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Shame on you! A computational linguistic analysis of shame expressions

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Abstract

The current study explored the unique linguistic characteristics of the self-conscious emotion shame. The data used for the analyses were part of two larger studies in which semi-structured interview techniques were used that had learners describe shameful or frustrating experiences in the context of psychology and engineering courses. Results revealed when describing an experience of shame, learners use significantly more positive emotional words, significantly more words associated with anxiety, and significantly fewer words associated with anger. Additionally, learners use simpler syntax, more abstract words, and have less cohesive speech. Educational implications are discussed.

Keywords: emotions; shame; learning centered emotions; cognition; computational linguistic analysis

Objective

A gap currently exists in the literature regarding a quantitative exploration of the self-conscious emotion of shame. Adding to the body of literature on negative emotions, this study explored the unique linguistic characteristics of shame and frustration with the hope that we can better understand students' experiences of these emotions.

Theoretical Framework

Language is a powerful cognitive communicative process that has been the focus of research for centuries. Speaking and writing are expressive through the specific words chosen by individuals, as well as the frequency of specific words, and become one's "style". One's linguistic style in speech and writing has been suggested to be indicative of individual differences and personality (Groom & Pennebaker, 2002). We explored differences with respect to descriptions of the emotions of shame and frustration to better understand cognitive aspects of these emotions through speech-analysis.

Linguistic Analyses

From the study of dead languages to the biological nature of language within the brain, researchers have sought to understand how humans possess complex language abilities, the impact of language on humans, and countless other aspects of human language-use. Human language is undeniably expressive in content and dialect, however, this does not account for the full expressive power of language. The style of which we speak and write is also critically expressive but is frequently unnoticed. Speaking and writing is expressive through the particular words chosen by individuals and the frequency of specific words; these linguistic styles in speech and writing have been suggested to be indicative of individual differences and personality (Groom & Pennebaker, 2002; Pennebaker & King, 1999).

The study of linguistic style and content has numerous applications, but, until recently, conducting these analysis has been a difficult task that consisted of counting and organizing words with the use of individual judges (Pennebaker, Mehl, & Niederhoffer, 2002). However, an objective analysis of language patterns through word counting software has led to an increase in our understanding of what particular parts of speech contain a deeper level that is not naturally perceived (Pennebaker & Graybeal, 2001). We believe that using this type of analyses, we can gain insight into students' experiences of emotions.

Shame

Although there are many ways to define shame, for the purposes of this study, shame is an acutely painful affective state that is brought on by a failure to meet internally set rules, ideals, goals, or standards (Turner, Husman, & Schallert, 2002). A gap currently exists in the literature regarding a quantitative exploration of shame. Of the research that has been conducted, much has been qualitative in nature and not focused on "academic" shame (i.e., shame affiliated with learning and education). One possible reason for the underdeveloped exploration of this construct is due to the difficulty in studying it. More specifically, research has shown that individuals may deny their feelings of shame, they tend to self-isolate when they feel shame, and they may be unwilling or unable to express themselves when they feel shame (citation needed). In fact, one's difficulty in communicating a shameful experience may be a distinctive characteristic of shame (Turner, 2014; Babcock & Sabini, 1990, Lunde, 1958).

Although research has suggested the *difficulties* in studying shame, the difficulty does not detract from the *importance* of studying shame. Tangney and Dearing (2002) suggested that, "Guilt, and especially shame ... are powerful, ubiquitous emotions that come into play across most important areas of life." (p. 8). Contemporary research has shown that experiences of shame can have a "negative impact on interpersonal behavior and functioning" (Tangney &

Dearing, 2002, p. 5). Within the context of education, a number of educational psychologists have asserted that feeling shame can interfere with motivation, and negatively impact students' academic goals and achievement (Pekrun, Frenzel, Goetz, & Perry, 2007; Weiner, 1986). Indeed, once students experience shame, their ability to become cognitively engaged may be hindered, they may lose motivation for studying, and, they may feel reluctant to attend class (Turner, Husman, & Schallert, 2002).

Given the importance of gaining a better understanding of this self-conscious emotion, the current study sought to compare the unique linguistic characteristics of shame with that of frustration. Our intent was to better understand the underlying composition of shame expressions.

Data Sources, Evidence, Objects, or Materials

Linguistic Inquiry and Word Count (LIWC)

The present study used a program called Linguistic Inquiry and Word Count (LIWC) to analyze speech. LIWC allows researchers to efficiently enter text files into the program in order to obtain outputs that cover a number of language indices. For example, if we were to convert *Of Mice and Men* by John Steinbeck into a text file and enter it into LIWC we would obtain the exact word count, words per sentence, and a description of approximately 90 indices. These indices are extremely insightful in objectively understanding what a text consists of and the mental state of the author or speaker (Groom & Pennebaker, 2002). For the current study, we focused only on indices that were theoretically relevant: 1) Affective processes (e.g., happy, cried) 2) Positive emotion (e.g., love, nice, sweet) 3) Negative emotion (e.g., hurt, ugly, nasty) 4) Anxiety (e.g., worried, fearful) 5) Anger (e.g., hate, kill, annoyed) and 6) Sadness (e.g., crying, grief, sad).

Coh-Metrix

Coh-Metrix, is a system for computing computational cohesion and coherence for written and spoken texts. For the purpose of the current study, we explored five specific indices within a Coh-Metrix: Narrativity, Syntactic Simplicity, Word Concreteness, Referential Cohesion, and Deep Cohesion. Narrative text tells a story, with characters, events, places, and things that are familiar to the reader. Syntactic simplicity reflects the degree to which the sentences in the text contain fewer words and use simple, familiar syntactic structures, which are less challenging to process by the reader. Word concreteness refers to texts that contain content words that are concrete, meaningful, and evoke mental images. Texts high in referential cohesion contain words and ideas that overlap across sentences and the entire text. Deep cohesion reflects the degree to which the text contains causal, intentional, and temporal connectives (McNamara, Graesser, Cai, & Kulikowich, 2011). The theoretical purpose of focusing solely on these five indices is because previous research has found that dozens of measures funnel into these five major factors (Graesser, McNamara, Cai, Conley, Li, & Pennebaker, 2014).

Methods

The data used for analysis are subsets from two larger studies. As part of one study, participants were recruited from an upper-division psychology course at a midwestern R1 university. Five-weeks into the semester, after obtaining in-class feedback on their midterm exam, students completed a survey (Experiential Shame Scale, Turner, 2014, Cronbach's alpha = .86) to determine the extent to which they perceived their grade was a failure and if they were experiencing the emotion of shame. Eight students, who indicated they experienced shame after their midterm exam, agreed to participate in semi-structured interviews two weeks before the final exam. All interviews were recorded and transcribed verbatim.

We compared the shame interviews with that obtained in a second study, one that used an interpretative phenomenological analysis (IPA) of students' experiences of frustration in the context of college-level science and engineering courses. The semi-structured interviews were conducted by an undergraduate student who had been extensively trained to conduct phenomenological interviewing. Select portions of these interviews comprised our frustration corpus ($n = 5$) (Huff & Clements, 2018).

The interviews from both studies were approved by the IRB offices of each investigator for the respective studies. Additionally, the procedures of the present investigation were approved by lead author's institutional IRB.

Results

Results from our LIWC analysis indicated that students describing a shameful experience tended to use more positive emotional words than students describing a frustrating experience, $t(11) = 1.629$, $p = .06$ (one-tailed), $d = .92$. Shame-describing students also used significantly more words associated with anxiety than students who described their frustration, $t(11) = 2.644$, $p = .023$, $d = 1.50$. Lastly, results showed that when describing a frustrating experience, students tended to use significantly more words associated with anger, $t(4.409) = 2.623$, $p = .05$, $d = 1.49$. See Figure 1.
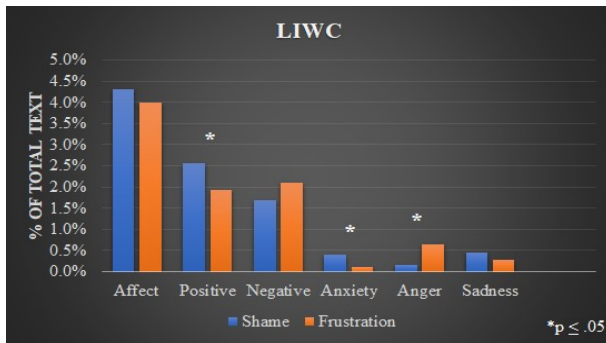
Figure 1: Linguistic Inquiry and Word Count (LIWC) results.

The results from the Coh-Metrix revealed that, when discussing an experience of shame, students tended to use significantly simpler syntax, $t(11) = 6.616$, $p = .000$, $d = 3.77$. They also used more abstract words, $t(4.326) = -2.909$, $p = .04$, $d = 1.66$, and had less referential cohesion, $t(3.062) = .01$, $d = 1.75$. See Figure 2.
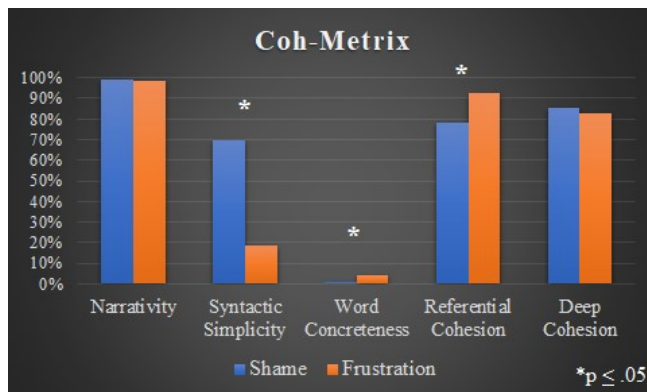

Figure 2: Coh-Metrix results.

Scholarly Significance

The results from the current study revealed that shame does in fact have a unique linguistic profile when compared to frustration. Surprisingly, learners who described an experience of shame tended to use significantly more positive emotional words (e.g., love, nice, sweet), along with more words associated with anxiety (e.g., worried, fearful). Additionally, students who described a shameful experience used significantly fewer words associated with anger compared to learners describing frustration. The Coh-Metrix results revealed that, when discussing a moment of shame, learners tended to use significantly simpler syntax, more abstract words, and demonstrated less referential cohesion.

Our results supported the notion that, when individuals talk about shame shame-experiences, the use of language is difficult. Students spoke abstractly about their shame experiences, while they were more able to articulate their frustration experiences. Shame-experiencing students also used less linguistic complexity and their narrative had less cohesion than students describing frustration. A teacher could learn to pick up on these linguistic elements and use this information to help students bounce back from the debilitating effects of experiencing academic shame.

Imagine a student who, after having failed an exam is staying after class to talk to the instructor about his/her performance. What if it could be determined, based on speech alone, whether these individuals are experiencing shame? What if a teacher was able to figure out which subset of students were actually experiencing shame and were able to be *proactive* to the potential negative consequences? Mitigating shame-consequences by understanding linguistic components of the *what*- and *how*-indicators of shame experiences, could facilitate teachers' ability to provide motivational interventions. Recognizing linguistic components of shame may be especially important given that individuals may deny their feelings, and may be unwilling or unable to express themselves, particularly if they self-isolate. In other words, as of now, we have no reliable way (other than perhaps self-report measures) to determine who is experiencing shame. Thus, intervention is near impossible without perceiving reliable indicators.

We do note that this study is limited in making comparative claims between the two sets of interview transcript-data. While the two sets of transcripts used in this analysis did, indeed, focus on different constructs (i.e., frustration and shame), they also differed according to other characteristics, such as the overall study-design, the methodology driving the investigations, and the institutions in which the data collection occurred. Thus, we make our claims with sensitivity to the multiple ways in which the two interview datasets can be compared. Yet, even with these limitations considered, we maintain that the linguistic profile that accompanies students' experiences of discussing shame provides compelling implications for educators.

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