LINGUISTS MEET CLINICIANS: A STUDY OF LANGUAGE DISORDERS

MARLYSE BAPTISTA, BESS FJORDBAK, MICHAEL A. COVINGTON

UNIVERSITY OF GEORGIA, UNIVERSITY OF TEXAS AT EL PASO, UNIVERSITY OF GEORGIA

GENERAL BACKGROUND

Perspectives on language: A human cognitive instinct?

- The properties of language
- The biology of language: Broca's area and Wernicke's area
- Language comprehension:
  - The perception of speech
  - The comprehension of words
  - The comprehension of sentences
  - Discourse and pragmatics (neurological properties)
- The evolution of language:
  - How did language evolve?
  - Biological adaptation or cultural invention?
- Language and thought:
  - Does language influence thought?
  - On linguistic relativity

FOCUS OF RESEARCH

Over the past hundred years, a great body of literature has been compiled on the mental processes involved in producing, perceiving and learning language. Over the same period of time, the research on the localization of different linguistic abilities in different regions of the brain and how neural computation works has significantly moved ahead. However, very little of what we know about the neurology of language can be expressed coherently in terms of what we know about mental processing of language. For instance, one of the most intriguing aspects of the neurology of speech and language is lateralization (the left cerebral hemisphere plays a dominant part in a number of language-related brain functions).

The large question we explore is two-fold:

- How are certain language-related tasks affected in cases of mental illness or head trauma?

- Can the detection of specific patterns in patients' language use ultimately lead to accurate medical diagnostic and efficient treatment?

We explore here whether a pragmatic/discourse approach (Fjordbak, 2006) and structural analysis (Covington et al., 2004; Piñango, 2000; Edwards, 2000; Balogh & Grodzinsky, 2000) of language disorders can provide new tools for ailment identification and lead to concrete clinical applications.

LITERATURE REVIEWED

Fjordbak (2006)

Subject: This study involves the analysis of a series of hand written journals prepared over almost thirty years by a patient whose diagnosis is Bipolar Disorder - Mania only.

Two main objectives:

- Identify patterns of language use in the manifestation of mental illness and examine the linguistic breakdown, particularly in social/pragmatic function.
- Provide linguistic tools to practitioners involved with observation and identification of disorders based on "abnormal" use of language so that they understand the underlying linguistic constructs.

Research question: What are the linguistic changes present in a diagnosis of mania?

Methodology: Reference corpora are organized and implemented for the purpose of comparison to a standard considered to be typical.

Covington et al. (2005)

Subject: This study involves the examination of abnormalities of language in patients diagnosed with schizophrenia.

Main objective:

- To review schizophrenic language from the linguistic perspective and evaluate how schizophrenia affects phonology, syntax, semantics and other organized components of language.

Research question: What is the relationship between schizophrenia and the structure of human language?

Methodology: Selective review of published review on the relationship between schizophrenia and the structure of human language.

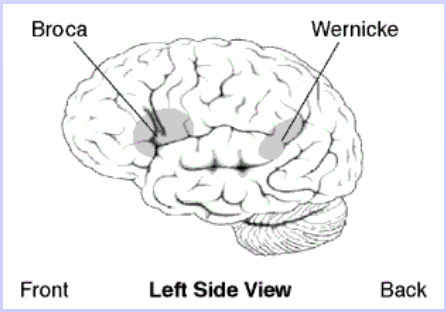
Piñango (2000), Edwards (2000), Balogh & Grodzinsky (2000)

Subject: This study involves the examination of abnormalities of language in patients diagnosed with aphasia.

Main objective: To characterize the syntactic operations present in patients affected with agrammatic Broca's aphasia.

Research questions: How do healthy and aphasic speakers deal with certain syntactic operations sch as reflexives, unaccusativity and passivization? How are verbs produced cross-linguistically (Dutch, English, Hebrew and Hungarian.)

Methodology: Cross-modal priming to assess on-line processing, picture pointing to evaluate comprehension, naming tasks to elicit verbs in isolation and in sentence context and spontaneous speech analysis.



LINGUISTIC OBSERVATIONS

Fjordbak (2006):

Linguistic patterns in this particular case of Bipolar disorder:

- Speech patterns lack cohesion and are difficult to interpret.
- Word selection may be governed by phonological properties rather than content.
- Flight of ideas involves increased rate of production with rapid topical shifts
- Other linguistically-mediated behaviors include grandiose idea generation, increased organization and planning, and increased socialization.
- Notable issue: Significant within-subject differences in patterns of written language during unmedicated versus medicated periods of time.

Covington et al. (2005)

Schizophrenic patients display variable and difficult to characterize language

Speech patterns at the syntactic level

- Normal but simplified syntax in speech
- Impaired syntactic comprehension
- Syntactic simplification as a negative symptom
- Complexity of written language is spared
- Measures of syntactic complexity (reduction in clausal embedding and relative clauses) and word salad

Piñango (2000), Balogh & Grodzinsky (2000), Edwards (2000)

Aphasia: **Syntactic features in Broca's agrammatic speech**

- Trace deletion
- Referential noun phrases and moved NPs with no thematic role
- Subject/object asymmetries in extraction constructions

PRELIMINARY CONCLUSIONS

The identification of clear linguistic patterns characterizing each type of ailment still has to be attained in spite of the significant progress delineated by the studies presented here.

In the case of Bipolarity, there is no 'manic language' among the general population that can be isolated and identified because it is within the patterns of individual variation that a diagnosis of mania is made. Mania is a property of the individual, and it is through observation of the language behaviors that such a diagnosis is applied, within the context of other non-linguistic manifestations.

In the case of Schizophrenia, a compelling portrayal of the structural properties of schizophrenic language has been drawn but other aspects of schizophrenic language remain unexplored (phonetic and pragmatic levels should be computerized…).

In the case of aphasia, some definite progress has been made in characterizing agrammatism but the scholars' findings are at times contradictory and impede further understanding of lexical and syntactic deficits found in this disorder. As suggested in Covington et al. (2005), the answer to a better linguistic characterization of each ailment may lie in a systematic computerized analysis of the "impaired" speech data.

SELECTED REFERENCES

Balogh, Jennifer and Yosef Grodzinsky (2000) "Levels of linguistic representation in Broca's aphasia: Implicitness and referentiality of arguments." In *Grammatical Disorders in Aphasia: A Neurolinguistic Perspective*, Roelien Bastiaanse and Yosef Grodzinsky (eds.). London/Philadelphia: Whurr Publishers. 88-104.

Covington, Michael, Congzhou He, Cati Brown, Jonathan McClain, Lorina Naci, Bess Fjordbak, John Brown (2005) "Schizophrenia and the structure of language: The linguist's view." *Schizophrenia Research* 77:85-98.

Edwards, Susan (2000) "A clinical assessment of verbs in an agrammatic patient." In *Grammatical Disorders in Aphasia: A Neurolinguistic Perspective*, Roelien Bastiaanse and Yosef Grodzinsky (eds.). London/Philadelphia: Whurr Publishers. 191-213.

Fjordbak, Bess (2006) Patterns of Language Use in Mania. Doctoral Dissertation, niversity of Georgia.

Guenther, Kim (1998) *Human Cognition*. New Jersey: Prentice Hall.

Piñango, Maria (2000) "Syntactic displacement in Broca's agrammatic aphasia." In *Grammatical Disorders in Aphasia: A Neurolinguistic Perspective*, Roelien Bastiaanse and Yosef Grodzinsky (eds.). London/Philadelphia: Whurr Publishers. 75-87.