**INTERPRETING LIWC OUTPUT**

There are many ways to think about the LIWC output – both linguistically and psychologically. Here are some helpful guidelines.

**WHERE DO THE NUMBERS COME FROM? HOW ARE THEY CALCULATED?**

A couple of LIWC variables are calculated differently from the others. The first is word count (WC) – which is just the raw number of words within a file. The second is words per sentence (WPS) which is the mean number of words within each sentence within the file.

***Percentage of total words***. Most of the LIWC output variables are percentages of total words within a text. For example, imagine you have analyzed a blog and discover that the Positive Emotions (or posemo) number was 4.20. That means that 4.20 percent of all the words in the blog were positive emotion words.

***Summary variables***. New to LIWC2015 is the inclusion of four summary variables: analytical thinking, clout, authenticity, and emotional tone. Each of the summary variables are algorithms made from various LIWC variables based on previous language research. The numbers are standardized scores that have been converted to percentiles (based on the area under a normal curve) ranging from 0 to 100. Although the algorithms are proprietary, you can compute them by going to the research articles on which they are based. A brief overview of each summary variable follows.

***Analytical thinking (Analytic)***. The analytical thinking variable is a factor-analytically derived dimension based on eight function word dimensions. Originally published as the categorical-dynamic index, or CDI, the dimension captures the degree to which people use words that suggest formal, logical, and hierarchical thinking patterns. People low in analytical thinking tend to write and think using language that is more narrative ways, focusing on the here-and-now, and personal experiences. Those high in analytical thinking perform better in college and have higher college board scores. To learn more about analytical thinking, see Pennebaker, Chung, Frazee, Lavergne, and Beaver (2014).

***Clout***. Clout refers to the relative social status, confidence, or leadership that people display through their writing or talking. The algorithm was developed based on the results from a series of studies where people were interacting with one another (Kacewicz, Pennebaker, Davis, Jeon, & Graesser, 2013). Note that Clout is different from the LIWC2015 Power variable. Power or, more accurately, need for power, reflects people’s attention to or awareness of relative status in a social setting. You can have a confident leader who has no interest in other people’s standing in the social hierarchy.

***Authenticity***. When people reveal themselves in an authentic or honest way, they are more personal, humble, and vulnerable. The algorithm for Authenticity was derived from a series of studies where people were induced to be honest or deceptive (Newman, Pennebaker, Berry, & Richards, 2003) as well as a summary of deception studies published in the years afterwards (Pennebaker, 2011).

***Emotional tone (Tone)***. Although LIWC2015 includes both positive emotion and negative emotion dimensions, the Tone variable puts the two dimensions into a single summary variable Cohn, Mehl, & Pennebaker, 2004). The algorithm is built so that the higher the number, the more positive the tone. Numbers below 50 suggest a more negative emotional tone.

**HOW DO I INTERPRET THE LIWC NUMBERS? WHAT DO THEY MEAN PSYCHOLOGICALLY?**

Most of the LIWC2015 variables are reasonably straightforward. Personal pronouns simply refer to the percentage words in a given text that are personal pronouns. The psychological meaning of the use of personal pronouns is less clear. Indeed, careers have been built on the underlying meanings of certain language dimensions.

Two good summary pieces on the interpretation of LIWC dimensions include an article by Tausczik and Pennebaker (2010) and the book by Pennebaker (2011). You are also strongly encouraged to go to [Google Scholar](http://scholar.google.com/) and enter search terms such as “LIWC and pronouns” or “LIWC and depression” or “LIWC” together with whatever dimension or psychological state you are interested in. There are several hundred articles published using LIWC. T