AN EXAMINATION OF VARIATIONS ON CONSUMER BEHAVIOR PREFERENCES AMONG UNDERGRADUATE STUDENTS BY GENDER USING TECHNOLOGY

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Introduction

Marketing studies related to differences in preferences among males versus females have not had a long history, as research on organizational marketing strategies based on the gender of the consumer have been studied for a short duration of time. This study will analyze student preferences by gender through analyzing the cognitive reactions of undergraduate students in the classroom to a series of videos, and will examine whether the preferences of college students vary by gender.

Background

While studies on marketing segmentation have been gaining focus since the 1960s, this research has traditionally focused on demographics such as age, socioeconomic status, lifestyle, and geography. For instance, younger age consumers are coveted more by multinational organizations in their advertising efforts because younger consumers being loyal will make more money for those organizations' overs time. As such, marketing segmentation based on age has been increasing (Dolnicar et al., 2018).

A traditional staple of an organization's marketing strategy, television commercials (TVCs), have been studied to assess their impact on various age groups, specifically the preferences of children (Blanc, 1953; Resik et al., 1977; Jeffrey et al., 1980; Galst, 1980; Greer et al., 1982) and teenagers (Wainwright, 1980, Lee & Browne, 1995; Ross & Stein, 2008; Shea, 2008). Of particular relevance to the study of TVCs is the research on the effects on college students. In the past, the consumer behavior tendencies of college students have been studied to assess the impact of TVCs on topics such as economics (Paden, 1977), tobacco advertising (Crawford, 2014), and sexism (Kassin et al., 2010).

Over the past several decades, studies about consumer behavior tendencies and marketing segmentation have increasingly been focused on gender (Wolf, 2009; Meyers-Levy & Zhu; 2010; Otnes & Tuncay-Zayer, 2012; Moss, 2017; Dobscha, 2019; Zawisza-Riley, 2019). Consumer behavior analysis based on gender has uncovered tendencies that are often associated with one gender. For instance, Moss (2017) discussed how marketing should be designed by keeping in mind that men and women react differently to different colors, and that men prefer objects that are moving in TVCs more than women.

As segmenting based on gender has become widely adopted, more nuanced gender-based marketing has begun to be implemented. For instance, marketing based on gender has received attention in studies on political advertising (Sapiro et al., 2011; Zotos et al., 2018), children's advertising (Bakir & Palan, 2010; Foss, 2019), marketing ethics (Peterson et al., 2001; Lund,

2008), and viral marketing (Vesey, 2013). Nevertheless, Dobscha (2019) stated that gender in marketing has not yet received the focus and attention that it needs, and Moss (2017) warned that gender-related biases often arise when marketers do not consider differences in consumer behavior preferences based on gender.

Consumers have been fast forwarding or switching past commercials they aren't interested in for quite some time (Elpers & Pieters, 2003). Grindstaff and Turow (2006) predicted the emergence of a "video culture" (p. 103) in which organizations will increasingly employ digital-interactive technologies in marketing. Today, TVCs can easily be converted to digital form "at near zero marginal costs" (Waldfogel, 2017, p. 195). TVCs will take on similar digital technologies in the future, so that an organization's marketing is consistent across various platforms.

YouTube and other streaming services have adopted Facebook's model of allowing users to click a "thumbs up" or "like" to show approval for a video clip, whereas Twitter allows users to click a heart to display viewer approval. A "like" is and has been said to be a measure of self-esteem and self-work for young people today, and has become sought-after (Puccio & Havey, 2016; Freitas, 2017; Wolk, 2017; Desjarlais, 2019). "Like" has evolved into an all-encompassing term to describe approval (Singer & Brooking, 2018).

An abundance of "likes" for a musical artist can result in a deal from a record label, while constantly gaining a high number of Twitter hearts can result in an actor being cast in a film (Bishop, 2015; Kane, 2018). Truly, modern popularity is often attributed to the quantity of likes, to which organizations and marketers pay close attention. Further, organizations today spend time and resources in marketing via social media in hopes of obtaining likes (Anderson, 2010; Evans, 2012; Charlesworth, 2014; Kellett, 2017; Samuel, 2017; Bartnik, 2018; Dahl, 2018).

Organizations today spend huge amounts of money on marketing research to build their brands, and technology will play an increased role (Verklin & Kanner, 2007; Yunus, 2016). TVCs will continue to be a vital component of an organization's marketing budget, but will continue to evolve from television-specific to digital, in order to be easily integrated into technology-based online and social media marketing efforts (Newth, 2013; Speck, 2013; Watkins, 2018).

Methodology

Previous research on TVCs has used predictive studies, a type of experimental design used to ascertain when and in what situations an event will occur. In this model, the goal is to discover which types of commercials or attributes within commercials prompt viewers to react cognitively, leading to a specific consumer behavior response. Past studies attempted to form relational or causal hypotheses. The purpose of this study is to ascertain if gender differences exist among undergraduate students in their preference for TVCs.

This study analyzed the cognitive consumer behavior of undergraduate college students toward "classic" American TVCs spanning multiple eras. Specifically, a list of the 50 most influential commercials was developed based on various surveys of marketing industry specialists (Elliott, 1995; EW, 1997; Advertising Age, 1999; Kanner, 1999; Vancheri, 1999; Harry & Stall, 2002; Kanner, 2003; Smith, 2003; Plunkett, 2006; Riggs, 2006). Their cognitive reactions were gathered to gauge their response to these commercials in the same fashion that they react to videos on social media. An immediate reaction was preferred rather than after time to reflect and conduct further investigation.

The same commercials were shown to students in three institutions of higher education (two public, one private) from 2006-2019. The students surveyed were majoring in either a business-

or technology-related field. Each TVC was played in class in its entirety, along with a brief script introducing it. Students were then asked to rate each commercial on five components: 1) Marketability, 2) Memorability, 3) Likeability, 4) Chance of Success, and 5) Level of Classicness. Each item was ranked on a scale of 1 = very low, 2 = low, 3 = medium, 4 = high, 5 = very high. In addition, the 50 commercials were labeled as having a script intended to be humorous or comedic.

As such, the model contained the following discrete variables, which served as predictors, in the experimental design: 1) Gender, 2) Major, and 3) If the commercial was intended to be comedic (Humor). Since the various years in which the commercials were produced (Year) had so many values, the year was treated as a continuous variable in order to provide for the best explanation within the model. To best interpret the intercept within the model, the year was centralized and thus could take on any value (calculated as year = year – mean (years)). This process scaled its value, whereas the centered year = 0, or the mean value of all years.

To allow the algorithm to develop the relationships between variables to best predict future values (i.e., fit the model), a generalized linear mixed model was determined to be the best fit. This model is a type of predictor containing random and fixed variables in order to form hypotheses. In this instance, the commercials themselves served as random factors and were interpreted as to how they affected the relationships and interactions between Gender, Major and the Commercial, whereas the interactions among Gender, Major, Humor, and Year were designated as fixed factors.

By conducting this multiple hypothesis test (a style of Chi-square test or a more specific style of generalized linear model) to explain the variance (which is designed to test for homogeneity), the final model (including each interaction of the five components) of marketability and likeability is seen in the figures below. This study will utilize the marketability and likeability models below to assess student consumer behavior preferences by gender.

$$Marketability_{ijmk} = \text{Gender}_i + \text{Humor}_j + \text{Commercial}_k + (\text{Commercial} * \text{Major})_{jm}$$
$$+error_{ijmk}$$

$i = j = m = 1,2; k = 1,2,3 \dots ,50; \text{Commercial}_k \sim N(0,0.09488);$
$(\text{Commercial} * \text{Major})_{jm} \sim N(0, 0.0375), \text{error}_{ijmk} \sim N(0,0.83)$

Figure 1.
Model for Marketability

$$Likeability_{ijmk} = \text{Humor}_j + (\text{Gender} * \text{Major})_{im} + \text{Commercial}_k$$
$$+ (\text{Commercial} * \text{Gender})_{ik} + (\text{Commercial} * \text{Major})_{mk} + error_{ijmk}$$

$i = j = m = 1,2; k = 1,2,3 \dots ,50; \text{Commercial}_k \sim N(0, 0.193); error_{ijmk} \sim N(0, 0.982)$
$(\text{Commercial} * \text{Major})_{mk} \sim N(0, 0.059); (\text{Commercial} * \text{Gender})_{ik} \sim N(0, 0.026);$

Figure 2.
Model for Likeability

Results & Future Studies
Likelihood ratio tests were conducted to examine and analyze the different statistical models, using the variables in the above models to interpret how they interact with each other. Alpha = .05 was utilized; those variables testing at a *p*-value > .05 were not significant, and those at *p*-value < .05 were significant.

From the marketability model and likelihood ratio tests, it can be confirmed that "Gender" does have a significant effect on the mean of marketability, with a *p*-value < .05 (along with "Humor"). As seen in Figure 3, males are more likely to perceive the commercials as more marketable. Since this is statistically significant, it may be inferred that males tend to feel that commercials make the products and/or the organizations more marketable. Future researchers may wish to analyze what factors within the commercials prompt males to feel that the commercials were more marketable.
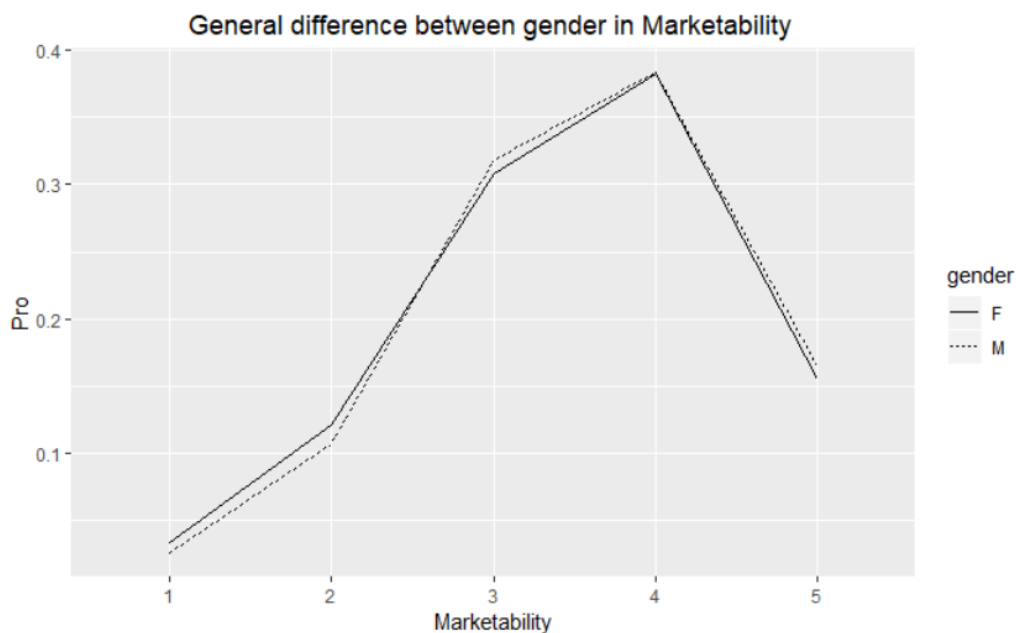

Figure 3.
Marketability Scores: Difference in Gender

From likeability model and likelihood ratio tests, it can be additionally confirmed that the interaction between gender and major has a significant effect on the likeability mean, with a *p*-value < .05 (along with Humor). Male students majoring in a technology-related field are more likely to perceive the commercial as being more likeable (see figures below). It would be interesting to investigate in future studies whether male students with proclivities to technology are more likely to feel that digital forms of classic commercials are more likeable since they are more relatable in the form in which they were viewed in class.
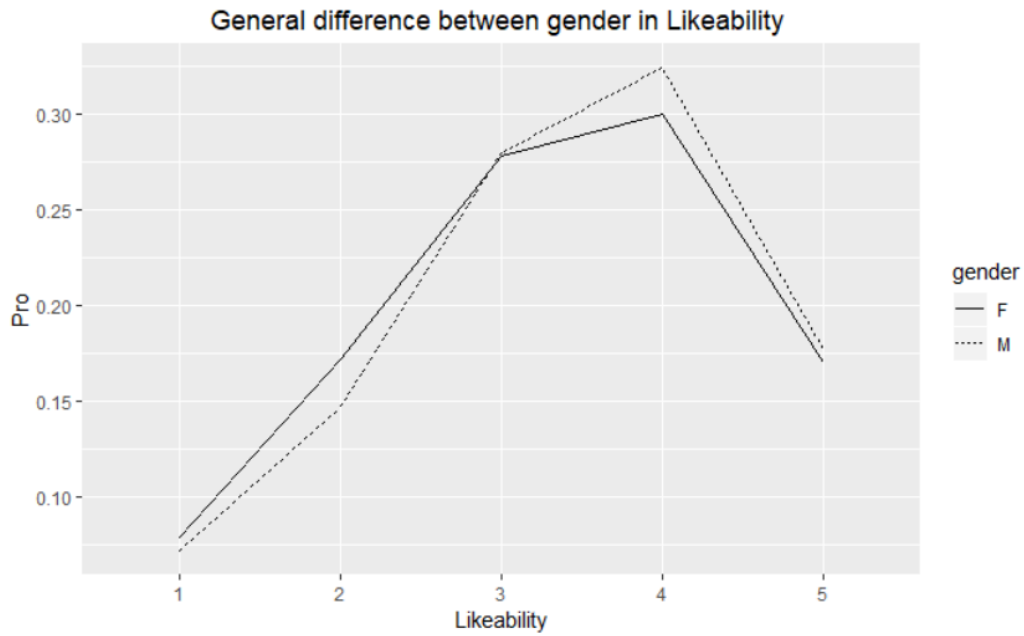
Figure 4.
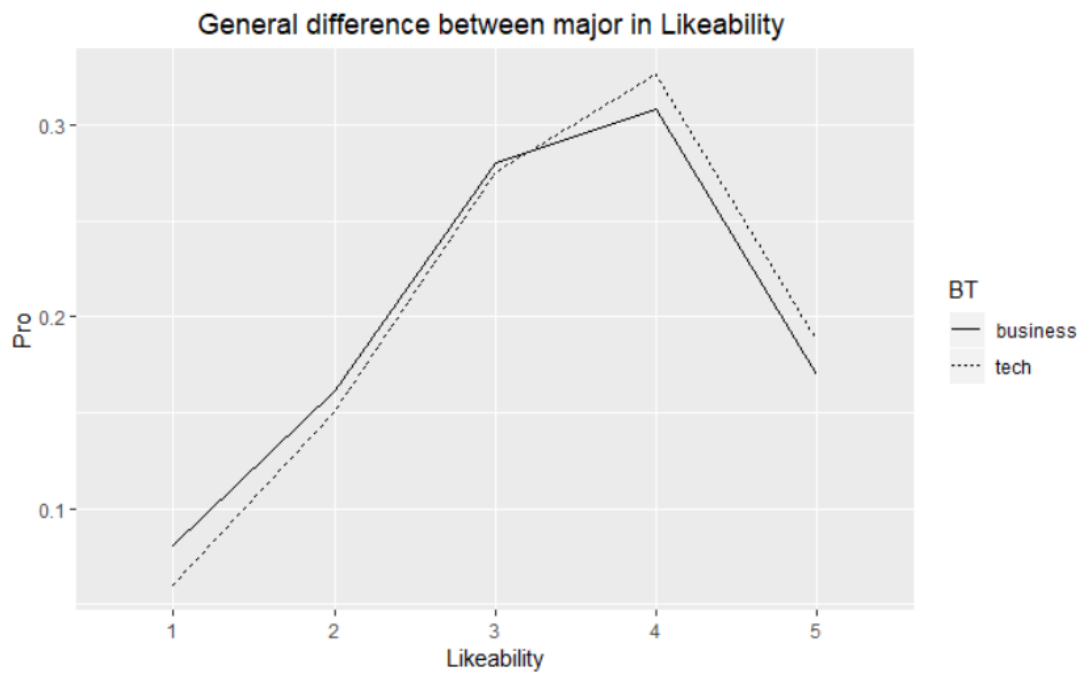*Likeability Scores: Difference in Gender*

Figure 5.
Likeability Scores: Difference in Major

Since it is not due to chance that the males found the commercials more marketable and likeable, future researchers should also analyze if allowing for time and reflection through assignments about the commercials might change the ratings by females or males of whether the brand and/or product in the commercial are more or less marketable compared to their immediate cognitive reaction elicited in class.

However, it should also be noted that just because a TVC is older or less modern does not indicate that younger viewers of both genders are not receptive to it and/or are likely to reject it. This may provide marketing researchers with more incentives to re-release older versions of their organizations' TVCs for younger demographics of consumers who may not be aware of the classic versions of the organization's past seminal advertisements.

Future studies may also cluster the TVCs into those that include movement and those that don't, since the Moss (2017) study found that men prefer objects that are moving in TVCs more than women. Since the commercials were probably created by men, especially the older ones, it would behoove future researchers to cluster commercials by category to ascertain which factors within the commercials are more liked by males. Future studies may additionally assess what proportion of these commercials were written, produced, and cast by males, and whether more modern commercials with female actors and scriptwriters were found to be more likeable by females. TVCs of the past may be inherently made with male characteristics in mind, since they were more likely to be put together by organizational brand campaigns made up of male employees.

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Appendix A.
Top 50 List of Classic American Television Commercials and Survey Data

Commercial Name	Year	Humor (Y/N)	Bus	Tech	M	F	N
Pepsi Michael Jackson	1983	N	162	46	104	105	209
Bartles & Jaymes "Thank You for Your Support"	1985	Y	150	59	104	105	209
Mr. Clean original	1958	N	148	47	101	94	195
Head On	2006	N	150	48	100	98	198
Grey Poupon	1987	Y	153	45	100	98	198
Gap Khaki's Swing	1998	N	149	55	97	97	194
Wendy's "Where's the Beef"	1984	Y	135	46	90	91	181
More Doctor's Smoke Camels	1949	N	167	49	105	111	216
Mars Blackmon Air-Jordan	1988	Y	132	53	93	92	185
1974 Ford Mustang	1974	N	133	53	96	90	186
Miller Lite (Taste Great Less Filling) Promotion	1978	Y	120	52	84	88	172
Lucky Strike Cigarette	1948	N	137	51	95	93	188
Like A Rock	1993-2004	N	132	50	97	85	182
1950 Gillette Razor	1950	N	139	47	99	87	186
Commodore Vic20	1982	N	139	48	97	90	187
California Raisins	1986	Y	114	48	88	74	162
Mama-Mia That's A Spicy Meatball	1969	Y	139	49	98	90	188
New Coke	1985	N	115	45	83	77	160
Talking Bud-Weis-Er Frogs	1995	Y	125	49	90	84	174
Bird vs. Jordan	1993	Y	155	48	104	99	203
I've Fallen and I Can't Get Up	1987	N	134	50	99	85	184
Energizer Bunny	1989	Y	72	52	67	57	124
Brain on Drugs	1987	N	139	48	98	89	187
Morning Again in America	1984	N	148	47	105	90	195

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Bo Knows…	1989	N	146	47	104	89	193
Nike: Revolution	1987	N	146	33	90	89	179
Apple McIntosh 1984	1984	N	145	41	102	84	186
Crash Dummies	1980's (series)	Y	137	46	99	82	181
Chevy in Technicolor	1940	N	137	46	96	85	181
Keep America Beautiful	1970	N	140	46	97	87	184
Dan vs. Dave	1992	Y	115	42	84	73	157
1958 Edsel	1958	N	136	44	97	83	180
Budweiser "wassuuup"	1999	Y	118	41	87	72	159
Manning Mastercard	2006	Y	127	45	95	77	172
Oscar Mayer	1973	N	131	48	99	80	179
Ray Charles/ Pepsi "You got the Right one Baby	1991	N	136	50	99	87	186
Volkswagen "Funeral"	1969	Y	137	49	100	86	186
Got Milk?	1993	Y	131	46	96	81	177
Little Penny Nike	1996	Y	130	44	93	81	174
Life Cereal	1972	Y	129	44	93	80	173
Kennedy Presidential Campaign	1960	N	126	45	92	79	171
Daisy Girl	1964	N	119	32	81	70	151
Magic Vs Bird	1986	N	87	52	75	64	139
GoDaddy.com	2005	N	34	11	22	23	45
Monster "When I Grow Up"	1999	Y	91	35	71	55	126
"I'd Like to Teach the World to Sing" Coke	1971	N	116	35	82	69	151
Max Headroom Coke	1986	N	101	35	72	64	136
Don't Squeeze the Charmin	50's-'70s (series)	Y	125	35	82	78	160
Federal Express "Fast Paced World"	1981	Y	101	34	70	65	135
Mean Joe Greene/ Coke	1979	N	125	36	84	77	161

Appendix B.

Commercials Counts Plot: Difference and non-difference based on Gender
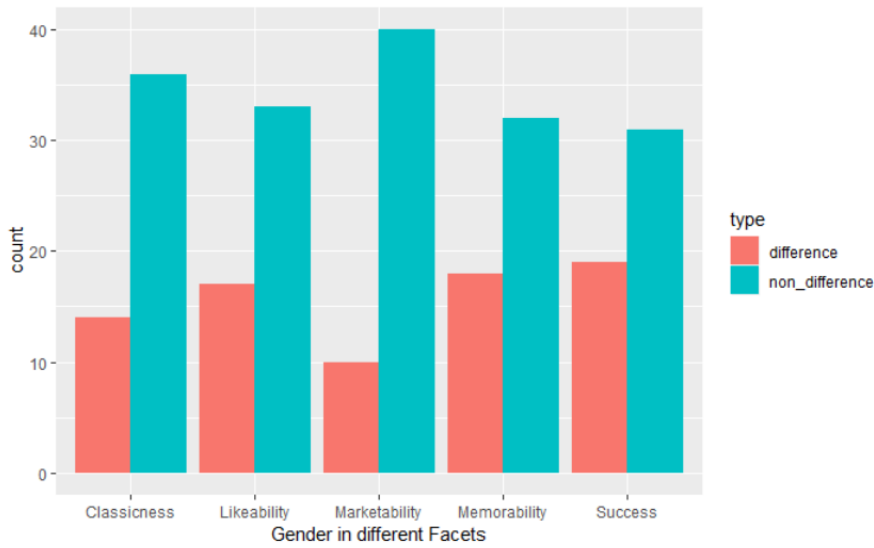
Appendix C.

Commercials Counts Plot: Difference and non-difference based on Major
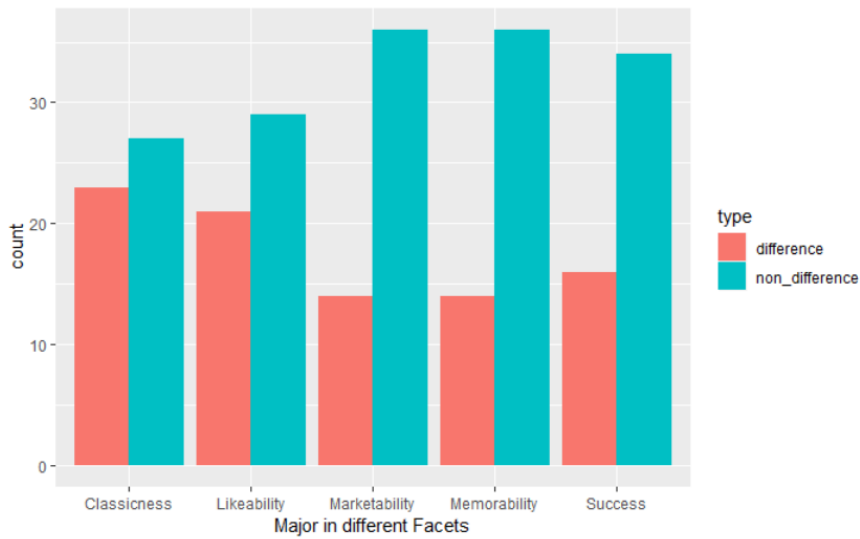
Appendix D.

P-value Data from Chi-square Test for All Commercials to Detect the Reaction in Terms of Gender and Major

	Marketability	**Likeability**
Gender	0.07614	0.007216

Appendix E.
Marketability Model's Code Output Report

```
Linear mixed model fit by maximum likelihood  ['lmerMod']
Formula: Marketability ~ gender + humor + (1 | commercial_index) + (1 |        commercial_index:BT)
   Data: data

     AIC      BIC   logLik deviance df.resid
 21829.1  21871.2 -10908.6  21817.1     8136

Scaled residuals:
    Min      1Q  Median      3Q     Max
-3.3793 -0.6262  0.0316  0.6878  3.1839

Random effects:
 Groups              Name        Variance Std.Dev.
 commercial_index:BT (Intercept) 0.03774  0.1943
 commercial_index    (Intercept) 0.09488  0.3080
 Residual                        0.83038  0.9113
Number of obs: 8142, groups:  commercial_index:BT, 100; commercial_index, 50

Fixed effects:
            Estimate Std. Error t value
(Intercept)  3.54842    0.04972  71.362
gender1     -0.02759    0.01116  -2.472
humor1      -0.11407    0.04965  -2.297
```

Appendix F.
Likeability Model's Code Output Report

```
> summary(Likeability_final)
Linear mixed model fit by maximum likelihood  ['lmerMod']
Formula: Likeability ~ gender:BT + humor + (1 | commercial_index) + (1 |
    commercial_index:gender) + (1 | commercial_index:BT)
   Data: data

     AIC      BIC   logLik deviance df.resid
 23207.4  23270.4 -11594.7  23189.4     8106

Scaled residuals:
    Min      1Q  Median      3Q     Max
-3.2549 -0.6896  0.0488  0.7736  3.1705

Random effects:
 Groups                  Name        Variance Std.Dev.
 commercial_index:BT     (Intercept) 0.05863  0.2421
 commercial_index:gender (Intercept) 0.02553  0.1598
 commercial_index        (Intercept) 0.19263  0.4389
 Residual                            0.98159  0.9908
Number of obs: 8115, groups:  commercial_index:BT, 100; commercial_index:gender, 100; commercial_index, 50

Fixed effects:
                  Estimate Std. Error t value
(Intercept)        3.50037    0.07849  44.598
humor1            -0.29215    0.07057  -4.140
genderF:BTbusiness -0.13269    0.06438  -2.061
genderM:BTbusiness -0.10351    0.05739  -1.804
genderF:BTtech    -0.22721    0.08827  -2.574

Correlation of Fixed Effects:
            (Intr) humor1 gndrF:BTb gnM:BT
humor1      -0.142
gndrF:BTbsn -0.432 -0.001
gndrM:BTbsn -0.370 -0.002  0.770
gndrF:BTtch -0.144  0.001  0.266     0.095
```