Complexity and incoherence of self-narration versus self-esteem and perceived social support in healthy people and individuals with a diagnosis of psychotic disorders

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Summary

Aim. The aim of the presented study was to compare self-narratives among participants with and without the experience of psychosis and to correlate this variable with self-esteem and perceived social support in studied groups.

Material and methods. The study group consisted of 31 adults with a diagnosis of psychosis according to ICD-10 (F20–29), and the control group consisted of 31 adults without a psychiatric diagnosis. The stimulus for creating self-narratives by the participants' was the first part of McAdams' autobiographical interview, according to which the coherence and complexity of self-narratives were determined. Other tools used in the study were Roseberg's self-esteem questionnaire and the *Scale of Perceived Social Support* by Zimet et al.

Results. The study showed that both groups differ significantly in the complexity of self-narratives ($t = -3.185$; $p < 0.05$), but do not differ significantly in terms of coherence. Additionally, a correlation between the incoherence of self-narrative and self-esteem in the control group was observed ($r = -0.455$; $p < 0.05$).

Conclusions. The self-narratives of people with a diagnosis of psychotic disorders turned out to be less complex than the self-narratives of people from the healthy group, while the incoherence was negatively correlated with self-esteem, but only in the control group. The clinical and control groups did not differ in terms of self-narrative incoherence. The presented study shows the possibilities of using qualitative methods and autobiographical interviews to analyse the language of mentally ill and healthy people and linking self-narratives with psychological characteristics. Both – the research procedure and the results have their limitations, which are discussed in the article.

Key words: psychotic disorders, self-narration, self-esteem

Introduction

In psychiatry, the linguistic field of mental illness and disorders has long been studied in its quantitative [1, 2] and qualitative [3, 4] aspects. In this part of medicine, on the one hand, a large part of the symptoms are diagnosed by observing the patient, on the other hand, by drawing conclusions from the patient's statements. Without doubt, language is one of the main sources of data for psychiatrists, psychologists and psychotherapists.

One of the most studied clinical group in the context of linguistic difficulties is people experiencing psychosis [5, 6]. To date, it has been shown that the language of people with experience of psychosis is, among other things: less semantically coherent [7], less syntactically complex [8], poorer in content [9], less logical and thus less comprehensible to those around them [10]. Based on research from the field of language, different kinds of theories and models of psychopathology are being built [11, 12], including the psychopathology of psychosis [13].

The merging of linguistics and psychiatry research is creating new fields and therefore new research methods, such as NLP (Natural Language Processing) [14], LDA (Latent Dirichlet Allocation) [15] or 2PN (Two Person Neuroscience) [16].

Another quite frequently studied aspect of verbal communication is its complexity. These are moments in which neither interlocutor utters words, although this is also when the process of communication takes place. In scientific discourse, moments of silence have already been studied as one of the important therapeutic tools [17]. Pausing is a communication that is not only used by psychologists and psychotherapists, but also patients. For each of these groups, a pause may have different communication meaning. The issue seems to be of particular interest, among those groups of people whose significant symptom of mental illness may be formal thinking disorders. People with documented experience of psychosis relatively often face formal thinking disorders [18], which are expressed, among other things, in language deficits [19], for example through inadequately long or frequent use of pauses in speech [20].

In contrast to pause, the communicative activity that requires the use of words is utterance. A number of studies indicates that the level of complexity of utterances, for example lexical, in patients with psychosis differs significantly from that of healthy individuals [21]. The difference may be that psychotic patients use significantly fewer words compared to people without such diagnosis. Several approaches are being developed to contribute to the narrative and linguistic complexity of utterances among people with psychosis such as metacognitive reflection insight therapy (MERIT) [22] or metacognitive narrative psychotherapy (MNP) [23]. It is worth noting, however, that the process of effective communication depends not so much on the number of words in general, but on their adequate accumulation within the story (including 1 or 10 threads using whenever 100 words will make a difference in communication). It would also be reasonable to ask a question about the adequacy in the qualitative (as opposed to quantitative) context of the words used in a given threads.

The aforementioned characteristics, i.e. the total length of the pauses used in the statements and the number of threads and words within the story, became the basis

for distinguishing the constructs under study, namely incoherence and complexity. As research practice shows, both the constructs of incoherence and complexity can be understood differently [24–26]. The discrepancies are due to the fact that both incoherence and complexity can refer to different elements of language and/or narrative. In the present study, incoherence is understood as the total length of all pauses used in speeches above 3 seconds, including so-called filled pauses [27], i.e. those with verbal signs of thought in the form of "hm", "yy", "ee". Therefore, the higher the score in this category, the more – when summed up: longer – pauses a given person's utterance contained, and in the understanding of the study, the more inconsistent it was. Complexity, on the other hand, represents the score that the subject obtained by dividing the number of total words in the utterance by the number of topics (threads) covered in it. Thus, the greater the number of words used in the person's topics (threads), the higher the complexity of utterance.

To our knowledge, no study to date has collated different types of indicators of mental wellbeing as variables that could potentially depend on the language characteristics of the patient or the mentally healthy person. Therefore, a study was designed to analyse two indicators of mental wellbeing, i.e. self-esteem and perceived social support, as factors that may be related to the potential incoherence and/or complexity of the subjects' self-narratives. It was decided to examine self-esteem because it is an area that can be significantly distorted and/or diminished as a result of the experience of psychosis [28]. Perceived social support, on the other hand, seems to be an interesting direction particularly because of the role of language as an important tool in creating, maintaining and deepening social relationships.

In relation to the review of existing literature, it was hypothesised that the self-narratives of patients diagnosed with a psychotic disorder would be characterised by (1) less complexity, i.e. a smaller number of both the threads and the number of words that will make up the whole utterance, while also being distinct by (2) greater incoherence, i.e. a greater number and duration of pauses in the utterances. Further assumptions arising from the research review were related to hypotheses concerning (3) the co-occurrence of lower complexity and/or greater incoherence of self-narratives together with lower rates of self-esteem and perceived social support regardless of the diagnosis of psychotic disorder or lack thereof, and thus in both groups.

The aim of the presented research was to empirically analyse self-narrative style among people with and without experience of psychosis and to compare this measurement with the self-esteem outcomes and perceived social support of these individuals.

Hypotheses

The research included: (1) an analysis of the complexity and incoherence of self-narration among people with diagnosis of psychotic disorders, as important variables that are related to the psychological wellbeing of individuals and valuable information for those diagnosing or supporting this group of people, and which to date have been poorly studied in this population or have not been studied through the lens of self-narration; (2) an examination of variables such as self-esteem and perceived social

support as indicators of psychological wellbeing, which are particularly important among people with diagnosis of psychotic disorders and are an important part of the treatment of this group of people [29]; (3) to capture the specificity of the aforementioned variables, it was decided to include a control group of people with no previous psychotic experience. The study proposed three hypotheses regarding complexity and three hypotheses regarding incoherence of statements, which are presented in Table 1.

Table 1. **Research hypotheses**

HYPOTHESES	
Complexity hypotheses	**Incoherence hypotheses**
H1: The self-narration of those in the study group will be less complex compared to the control group.	H4: The self-narration of those in the study group will be less consistent compared to the control group.
H2: The lower the level of complexity of self-narration, the lower the self-esteem in both groups – study and control.	H5: The higher the level of incoherence of self-narration, the lower the self-esteem in both groups – study and control.
H3: The lower the level of self-narrative complexity, the lower the perceived social support in both groups – study and control.	H6: The higher the level of self-narrative incoherence, the lower the perceived social support in both groups ⬜ study and control.

Material

A total of 62 participants took part in the study, including 31 participants in the study group and 31 in the control group. All subjects were of legal age at the time of the study. All participants were informed about the purpose and conditions of the research. All participants provided written informed consent to participate in the study.

The study group consisted of patients of the outpatient clinic – Mental Health Counselling Centre at the Józef Babiński Clinical Hospital in Krakow – who were previously treated in the Hospital Ward of the same hospital. All patients achieved a state of remission that currently allows for outpatient treatment, and the remission lasted for at least 30 days. Further criteria for inclusion in the study group were as follows: (a) age over 18 years, (b) diagnosis of a psychotic disorders in the range F20–F29 according to ICD-10, (c) current lack of positive symptoms, (d) attending psychiatrist's declaration that the patient's condition is stable and allows for free conversation (lack or low intensity of negative symptoms) and (e) the patient's consent to participate in the study.

The control group consisted of individuals self-reporting their participation in the study via social media. Inclusion criteria for the control group were as follows: age over 18 years, no lifetime diagnosis of a psychotic disorder and the person's consent to participate in the study. Table 2 shows the socio-demographic characteristics of all study participants.

Table 2. **Socio-demographic characteristics of the subjects**

Socio-demographic variables		Study group N = 31	Control group N = 31
Gender (%)	Women	16 (52%)	17 (55%)
	Men	15 (48%)	14 (45%)
Mean age (SD) (min-max)	Women	51 (SD = 15.49) (22-72)	49 (SD = 13.68) (28-74)
	Men	43 (SD = 12.69) (25-64)	49 (SD = 13.98) (24-68
Duration of illness (SD) (min-max)	Women	21 (SD = 10.67) (4-45)	Lack of mental illness
	Men	17 (SD = 8.16) (4-31)	Lack of mental illness
Relationship	In a relationship	10 (32%)	22 (71%)
	Not in a relationship	21 (68%)	9 (29%)
Education	Primary	1 (3%)	0
	Secondary	15 (49%)	13 (42%)
	Vocational	6 (19%)	0
	Higher	9 (29%)	18 (58%)
Work	Job	16 (52%)	27 (87%)
	Not working	1 (3%)	0
	Pension	9 (29%)	3 (10%)
	Retirement	5 (16%)	1 (3%)
Diagnosis	Schizophrenia (F20)	25 (82%)	-
	Delusional disorder (F22)	2 (6%)	-
	Acute transient psychotic disorder (F23)	2 (6%)	-
	Schizoaffective disorder (F25)	2 (6%)	-

Methods

Table 3 shows the division of the dependent and independent variables, their method of measurement and how the result was interpreted.

Table 3. **Division of dependent and independent variables, method of measurement and method of interpretation**

Variable name	Method	Interpretation
Independent variables		
Complexity	Number of words in threads divided by number of threads	The higher the score, the greater the complexity of the subject's self-narration [30].
Incoherence	Length of pauses (breaks of more than 3 seconds)	The higher the score, the greater the incoherence of the statements [31].
Dependent variables		
Self-assessment	Rosenberg SES test score	The higher the score on the questionnaires, the higher the self-esteem of the subject.
Perceived Social Support	Zimet's MSPSS test score	The higher the score in the questionnaire and in the individual subscales, the higher the perceived social support.

Procedure

The study was conducted from September 2021 till march 2022. The research followed the rules contained in the Declaration of Helsinki and its protocol was approved by the Research Ethics Committee of the Institute of Applied Psychology (decision number: 101/2021). The research procedure for participants in the clinical group began with a consultation with the attending psychiatrist to identify whether the person would be able to participate in the study. For those in the control group, it was a request to participate in the study and an appointment date was set. On the day of the study both groups were presented with a description and the study regulations. Individuals were informed of their rights, including whether each piece of information given to the subjects was understandable to them. Subjects were then asked if they consented to participate in the study, after which they were asked to declare their consent in writing. The next step was to present the study procedure. The respondents were also instructed that they could withdraw from the study at any stage without any consequences. The single study, lasting on average about 45 minutes, was conducted in the following stages:

1. The first part of the biographical interview by Dan McAdams [32], adapted by Magdalena Budziszewska [33]. The interviewees' statements were recorded using a voice recorder for later detailed analysis.
2. Morris Rosenberg's [34] *Self-esteem Scale*, adapted by Łaguna, Lachowicz-Tabaczek and Dzwonkowska [35].
3. *Perceived social support scale* by Zimet et al. [36] adapted by Buszman and Przybyla-Basista [37].

All interviews, both in the study and control groups, were conducted by one of the authors, and the interviews were recorded using a voice recorder. Then the record-

ings were transcribed by the second author and his colleague – these two researchers constituted a team of competent judges. Each competent judge independently parameterised the interview text in terms of specific variables. Where there was high agreement, a given fragment was assigned as variable. All statistical analyses were carried out using PS Imago Pro 8 and Microsoft Excel, with statistical significance assumed at $p < 0.5$.

Results

Descriptive Statistics

Sixty-two people were surveyed. Tables 4–6 describe the general characteristics of the recordings such as speaking time (in minutes), number of words, number of pauses (pauses of more than 3 seconds), length of pauses (in seconds), and average length of one pause (in seconds).

Each of the above formal characteristics is presented as mean in the tables. Two of them were rounded to two decimal places and these were: the mean duration of one pause and the mean duration of the whole speech.

Table 4 shows all descriptive statistics in graphical form.

Table 4. **Descriptive statistics of the recordings of respondents' statements**

Descriptive statistics (mean)	Study group (N = 31)	Control group (N = 31)
Time (min.)	19	28.41
SD	18.82	22.99
min-max	2.13-86.4	2.57-84.21
Number of words	2082	3295
SD	2223.46	2857.28
min-max	115-9882	372-10730
Number of pauses (sec) SD min-max	8 12.16 0-55	3 6.87 0-34
One pause (sec)	3.89	3.39
SD	2.68	3.04
min–max	3.5-9.67	4-11
Number of threads	12	16
SD	11.03	11.17
min-max	1-55	2-44
Words in threads	1891	3086
SD	2142.54	2777.74
min-max	83-9505	179-10384

Words outside threads	191	209
SD	152.07	135.75
min-max	6-608	0-610
Complexity*	127.96	167.91
SD	54.17	43.37
min-max	37-292	85-255
(In)coherence**	46.46	21.45
SD	75.25	49.31
min-max	0-317	0-255

Results in complexity and incoherence

Table 5. **Results of the Student's t-test for the complexity and coherence measure in the study (N = 31) and control (N = 31) group**

Results of the Student's t-test for independent groups					
	Group (N = 31)	Mean	Standard deviation	Student's t-test	Significance
Complexity	Study	127.97	54.179	-0.3185*	p <0.05
	Control	167.92	43.377		
Incoherence	Study	46.47	72.257	1.584	p >0.05
	Control	21.45	49.315		

*correlation significant at 0.05 (two-tailed)

The Student's *t*-test value for the "complexity" variable is statistically significant at − 3.185. A higher mean was recorded in the control group (167.92) compared to the study group (127.97). It is therefore appropriate to accept the hypothesis (H1) that the control group is significantly more likely to have higher levels of self-narrative complexity.

The Student's *t*-test for the "coherence" variable is not statistically significant, so the hypothesis (H4) that the control group is characterised by higher coherence compared to study group should be rejected.

The next step in the data analysis was to test possible correlations between the independent variables complexity and coherence, and the dependent variables: self-esteem (measured by the SES questionnaire score) and perceived social support (measured by the MSPSS questionnaire). The results are presented in Table 6.

Table 6. **Pearson's r test correlation results between complexity and incoherence and the dependent variables self-esteem and perceived social support in the study (n = 31) and control (n = 31) group**

Results of Pearson's r correlation						
	Group (n = 31)	SES	MSPSS general result	MSPSS friends	MSPSS family	MSPSS significant person
Complexity	Study	0.091	0.085	-0.012	0.023	0.207
	Control	-0.296	-0.701	-0.080	-0.075	-0.035
Coherence	Study	-0.091	-0.174	-0.137	-0.221	-0.104
	Control	**-0.455***	-0.316	-0.310	-0.346	-0.164

*p <0.05. The result is statistically significant.

There were no statistically significant correlations between the complexity of utterances in either the study group or the control group, and scores on the questionnaire measuring perceived social support, both in the total score of the above test and in terms of its individual dimensions (friends, family, significant person). There were no statistically significant correlations between the score in the complexity category and the self-assessment score measured using the Rosenberg test.

The results therefore indicate that the hypothesis regarding the correlation between the complexity level of self-narration and the score on the test measuring self-esteem (H2) should be rejected. The hypothesis of a correlation between complexity and perceived social support score is also rejected (H3).

In terms of incoherence in the study group, there were no statistically significant correlations between this variable and test scores on self-esteem and perceived social support. In the control group, there was one statistically significant correlation and it concerned the coherence of statements and the score on the self-esteem questionnaire. Consistency of utterances, understood as the total sum of the duration of all pauses in an utterance, correlates negatively with the self-esteem score on the Rosenberg SES questionnaire. This means that a longer sum of pauses co-occurs with a lower self-esteem score among people without a diagnosis of psychiatric disorders.

Thus, the hypothesis for the control group of a correlation between a lower level of coherence and a lower self-esteem score is confirmed (H5). At the same time, the same hypothesis (H5) is rejected for the study group. The hypothesis that coherence is correlated with perceived social support scores is also rejected (H6).

Discussion of the results

In the first hypothesis it was assumed that the self-narration of people in the study group would be less complex compared to the control group. The researchers succeeded in confirming the hypothesis. Statistically significantly more complex self-narratives were reported among the control group and less complex narratives were reported among the study group. This is in line with reports by Moe et al. [38], whose study

suggests that the utterances of people with schizophrenia are less rich in what is known as idea density compared to those of the control group. This construct was understood in that research as a measure of the amount of information contained in self-narration. This quantity was obtained by summing the number of statements or assertions in the language sample, which was then divided by the total number of words in the sample.

The second hypothesis stated that the lower the level of complexity of self-narration, the lower the self-esteem in both the test and control groups. The results of the study contradicted this hypothesis. The rejection of hypothesis two (H2) may be surprising when looking through the meta-analysis by Bemros et al. [39], which suggests that the self-esteem of young people at high risk of psychosis appears to be lower than among healthy individuals. The authors also report that this difference increases with age. The fact of having a mental illness is certainly not without its impact on the patient's self-esteem [40], however, our research suggests that there is no connection between the self-esteem result and the person's less complex self-narrative. Perhaps, looking through the prism of research indicating the positive effects of resilience building among this group of people [41], longer period of illness experienced by the study group in the proposed project was also associated with building a resilience resource, which may result in an increase in the level of self-esteem [42].

The third hypothesis, on the other hand, implied that the lower the level of self-narrative complexity, the lower the perceived social support in both the test and control groups. However, this hypothesis was refuted. This type of result interacts in an interesting way with research by Cechnicki et al. [43], who report that the index of perceived social support may be elevated, while its objective measures, such as frequency of contact with others or number of beyond-familiar social relationships, may be lowered. Other research suggests that levels of subjectively perceived social support appear to be lower in people with experience of psychosis [44]. However, it appears that potentially lower levels of perceived social support do not co-occur with low self-narrative complexity, that is, such self-narrative that is characterised by fewer themes addressed and generally fewer words used to elaborate on those themes. This may be optimistic news for patients with diagnosis of psychotic disorders struggling with negative symptoms of psychosis (associated e.g. with poor verbal communication), because they do not clearly determine the quality of social support experienced by these people. The sense of support, even though it is built on the basis of, among other things, relationships with people, does not seem to be related to the expansion or impoverishment of self-narrative among any of the study groups.

The fourth hypothesis was that the self-narration of those in the study group would be less consistent in comparison with the control group. This hypothesis was not confirmed. It could be hypothesised that the experience of a psychotic episode co-occurs with a greater need for pauses and an increase in their duration in self-storytelling, as evidenced by the findings of Cohen et al. [45], who, using computer acoustic analysis of natural speech of people with psychotic disorders, demonstrated that the intensity of psychiatric symptoms such as – for example: paranoia and bizarre behaviour – coexists with an increased intensity of symptoms of alogia, including, among other things, a longer average pause duration. In the aforementioned study, the length of pauses of

people with schizophrenia increased with the severity of cognitive symptoms, especially those concerning attention. Perhaps it would be important in the future to make a distinction in terms of illness symptoms, since, as the results on positive psychotic symptoms indicate the ill person has difficulty in, for example, disorganising the stream of thoughts, which may translate into verbal intensification for the patient [46].

The fifth hypothesis indicated that the higher the level of incoherence of self-narration, the lower the self-esteem in both the study and control groups. While the hypothesis was confirmed for the control group, it was found to be false for the study group. In the control group, there was a statistically significant correlation between incoherence and self-esteem score ($r = -0.455$; $p < 0.05$). Such a correlation was not found in the study group. More frequent and longer interruptions in the statements of people with experience of psychosis have already been confirmed in previous studies [45], but in the case of people with diagnosis of psychotic disorders, this seems to be unrelated to the subjective attitude towards the self. However, a closer look at this phenomenon would be warranted, as it remains unclear in the light of previous research, why the number and length of utterance interruptions co-occur with lower self-esteem in control group, whereas no such co-occurrence is found for individuals with a diagnosis of a psychotic disorders.

In the final, sixth hypothesis, the researchers presumed that the higher the level of self-narrative incoherence, the lower the perceived social support in both groups. The results of the study do not support this hypothesis. Among healthy people, although incoherence of utterances seems to coexist with lower self-esteem, no such correlation was found for perceived social support.

In the case of people with diagnosis of psychotic disorders, incoherence of self-narration, does not seem to be an indicator that co-occurs with either lower self-esteem or perceived social support. The key to the answer could be to design a study that varied the length of time of illness, as the subjects in the proposed project had a minimum of two acute psychotic episodes. It would therefore be important to look in the future at whether the length of illness has any effect on the characteristics of self-narration among this group of patients, or indeed whether the possible length of illness translates into a stabilisation of indicators of their psychological wellbeing.

Recapitulation

The focus of the presented study was language and the story about oneself which is called self-narration. The experience and diagnosis of a psychotic illness or psychotic episode was crucial for the study. The present study looked at the self-narratives of people with and without such experience in order to capture potential differences characterising the self-narratives of both groups and possible relationships between the stories about oneself and the connections with the self-esteem and perceived social support of the narrators of these stories. The desire to get closer to answering the general question about the reality-shaping role of language was important for the genesis of the study. The hypotheses concerned the possible relationships between the formal features of the narrative (complexity and incoherence) and the level of self-esteem and

perceived social support among people with diagnosis of psychotic disorders compared to people without experience of psychotic illness.

It is important to mention the possible limitations of the conducted research project. There are numerous methods for the study of narrative and self-narration, e.g. theme analysis [3], dialogical analysis [47], linguistic analysis [48], or quantitative analysis [49]. The quantitative aspect in the proposed study was expressed by measuring the time of utterance, counting the frequency and duration of pauses in the utterance, and adding up the plots and words that make up the entire utterance of the subject. However, each of the above approaches to narrative research involves different risks or opportunities.

The complexity of the self-narrative analysis process and the multitude of possible directions of interpretation determined that, in addition to following specific and detailed criteria for extracting themes, it was also decided to carry out a quantitative analysis of the self-narration in the form of looking at its formal features (such as, for example, speaking time, number of words, length of pauses). This reduced the risk of a biased process in analysing the self-narration. How the patient is stimulated to produce the narrative also has an influence in this type of research. This is particularly the case in the social constructionism stream, where it is assumed that the very presence of the researcher influences the person's narrative. It must therefore be presumed that, also in the case of the above study, such an interaction between the researcher and the subject took place. In order to keep this influence as small as possible or as controlled as possible, care was taken to ensure that the research procedure, despite its verbal nature, was as structured as possible (e.g. interviews in both clinical and control groups were conducted in similar research conditions by the same researcher using written, pre-learned by heart instructions for the subjects). We made an effort that the clinical and control groups were similar as more as possible, but as Table 2 shows, this was not entirely successful – in terms of psychosocial variables such as job and relationships the groups differ from each other. In subsequent research projects, it is planned to include a more careful selection of the control group, especially in terms of socio-demographic parameters.

Another factor that may have had a detrimental effect on the study may have been the sheer heterogeneity of the psychotic experience, which is characterised, among other things, by the fact that its course, depending on the individual, may be extremely different. Moreover, the symptoms of psychosis are associated with disorders of formal thinking and speaking disorders, which cannot be completely controlled in clinical trials.

In conclusion, the self-narratives of people with diagnosis of psychotic disorders were statistically significantly less complex than the self-narrations of control subjects. On the other hand, the complexity of the self-narration understood as the number of words used in all the isolated threads in total, divided by the number of threads the person addressed, does not seem to correlate with the self-esteem score and perceived social support, neither in the study group, nor in the control group. Incoherence, understood as the number of all breaks in the person's speech in total, seems to correlate negatively with self-esteem levels among people without experience of psychosis ($r = -0.455$; $p < 0.05$). In contrast, incoherence of self-narrations in the group of indi-

viduals with psychotic disorders was not statistically significantly different from the level of self-narration incoherence recorded in the control group.

Acknowledgements

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