



# Sentence length of Turkish patients with schizophrenia

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## **Abstract**

*Schizophrenia is a devastating mental disorder that affects thought, language and communication. Considering the language disorders, the aim of this study is to examine the average sentence length of patients with Schizophrenia and compare the results with a control group by using four different language tests. Fifty patients with schizophrenia diagnosed according to DSM-IV criteria have been included in the study and compared to fifty healthy subjects matched for age, sex and education level with the patients. The subjects' speech has been evaluated in four stages. These are narration, story picture sequencing, semi-structured speech and free speech. The data consists of 8-10 minute recorded interviews. The recordings have been transcribed based on DuBois' Discourse Transcription Symbols. The statistical and linguistic analyses have shown significant differences between sentence length's of patients with schizophrenia and control group. Patients with schizophrenia have produced shorter sentences than the control group. In sum, this study concludes that the speech patterns used by Turkish Schizophrenia patients are different in terms of sentence length, and they prefer short and less complicated sentences in communication as a result of their cognitive disorders, including impairment to their attention and abstract thinking abilities.*

**Key words:** Schizophrenia, language disorder, cognitive disorder, sentence length.

## **Introduction**

Schizophrenia is one of the most serious major psychiatric disorder, usually developing in late adolescence or early adulthood in about 1 in 100 individuals, and often having a profound effect over the lifetime on daily functioning. According to American Psychiatric Association, (2000) people with schizophrenia frequently have difficulties living independently and caring for themselves, working or attending school, fulfilling parental or other role obligations, and enjoying close relationships and rewarding leisure activities. The characteristic symptoms of schizophrenia involve dysfunctions in multiple cognitive and functional spheres that include perception, inferential thinking, language and communication, behavioral monitoring, affect, fluency and productivity of thought and speech, capacity to experience pleasure, decision making, drive, and attention (Vahia & Cohen, 2008).

The presence of deficits in memory, attention, speech and language, and executive functions are among the most extreme and obvious symptoms in Schizophrenia Disorder. These symptoms can be observed in multiple aspects of human language such as phonology, morphology, semantics or pragmatics. Placing events and symptoms in proper time sequence, or determining the consistency and intensity of symptoms over time, may be a challenge. Depending also on the degree of intellectual impairment present, perseverative thinking or speech, or a limited repertoire of responses, can create problems of understanding (Ferrell & Mcallister, 2008). There is also evidence that the speech produced by patients with schizophrenia is syntactically less complex and shorter than that of healthy controls. In addition, patients show some deficits in comprehending long and grammatically complex sentences (Kuperberg, 2010). Subsequent analyses of the speech produced by patients with schizophrenia show that their speech is more grammatically deviant (Hoffman and Sledge, 1988) and less syntactically complex than that of controls (Sanders et al., 1995). Studies also indicate, in the patients' speech, a higher percentage of simple and compound sentences, and fewer dependent clauses that are not deeply embedded (Fraser et al., 1986; Morice and Ingram, 1982).

Language disorders, in sum, has long been considered a diagnostic indicator of schizophrenia and in this sense, the aim of this study is to examine the average sentence length of patients with schizophrenia and compare all the results with the control group by using four different language tests. By doing this, the differences in sentence processing in Schizophrenia is aimed to reveal.

## Methodology

### Subjects

Prior to data collection, in order to do research with the patients, the approval of the ethical committee of Dokuz Eylul University was obtained on 06.06.2013. A power analysis was conducted with regards to the number of the patients living in İzmir as 0.85 % of total population and the sample size of the study was determined. As a result, fifty patients with schizophrenia receiving treatment in Dokuz Eylul University, School of Medicine, Department of Psychiatry and diagnosed according to DSM-IV criteria and fifty healthy subjects matched for age, sex and education level with the patients, were included in the study. Table 1. shows the demographic information of the patients and healthy individuals.

Table 1. *Demographic Information of the Patients with Schizophrenia and Healthy Subjects*

	Schizophrenia (n=50)	HealthySubjects (n=50)	<i>p-value</i>
Age	41.98	41	p=0.60
Sex			
Women	17	17	p=1.0
Men	33	33	p=1.0
Education Level	10.9	11.21	p=0.94

### Procedure

Data collection was carried out at Dokuz Eylul University, Department of Psychiatry on Wednesdays between 2012 and 2014. Prior to testing, subjects were asked to sign a written consent form. Each subject was tested on one-to-one basis in the office of the psychologist room. In order not to distract patients' attention, the research room was always kept silent during the task. Subjects in the control group were also matched for age, sex and education level with patients and were tested in the same way. The speech of all subjects was recorded via Philips LFH0615 recorder and transcribed based on the symbols indicated by Du Bois et al.(1991).

### Task

The average sentence length of the patients with schizophrenia who received treatment at Dokuz Eylul University, Department of Psychiatry were evaluated in four stages: narrative picture task, story picture sequencing task, semi-structured speech and free speech tasks. For the narrative picture task, the Picnic Picture chosen from Western Aphasia test, was used. For story picture sequencing, the picture story about a man buying a hat was chosen from "VosstanovleniyeReçi u Bolnix s Afaziey" book, was used. Pictures for both tasks were chosen on the basis of their relevance for the Turkish culture. The subjects did not have any difficulties in interpreting the pictures. All tasks were administered to all the subjects in the same order. Anderson (1988) and Wicksell, et al. (2004) indicated that problems in short-term memory are the most apparent, suggesting

specific cognitive deficits and can cause a decrease in performance. In order to prevent these problems, subjects were allowed to look at the pictures during the test process. Following this task, they were first asked to talk about the recent situation of Turkey. They were then asked to talk about anything they have wanted. The interview lasted nearly 8-10 minutes and all the subjects' speech was recorded. The recordings were then transcribed using DuBois' Discourse Transcription Symbols. Finally, the average sentence length of the control group and patients with schizophrenia was compared statistically.

### Data Analysis

Data analysis was performed using Statistical Package for the Social Sciences (SPSS) version 16.0 for Windows. The independent-samples t-test was used to compare the means of sentence length between the subject and control groups. When the analysis have been completed, findings have been commented in consideration of relevant literature.

### Results

The comparisons of sentence length obtained in four language tests are presented in Table 2. Results suggest that there is a statistically significant difference between patients with schizophrenia and control group in narration, story picture sequencing, semi-structured speech and free speech.

Table 2. Comparisons of sentence length on four language tests of patients with SCH and CG

Task	Group	Number of Subjects	Average Sentence Length	Std. Deviation	Std. Error	t-test p-value
Narration Task	Patients with Schizophrenia	50	6.34	1.92	0.27	0.001
	Healthy Subjects	50	4.53	2.02	0.87	
Story Picture Sequencing Task	Patients with Schizophrenia	50	7.11	1.63	0.23	0.001
	Healthy Subjects	50	4.31	1.30	0.19	
Semi-Structured Task	Patients with Schizophrenia	50	9.49	5.15	0.73	0.001
	Healthy Subjects	50	5.60	2.76	0.39	
Free Speech Task	Patients with Schizophrenia	50	7.50	2.90	0.41	0.001
	Healthy Subjects	50	5.41	2.76	0.39	

The comparisons of sentence length obtained in four language tests are presented in Table 2. Results suggest that there is a statistically significant difference between patients with Schizophrenia and control group in all tests ( $p=0.001$ ). The average of sentence length shows that patients with schizophrenia have shorter sentences compared to the control group.

## Discussion

The results of this study show that patients with schizophrenia tend to form shorter sentences compared to the control group and the findings are similar to the other studies in the literature. Andreasen (1982) states that negative speech symptoms refer to a paucity of speech amount and speech content and disorganized speech symptoms refer to speech that is difficult to understand or is poorly organized. There are at least two ways of assessing and conceptualizing disorganized speech symptoms. While one way is thought in terms of communication impairment, (Docherty et al., 1996) another way is considered in terms of formal thought disorder, or the occurrence of specific types of speech symptoms (e.g., instances of derailment or of word approximations; Andreasen, 1979). Thomas (1996) also found that the speech of schizophrenic subjects contained more syntactically and semantically deviant sentences. The negative symptom group produced shorter sentences that contained lower levels of clausal embedding. Bagner et. al. (2003) examined the relation between comprehension and sentence length and found that language comprehension deficits increased among patients with schizophrenia as sentence length increased, but patients were not differentially impaired on object relative as compared to subject relative sentences. It is also found that speech deficits, notably those involved in psychomotor retardation, blunted affect, alogia and poverty of content of speech, are pronounced in a wide range of serious mental illnesses (e.g., schizophrenia, unipolar depression, bipolar disorders). Results suggest that certain speech deficits, notably involving pause length, may manifest as a function of cognitive resource limitations (Cohen et. al.,2014).

Jeffrey et. al. (2014) states that diminished communication has been reported in a subset of individuals with schizophrenia, and there is evidence that this involves separate channels of speech production (i.e., alogia) and speech variability (i.e., flattened vocal affect; Blanchard and Cohen, 2006). Diminished vocal prosody in schizophrenia also has been associated with basic neurocognitive abnormalities (Cohen et al., 2013) and poor social functioning (Cohen et al., 2012).

Heim & Cohen (1981) in the same way examined the patients with schizophrenia and They showed a steeper slope of utterance length across levels of difficulty. In the schizophrenic group, the degree of general psychopathology as well as paranoid and anergic tendencies correlated negatively with communication accuracy, utterance length, and the number of descriptions referring to both colors of an item in the simultaneous presentation condition. Özcan et. al. (2017) also found that in addition to diminished speech amount in terms of complex sentence structure patients with schizophrenia display abnormalities of language. Results showed that patients and controls differed in their production of a complex sentence, with patients exhibiting a significant reduction in their production, compared to the speech of the control group. This was particularly significant in adjectival and adverbial clauses. It is also observed that patients tended to produce fewer complex sentences and more simplex or coordinated sentences. As such, patients tended to make syntactic simplification. It is concluded that these result from an overall cognitive deficit, difficulty in concentrating, distraction, or a preference for expressing simpler ideas.

In conclusion in this study schizophrenia patients' speech was examined by using four different language tests and it was revealed that the patients tended to use shorter sentences more, compared the control group. It is believed that schizophrenia patients have different sentence processing due to the cognition problems.

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