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Feast or famine: Fixed expressions in the spontaneous speech of left hemisphere- and right hemisphere-damaged subjects

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Background

The preservation of swearing, serial speech, and speech formulas is well-attested in clinical descriptions of aphasia. Survey studies have not only confirmed these observations; they have also documented the selective preservation of proper nouns in the residual speech of left hemisphere (LH) damaged subjects (Blanken, Wallesch, & Papagno, 1990; Code, 1982). It had not been resolved whether these preserved utterances are produced by the undamaged right hemisphere (RH), or by intact areas of the LH. Further insights have come from functional brain imaging and behavioral studies, which have suggested that unlike novel expressions (which are lateralized to the left hemisphere), serial speech (i.e., counting), fixed expressions (i.e., idioms), and proper nouns (names of known persons) may be represented in the both hemispheres (Kempler, Van Lancker, Marchman, & Bates, 1999; Ohnesorge & Van Lancker, 2001; Van Lancker, McIntosh, & Grafton, 2003).

Relatively little is known about incidence of non-novel expressions in the spontaneous speech of normal or brain damaged subjects. Interest in this property of normal speech has recently arisen (e.g., Wray & Perkins, 2000). Counts derived from studies of conversation using a screenplay, compared to published accounts derived from natural speech corpora, suggest that between 15 and 40% of utterances are fixed expressions (Van Lancker-Sidtis & Rallon, 2004).

The importance of fixed expressions in language use, combined with converging evidence of a role of the RH in processing non-novel language, led to this study. Our goal was to examine hypotheses about hemispheric processing of fixed expressions in the spontaneous speech of persons with unilateral brain damage, in comparison with age and education matched normal–control subjects.

Method

Natural spontaneous speech samples were collected from 5 patients with aphasia due to LH damage, 5 patients with RH damage, and 5 neurologically intact normal–control subjects (N–C). LH damaged subjects, including one anomic and four Wernicke's aphasia, ranged in age from 49 to 76 (mean 62.8), average education of 12.6 years; RH subjects' age ranged from 41 to 70 (mean 59.4) with 12.2 years of education; N–C subjects were 46–78 years of age (mean = 63.6), educated at 15.2 years. All were male except for 2 N–Cs. For spontaneous speech samples, subjects described their family and work. Written transcripts were searched to identify fixed expressions (classes listed below), proper names, and numerals.

The difficulties of classifying fixed expressions are well known (Wray, 2002). After a preliminary analysis of the speech samples, nine categories of fixed expressions were chosen for this analysis. We used a guideline similar to the "well-formedness" principle for sentences: will a native speaker of English recognize this expression as "familiar"? (Van Lancker-Sidtis, 2003). As demonstrated by Van Lancker-Sidtis and Rallon (2004), this criterion further predicts that native speakers will "correctly" fill in a missing word for the expression under scrutiny. Functional and formal criteria also aided in identifying the appropriate exemplars. Idioms (e.g., "lost my train of thought") have non-literal meanings; conventional expressions (e.g., "as a matter of fact") are unitary expressions of specified shape; expletives (e.g., "Christ") are readily identifiable; speech formulas (e.g., "first of all," "right") serve to move the talk forward; sentence stems (e.g., "I guess") initiate a turn; discourse particles (e.g., "well") are word-like fillers, and pause fillers (e.g., "uh") are subword forms. In addition, we counted numerals and personally familiar proper nouns. Identification of this array of fixed expressions along with proper nouns and numerals was accomplished by two independent raters. Any differences between raters were discussed and resolved.

Preliminary results were calculated as the percentage of words in each patient's sample comprising fixed expressions. Calculations including and excluding proper nouns and numerals were performed separately.

Results

Results for 5 LH damaged, 5 RH damaged, and 4 normal–control subjects are shown in Fig. 1. LH spontaneous speech contains a larger percentage of fixed expressions than normal–control speakers, while RH spontaneous speech contains a notably smaller percentage. Two-sample, two-tailed t-tests comparing results obtained from LH and RH damaged subjects on fixed expressions revealed a significant difference between groups in percentages of fixed expressions (idioms, conventional expressions, expletives, speech formulas, sentence stems, discourse particles, and pause fillers) ($t = 3.91752582$, $df = 8$, $p < .01$) and

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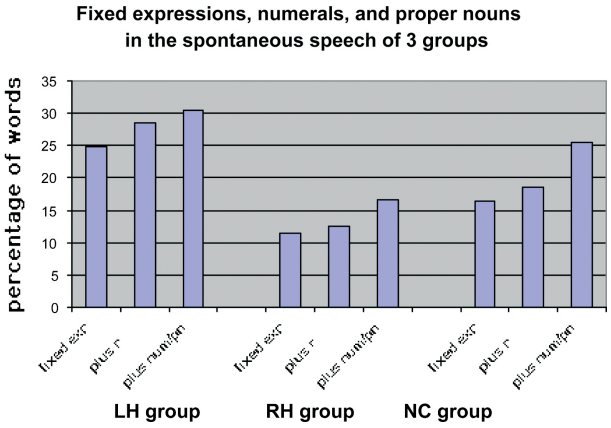

Fig. 1. Percentage of words comprising fixed expressions, numerals, and proper nouns in the spontaneous speech of 5 patients with LH damage, 5 patients with RH damage, and 4 normal–control subjects.

total fixed expressions (including proper nouns and numerals) (t = 3.5142844, df = 8, $p < .01$).

Conclusion

The finding that RH damaged subjects used significantly fewer fixed expressions than LH damaged subjects in spontaneous speech supports the notion that an intact right hemisphere contributes to processing of fixed expressions. Refined analysis of these data will focus on the relative incidence of fixed expression subtypes.

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