A linguistic analysis of transitivity in delusional speech: a case study

Uma análise linguística da transitividade em discurso delirante: um estudo de caso

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Abstract

This article presents results of a research that investigated some syntactic and semantic aspects of the expression of delusional events in the discourse of a person with schizophrenia. Based on Cognitive Linguistics (CL), we analyzed 1104 clause units taken from her speech. The case analyzed shows a specific linguistic syntactic pattern related to the expression of delusional events. Results indicate a highly significant relation between the transitive construction and the clause units involving delusional entities (χ^2(1, N=98) = 45.097, p<.0001) and also a significant difference in the mean of transitivity rate in these clause units (t(80)=2.71, p=.008). These results were interpreted as evidence of a schematic conceptual core, i.e., a prototypical schematic cognitive structure associated to delusion. These findings suggest, albeit in a preliminary way, the possibility of describing delusion also on a linguistic basis.

Keywords: delusion; schizophrenia; cognitive linguistics; transitivity; grammatical constructions.

Resumo

Este artigo apresenta os resultados de uma pesquisa que investigou alguns aspectos sintáticos e semânticos ligados às estruturas que compõem o discurso delirante de uma paciente com esquizofrenia. Com base no quadro teórico da Linguística Cognitiva, foram analisadas 1104 unidades oracionais que compõem o discurso dessa paciente. O caso analisado mostra um padrão sintático específico relacionado a essas estruturas. Os resultados indicam uma relação altamente significativa entre a construção transitiva e as unidades oracionais que envolvem entidades delirantes (χ^2(1, N=98) = 45.097, p<.0001), assim como uma diferença significativa na transitividade média dessas unidades oracionais (t(80)=2.71, p=.008). Esses resultados foram interpretados como uma evidência de um núcleo conceptual esquemático, i.e, uma estrutura cognitiva esquemática e prototípica associada ao delírio. Esses achados sugerem, ainda que de maneira preliminar, a possibilidade de se descrever o discurso delirante em uma base linguística.

Palavras-chave: delírio, esquizofrenia, linguística cognitiva, transitividade, construções gramaticais.

1. Introduction

This article presents results of a research that investigated some syntactic and semantic aspects of the oral language of a patient with schizophrenia. Based on the theoretical framework of Cognitive Linguistics (CL), transitivity and grammatical constructions used by this patient in clause units involving delusional entities were investigated. This investigation had the objective of establishing a relation between the prevalence of certain linguistic patterns and a schematic cognitive structure (a conceptual core) associated to delusional events.

Language changes in patients with schizophrenia have been described since Bleuler (1916/1985) until the latest diagnostic classification manuals, such as the Diagnostic and Statistical Manual of Mental Disorders (DSM) and the International Classification of Diseases (ICD). More recently, the question about the nature of these changes has been widely analyzed based on contributions from linguistics, and part of the specialized psychiatric literature emphasizes the importance of language to the comprehension of this psychopathology.

According to DeLisi (2001), a literature review provides evidences for widespread changes in the comprehension and production of language by schizophrenia patients. Those evidences are interpreted through a variety of approaches to the issue. Morice and Mcnicol (1986) suggest the presence of measurable changes in the complexity of linguistic structures. Chaika and Lambe (1986) suggest changes in the pragmatic level and point out the necessity to take language structure into account before making inferences about thinking and cognition. For Harrod (1986), language and thought disturbances are secondary to a disturbance in the semiotic domain.

This work is based on the theoretical framework of Cognitive Linguistics, and it assumes that linguistic forms are intrinsically related to cognitive processes. We can therefore expect that psychopathological conditions have effects on language production and the study of such reflections can contribute to the comprehension of language processing and to the understanding of psychopathologies.

CL has developed a usage-based language approach linked to the studies of cognitive and subjective phenomena. This linguistic field offers a perspective on questions about the mind that may have an impact on psychiatry. In this sense, it has the potential to assist in the development of new methodologies for psychiatry and psychology studies. On its turn, expertise in mental pathology may be required for further development in CL (Lakoff as cited in Eynon, 2002).

Specifically, this study aims to examine the conceptual core of delusional events as well as the correlation between these events and their linguistic expression. This analysis is based on the assumption adopted by several CL authors (Brandt, 2004; Goldberg, 1995; Radden & Dirven, 2007) that there is a relation between a conceptual core of a given situation and its expression in grammatical constructions. In other words, our experiences are more or less repeated and stabilized in syntactic and grammatical forms, and rightfully so, language can inform us about the structure of ongoing thought (Brandt, 2004).

This work is an attempt to build up a dialogue between different epistemological fields and contribute to the understanding of the issue of language change in linguistic and clinical studies. We try to break with the traditional normative perspective, found in some language and psychiatric approaches, which interprets language changes in patients as deficits in relation to normal linguistic behavior. We assume a critical point of view, already current in most recent cognitive analysis, that language alterations are cognitively motivated and linguistic forms are relevant expressions of underlying conceptualization.

2. Method

The *corpus* of this research, recorded in Prado's (2005) documentary film, consists of oral reports, basically interviews and spontaneous speech produced by Estamira, a 63 year-old person diagnosed with schizophrenia, who worked at a garbage dump in the city of Rio de Janeiro, Brazil.

In order to describe the conceptual core of the delusional events in this *corpus*, we examined semantic and syntactic aspects of clause units. The choice of the clause as our unit of analysis is justified by the fact that it expresses the linguistic event. This syntactic unit is basically structured in terms of processes or actions (verbs), arguments (subjects and objects), qualities (subject/object complements), and circumstances (adjuncts). Clause units are, then, structured interpretative expressions, in language, of experienced events. Rightfully so, we hypothesized that the clause unit structure be especially influenced by the nature of delusion events. Delusion, as chaotic as it can be, will have to be expressed, at first, through these linguistic units.[1]

At the clause unit level, we analyzed two distinct, but interrelated, things: first, the transitivity parameters (Hopper & Thompson, 1980; Thompson & Hopper 2001); second, the argument structure constructions, a special subclass of linguistic constructions that provide a basic clause meaning (Goldberg, 1995, 2006). In Goldberg's Construction Grammar, linguistic constructions are symbolic structures, i.e., pairings between a formal structure (phonological, morphosyntactic and in some cases prosodic) and a meaning structure (semantic, pragmatic or discursive).

Briefly, this work is an analysis of argument structure constructions of clause units and the grammatical transitivity associated to them.

Transitivity has a central role in most linguistic theories, mainly due to the fact that a significant number of languages have formal constructions – the transitive clause - whose core function is to express a cluster of specific semantic properties (Naess, 2007). In a well-known article on the topic, Hopper and Thompson (1980) isolate some of the component parts of the transitivity notion and study the ways in which they are typically encoded in grammar. Supported by cross-linguistic evidence, the authors argue that the grammars of human languages group morphosyntactic and semantic features as a function of transitivity, i.e., in the same sentence, a morphosyntactic or semantic feature that marks high transitivity tends not to occur with another that marks low transitivity. The authors identified, then, 10 syntactic and semantic transitivity parameters that co-vary extensively and systematically in a wide variety of languages. This observation leads them to propose that this regularity is a universal (or near universal) property of grammars.

In our work, we are dealing with 8 parameters of transitivity: Participants, Aspect, Modality, Punctuality, Kinesis, Agency, Volitionality, and Affectedness of O (the syntactic object). In Hopper and Thompson (1980), apart from these, we also find Affirmation (or Polarity - the negative or affirmative form of a clause unit) and Individuation of O. Our rank does not include polarity because, according to Thompson and Hopper (2001), this parameter is not highly correlated with the other components; the rank does not include individuation of O either because the authors propose a specific gradation scale for this parameter. Each of these parameters analyzed are exemplified in sessions 3.1 to 3.6.

Based on this parameter scale, the hypothesis is that the delusional discourse analyzed in our work is highly transitive and, rightfully so, we can identify syntactic patterns, specifically the transitivity construction, associated to it. Therefore, the second investigation carried out here, refers to the proportion of this construction in the *corpus*. This hypothesis of the prevalence of certain constructions in delusional speech come from Lepesqueur's qualitative research (2012,

2015), which suggested the existence of a cognitive schema of semiotic interaction involved in delusional meaning, which is expressed by means of a prototypical transitive construction.

We used Naess's (2007) definition of the prototypical transitive construction as composed of two syntactically privileged arguments and two participants maximally semantically distinct, both in the sense that: 1) they are conceptually independent entities, and 2) their roles in the event are clearly distinguishable. Based on Goldberg (1995, 2006), the prototypical Portuguese transitive construction could be represented through the following notation:
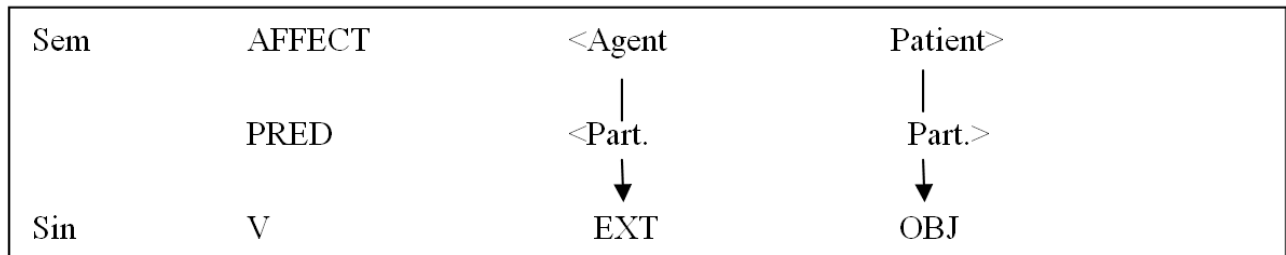
Sem	AFFECT	<Agent	Patient>
	PRED	<Part.	Part.>
Sin	V	EXT	OBJ

Figure 1 - Transitive Construction
Source: Self-elaboration

This notation represents a set of clause units with similar semantic and syntactic features. The horizontal axis "Sem" stands for the semantic structure, defined in terms of the argument roles attributed by the construction: Agent and Patient are prototypical values, semantically schematic, encoded in the syntactic structure. Agent is considered a type of schematic causer of an event, and Patient is seen as the one who is affected by the event. "PRED" is a variable filled by a particular verb that assigns its own participant roles (Part.) The construction also specifies which argument roles are necessarily fused with the participant roles. This fusion is represented by the solid line connecting argument roles to participant roles.

The "Sin" axis represents the syntactic structure in terms of grammatical functions. "V" represents a verbal unit that includes not only the verb, but also aspectual or modal auxiliary verbs, in periphrases, as well as light verb composite constructions. Based on the FrameNet project (Ruppenhofer, Ellsworth, Petruck, & Johnson, 2010), we use "EXT" (external argument) as a variable that represents any of the following cases: 1) the syntactic subject, regardless of its position; 2) the verbal ending, which in Portuguese indicates the grammatical notions of the subject's person and number, or 3) a phrase outside of the clause unit scope[2] that has a semantic role associated with the verb and the construction. "OBJ" represents a particular argument structure position filled by a syntactic object.

This type of construction classification depends on the consideration of various aspects of the clause unit structure that cannot be described in detail here.[3] For instance, in our analysis, we considered both that sentences are part of a broader discursive context, and that clause constructions often appear in reduced forms with anaphoric arguments recovered from the discursive context. These reduced sentences can usually be analyzed in terms of their complete structure and are identified as regular syntactic structures (Perini, 2008). Also, we took into account the fact that cleft constructions, topicalized structures, negative or interrogative forms, and clauses with subject inversion are variations of the base argument structure constructions. According to Goldberg (1995), these are non basic clause-level constructions that provide an alternative information structure of the clause.

Idiomatic expressions, on their turn, were not analyzed in our research, since they are conventionalized structures, entrenched in long-term memory, with their own syntactic and

semantic specifications. Likewise, discourse markers were not analyzed. These elements only perform discursive functions; even having a verbal form, they do not evoke an event schema.

Thus, in this research, the *corpus* was tabulated in the R Software for Statistical Analysis (R Development Core Team, 2012) according to Hopper and Thompson's (1980) transitivity parameters and the type of linguistic construction.

All clause units that have an entity that takes part in the patient's delusion as one of its syntactic arguments were selected. These entities recur throughout the interviews with a constant set of names, such as "trocadilo"[4], "gods", "remote control", "technical scientists", and "negative stars". According to the delusion typology proposed by Dalgalarrondo (2000), these entities compose Estamira's persecutory and influence delusions. Estamira has a systematized delusion, i.e., it remains organized and constant along the discourse.

Below, we present some clause units that encode delusional entities from the corpus:[5]

(1) *Porque o controle remoto ele não queima, torce.*
"Because the remote control he does not burn, twists."

(2) *Agora, os deuses que são os cientistas técnico, eles controla.*
"Now, the gods that are the technical scientists, they control."

(3) *A noite inteira perturbando, os astros negativo, ofensível.*
"The whole night disturbing, the negative stars, offensible*".

(4) *Os astros ofensível, negativo, que atentava ela.*
"The stars offensible*, negative, that bothered her."

(5) *O controle remoto atacou, em.desde manhã.*
"The remote control attacked, since morning."

In the extracts above, all clause structures code, in syntactic arguments, the entities of the patient's delusion. In the corpus, 98 clause structures involving those entities were counted. The transitivity characteristics and the construction of the argument structure used by Estamira in those specific cases were compared to the transitivity characteristics and the construction of the argument structure in her discourse as a whole.

Despite controversies regarding the criteria for the definition of delusion, the case analyzed in this research comes very close to traditional definitions. Rodrigues and Banzato (2010) argue that delusion is a non-discrete phenomena class that can be best understood within a prototypical definitions model. Thus, the traditional definitions describe the prototypical cases while other cases require special references to be identified. For this reason, delusion is identified based on theoretical formulations of empirical findings, clinical practice, and especially from the set of other signs and symptoms of the patient's clinical condition. The study of such prototypical cases seems to be the easiest way to identify the cognitive processes involved in delusional meaning.

Estamira presents a type of delusion that can be considered prototypical. Taking into account the classical criteria for delusion characterization, proposed by Jaspers (1913), we find in Estamira's discourse the basic elements that indicate the presence of delusion: the patient firmly believes in the truth of the delusional event (subjective certainty), the event content is impossible or unrealistic (implausibility of content), the delusional event does not change by experience, by explicit evidence, neither by logical or plausible arguments (imperviousness to counter

arguments). Estamira's delusion has persecutory and influence contents, which are very similar to these traditional delusional categories found in clinical practice.

3. Analysis criteria of transitivity parameters

Below, we describe the analysis involving Hopper and Thompson's transitivity parameters, providing a few examples from the corpus.

3.1 Participants

The prototypical transitive clause has two syntactically and semantically distinct participants. This means that those arguments occupy two syntactic positions and are conceived as two independent entities with clearly distinguishable roles in the event (Naess, 2007).

In our analysis, the following elements were not considered participants in the event: the locative arguments, such as those in (6) and (7), being it implicit (6) or explicit (7); the subject complement in clauses with linking (copula) verbs, as in (8) and (9), where there is a semantic equivalence between the subject and the subject complement; the clausal argument that constitutes a second complete event in causative constructions, as that in (10); the clausal argument of epistemic verbs, such as the one in (11). Therefore, structures presenting those types of arguments were considered one participant clauses. We also analyzed as one participant clauses the intransitive constructions, as in (12).

(6) *e vai.*
"and goes."

(7) *Por isso que ainda estou aqui visível*
 "That is why I am still visible here"

(8) *eu sou Estamira.*
"I am Estamira."

(9) *isso aqui é um depósito dos restos.*
"This is a deposit of the remains"

(10) *fez eu levar a minha mãe lá no Engenho de Dentro*
"he made me take my mother to Engenho de Dentro"

(11) *porque o comet achava que ele não deveria procurar uma carcaça como a minha*
"because the comet thought that he should not look for a carcass like mine"

 (12) *meu pai morreu*
 "my father died"

We analyzed as clauses with two participants: clauses with syntactically and semantically distinct subject and object, as the one in (13); V-O compounds followed by an argument, such as the one in (14); metaphorical constructions, such as the one in (15); clauses with objects

anaphorically recovered from the discourse or conversational context, as those found in parenthesis in (16) and (17); clauses with schematic objects, as the one in (18).

(13) *eu casava com esse senhor.*
"I would marry this man."

(14) *eu dei uma briga com meu próprio pai astral*
"I had a fight with my own astral father"

(15) *seja capturar a mentira*
"be it capturing the lie"

(16) *uma conversinha qualquere (eles) só copeia (a receita)*
   "any small talk and (they) only copy (the recipe)"

(17) *O controle remoto (me) atacou.*
"The remote control attacked (me)."

(18) *ela falava*
"she used to say"

3.2 Kinesis

The second transitivity parameter is Kinesis, which distinguishes clauses that designate an action or process from clauses that designate a state. The examples in (19) and (20) express actions or processes, while those in (21) and (22) are examples of states.

(19) *E aí vem o sol.*
"And then comes the sun."

(20) *Falei com o médico*
"I talked to the doctor"

(21) *eu tô lá*
"I am there"

(22) *a água é abstrato*
"water is abstract"

3.3 Aspect

The third transitivity parameter analyzed in this research was Aspect. Hopper and Thompson (1980) define Aspect in terms of telicity. Telic clauses, i.e., the ones that express actions that are conceived as having a specific end point, a point in which it is completed, were marked for high transitivity. Inversely, atelic clauses, the ones that do not have this end point, were marked for low transitivity.

The following cases were marked as atelic: states, such as the clauses in (23) and (24); existential clauses, as in (25); clauses that express activities that are repeated through time, such as those in (26) and (27).

> (23) *eu tenho raiva, ódio, nojo!*
> "I am angry, I hate, I'm disgusted!"
>
> (24) *Eles tá com raiva do cometa.*
> "They are angry with the comet"
>
> (25) *Esse controle remoto, tem o artificial*
> "This remote control, there is the artificial"
>
> (26) *ela falava*
> "she used to say"
>
> (27) *Era os astros que atentava ela.*
> "It was the stars that bothered her."

We marked as telic, cases of achievement (28) and accomplishment (29), in Vendler (1967)'s terminology.

> (28) *meu pai morreu*
> "my father died"
>
> (29) *seja capturar a mentira*
> "be it capturing the lie"

3.4 Punctuality

A punctual event was described by Hopper e Thompson (1980) as an event that does not have transition phases between its beginning and its end. These are examples of clauses with punctual events:

> (30) *porque eu derrubo mesmo.*
> "because I really knock it down."
>
> (31) *cegaram o cérebro, o gravador sanguino de vocês.*
> "They blinded the brain, the sanguine recorder of yours."
>
> (32) *meu pai morreu*
> "my father died"

3.5 Agentivity and Volitionality

Agentivity refers to control over the triggering of the event, and volition refers to the existence of intention, both related to the external argument. In (33) to (35), the external

argument displays Agentivity and Volitionality; on the other hand, (36) to (38) display neither of those characteristics.

(33) *Falei com o médico*
"I talked to the doctor"

(34) *porque eu derrubo mesmo.*
"because I really knock it down."

(35) *eu casava com esse senhor.*
"I would marry this man."

(36) *Esses remédios são da quadrilha*
"This medicine belongs to the gang"

(37) *eu sou Estamira.*
"I am Estamira."

(38) *quando eu tinha nove anos*
"when I was nine years old"

Taking into account the hypothesis that the clauses in Estamira's delusion are highly transitivity clauses, we adopted a conservative position in relation to controversial cases, such as those from (39) to (41), which were counted as low transitivity for Agentivity and Volitionality.

(39) *As doutrina errada, trocada, ridicularizou os home.*
"The wrong, changed, doctrine, ridiculed men."

(40) *O controle remoto atacou.*
"The remote control attacked."

(41) *o medidor que controla*
"the meter that controls"

Although in Estamira's discourse those entities (the doctrine, the remote control, the meter) seemed to be agentive and volitive, those elements could be interpreted as instruments, with neither of those values, due to the literal meanings of the lexical items. Adopting a conservative approach in the analysis ensures that the hypothesis is not an effect of controversial cases such as these. In other words, a non-conservative position analysis only increases the statistical significance found in our research.

3.6 Mood

The Mood category, according to Hopper and Thompson (1980), refers to the distinction between a 'realis' event, which corresponds to an action whose occurrence is being asserted as a real event, and an 'irrealis' event, which is considered as either not having occurred or having occurred in a "non-real (contingent) world".

In this work, irrealis events are modal periphrasis, as in (42); subjunctives, as in (43) and (44); imperatives, as the example in (45), and hypothetical structures, such as those in (46) and (47): [6]

(42) *que ele não deveria procurar uma carcaça como a minha*
"that he should not look for a carcass like mine"

(43) *comose fosse um pássaro*
"as if it were a bird"

(44) *que eu aceitasse Jesus*
"that I would accept Jesus"

(45) *Olha essa porra aí*
"Look at this fucking thing"

(46) *Se eu não der conta de distinguir a perturbação*
"If I cannot distinguish the disturbance"

(47) *eu casava com esse senhor.*
"I would marry this man."

3.7 Affectedness

The notion of Affectedness, normally defined as a change of state related to the syntactic object, is a criterion that is usually more specifically linked to the definition of transitivity. Many languages tend to codify arguments that are strongly affected as syntactic objects of transitive constructions, while they place non-affected or less affected arguments in other syntactic positions (Naess, 2007).

We find non-affected objects in state clauses, as the one in (48), intransitive constructions, as the one in (49), constructions with *dicendi* verbs or perception verbs, as the ones in (50) e (51), respectively. Some verbs that typically occur in transitive constructions but that do not have an explicit meaning of change of state in relation to the syntactic object, as in (52), were also analyzed as non-affected cases.

(48) *O cientista tem o medidor*
"The scientist has the meter"

(49) *meu pai morreu*
"my father died"

(50) *Falei com o médico*
"I talked to the doctor"

(51) *Olha essa porra aí*
"Look at this fucking thing"

(52) *que ele não deveria procurar uma carcaça como a minha*
"that he should not look for a carcass like mine"

These are examples of clauses with an affected object:

(53) *cegar os home*
 "blind the man"

(54) *Fez do homem pior do que um quadrúpulos.*
"He made man worse than a quadruped"

(55)*seja capturar a mentira*
"be it capturing the lie"

3.8 Other transitivity parameters

As in Hopper and Thompson (2001), the Affirmation parameter was not adopted in this work due to the fact that it does not present high correlation with the other transitivity parameters. The Individuation of the O parameter was not considered either, since the authors propose a different scale for this parameter.

Table 1 displays the proportion of high transitivity parameter taking into account parameter and type of sample. Table 1 shows that, in Estamira's speech, clause units involving delusional entities have proportionally more high transitivity parameters than other clause units.

	Clause units involving delusional entities	Other clause units
2 or more participants	68.29%	41.46%
Action	68.29%	53.66%
Telic	48.78%	46.34%
Punctual	39.02%	19.51%
Volitional	48.78%	31.71%
Realis	90.24%	70.73%
Agency	53.66%	43.90%
Affected O	41.46%	9.76%

Table 1. Percentage of high transitivity clauses
Source: Self-elaboration

4. Results

From those 1104 clause units that compose the corpus, 106 idiomatic expressions or discourse markers were removed, leaving a total of 998 units effectively analyzed. Two groups of

41 clause units were selected at simple random sampling.[7] The first group consisted of clause units that encoded entities of delusion and the second consisted of any other clause in Estamira's discourse. The clause units in both groups were analyzed according to Thompson and Hopper's (2001) criteria, in a rank classification rating from 0 (having no transitivity component) to 8 (having all transitivity components).

Based on this rank, an independent-samples t-test compared the estimated mean of transitivity in the clause units that encode delusional entities (M=4.585, SD=2.327) and the other clause units in Estamira's discourse (M=3.171, SD=2.347). Figure 2 presents the test results.
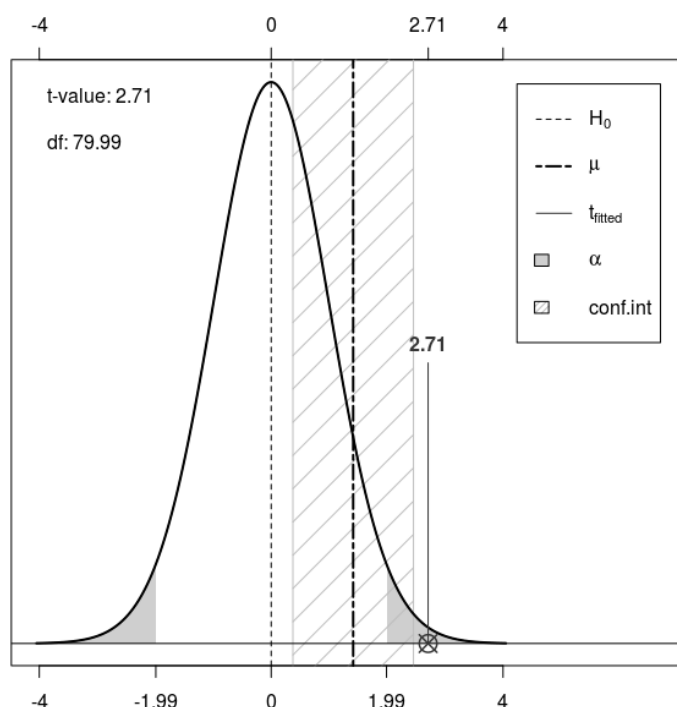

Figure 2. Independent samples t-test of transitivity rate.
Source: Self-elaboration

The figure shows the probability Student's t-distribution. The thin dashed line (H_0) provides the value that is assumed in the null hypothesis (in which case the difference between the estimated mean for each sample is zero). The bold dashed line (μ) shows the difference between the estimated mean of each group. The gray cross-hatching area (conf. int) marks the 95% confidence interval for this estimated mean. The non-dashed line indicates the fitted t-value and the gray painted areas show the rejection region at 95% confidence level. Results show a significant difference in the mean of transitivity rate of each group ($t(80)=2.71$, $p=.008$). The clause units that encode delusional entities have a higher transitivity rate compared to the others.

Once the components of transitivity tend to be correlated with grammatical forms, i.e., high transitivity parameters have a strong tendency to be grammaticalized, and due to the fact that high transitivity characterizes Estamira's delusion, we expected to find morphosyntactic patterns related to it. Indeed, comparing the proportion of the transitivity argument structure constructions that compose delusional discourse to the proportion of this construction in the entire corpus, there is a highly significant correlation between the transitivity construction and delusional discourse ($\chi^2(1, N=98)=45.097$, $p<.0001$). Table 2 shows the frequency and proportion of the prototypical transitive construction (see definition in the Method session) in delusional events as opposed to the discourse as a whole.

	Transitive construction	Other constructions	Total	Proportion of transitive construction
Clause units involving delusional entities	38	60	98	0,3877
Whole discourse	144	854	998	0,1443

Table 2. Proportion of argument structure constructions
Source: Self-elaboration

In summary, Estamira used proportionally more transitive constructions to express events related to delusional entities than to express other events in her discourse. These findings show, then, a clear syntactic pattern related to delusional events.

5. Discussion

Many Cognitive Linguistics authors, adopting an embodiment perspective, have claimed that there is a relation between the conceptual core of a given situation and its expression in grammatical constructions. The embodiment or enactment perspective has been specially discussed in Johnson (1987) and in Varela, Thompson, and Roch (1991) in the field of Cognitive Sciences, and can be summarized by the statement that cognition cannot be understood without consideration of our social history and embodied actions. For embodied action we mean, first, that our cognition is inseparable from the way we experience sensory and motor processes (perception and action) and, second, that this experience is immersed in a broader biological, psychological and cultural - we also include the semiotic - context (Varela et al., 1991).

Goldberg (1995, 2006), supported by theoretical reasons and evidence from sentence processing and child language acquisition, argues that certain English clause constructions are directly associated with semantic structures that reflect scenes that are basic to human experience. In this framework, linguistic constructions are associated with dynamic scenes, experientially grounded gestalts, such as those of someone transferring something, someone causing something, or someone experiencing something. For Brandt (2004), experience patterns form a repertoire of schemas from which language eventually derives its default constructions. Thus, in a particular phrase structure, both its core and its complements are linked to specific cognitive schemas. Overall, it is a consensus that morphosyntactic patterns may reflect semantic patterns and reveal a specific organization of our conceptual system. In this view, cognitive schemas are a central intersection point between linguistic structures and cognitive processes.

Based on that, we suggest that the clause pattern found in our analysis is the result of a schematic conceptual core of the patient's delusion. This supports Lepesqueur's (2015) hypothesis of a certain semiotic schema in the construction of delusional meaning in schizophrenia. For this author, part of the delusion can be understood as a conceptual blending process[8] organized by an iconic interaction schema. In other words, the iconic nature of the conceptual delusion constrains the linguistic grid available for expressing delusional events towards a greater number of transitive constructions.

The results in this work could have revealed an even closer relationship between delusion and linguistic forms, had it not been conservative in the categorization of transitive constructions. For the moment, we restricted our analysis to strictly prototypical structures and values.

Theoretical advances in the understanding of blending processes and inheritance hierarchies among the constructions[9] would allow a more refined analysis of this phenomenon.

Any replication of this study in another language should take into account the way transitivity is encoded in that specific language. On the other hand, if the expression of delusion is related to transitivity components, and due to the fact that the grammaticalization of transitivity is a near-universal (or universal) phenomenon, we would be able to find, in any language, specific syntactic patterns related to both transitivity and delusional events.

6. Conclusion

Departing from interviews and the spontaneous speech of a person diagnosed with schizophrenia, we conducted a linguistic analysis of clause units that revealed specific syntactic patterns related to the expression of delusional events. Results indicate a highly significant correlation between the transitive construction and the delusional discourse of this person, as well as a significant difference in the mean of transitivity rate in clause units involving delusional entities. The findings in this work suggest, albeit in a preliminary way, the possibility of the description of delusion on a linguistic basis, which could help establish more refined criteria for the characterization of delusion and other psychopathological symptoms.

Other studies involving a larger number of clinical cases would be necessary for generalizations concerning schizophrenia to be made. If the pattern found in this research proves to be consistent across patients, we could compare it with non-clinical samples and find linguistic markers of a prototype delusional discourse.[10] Syntactic patterns in delusional discourse could also be correlated to the delusion typology or to the severity of clinical condition.

Although being a case study, this research can assist in the general understanding of certain aspects of schizophrenia and of language processing. By establishing the relationship between language and cognition, this kind of linguistic analysis potentially allows for the inference of structures on the cognitive level, revealing conceptual networks connected to the way we think and construct meaning.

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Notes

(1) Some schizophrenia phenomena, not analyzed in this research, suggest no conventional linguistic uses, such as neologisms and glossolalia.

(2) This phrase can be exemplified by the underlined elements in the following sentences: *They persuaded <u>the doctor</u> to treat me* and *They gestured <u>to us</u> to leave*. These underlined elements are external arguments of the verbs *treat* and *leave*, respectively. For more details, see Ruppenhofer et al. (2010).

(3) For more information on this type of analysis, see Lepesqueur (2012).

(4) This is a neologism. In Portuguese, it resembles phonetically the word for 'pun', *trocadilho*.

(5) The complete Portuguese transcription of the corpus can be found in Lepesqueur (2012), and it can be accessed at http://hdl.handle.net/1843/LETR-8Y2R3K.

(6) In Brazilian Portuguese, in oral texts, we frequently find non-cannonical verbal forms, such as these: a present (*presente do indicativo*) form with an imperative meaning, as in [45], and the imperfective past (*pretérito imperfeito*) form with a hypothetical meaning, corresponding to future in the past (*futuro do pretérito*), as in [47]. See this discussion in Tenuta and Lepesqueur, 2010 and 2014, respectively.

(7) The sample size was calculated based on the statistical margin of error at 95% confidence for the finite population. Once the population standard deviation is unknown, we have used an approximation practical rule of $\sigma \approx$ data range/4.

(8) Conceptual blending is a basic cognitive operation originally formalized by Fauconnier and Turner (1996, 1998; 2002). The blending process consists basically of mappings and structural projections between conceptual contents, represented in mental spaces, which allow for emergent meanings.

(9) Goldberg argues "that constructions form a network and are linked by inheritance relations which motivate many of the properties of particular constructions" (Goldberg, 1995, p.67). The author describes four major types of inheritance relations among constructions: metaphorical extension, polysemy, subpart and instance.

(10) We are currently carrying out a research in this perspective.

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