

# The Structuring of Narrative Texts into *Figure* and *Ground*: Attention, Memory and ADHD

*Adriana Maria Tenuta*  
*Marcus Lepesqueur*

Federal University of Minas Gerais - Brazil

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The Attention Deficit Hyperactivity Disorder (ADHD) is considered one of the most common disorders in childhood and adolescence.

DSM IV manual indicates ADHD symptoms related to a change in language patterns without a precise definition of the characteristics of this linguistic behavior.

There is strong evidence that difficulties presented by ADHD patients are related to the central executive system of working memory.

Kofler et al. (2009) suggest that internal attentional focus, one of the subsystems of the central executive system, is associated with the inattentive behavior of ADHD children.

# Objective

Considering the existence of a common ground for linguistics and psychology, a cognitive approach to language contributes to psychological investigation.

Cognitive Linguistics	Cognitive Psychology
Centrality of meaning	Construction of experience meaning
Cognitive processes are at the base of language use: memory, attention, categorization	Cognitive processes are at the base of disorders: memory, attention, categorization

Once cognitive processes are at the base of language use (Fauconnier, 1994) as well as at the base of psychopathological conditions, language investigation may reveal aspects of certain psychopathologies.

Cognitive capacities of **attention** and **memory** are involved in the production of narrative texts. These capacities are also related to ADHD.

In this perspective, the analysis of the narrative production of people with ADHD is a powerful tool for a better comprehension of certain aspects of the disorder.

# Figure and Ground

These notions are  
original from Gestalt Psychology

(Koffka, 1935; Wertheimer, 1938)

- Cognitive Perception (that underlies higher mental processes) involve selective attention:

Most salient aspects of perception – Figure

Less salient aspects of perception – Ground

used in Functional Linguistics (Hopper, 1979)  
and in Cognitive Linguistics

(Talmy, 2000, Langacker 2008, Tenuta 2006)

# Figure and Ground in Narratives

**Figure** - central, story events

**Ground** - additional information, description,  
evaluation, comments

The verbal TAM (Tense, Aspect and Modality) system is linguistically responsible for the expression of this cognitive principle.

(Hopper, 1979; Tenuta, 2006)

# Participants

Patients at ADHD Clinic / Medicine School  
Hospital/UFMG (experimental group)

Students at an elementary school  
psychologically tested as not having ADHD  
(control group)

Equivalent age and schooling  
- 25 subjects, 7 to 14 years old

# Research Focus

## Figuration process in narratives:

the way people interpret and distribute information in a story between figure and ground narrative events.

## Purposes:

identification of any distinct patterns of figuration in ADHD participants in relation to the control group.

# Procedures

- Each subject was presented with 4 tasks, with different cognitive demands on memory and attention and produced 4 corresponding narratives (N1,N2,N3,N4).
- Each narrative was separated into clauses.
- Each clause was attributed a figure or a ground status (based on grammatical and discourse marks).

Total of clause units = 2300

# 4 tasks

**TASK 1 (N1)** : Produce a story from comic strips without words: **Telling while Seeing**

**TASK 2 (N2)** Produce a story from comic strips without words: **Telling after Seeing**

**TASK 3 (N3)** Produce the end of a story from a short animated film without words. **Creating.**

**TASK 4 (N4)** Produce an autobiographic story.  
**Remembering**

**Logistic Regression** was used as statistical methodology because it allows us

1) to treat categorical variables:

*Figuration* (Figure/Ground)

*Task* (N1/N2/N3/N4)

*Clinical Condition* (ADHD/Non-ADHD)

2) to estimate the predictability of *Figuration* in terms of *Task* and *Clinical condition*.

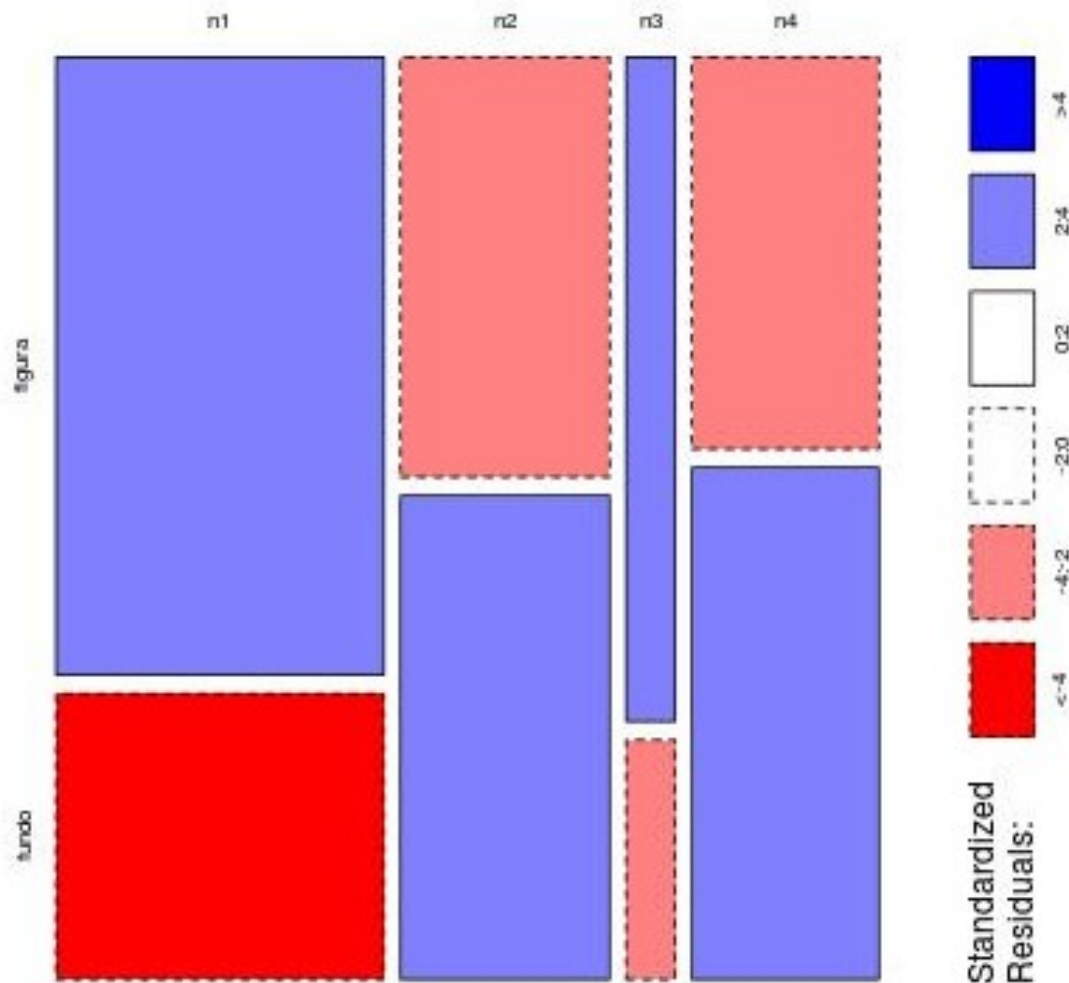
The question is:

***Does any Task or Clinical condition increase the probability of narrative figure or ground?***

# Task Investigation

According to this logistic regression analysis, the production of narrative ground is positively associated with tasks N2 and N4 ( $p > 0.001$  - Wald test). More precisely, the N2 and N4 tasks increase in a 2.54 and 2.63 factor, respectively, the odds of occurring narrative ground.

# Mosaic Plot



The graph shows the observed frequency of figure and ground on each type of task compared to the expected frequency if the variables *Task* and *Figuration* were independent.

The red color represents lower than expected frequency. Conversely, the blue color represents higher than expected frequency.

Thus, N1 and N3 present a distinct pattern in relation to N2 and N4. N1 and N3 have less ground and more figure than expected while N2 and N4 have less figure and more ground than expected.

# Task Investigation

These results suggest a positive correlation between the representation of linguistic information from memory and the amount of narrative ground structures (i.e tasks that require retrieval of information from memory have more narrative ground).

# Task Investigation

In Bruner (2002) and Chafe (1990)'s perspective, memory content is not a truthful, objective representation of reality, and is enriched by perception, imagination and by manipulation of cognitive models.

This enriched content appears in descriptions, evaluations, justifications, for example, which typically integrate narrative ground.

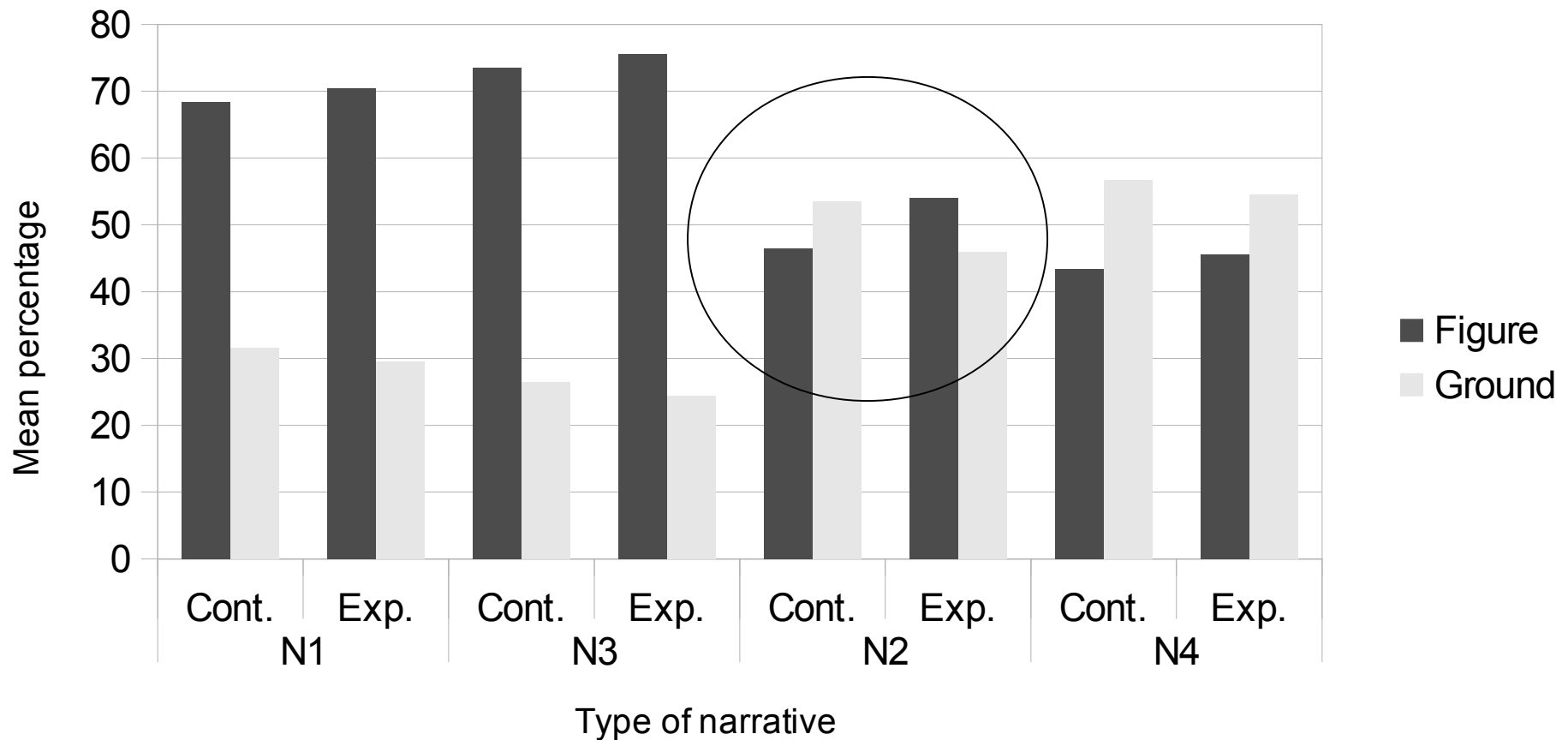
# ADHD Investigation

There were no statistically significant results in figuration, comparing control and experimental groups in the different tasks, except for N2.

In this case, the mean proportion of ground is lower in the experimental group:

- participants with ADHD tended to produce a lower proportion of ground in the narratives that required the retrieval of information from working memory without the aid of visual cues (internal focus of attention).

# ADHD Investigation



# ADHD Investigation

In relation to N2:

ADHD diagnosis reduces in 0.74 the odds of occurring narrative ground - that is, the chance of production of ground structures by ADHD is lower in this type of narrative ( $p=0,068$  - *wald test*).

Even though the analysis has not reached the 95% degree of confidence (It reached 93,2%), the results suggest the tendency for a different figuration between control and experimental groups in this task.

Further studies that control medication use and clinical ADHD subtype can corroborate this preliminary hypothesis

# ADHD Investigation

These results support Kofler et al. (2009)'s hypothesis that ADHD may be related to the central executive system of working memory, specifically the difficulty in maintaining an internal focus of attention, required when information needs to be activated from memory without the aid of external cues.

Tasks that require these internal processes of working memory seem to better distinguish children with ADHD from children with normal development. (Kofler et al, 2009)

# ADHD Investigation

Corroborating this hypothesis, children with ADHD and the control group differ neither in the task that required external attentional focus (N1), nor in the task that required the production of new content (N3), nor in the task that required retrieval of information from long-term memory (N4). However, children with ADHD tended to display a different pattern in the proportion of *figure* and *ground* in narratives that required retrieval of information from working memory without the aid of visual cues (internal focus - N2).

# Conclusion

It is important to control the kind of task when we use the methodological tool of narrative production because different cognitive demands can result in the production of narrative structures which are different.

In ADHD literature, we find statements about the language of children with ADHD being disfluent, presenting pragmatic and cohesive problems as well as having global organization problems. (Tannock, 2005) We find statements about their narratives being poor, but with no or little specification of what these problems or such impoverishment really mean.

# Conclusion

Poor narrative can be explained, for example, as narratives with fewer ground units, or ground or figure units with certain specific grammatical or discursive characteristics.

Considering the interrelation between Language and Cognition, as well as the potential interdisciplinarity of linguistics and psychology, investigation of the linguistic production of a subject can potentially help reveal aspects of psychological conditions in which are involved common ground cognitive processes, such as memory and attention.

Thank you

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# Data

Group	<u>Type of clause unit</u>	Total Sample (n)	<u>Tasks</u>			
			N1	N2	N3	N4
Control (13 <u>subjects</u> )	Figure	740	378	164	61	137
	<u>Ground</u>	565	175	189	22	179
Experimental (12 <u>subjects</u> )	Figure	634	417	135	31	51
	<u>Ground</u>	361	175	115	10	61
Total		2300				

Even though the table displays clustered data, the analysis considered variation in the production of each of the 25 participant subjects, for each task.