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GRAMMATICAL AND SEMANTIC ACCEPTABILITY
OF UTTERANCE TEXTS OF PATIENTS DIAGNOSED
WITH PARANOID SCHIZOPHRENIA.
A RESEARCH REPORT

The present study compared utterance texts of healthy individuals and individuals suffering from paranoid schizophrenia, by using a purpose-built Grammatico-Semantic Acceptability Quotient which examined the degree of linguistic acceptability of analyzed sentences. The study involved 130 hospitalized psychiatric patients diagnosed with paranoid schizophrenia and 130 healthy individuals. The study yielded the biggest so far corpus of marked utterance texts of schizophrenic patients in the Polish language. A total of 11,414 sentences were isolated, 7,180 of which were produced by individuals suffering from schizophrenia. The level of their acceptability was found to be considerably lower, especially in the case of sentences produced by patients with positive type schizophrenia.

Key words: paranoid schizophrenia, acceptability, syntax

Introduction

The concept of “acceptability” was introduced into linguistics in 1965 by Noam Chomsky to denote the specific feature of an utterance that makes that utterance agreeable to the language user’s linguistic sense, i.e. makes it understandable and meaningful to them: “...let us use the term *acceptable* to refer to utterances that are perfectly natural and immediately comprehensible without paper-and-pencil analysis, and in no way bizarre or outlandish” (Chomsky, 1965, p. 10). Contrary to grammaticalness, which is related to competence, Chomsky considers acceptability to be a feature of language performance, and he does not identify it with grammatical correctness alone: “Like acceptability, grammaticalness is, no doubt,

a matter of degree, but the scales of grammaticalness and acceptability do not coincide. Grammaticalness is only one of many factors that interact to determine acceptability” (Chomsky, 1965, p. 11). Thus, a given utterance may be grammatically incorrect but semantically acceptable. Consequently, grammatical acceptability may not necessarily correspond to semantic acceptability.

A phrase can be regarded as grammatically unacceptable when:

- 1) it is incorrect grammatically, e.g. “Nasza sąsiad nas dokucza” [Ours neighbor keeps bother us];¹
- 2) it is stylistically awkward, for instance containing many relative clauses, e.g. “Przyjechał do mnie kolega, który pracuje w wydawnictwie, które wydało ten bestseller, o którym przed chwilą wspominałem” [I was visited by a friend who works at the publishing house that released the bestseller which I just mentioned].

By comparison, a phrase can be considered semantically unacceptable when:

- 1) it is semantically contradictory, e.g. “Janek jest kawalerem, a żonę ma z Przemysła” [Janek is a bachelor and his wife is from Przemysł];
- 2) it includes content inconsistent with our knowledge about the world, e.g. “Potężny głaz oderwał się od szczytu, sfrunął na dół, usiadł na znajdującej się tam ławce i zaczął czytać napis na pomniku” [A big rock broke off from the peak, flew down, sat down on the bench and started reading the inscription on the monument].

Based on this distinction Ida Kurcz (1987, p. 212-213) distinguished four types of sentences (examples quoted from Kurcz’s original work) which constitute the Grammatico-Semantic Acceptability Quotient used in the present study:

- 1) sentences acceptable grammatically and semantically, e.g. “Duży pies biegnie prędko do domu” [The big dog is running quickly home];
- 2) sentences acceptable grammatically but unacceptable semantically, e.g. “Bezbarwne zielone myśli śpią wściekle” [Colorless green ideas sleep furiously];
- 3) sentences acceptable semantically but not grammatically; i.e. sentences that remain understandable to the utterance receiver despite the violation of grammar rules, e.g. “Pies biegnie prędko, duży, do domu” [The dog is running, big, quickly home];
- 4) sentences unacceptable both grammatically and semantically, e.g. “Duży domu biegnie do prędko pies” [The big home is running quickly dog].

To simplify the subsequent analysis, we will use the following abbreviations in the text: $S_1(G^+S^+)$, $S_2(G^+S^-)$, $S_3(G^-S^+)$ and $S_4(G^-S^-)$, where S_n stands for sentence, G – for the grammar aspect, S – for the semantic aspect, (+) – for acceptability, in the sense of grammatical or semantic correctness, (-) – for unacceptability, in the sense of grammatical or semantic incorrectness.

¹ Examples in the Polish language taken from: Polański, K. (1993). *Encyklopedia językoznawstwa ogólnego* [Encyclopedia of General Linguistics]. Wrocław: Ossolineum.

In the present study we calculated the ratio of the usage frequency of each sentence type by healthy individuals and individuals suffering from schizophrenia. A lack of grammatical acceptability, seen as compliance with a given language's grammatical and stylistic norms, will be indicated by a predominance of $S_3(G^+S^-)$ and $S_4(G^+S^-)$ sentences, while a lack of semantic acceptability, understood as a text feature determining the adequacy of the relation between the semiotic sign and the designated object, will be shown by a predominance of $S_2(G^+S^-)$ and $S_4(G^+S^-)$ sentences.

The present study is part of a bigger project, the preliminary results of which have been presented in several other publications (Obrębska, 2011; Obrębska & Nowak, 2011; Obrębska & Obrębski, 2011).

Research into syntax in schizophrenia

Research into the syntactic level of utterances of schizophrenic patients, carried out across different countries and language systems, shows clear similarities, especially in the simplification of syntax and a lower number of correctly constructed sentences (Covington et al., 2005). This tendency has also been confirmed by Polish studies, conducted by Andrzej Czernikiewicz (2004) and Tomasz Woźniak (2000). Additionally, their research showed impoverishment of syntactic complexity and a disruption of the schizophrenic discourse's cohesion on the grammatical, semantic and pragmatic level. These tendencies are especially pronounced in patients with chronic schizophrenia.

A detailed examination of the syntax of schizophrenic patients' utterances indicates a lower level of syntactic complexity of these utterances as compared with the norm and other mental illnesses, and as demonstrated by a lower number of compound sentences, higher number of simple sentences, higher number of syntactically incorrect sentences and less frequent use of conjunctions.

Another language feature commonly found in schizophrenia are anacoluthic constructions (Woźniak, 2005), characterized primarily by the formulation of unfinished, interrupted utterances, the introduction of incomprehensible word forms or words not associated to one another, as well as the construction of incoherent utterances based on an unknown context and not related to the current situation. Anacoluthic constructions disrupt both the grammatical and semantic coherence of a text, which can cause the utterances of schizophrenic patients to be completely incomprehensible to the listener.

Another interesting language-related phenomenon in schizophrenia are "frequent lexical associations" (Czernikiewicz, 2004), which make use solely of the lexical coherence rules of the text through repetition of words with a similar meaning in subsequent utterances. This reflects a certain stereotypy of psychotic thinking, demonstrated by a more rigid repetition of phrases, topics and behaviors. This was also confirmed in the author's earlier study (Obrębska, 2007), where the level of repetition of words was found to be significantly higher in the group of

schizophrenic patients than in the group of healthy individuals. The largest differences were observed for the context of 7-15 preceding words, especially verbs: repetitions occurred as much as three times more frequently in the utterances of schizophrenic patients than those of healthy individuals. In the case of nouns these differences were smaller, but also statistically significant.

To summarize, the research findings indicate that the most frequent type of dysfunction in schizophrenia is the disintegration of utterances on the highest, textual level, whereas lexical phenomena occur less frequently. According to Czernikiewicz (2004, p. 31), these results confirm the hypothesis about the dissolution of language in schizophrenia: in individuals suffering from chronic schizophrenia, the relative prevalence of language phenomena indicating a dysfunction in the production of a comprehensible and coherent text, which occurs mostly in the frontal structures, together with a relative scarcity of lexical phenomena, which in turn are mostly related to the temporal lobes, demonstrates that the disintegration of the language system is the effect of damage at the highest level of mental activity, i.e. the level of "frontal activity". The hypothesis about the dissolution of the language system in schizophrenia refers to the psychophysiological theory of Jan Mazurkiewicz (1980), who wrote about a progressive, "inter-level dissolution" in schizophrenia, the course of which leads to a decline in the high-order brain functions associated with the frontal lobes and to the exposure of lower-level activity. Likewise, in the case of language functions in schizophrenia, more complex activities associated with organization at the utterance (text) level are disrupted sooner than simpler ones related to the organization of a single sentence or the choice of an appropriate word.

This disruption of the coherence and comprehensibility of an utterance text is an external indication of disintegration of mental functions, which for many constitutes the basic diagnostic criterion of schizophrenia. According to Krystyna Drat-Ruszczak (1995, p. 25), this disintegration includes not only speech, thought processes and the emotional-motivational sphere, but also the homogeneity of cognitive and emotional reactions: "The intrapsychic split, encompassing the disintegration of many mental functions, is so pronounced in schizophrenia that a specification of incoherent activities and functions would be exhaustive not only of the symptomatology of schizophrenia, but also of the list of activities and functions generally possible."

Furthermore, according to Waszkiewicz et al. (2012, p. 5), many mental functions can play a role in such a complex phenomenon as the creation of utterances which are coherent and which "fulfill their communicative function and are adequate in a given context." Especially interesting, in the authors' opinion, is the analysis of the relationships between language dysfunctions and executive functions, which – being a very broad construct – could influence language on different levels. These functions would encompass such activities as speech generation, utterance planning and monitoring, correction of potential errors and maintaining an appropriate level of generality of the spoken content, all of which influence the grammatical coherence

of a text. The research evidence suggests that difficulties in planning and editing a text are often associated with disturbed functioning and structural changes in the frontal lobes, as well as subcortical structures affiliated with the frontal lobes. More pronounced language dysfunctions are also related to a volume reduction in the orbitofrontal cortex. This brain structure is responsible, among other things, for guiding and monitoring goal-oriented behaviors, which constitute components of executive functions.

In the context of the aforementioned research evidence we can assume that also the Grammatico-Semantic Acceptability Quotient, which measures the level of comprehensibility and grammatical and semantic adequacy of utterance texts, will be found to be lower in the group of individuals suffering from schizophrenia, especially so in patients with predominant negative symptoms, which characterize the chronic form of schizophrenia.

Method

In order to verify the above hypothesis, we conducted a study involving 132 hospitalized psychiatric patients diagnosed with paranoid schizophrenia. The study was financed through the individual research project No. N N106 039734 of the Ministry of Science and Higher Education. The study was carried out in the years 2008-2009 at five large neurological and psychiatric care centers in Poland:

- 1) the Regional Hospital for Mental Health and Psychiatric Patients in Gniezno,
- 2) the Regional Hospital for Mental Health and Psychiatric Patients in Cibórz,
- 3) the Regional Neuropsychiatric Hospital in Kościan,
- 4) the Józef Babiński Hospital for Neurological and Psychiatric Patients in Kraków,
- 5) the Independent Public Hospital for Neurological and Psychiatric Patients in Międzyrzecz.

Both in the pilot study and in the subsequent study proper, all the participants gave their written consent to participate in the research and to have their utterances recorded on a dictation machine. To take part in the study the patients were required to be able to maintain relatively good contact with their social environment. In accordance with the principles of purposive sampling, patients were referred for the study on the basis of a specialist medical diagnosis (recognized paranoid schizophrenia) by the treating psychiatrist who, having sound knowledge of both the state of the patient and the framework of the study, decided whether a given patient would be able to participate.

The patients' examination was conducted with the use of a set of pictures. They were selected by five experts who were experienced in working with psychotic patients (3 psychiatrists and 2 practicing psychologists) and approved by the Ethics Committee of the Institute of Psychology at the UAM. The selection was made out of 14 black-and-white and realistic photographs taken from a collection of works

of world-famous artistic photographers: W. Ronis, R. Doisneau, Z. Matuszewski, Z. Nasierowska, K. Kurzydło. The photographs depicted landscapes (4), portraits (3), animals (3) and interpersonal situations involving multiple persons (4). The experts were asked to rank the photographs according to two criteria: patient wellness (low risk of the patient's condition worsening) and content richness (better narrative stimulation). Five photographs with the highest total score were chosen. These were:

- 1) *Chez Maxe* by Willy Ronis – people dancing outdoors;
- 2) *Villa Médicis* by Willy Ronis – a man playing with a child in a park;
- 3) *Sélestat* by Willy Ronis – a family sitting at a table;
- 4) *Pluie d'été* by Robert Doisneau – children playing in the rain;
- 5) *Złodziejaszki* by Zbigniew Matuszewski – cats drinking milk from a bucket.

Participants were shown a sequence of five photographs, always in the same order, and were asked to describe what they saw in them. The examination ended when the participant signaled that he or she had finished, e.g. by saying “that's it,” “that's all.”

All utterances were recorded on a dictation machine, which allowed the free flow of speech to be replayed later. We deemed it important that the utterances should be non-directed and spontaneous in character. Many researchers (Žurko, 2008, p. 109) emphasize the higher psychological value of spontaneous utterance texts over written texts, as the former allow one to enter into a personal system of meanings and promote the generation of a deepened story by transgressing the cultural and formal norms of text organization.

Once this part of the study was over, the researcher together with the patient's treating psychiatrist filled in the PANNS scale in order to assign the patient to positive or negative type schizophrenia. In the course of the research we identified a total of 80 patients with positive and 52 patients with negative symptoms of schizophrenia (two recordings from the latter group turned out to be incomprehensible, therefore 50 recordings of utterances of patients with negative symptoms were qualified for analysis).

After testing the experimental group, a similar procedure (showing photographs) was used to test the healthy individuals from the control group. A control group (n=130) matched to the patients on age, gender and education level was included; the main differentiating variable between the two groups was morbidity. This method of sampling allowed for control of demographic variables – sex, age and education – which could also have influenced the lexical choices and the organization of utterances by participants. On this basis two reference control groups were distinguished: a control group for the patients with positive symptoms (C_p) and a control group for the patients with negative symptoms of schizophrenia (C_N), identical with regard to demographic variables with the corresponding experimental groups. For subject characteristics, see Table 1.

In the group of patients with positive schizophrenia symptoms there was a slight predominance of men (54%), young individuals within the age range of 18-30

Table 1. Demographical data

	Gender		Age					Education			
	W	M	18-30	31-40	41-50	51-60	61-70	Primary	Secondary	Higher	
Patients with positive schizophrenia symptoms	37	43	27	13	19	16	5	31	38	11	S = 80
Patients with negative schizophrenia symptoms	17	33	11	13	14	9	3	32	16	2	S = 50

years old (34%), and individuals with a secondary education (47.5%). In the group of patients with negative schizophrenia symptoms (as well as the control group for the negative patients) we found a predominance of men (66%), middle-aged individuals within the age range of 41-50 years old (28%), and individuals with a primary education (64%). This distribution agrees with the assumption of McGlashan and Fenton (1992) and other clinicians who associate the level of intensity of positive and negative results primarily with the phase of the illness. In its initial phase one usually observes the predominance of positive symptoms that develop into negative symptoms as the illness progresses. In the present study most of the patients with positive symptoms had been hospitalized for the first time, they had not yet experienced a significant disruption of their daily lives and had no cognitive deficits; hence their younger age and higher education level in comparison with the group of patients with negative symptoms.

After completion of the testing all the utterance texts were transcribed using the Transcriber software. The UAM Text Tools software package, created at the Department of Mathematics and Computer Science at UAM, was used for text annotation. Each word of the text was marked with morphological information, including the part of speech and morphological attributes (such as grammatical number, gender, person...), using the data from the Pollex/PMDB electronic morphological dictionary (Vetulani et al., 1988). The annotation generated automatically obviously needed manual verification, which was performed by two experts with a linguistic background (both with PhD degree: one in general linguistics, the other in computer science in the field of computational linguistics) and was based on the Contemporary Dictionary of the Polish Language by Bogusław Dunaj (Dunaj, 2007) and the Dictionary of the Polish Language by Mieczysław Szymczak (Szymczak, 1982).

The study yielded the largest so far corpus of marked utterance texts of schizophrenic patients in the Polish language. The corpus contains 200,000 words in total, $\frac{3}{4}$ of which consist of utterances of schizophrenic patients. Patients with positive symptoms of schizophrenia produced significantly longer utterances (1,500 words on average) compared to patients with negative symptoms (300 words) and healthy individuals (300 words). The present study of the language of schizophrenic patients is the largest of all such studies conducted in Poland to date.

Results

Let us reiterate that our purpose-built Grammatico-Semantic Acceptability Quotient represents the ratio of grammatically and semantically acceptable sentences $S_1(G^+S^+)$ to sentences acceptable grammatically but unacceptable semantically $S_2(G^+S^-)$, sentences acceptable semantically but not grammatically $S_3(G^-S^+)$, and sentences unacceptable both grammatically and semantically $S_4(G^-S^-)$. A high value of the quotient indicates correctness and comprehensibility of analyzed texts.

The concept of linguistic “acceptability,” introduced into linguistics by Chomsky, denotes agreeability to the language user’s linguistic sense. Such an understanding of this concept implies a certain degree of subjectivity in the evaluation, stemming from the fact that what is seen as acceptable by some language users may not be acceptable to others, especially since acceptability can be gradual in character. If a given language user as a rule uses an incorrect form of the verb “umieć” [to know (how)], saying “umią” instead of “umieją”, he or she will not evaluate it as being grammatically unacceptable. Thus, we can assume that the higher the awareness and metalinguistic knowledge of the given language’s users, the more accurately they will evaluate any given utterance as acceptable or unacceptable on the grammatical and semantic level.

In order to minimize the subjectivity of the evaluation of the degree of acceptability of utterances produced in the current study by healthy individuals as well as individuals suffering from schizophrenia, the task of ascribing sentences to the aforementioned categories was carried out by three experts with a linguistic education. Any doubts regarding the choice of categories were discussed and consulted with independent experts. The highest level of disagreement in opinions occurred in the evaluations of semantic unacceptability; we regarded as unacceptable only those sentences which were rated so in agreement by all the experts.

The sentences were isolated on an auditory basis – a sentence was “a section of an utterance between two longer pauses” (Woźniak & Czernikiewicz, 2002/2003, p. 571). Sentences satisfying the requirements of linguistic correctness were considered to be grammatically acceptable. To be rated as semantically acceptable, the sentences could not contain contradictions, their content had to be comprehensible, without neologisms or incomprehensible expressions, and had to fully correspond to reality.

Table 2. Values of means and standard deviations

	Values of means	Values of standard deviations
P	0.450	0.201
N	0.464	0.189
CP	0.845	0.125
CN	0.824	0.128

In the course of the analysis we isolated a total of 11,414 sentences, 7,180 of which came from utterance texts produced by participants in the experimental group (5,842 sentences – positive patients, 1,338 sentences – negative patients), while 4,234 sentences came from the utterance texts of participants from the control group (2,650 sentences – positive control group, 1,584 sentences – negative control group). In the group of patients with positive symptoms of schizophrenia each individual produced 73 sentences on average, in the group of patients with negative symptoms – 27 sentences, in the positive control group each individual produced 33 sentences on average, in the negative control group – 32. Therefore, it is clear that the longest utterances were generated in the group of patients with positive symptoms of schizophrenia, while the shortest ones were found in the group of patients with negative symptoms.

Incorrect sentences predominated in the experimental group, constituting 57.7% of all spoken sentences in the group of patients with positive symptoms and 54.7% in the group of patients with negative symptoms. We registered cases of semantically unacceptable sentences only in the group of positive patients. Sentences acceptable grammatically but unacceptable semantically, $S_2(G^+S^-)$, accounted for 1.3% of all incorrect sentences, while sentences unacceptable both grammatically and semantically, $S_4(G^-S^-)$, constituted 3.2% of all incorrect sentences.

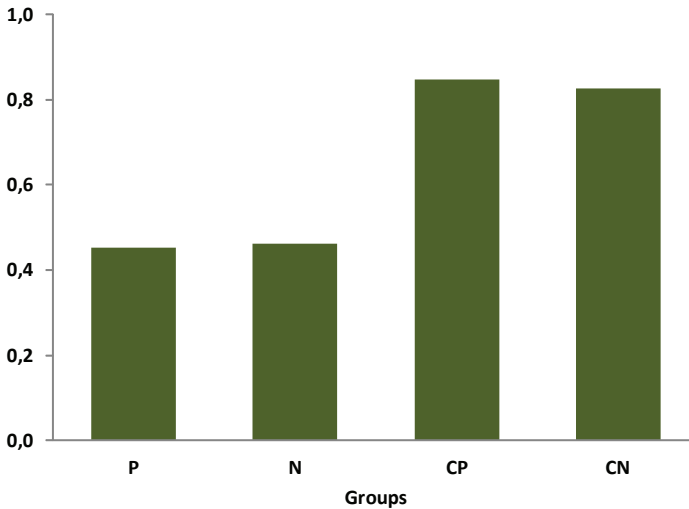
Meanwhile, grammatically and semantically correct sentences, $S_1(G^+S^+)$, were the most prevalent in the control group. In the positive control group they constituted 86.1% of all spoken sentences, in the negative control group – 83.4%.

To conduct a more detailed analysis we calculated the Grammatico-Semantic Acceptability Quotient according to the following equation:

$$GSAQ = \frac{S_1(G^+ S^+)}{S_1(G^+ S^+) + S_2(G^+ S^-) + S_3(G^- S^+) + S_4(G^- S^-)}$$

The Grammatico-Semantic Acceptability Quotient was calculated separately for each utterance and was then averaged within each of the sample groups. The means and standard deviations for each group are presented in Table 2.

Figure 1. Values of means for Grammatical-Semantic Acceptability Quotient



The means obtained for each group are illustrated in Figure1.

The highest value of the Grammatico-Semantic Acceptability Quotient was noted in the control group, supporting the direction of the research hypothesis, which assumed a higher value of GSAQ in the group of healthy individuals as compared to the group of individuals suffering from schizophrenia. This result indicates a higher degree of grammatico-semantic correctness of utterance texts of healthy individuals as compared to schizophrenic patients. The research hypothesis for the Grammatico-Semantic Acceptability Quotient also assumed a higher value of GSAQ in the case of individuals with positive symptoms of schizophrenia and a lower value in individuals with negative type schizophrenia. This assumption was not supported by the empirical evidence – the result for individuals with positive type schizophrenia was found to be marginally lower. Their utterances were found to be the least comprehensible and the least correct in comparison with the other groups in the study.

To determine the level of statistical significance of the discovered differences we used Tukey’s HSD comparison. The statistically significant results for $p < 0.05$ have been marked in bold font. They are presented in Table 3.

The differences between the experimental groups (positive and negative) and the control groups (positive and negative) were found to be statistically significant. The measure of the effect size, represented by Cohen’s d index: $d = 2.235$ (for n-cn), $d = 2.224$ (for p-cn), $d = 2.375$ (for n-cp) and $d = 2.36$ (for p-cp), indicates very large differences between these groups. The results show that the schizophrenic patients differ significantly from healthy individuals in terms of the grammatical and se-

Table 3. Statistical significance results for Grammatical-Semantic Acceptability Quotient

	Difference	Lower limit of the confidence interval	Upper limit of the confidence interval	Statistical significance
CP-CN	0.021	-0.056	0.098	0.894
N-CN	0.360	0.274	0.445	$p < 0,001$
P-CN	0.374	0.297	0.451	$p < 0,001$
N-CP	0.381	0.304	0.458	$p < 0,001$
P-CP	0.395	0.327	0.463	$p < 0,001$
P-N	-0.014	-0.091	0.063	0.965

semantic acceptability of their utterance texts. The utterance texts of the schizophrenic patients are considerably less correct and less comprehensible than the utterance texts of healthy individuals. On the other hand, no statistically significant differences were found between patients with the positive and negative type of schizophrenia and between the groups of healthy individuals.

To examine the distribution of values of the Grammatico-Semantic Acceptability Quotient within each group, we have prepared a box plot (Figure 2).

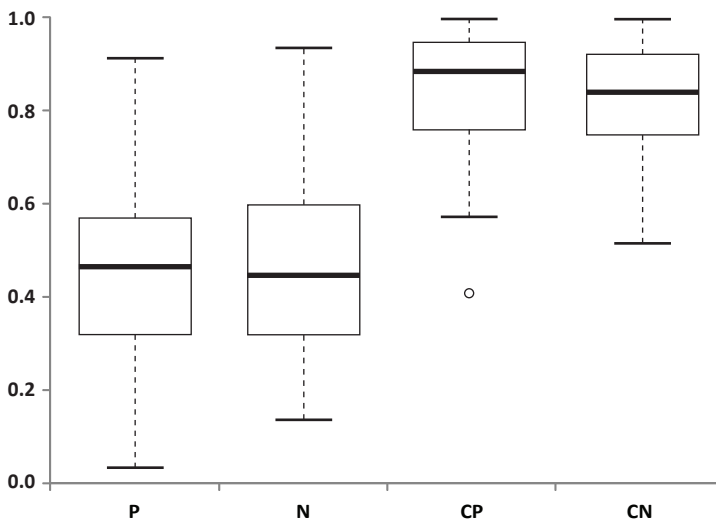


Figure 2. Data distribution characteristics within each group

The box plot indicates a rather symmetrical distribution of results in the sample groups. Only the positive control group showed a left-skewed distribution, with a predominance of high values and single outliers. The positive control group was found to be the most homogeneous, with the lowest dispersion of data, while the group of patients with positive type schizophrenia turned out to be the least homogeneous, as illustrated by the length of the whiskers on the boxplot and the value of the standard deviation.

Discussion

Summarizing the results, we found the level of acceptability of utterances of patients with schizophrenia, especially of the positive type, to be considerably lower. At the syntactic level, their stories are often perceived as less correct, less comprehensible and less meaningful. Their speech is often distracted and incoherent, the meaning incomprehensible to the receiver. The appearance of semantic unacceptability in this particular group of patients was an interesting result. Semantic unacceptability was most of ten associated with grammatical unacceptability, but there were also cases of sentences which were absolutely correct but nonetheless incomprehensible, like this utterance of patient P-Kr-056²:

raczkowałem asymfonicznie | i byłem terapiiony poza oknem
[I crawled asymphonically | and was therapeuted beyond the window]

This sentence is absolutely correct grammatically, but completely unacceptable on the semantic level. The most common examples of semantic unacceptability were associated with choosing words on the basis of their auditory similarity instead of their meaning (patient P-Gn-01: *tapicer to picer | tapicery to picery* [upholsterer is bolsterer | upholsterers are bolsterers]), using neologisms with different levels of comprehensibility (patient P-Ob-116: *wlaskoty dorwały się do mleka* [the catfiddles got at the milk]) and the introduction of content incongruent with our knowledge of the world, like in the case of patient P-Kr-056 describing a photograph of cats drinking milk from a bucket:

kotów na tym zdjęciu nie ma | tylko koty jak druty |-| obłąk ucho obąk antena tvn |-| a kotów nie ma tylko druty | w tej postaci takiej polaryzującej |-| jak i postać polaris skolaris skurmi | polaris skolaris krearis skurmi | ale na zlecenie tvn-u antena
[there are no cats in the photo | only cats like wires |-| madne ear madn antenna tvn |-| and no cats just wires | in kind of polarizing form |-| like the form polaris skolaris skurmi | polaris skolaris krearis skurmi | but commissioned by tvn antenna]

² P stands for the positive type of schizophrenia, Kr – the location of the study (Kraków), 056 – the participant's code.

The patient directly contradicts the reality, saying that the photo does not in fact depict cats but “polarizing wires,” giving a completely different, personal meaning to objects. The semantics of this text undermines the general understanding of the world, becoming difficult to understand and accept.

The level of grammatical and semantic unacceptability tended to increase together with the length of the utterances, which in the case of patients with positive symptoms of schizophrenia were usually very long (73 sentences on average), which can be related to deficits in attention and short-term memory typical for this illness, which make prolonged concentration on one activity impossible.

Meanwhile, the utterances of healthy individuals were characterized by higher levels of correctness, comprehensibility and conventionality of meanings. This implies their predictability. The healthy individuals’ descriptions of the photographs were similar to one another and one would be able to reconstruct the depicted image quite reliably on their basis. On the other hand, images reconstructed on the basis of the patients’ descriptions could be surprising in their diversity and disparate symbolism.

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