Assessing Consumer Behavior Components of Likeability Among Undergraduate Students Using Technology in the Classroom

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Abstract

Analysis of market research in Western society began in the early twentieth century and eventually spawned interest in the prediction of consumer behavior preferences. More recently, inquiry into consumer behavior patterns has focused on digital technologies and online platforms. Through a series of likelihood ratio tests, this study will assess cognitive reactions of undergraduate students to a compilation of classic American television commercials. Various components for determining likeability will be used in order to steer future market research and digital branding strategies.

Keywords: likeability, consumer behavior, television commercial, branding, digital technology

1. Introduction

There are numerous studies related to consumer behavior preferences of audiences. These studies have often focused on younger demographics, because young consumers will bring in revenue over longer durations of time and thus are coveted more by multinational organizations. Today, these studies are less likely to be based on traditional television viewing consumption and instead focused on viewers of digital media. This study will analyze the consumer behavior preferences of undergraduate college students by analyzing students' cognitive reactions to classic television commercials.

2. Literature Review

In the US, television commercials (TVCs) first gained mainstream marketing focus in the 1950s, when the percentage of Americans with a television grew from 9% in 1950 to 90% by the end of the decade (Library of Congress, 2018). The use of TVCs in the US accelerated in the 1960s, modeling an emerging consumerism that relied on buying products more often (Zapf, 2016). The impact of American TVCs was greatest during the golden era of the American television networks in the early 1980s, when most Americans had only the three major networks on their television sets. During this era, mainstream advertisements were the norm because the viewing audience was not yet fragmented into niche cable channels, and most viewers couldn't yet record their favorite shows or fast-forward through commercials like today's audience, who can choose streaming services like Hulu and pay more for premium packages that don't include commercials. Today, variations of TVCs are presented in the form of 10 to 15-second clips rather than the traditional 30-second form, usually before a longer video clip is accessed.

Over the decades, American TVCs have reflected the values, marketing trends, cultural tendencies, and even comedic tastes of Americans (Rutherford, 1994; O'Barr, 2010). TVCs have even been attributed as having an impact on America's culture of materialism. TVCs have been a staple of an organization's marketing focus since the advent of television itself. Yunus (2016) detailed how brand image can be enhanced through TVCs due to commercials' ability to help viewers "to *see* the opportunities" on their screens in a way that other media doesn't necessarily provide.

The popularity of TVCs has spawned numerous academic studies on their effects. These studies have focused on consumer behavior topics such as product wear out effects (Calder & Sternthal, 1980), variables prompting consumer acceptance (Belch, 1982), repetition and commercial length (Rethans et al., 1986), and consumer recall effects (Singh et al., 1988).

In particular, TVCs have been analyzed from the perspective of various consumer age cohorts to investigate their impact. Younger consumers are coveted more in multinational organizations' advertising because younger consumers who are loyal will make more money for those organizations over time. For instance, organizations pay

more for TVCs during programs with a younger demographic of viewers. Over the years, the impact of TVCs on 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) has been commonly studied. Of particular relevance to this study is the research on the effects of TVCs 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).

Pedagogies related to the utilization of technology in the classroom has been broadly studied (Tiene & Luft, 2001; Tiene & Luft, 2002; Bitter & Pierson, 2005; Schifter, 2008; Boles, 2011; Hicks, 2011; Rehmat & Bailey, 2014; Magana, 2017). In addition, the effect of technology in marketing and consumer behavior (Sweeney, 1972, Rust, 2006; Milne & Bahl, 2010; Belch & Belch, 2011; Moutinho et al., 2014: Simonson & Rosen, 2014; Spotts, 2014; Woersdorfer, 2017; Fasasi, 2019) have been studied for generations.

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. Twitter allows users to click a heart to display viewer approval. An abundance of "likes" for an 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. Truly, popularity is attributed to the quantity of likes, and organizations and marketers pay attention.

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), and has evolved into an all-encompassing term to describe approval (Havery & Puccio, 2016; Singer & Brooking, 2018). 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 in marketing research (Verklin & Kanner, 2007; Yunus, 2016). TVCs will continue to be part of an organization's marketing budget and will continue to evolve from television-specific to being integrated into technology-based online and social media marketing efforts (Newth, 2013; Speck, 2013; Watkins, 2018).

3. 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.

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). In efforts to gauge students' response to these commercials in the same fashion that they react to videos on social media, their cognitive reactions were gathered. An immediate reaction was preferred rather than after time to reflect and conduct further investigation because the like of a student is much like an instant reaction on a social media post, such as when someone immediately decides whether to click the "thumbs-up" or other synonymous symbol of a "like". As such, commercials were intended to analyze the likability, whereas young people today rate how much they "like" these classic, influential commercials of the past.

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 Classic-ness. 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 for each interaction of the five components was determined (see appendix). The final model for "likeability" is seen in Figure 1 below.

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

Figure 1. Model for Likeability

4. Results & Future Studies

Likelihood ratio tests were conducted to examine and analyze the different statistical models, using the variables in the above model 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 likeability model and likelihood ratio tests, it can be confirmed that the "Year" in which the commercial was produced does not have a significant effect on Likeability, with a p-value > .05. However, the same tests show that "Humor" and the interaction of "Gender" and "Major" have significant effects on the likeability mean, with p-values < .05. These variables are deemed significant and thus do play an important role in Likeability (see the model summary's code output report of the commercial dataset below). Males majoring in a technology-related field tended to like the commercials more so.

```
> 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
```
Figure 2. Likeability Model's Code Output Report

Figure 3 is a visual depiction of the relatively higher scores of likeability attributed by males. Since the average scores of males majoring in technology rated the commercials at a statistically significant rate for likeability, it may be inferred that they tend to feel that commercials make the products and the organizations more likeable. Future researchers may wish to assess which of these commercials were written, produced, and cast by males employed in technology-related fields, and whether more modern commercials with female actors and scriptwriters were found to be more likeable by females.
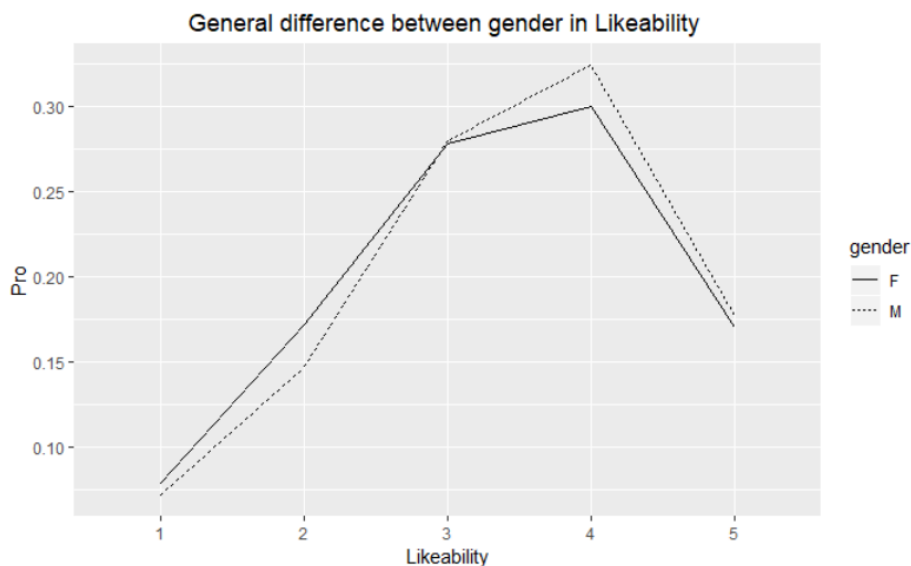

Figure 3. Likeability Scores: Difference in Gender

Figure 4 shows the difference in likeability scores by major. Students majoring in technology-related fields generally rate likeability of the commercials at higher rates, but not significantly, unless they were also male students. Subsequently, it may be pondered for future studies whether male students with proclivities to technology in general 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.
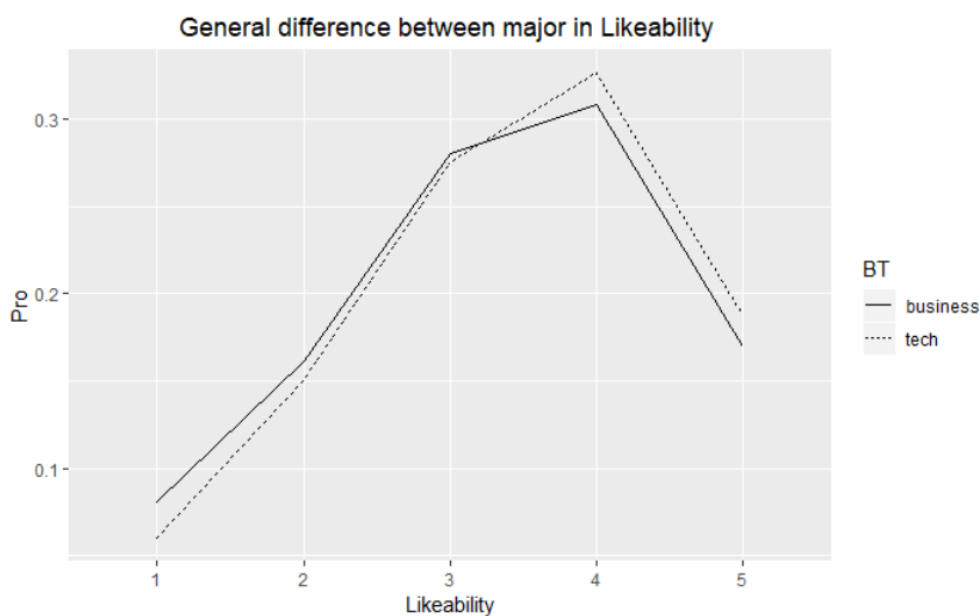

Figure 4. Likeability Scores: Difference in Major

In addition, more humorous commercials generally rated higher in likability, with a *p*-value < .05, which means that it is not likely to be due to chance that commercials intended to be funny were more likely to be perceived as more likeable. However, it should be noted that several commercials that were unintentionally funny ("campy") were not considered in the sample set of commercials labeled "Humor". In addition, since the year in which the commercial was produced does not have a significant effect and/or interaction on likeability, it may also be ascertained that just because a TVC is older or less modern does not indicate that younger viewers are not receptive to it and/or are likely to reject it just based on age. This may provide those in an organization more incentives to re-release older versions of their organizations' TVCs for younger demographics of viewers who may not be aware of the classic versions of the organization's past seminal advertisements. Organizations with classic commercials from the past may wish to take the opportunity to re-release them in digital form for new generations of viewers to gain likes.

Since it is not due to chance that the males found the commercials more likeable, future studies should analyze whether allowing for time and reflection through assignments and research about the commercials prompts males to feel the brand and/or products in the commercial are less marketable than the cognitive reaction from class. Furthermore, streaming services that employ models of allowing users to click a "thumbs up" or "like" to show approval for digital videos.

Segmentation based on gender should be at the forefront of market research. Future researchers may also assess whether technology-related majors rated the commercials higher in likeability compared to all other majors (not just business-related majors). While much attention in the field of marketing segmentation has been based on the age of the consumer, more attention should be spent on consumer behavior assessment based on gender.

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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
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.

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

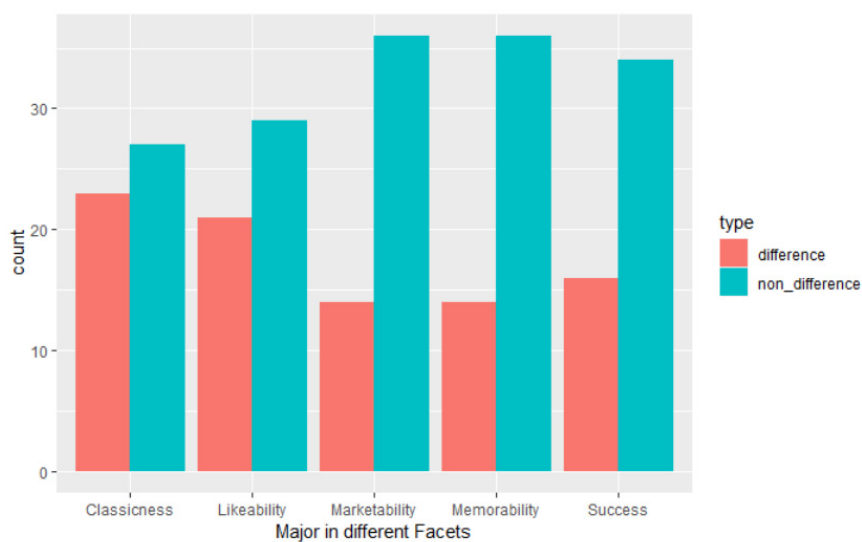|	Likeability
Gender	**0.007216**
Major	**0.001884**

Appendix C.

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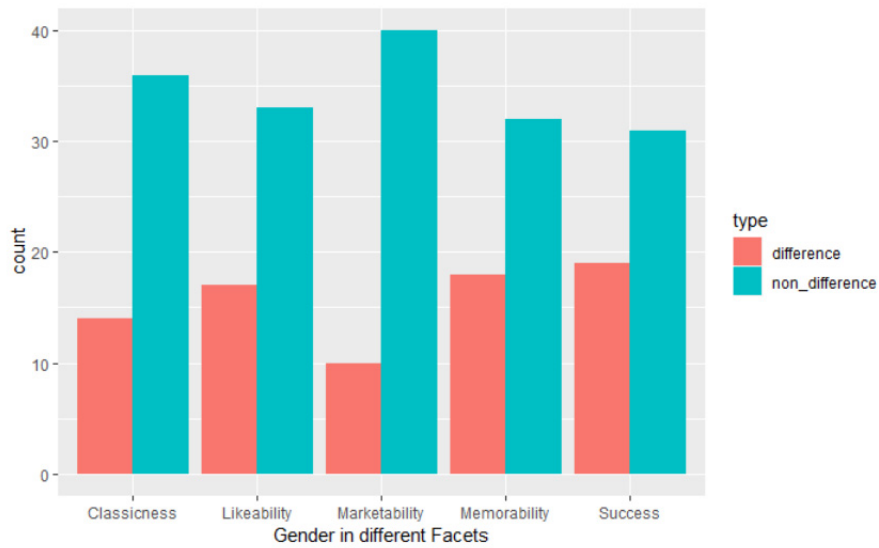
Appendix D.

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

Appendix E.

Model for Memorability

$$Memorability_{ijmk} = \text{Gender}_i + \text{Humor}_j + \beta(\text{Year}_{ijmk} - \overline{year}) + \text{Commercial}_k \\ + (\text{Commercial} * \text{Gender})_{ik} + (\text{Commercial} * \text{Major})_{mk} + error_{ijmk}$$

$i = j = m = 1,2; k = 1,2,3 \dots ,50;$

$\text{Commercial}_k \sim N(0,0.12269); (\text{Commercial} * \text{Major})_{mk} \sim N(0,0.058);$

$(\text{Commercial} * \text{Gender})_{ik} \sim N(0,0.0175); error_{ijmk} \sim N(0,0.992)$

Appendix F.

Model for Marketability

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

$i = j = m = 1,2; k = 1,2,3 \dots ,50; \text{Commercial}_k \sim N(0,0.09488);$

$(\text{Commercial} * \text{Major})_{jm} \sim N(0,0.0375), error_{ijmk} \sim N(0,0.83)$

Appendix G.

Model for Chance of Success

$$Success_{imk} = \text{Gender}_i + \text{Commercial}_k + (\text{Commercial} * \text{Gender})_{ik} \\ + (\text{Commercial} * \text{Major})_{mk} + error_{imk}$$

$i = m = 1,2; k = 1,2,3 \dots ,50; \text{Commercial}_k \sim N(0,0.149); (\text{Commercial} * \text{Major})_{mk} \sim N(0,0.045); (\text{Commercial} * \text{Gender})_{ik} \sim N(0,0.0169); error_{imk} \sim N(0,0.905)$

Appendix H.

Model for Classsicness

$$Classicness_{ijmk} = \text{Gender}_i + (\text{Gender} * \text{Humor})_{ij} \\ + (\text{Humor} * \text{Major})_{jm} + (\text{Gender} * \text{Major})_{im} + \beta(\text{Year}_{ijmk} - \overline{year}) \\ + \text{Commercial}_k + (\text{Commercial} * \text{Major})_{mk} \\ + (\text{Commercial} * \text{Gender} * \text{Major})_{imk} + error_{ijmk}$$

$i = j = m = 1,2; k = 1,2,3 \dots ,50; \text{Commercial}_k \sim N(0,0.124); error_{ijmk} \sim N(0,1.075)$

$(\text{Commercial} * \text{Major})_{mk} \sim N(0,0.07557); (\text{Commercial} * \text{Gender} * \text{Major})_{imk} \sim N(0,0.01547);$

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