased frequencies and intensity of the negative content (that may occur in the form of commenting or commanding voices), and with increased degrees of distress caused by the auditory hallucinations. These results are congruous to the aforementioned model, to the extent that emotional reactions may depend on the attributions and beliefs about the voices. In fact, we confirmed that voices perceived as more powerful and threatening (malevolent voices) can trigger defensive and protective responses and elicit distress in the patients [12]. The resistance of patients to their malevolent voices can be a clear example of this response. However, in our study, this malevolent intent bestowed on voice was also related to the negative content, which does not allow us to state that these reactions are independent from the content and derive exclusively from those beliefs. Similar to social interactions, the associations between malevolence and resistance and increased frequency of hallucinatory experiences may be related to the presence of threatening stimuli and elicit worry and hypervigilance to threat. Considering the similarity between social stimuli and auditory hallucinations, the probability of patients perceiving auditory hallucinations may also be increased when individuals face more threatening circumstances, in consonance to the vulnerability to stress proposed by [40] that states that psychotic symptoms may aggravate in the face of stressful situations.

Contrarily, regarding voices as benevolent and increased engagement from the patients is associated with decreased frequencies and intensity of negative content, and decreased distress resulting from auditory hallucinations. Increased engagement was also associated to voices being perceived as originating from an external source. Voices perceived as safe or non-threatening stimuli possibly elicit responses similar to the type of responses to friendly real-life social interactions. The association with decreased frequencies of hallucinatory experiences and less negative content is an important finding, but these phenomena may also not be exclusively due to the beliefs about the voices.

The existence of commanding voices was also associated

with the number of distressing voices and the degree of distress caused by auditory hallucinations, a finding that is consistent with those of [3], whose findings point out to the content and intensity of commanding voices exerting more influence in patient's responses to auditory hallucinations than the patients' beliefs.

In addition, social comparison with others had a significant impact on how patients with schizophrenia will compare themselves with the voices, similar to previous studies focusing on social relationships established with voices [10], [14]. This was observed whether in terms of the global comparisons of how patients position themselves in the social hierarchy can predict global comparison with the voices, and also concerning the perceptions of the position in the social rank that patients occupy in relation to others, which will also have a significant impact on how patients rank themselves in relation to their voices in the social hierarchy. The higher number of distressing voices was also associated to patient's positioning themselves in a lower social rank relatively to their voices. On the other hand, when patients feel that they belong to the same social group as the voices seems related to characteristics such as more external source of the voice, less negative content and less of distress caused by auditory hallucinations. As a consequence, the less distress these voices will provoke, whether in terms of the number of distressing voices, or in terms of the intensity of distress caused by them.

The results also pointed out to other psychosocial variables influencing the frequency, duration, location, distress and beliefs of patients relatively to their voices'. We observed that antipathy from father (hostile criticism, dislike) was a significant factor involved in the malevolence and omnipresence of voices, as well as the memories of omission, where the more the patients continue to endorse these submissive behaviors in adulthood, the more omnipotence will be attributed to their voices. It is possible to hypothesize that, similar to the processes involved in paranoid ideation [23], [41], when individuals create a schema of a world that is characterized by relationships based on power, in which others are seen as potentially hostile and dominant, this same schema about the patient's reality will be used when relating to the voices.

It is noteworthy that no associations between the depressive symptoms and the frequency, negative content, the capacity to control and the invalidation caused by auditory hallucinations in the current sample, despite patients presenting mild depression, based on the mean BDI scores. The depressive symptomatology seems to contribute to the perceptions of the patients relatively to the location of voices as more internal, which is associated to increased distress resulting from hallucinatory activity. Moreover, the patients with commanding voices tended to be more depressed than patients without commanding voices, which may be related to the degree of omnipotence and resulting submission to their voices.

A negative view of the self will be reflected in the occurrence of more depreciative voices, which in turn can help shape the vision of the self [42]. Therefore, these beliefs

related to the incapacity to resist to the voices may be related to a schema of the self as more vulnerable and incapable. These are the same characteristics that, towards situation in which others are perceived as capable of harming the self, can lead individuals to regard themselves as helpless and incapable of defending themselves, which help in the maintenance of depressive symptoms. This relationship is also demonstrative that the relationship established with the voices is governed by the same principles that underlie social relationships [5], [37].

Overall, results indicate that there is a strong link between the self-schemas and social relationship established between patients and others and the social relationships between patients and their voices. This study, however, is not free of methodological limitations. The small convenience sample of patients diagnosed with schizophrenia should be taken into account and generalization of the results should be done with care. The transversal feature of this study has imposed that researchers partially rely on retrospective assessments. Future studies with larger samples of patients or longitudinal designs can lead to further understandings on gender effects, the complexity, development and maintenance of auditory hallucinations and their relationship with paranoid ideation.

In this particular study, we demonstrated the relevance of developmental aspect, such as family and social dynamics, bullying, and socio-cognitive variables on auditory hallucinations. Because the individuals' life experiences seem relevant to the manifestation of symptoms, it is fundamental to carry out more in-depth studies exploring the social relationships in schizophrenia. It would also be of fundamental importance to study in patient's relatives, who also present increased genetic risk, the influence of life events and socio-cognitive variables in order to understand the etiological factors of schizophrenia. This understanding allows the development of more promising therapeutic interventions that can be more effective in decreasing invalidation caused by this devastating mental illness. Finally, future studies should aim at further exploring the role of depression, if whether social schemes influence depression and the patients affects and attributions towards voices, or if directionality is imposed by the psychotic illness, to which the contents of the voices can affect depressive symptoms and patient's perceptions of power and social rank.

In clinical settings, it seems relevant that understanding the psychotic phenomena within the social context can lead to important implications in the development of therapeutic interventions aiming at increasing the perceived social rank of the individuals (e.g. assertive training, aiding the identification with a group, etc.) that may have a positive impact in patients' attempts to cope with their voices and promote a change in the balance of power between patient and the voice [2], [6], [13], [43]–[45].

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