GENDER DIFFERENCES IN LANGUAGE USE: STUDY ON CROWDFUNDING PROJECTS

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Abstract - In the last two decades, a new source of financing called crowdfunding has been introduced to allow a project founder to raise fund from crowd to support their projects. Prior research has pointed to a number of factors that may influence the fund raising projects—duration, target goal, rate of donation or pledging and quality of the projects. There is, however, one other important factor which is style of language use that contributes in raising fund, has hardly been discussed. This paper describes an investigation of the differences in language use by male and female in crowdfunding projects. 60 crowdfunding projects are subjected to LIWC analysis, and these linguistic data areanalysed. The results show that female and male do not merely focus on the differences of word categories, but also focus on the language dimensions. Furthermore, this study identifies what kind of processes relating to female and male text language.

Index Terms - Crowd funding, gender, language.

I. INTRODUCTION

In recent years, a new source of financing called crowdfunding has been employed by entrepreneurs (founders). Crowd funding has become capital mechanism for entrepreneurs enabling them to acquire funds to start their business operations. According to the report by Massolution, there has been an immerse growth in the amount of total global fundraising which doubled from $16.2 Billion in 2014 to $34.4 Billion in 2015[1]. A key part of any crowdfunding project is a text narrative, which describes about founders' project that need to be funded. Prior research has highlighted the important of improving founders' project presentation by using appropriate textual description on the project that may lead to success rate of project[2]. In line with this, the differences in language use by male and female might improve project success rates. However, the investigation of the differences in language use by male and female in crowdfunding projects has hardly been discussed. This paper contributes to the literature by analysing that when the differences in language use by male and female in crowdfunding projects are determined, the project founders become more capable of presenting their text according to the expectations of their potential funders.

II. LITERATURE REVIEW

It appears that gendered language has imposed as a not negligible issue that has been addressed in studies primarily focusing on computer mediated communication (CMC). Few studies have argued that gendered language in CMC is similar to that found in written communication and face-to- face [3], [4]. More specifically, these studies have revealed that there are differences in language function, style and features by gender. Interestingly, readers of CMC capable to predict author gender with a high accuracy [5]. The differences of these studies so clear-cut because gender influences language in several different ways. Thomson (2006) argued that both men and female are capable in using a wide range of language styles depending on whom they are communicating with. For instance, in face to face communication, the greater differences gender linked language in same sex groups when women and men interact [6], [7]. Similarly, in CMC, while gender may not be immediately apparent due to the anonymity, a person's own language is influenced by both the gendered style and the gender label of his or her partner [3]. Previous research have reported men and women have different semantic goals in mind when they construct sentences [8]. Women prefer to use words that relate to psychological and social processes meanwhile men more to object properties and impersonal topics. A stream of studies suggest that female tend to use tag questions, use phrases that connect relative word with uncertainty verb and to use extra polite forms than men[9]–[11]. Some studies emphasize on the interaction features of woman and men based on dyadic and directive[7], [12], sentence length [11], speaking while promoting the project [7], [10]. Other than that, several researchers also examine the gender differences in language use according to actual words that male and female use every day, revealing that women are more preferred to use more intensive adverbs, more conjunctions, more modal supporting verbs [9], [13], [14]. Meanwhile men always use longer words, swear more, use more references to location and use more articles[10], [13]. Based on few studies, it is complicated to claim which gender is more use first person singular than others. Mehl and Pennebaker (2003) have reported that women are more likely to use first person singular. Meanwhile, other studies have found that men are more likely to use first person singular [8], [14]. Emotion words appear to be another area of conflicting findings, despite the existence of a fairly

clear stereotype. Women refer to emotion often than men[5], [12]. However, the features of language use in manager's criticism has been investigated in a role play found precisely the reverse[15]. In line with this, women use more references to positive emotion meanwhile men refer to anger [13]. It is also found that female and male use more pronouns and more noun specifiers, respectively. Due to some limitations of other studies that analyse a small number of text samples in finding the differences in language use by gender, a big database that consists of over 14,000 text files from 70 separate studies has been analysed[8]. The results show that female tends to include pronouns and social words, negation words, a wide variety of other psychological process references, and verbs. Meanwhile men tends to use length words, many numbers, preposition, and swear word. Instead of focusing into CMC, this study attempts to identify the different in language use by male and female in crowdfunding projects. A revelation may lead to better understanding on how male and female founders express their though using text in persuading potential funders to fund their projects.

III. METHODOLOGY

A. Sample

Determining the sample size needed to be representative of a given population is crucial for any study. The sample size of this study is based on Sekaran and Bougie (2016), which posit that 30 subjects from population able to estimate the inconsistency of the total sampling. In this study, the sample includes 60 crowdfunding projects (subjects) listed on Generosity websites, where 50% of the projects created by male and the remaining 50% by female. Generosity is a part of Indiegogo sites, which serves a platform for people to raise money for medical expenses, celebrations emergencies, or other life events. Gorbatai and Nelson (2015) have found that most projects that narrated using more than 50 words lead to crowdfunding projects success. Based on this finding, this study only selects projects that have more than 50 words.

B. Text Analysis

To identify the differences in language use by gender for the selected crowdfunding projects, Linguistic Inquiry and Word Count (LIWC) software package. This software analyses text on a word by word basis, which then groups the words into predefined 74 linguistic categories [8]. Previous studies have argued that LIWC software is the most commonly language analysis software that can analyse linguistic data for identifying the main effects of gender [8], [16], [17]

C. Statistical Analysis

Shapiro–Wilk normality test is used to test the normality of all text languages used by male and female founders. This normality test is used to investigate whether sample data has been drawn from a normally distributed population or not. The results are reported using mean and standard deviations. Data are analysed using a multivariate analysis (MANOVA) on all the LIWC categories that related to this study with gender as the independent variable. This analysis is performed to answer the primary concern of this study, whether the projects created by male and female have a significant difference in term of language use.Significant differences are then followed up by univariate analyses of variance (ANOVAs) to determine the difference of language use for each dimension by male and female.

III. RESULTS AND DISCUSSIONS

Table 1 shows the result of the Shapiro–Wilk test. Df and Sig in Table 1 refer to degree of freedoms and significance level, respectively. The Shapiro–Wilk normality test for alltext languages used by male and female founders ($p > 0.05$) showsthe data scores are approximately normally distributed, that is, bothtext languages used by male and female founders follow Gaussian distributions. Based on this reason, MANOVA and ANOVA which are two of popular parametric tests are then carried out.Results performing MANOVA indicate that there is significant difference in using language between male and female founders (multivariate effect, $F = 24.957$, $p < 0.05$). Table 2 shows the results of each univariate ANOVAs including effect size with significant is set to 5% (p-values < 0.05). Effect size is a simple way of quantifying the difference between two groups, which emphasizes the size of the difference rather than confounding this with sample size[18]. Table 2 presents main effects of gender on language use for the selected 60 crowdfunding projects. Table 2 groups the related language dimensions into 6 categories, namely linguistic processes, other grammar, psychological process, time orientation, personal concerns, and informal word.

The findings, displayed in Table 2, shows that female founders are more likely to use personal pronouns such as first person plural (we, us), second person (you) and third person (she/he) in engaging their funders to their crowd funding projects. Similar with previous studies, female founders have been found to use language that related to psychological process such as emotion and social process[8]. Other than that, negation, focus present, and informal language are also features of text language used by female founders. Meanwhile, male founders tend to use longer words, article words (a/an/ the), and prepositions. In line with this, male founders also are more likely to use cognitive process (insight/ cause) and personal concern.

	Gendered language	Statistic	Df		Sig
Independent variable	Male	.963	30		.379
	Female	.962	30		.357

Table 1: Shapiro–Wilk Test

However, there are no significant differences between female and male founders in the usage of personal pronouns third person plural (they), auxiliary verb, adverb, conjunction, verb, and adjective in language use in their crowdfunding projects.

CONCLUSION

In this study, the differences in language use by male and female founders in crowdfunding projects have been determined. This finding provides a clear map of the differences in language use by male and female in crowdfunding projects.

Dimension LIWC	Female		Male		Effect size (g)
	Mean	SD	Mean	SD	
Linguistic Processes					
WC	248.70	118.26	307.80	142.77	Ns
Function	47.78	4.17	49.70	3.90	Ns
Pronoun	11.78	3.47	12.10	3.72	Ns
Personal pronouns	8.37	3.34	8.06	3.54	Ns
1st person singular: I	1.32	2.27	4.93	3.67	-1.17
1st person plural: we/us/our	2.64	2.37	0.67	0.95	1.08
2nd person: you	1.43	0.83	0.87	0.84	0.66
3rd person singular: She/he	1.89	2.53	0.62	1.60	0.59
3rd person plural: they/their	1.10	1.47	0.98	1.01	Ns
Article	5.59	1.87	7.61	1.73	-1.11
Prep	13.75	1.92	15.67	2.57	-0.84
Auxiliary verb	7.63	1.76	6.87	2.11	Ns
Adverb	3.73	1.82	3.14	1.25	Ns
Conjunction	6.49	1.38	6.19	1.87	Ns
Negation	0.92	0.73	0.47	0.45	0.73
Other Grammar					
Verb	14.16	2.92	12.80	2.55	Ns
Adjective	4.24	1.79	3.97	1.64	Ns
Psychological Processes					
Affective process	6.17	1.67	5.20	1.78	0.55
Positive emotion	4.97	1.55	3.53	1.41	0.96
Negative emotion	1.15	1.09	1.61	1.22	Ns
Anx	0.18	0.28	0.31	0.52	Ns
Anger	0.25	0.55	0.49	0.57	Ns
Sad	0.44	0.71	0.33	0.47	Ns
Social process	14.39	4.43	8.57	3.45	1.45
Family	1.01	1.19	0.54	0.75	Ns
Friend	0.40	0.74	0.38	0.44	Ns
Female	1.92	2.37	0.35	0.66	0.89
Male	0.54	1.81	0.69	1.54	Ns
Cog process	8.29	2.86	8.99	2.97	Ns
Insight	1.24	0.88	2.06	1.31	-0.72
Cause	1.23	1.17	1.93	1.05	-0.62
Discrepancy	1.32	1.00	1.32	0.82	Ns
Tentative	1.92	1.21	1.84	1.38	Ns

Certainty	1.53	1.08	1.13	0.68	Ns
Differentiate	2.12	1.40	1.79	1.24	Ns
Perceptual process	1.15	1.16	1.32	1.10	Ns
See	0.62	0.67	0.57	0.56	Ns
Hear	0.11	0.22	0.20	0.37	Ns
Feel	0.31	0.51	0.47	0.57	Ns
Focus past	2.52	1.43	3.28	1.83	Ns
Time Orientation					
Focus present	10.00	2.24	8.10	2.59	0.77
Focus future	1.43	0.88	1.39	0.77	Ns
Relative	13.79	3.76	14.03	3.55	Ns
Motion	2.38	1.62	2.30	1.04	Ns
Space	6.88	2.33	7.35	2.48	Ns
Time	4.82	2.22	4.46	1.95	Ns
Personal concerns					
Work	3.15	2.59	4.12	2.75	Ns
Leisure	1.63	1.28	1.57	1.11	Ns
Home	1.40	1.96	0.83	1.28	Ns
Money	2.59	1.86	2.07	1.32	Ns
Religion	0.26	0.50	0.22	0.52	Ns
Death	0.05	0.17	0.24	0.49	-0.51
Informal	0.40	0.57	0.19	0.30	Ns
Informal word					
Swear	0.00	0.00	0.04	0.18	Ns
Net speak	0.27	0.53	0.03	0.12	0.61
Assent	0.06	0.15	0.03	0.11	Ns
Non-fluencies	0.06	0.15	0.06	0.14	Ns
Hedges	0.01	0.05	0.01	0.06	Ns

Table 2: Main Effects of Gender on Language Use

(Note: Means (except for word function) refer to percentages of the total words in a sample. Effect size (Hedges g) is calculated by dividing the mean difference by the pooled standard deviation. Positive effect sizes mean female used the category more; negative effect sizes mean male used it more. All mean differences except those labelled "ns" are significant at $p < .005$, based on univariate statistics from a multivariate analysis of variance). Computerized analysis using the predefined language dimensions with an ability to be upgraded over time seems to be practically efficient compared to human judgement, in which human give inconsistent judgement towards each word used. Project founders can get benefit from the revelation of the differences in language use by male and female founders in crowdfunding projects. More specifically, the success rate of any new founder of crowdfunding project can be increased by integrating suitable word dimensions used by male and female founders while promoting their projects in crowdfunding websites.

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