Chapter 32
Using LIWC and Coh-Metrix to Investigate Gender Differences in Linguistic Styles

Courtney M. Bell
Northwest Community College, USA

Philip M. McCarthy
The University of Memphis, USA

Danielle S. McNamara
Arizona State University, USA

ABSTRACT
We use computational linguistic tools to investigate gender differences in language use within the context of marital conflict. Using the Language Inquiry and Word Count tool (LIWC), differences between genders were significant for the use of self references, but not for the use of social words and positive and negative emotion words. Using Coh-Metrix, differences were significant for the use of syntactic complexity, global argument overlap, and density of logical connectors but not for the use of word frequency, frequency of causal verbs and particles, global Latent Semantic Analysis (LSA), local argument overlap, and local LSA. These results confirmed some expectations but failed to confirm the majority of the expectations based on the biological theory of gender, which defines gender in terms of biological sex resulting in polarized and static language differences based on the speaker’s gender.

INTRODUCTION
Men and women have long been in dispute over issues such as spending, emotions, division of labor, and male withdrawal during conflict. One of the factors that may contribute to the continuation of such disputes is language differences between the two genders. The biological theory and the sociological theory are the two competing theories that have evolved to explain linguistic differences between males and females. Language and gender research tend to provide little empirical evidence in support of the sociological theory (Eckert & McConnell-Ginet, 2003; Goodwin, 1990) because...
social psychologists have traditionally studied the decontextualized and mechanical features of language while isolating the individual from the social context (Coates & Johnson, 2001). Therefore, the biological theory is the most cited and accepted theory by default.

Currently, results from gender and language research are inconsistent. This is exemplified by the research on gender and interruptions. Evidence suggests that men are more likely to interrupt women (Aries, 1987; West & Zimmerman, 1983; Zimmerman & West, 1975) and overlap women’s speech (Rosenblum, 1986) during conversations than the reverse. On the other hand, other research indicates either no gender differences in interruptions (Aries, 1996; James & Clarke, 1993) or insignificant differences (Anderson & Leaper, 1998). However, positing possible explanations for why these linguistic variations might exist is potentially more important than merely citing them. We approach that problem here by examining various expectations of language differences between genders based on the biological theory (Bergvall, 1999; Coates & Johnson, 2001; Leaper & Smith, 2004), the most dominant theory by which researchers define the construct of gender (see Sheldon, 1990, for a review). We do so using two computational tools, the Language Inquiry and Word Count (LIWC; Pennebaker, Francis, & Booth, 2001) and Coh-Metrix (Graesser, McNamara, Louwerse, & Cai, 2004), to perform corpus analyses of emotionally laden marital disputes.

**Biological Theory of Gender**

The biological theory defines gender in terms of biological sex. According to the theory, it is assumed that men outsize and outpower women (Bergvall, 1999; Tannen, 1993) and that gender polarities exist in language use. The theory gives little regard to language individualization (Coates & Johnson, 2001). The biological theory also assumes that gender roles are static and contextually independent.

Two examples illustrate the influence of researchers’ theoretical orientation towards gender on their explanations of gender and language variation. Maltz and Borker’s (1982) theory of gender-marked language use is based on the assumptions of the biological theory. Their model claims that male and female speech has different contents and serves different purposes. Male speech is characterized as competition oriented or adversarial while being used primarily to assert men’s position of dominance, attract and maintain an audience, and to assert themselves when other speakers have the floor. In contrast, female speech is characterized as collaboration oriented or affiliative. Women use language more cooperatively than men, respond to and elaborate on what others have said, make more supportive comments, ask more questions, and work to keep conversations going. Finally, women use language to create and maintain relationships of closeness and equality, to criticize others in acceptable ways, and to accurately interpret other females’ speech (Sheldon, 1990).

In addition to Maltz and Borker’s model, Gilligan’s (1982, 1987) theory of gender-marked conflict styles also provides an example of how researchers’ theoretical orientation towards gender influences their explanations of gender and language variation. The theory is also based upon the assumptions of the biological theory of gender and suggests that males’ conflict style has a justice orientation. The theory claims that during conflict, males maintain a universal point of view and use language to command respect while assuming separation between themselves and others. Finally, during conflict, males value logic and rationality while attempting to resolve differences through rules or reason.

Gilligan (1982, 1987) asserts that females’ conflict style has a caring orientation, focuses on the relationship, and on maintaining connections between self and others. Her theory also claims that women use more collaborative speech acts, pay more attention to the needs of others, and
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