Measuring Gender Stereotypes Using Readability Indexes On Advertising Ad Copy

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Abstract: Gender stereotypes can have negative influences on audiences, especially when considering children. In this study, we argue that professionals who create advertising ad copy - words used in advertisements - are influenced by biased views of gender. We collected 405 toy ads and transcribed the advertising copy, using readability indexes (Automatic Readability, Coleman Liau, Gunning Fog) to compare the level of advertising copy complexity for ads directed to girls, boys, and mixed audiences. Our findings showed that boys' ads were more complex than ads for girls, and ads aimed at both genders presented slightly mixed results but leaned towards being more complex than those for boys. The results suggest that advertising agencies are patronizing female audiences by producing ads that are less complex, despite several studies demonstrating that girls develop earlier than boys. These findings underscore the need for toy companies to be more mindful of the complexity of their ads and their impact. The study sheds light on the role of gender stereotypes in advertising and provides insights into how toy companies can create more inclusive and representative ads.

Key Words: gender stereotypes, readability indexes, advertising copy.

Track: Advertising & Marketing Communications

1. Introduction

Can you remember an occasion when you witnessed an adult talking down on children? Did you feel the children's anguish? Now imagine brands doing this to their customers for years without knowing it? And worst of all, doing this by using a gender stereotype that belittles girls. This paper investigates how toy brands treat girls as underdeveloped to same-aged boys, even in sight of developmental theories that would suggest the opposite. We do so by looking into advertising copy of ads—words, spoken or written, used in advertisements (Abruzzini, 1967)—and calculating readability indexes that use quantity and length of words and sentences to measure complexity (Smith; Kincaid, 1970; Kincaid et al., 1975).

Studies on gender stereotyping in advertising to children have focused on several characteristics of the ads, such as gender of the models, the number of actors, age of characters, types of interactions, production techniques, appeal (rational vs. emotional), and voice-overs, but have overlooked the possibility of using readability indexes to measure the complexity of advertising copy in advertising to children as a tool for identifying gender-stereotyped behavior by creatives in advertising agencies. We argue that the complexity of advertising copy happens on assumptions that creatives working in advertising agencies have on their target markets. The more knowledgeable they feel the audience is, the more complex the ad will be, and vice-versa.

Since excessive complexity of ad copy can hurt comprehension and recall, it is important to measure if the ad is adequate to the target-market. When designing ad copy for children the creative process becomes challenging for three reasons. First, adults have difficulties in comprehending a child's perspective. Second, boys and girls develop in different time frames, with girls presenting superior cognitive skills at earlier ages (Adani; Cepanec, 2019). Finally, ad agencies are dominated by male executives (Maheshwari, 2017) and a workaholic "Macho" environment (Nixon; Crewe, 2004) that can be a fertile ground for stereotype behavior.

We analyze 405 toy ads collected from YouTube and classify them as oriented to boys, girls, or both. Based on each toy-ad ad copy, we calculate several measures of complexity (e.g., Automatic readability, Coleman Liau, and Gunning Fog) to understand if the same level of complexity is directed to both boys and girls.

2. Theorethical background

2.1 Readability Indexes

The first known readability tests were developed by Rudolph Flesch in the 1940s. However, their popularization intensified in the 1970s with adjustments made by Peter Kincaid and a team of Navy researchers, making the test easier to apply (Abruzzini, 1967).

In general terms, readability can be defined as reading ease, especially as it results from a writing preference. Logically easy reading text improves comprehension, retention, reading speed, and reading persistence. Ease-of-reading is the result of the interaction between the text and the reader. For readers, those features affecting readability are knowledge, reading skill, and motivation. For text itself, those features are content, style, and design (Dubay, 2004). Deeply, readability relates to the linguistic complexity of the text, particularly to the semantic and syntactic dimensions (Chebat et al., 2003). There are several examples of the use of readability indexes, such as print media (Trenchard; Crissy, 1952; Bruno, 1974; Wesson, 1989; Williams; Beard; Kelly, 1991; Sheehan, 2006; Kondilis et al., 2010) and television advertising (Lowrey, 2006; Kim et al., 2016; Lee; Huhann; Yun, 2020; Guido et al., 2020). Within television advertising, the focus has been on the impact of ads' complexity on comprehension (Lee; Huhann; Yun, 2020) and recall (Lowrey, 2006; Kim et al., 2016).

2.2 Developmental theories and advertising to children

When considering advertising to children, we can observe that the readability of advertising copy becomes especially relevant. As children develop, they start to process the knowledge of words, understand text and their different capability levels in reading, and eventually deal with increasingly complex text (Kail, 2015; Piaget, 2002; John, 1999). If practitioners, when developing advertising copy, don't take into account this developmental process, they could be developing ads that are not well suited to their target audience's current capacity. There is evidence that girls develop earlier than boys do (Ardila et al., 2011; Hyde; Linn, 1988). More specifically, classic reports have highlighted that girls possess superior languages abilities from early age to maturity (e.g., Anastasi, 1958; Maccoby; Jacklin, 1974).

For example, there is a recurring issue that boys have an inferior progress in writing development on tests, tending to create simpler and shorter compositions with fewer correctly

spelled words when compared to girls (Adams; Simmons, 2019). Also, Reynolds et al. (2015) noted that tasks with reading, spelling and writing throughout childhood are better performed by girls. Based on these differences, distinct levels of advertising copy complexity are desired when aiming at girls versus boys.

3. Method

The purpose underlying our procedure was to collect online toy ads from companies operating in Brazil. Our procedure for searching for ads relied upon searching for brands and companies' online presence from the toy industry. We did this using a series of search keywords that originated from three complementary approaches: (1) members of the Brazilian Toy Manufacturers Association – ABRINQ; (2) top 20 toy sellers in Brazil; and list of major toy retailers. This effort generated a list of brands and companies that coupled with a series of keywords ("toys," "advertisements," "commercials," "ads," "children") allowed us to search online repositories (e.g., Google, Yahoo, YouTube, and Vevo) and construct a database composed of 452 ads from 37 different companies, including many of the top 20 toy sellers. These ads had been seen more than 50 million times on YouTube.

Finally, we coded the number of characters, words, sentences, and complex words (3 syllables or more) per advertisement to calculate readability indexes. The coding was done using the transcription of the ads' advertising copy, resulting in 24,666 words used in 3,683 sentences, with 4,705 complex words. The ad focus's coding procedure showed that 154 ads focused on boys, 183 on girls, and 115 were neutral. Most of these ads had 30 seconds or less (97.7%). These ads came from 44 different companies. The top 10 companies in ads were responsible for 77% (349) of the ads. For our analysis, we used three readability indexes: Automatic readability, Coleman Liau, and Gunning Fog indexes (see Table 1 for formulas). These indexes rely on formulas that use the number of words, the complexity of words, length of sentences to calculate the level of complexity of a given text (Smith and Kincaid, 1970; Kincaid et al., 1975): Automated readability index-ARI based on the following formulae = 4.71* (characters/words) + 0.5 * (words/sentences) - 21.43; Coleman Liau Index-CLI based on the following formulae = 0.0588L - 0.296 * S - 15.8; L stands for average number of letters per 100 words and S average number of sentences per 100

words); Gunning Fog Index - GFog based on the following formulae = 0.4 * [(words/sentences) + 100 * (complex words/words)].

4. Analysis and Discussion

In table 1 we present the results of the analysis for all ads, using the subsequent notation is used: "a" means that the result is significant (p<.005, otherwise noted) different from "Ads for Boys; "b" relates to "Ads for Gils" and "c" to "Neutral ads" within the analysis of each index. We also included in our analysis complex words (with three or more syllables) and words per sentence, since these are the drivers of higher readability indexes.

Table 1: ANOVA Results for all 452 ads

All ads	**Ads for Boys**	**Ads for Girls**	**Ads for Boys and Girls**	**F**	**Sig**
Number of Ads	154	183	115		
Automated readability index	5.40[bc]	4.30[a]	4.10[a]	14.053	.000
Coleman Liau Index	8.80[bc]	7.40[a]	7.20[a]	15.386	.000
Gunning Fog Index	11.90[bc]	9.50[a]	10.00[a]	27.505	.000
Complex Words	12.78[bc]	9.35[a]	10.10[a]	18.576	.000
Words Per Sentence	7.47[b]	6.61[ac]	7.38[b]	8.627	.000

Source: Data analysis

Passages of text with more extensive sentences, with bigger words, receive higher indexes, signaling that the level of complexity is higher. Besides that, it becomes clear from our analysis that advertisements with more prominent phrases and words impact boys. When asked to create scripts for boy ads, these results tell us that screenwriters tend to use more complex language than when writing scripts for girl ads. Results demonstrate that ads for boys are more complex than ads for girls in all cases, and except for Words Per Sentences, ads for boys are also more complex than ads for a mixed audience. Ads for girls are not significantly different from ads for boys and girls. Veloso, Hildebrand, and Srewnewsky (2017) identified differences in advertising strategies regarding disclaimer use in toy advertising between companies from Brazil and the United States. Therefore we conducted another ANOVA analysis focusing on the headquarters origin of the company behind the toy ads. This resulted in 121 ads from the US and 331 from Brazil. We present these results in Tables 2.

Table 2: Companies headquarters from the US and Brazil

US	**Ads for Boy**	**Ads for Girls**	**Ads for Boys and Girls**	**F**	**Sig**
Number of Ads	42	59	20	-	-
Automated readability index	5.44[bc]	4.06[a]	3.35[a]	7.576	.001
Coleman Liau Index	8.89[bc]	7.02[a]	6.09[a]	8.175	.000
Gunning Fog Index	11.50[bc]	8.89[a]	8.75[a]	12.039	.000
Complex Words	12.64[bc]	8.76[a]	7.70[a]	10.056	.000
Words Per Sentence	7.59[b]	5.91[a]	6.57	12.052	.000
Brazil	**Ads for Boy**	**Ads for Girls**	**Ads for Boys and Girls**	**F**	**Sig**
Number of Ads	112	124	95	-	-
Automated readability index	5.37[bc]	4.41[a]	4.26[a]	7.825	.000
Coleman Liau Index	8.76[bc]	7.52[a]	7.42[a]	8.508	.000
Gunning Fog Index	12.00[bc]	9.78[a]	10.23[a]	16.786	.000
Complex Words	12.83[bc]	9.70[a]	10.62[a]	10.406	.000
Words Per Sentence	7.43	6.95	7.56	2.489	.000

Source: Data analysis

Results from Table 2 repeat results from Table 1, thus demonstrating that the company's origin does not explain differences in advertising copy in children's toy ads. Both Brazilian and American companies are developing ads for boys that, in general, are more complex than ads for girls and more complex than ads for boys and girls. Ads for girls and ads for boys and girls maintain the same level of complexity. Our final analysis focused on the age of children. Children's development theories posit that children go through different development phases, with major language changes, social cognitive skills happening between 7 as 12 (Kail, 2015; Piaget, 2002; John, 1999). This classification resulted in 159 ads for children under six years old, 221 for children between seven and nine, and 72 for children over ten years old.

Table 3: Ads targeted at children by age

Age - up to 6 years old	**Ads for Boy**	**Ads for Girls**	**Ads for Boys and Girls**	**F**	**Sig**
Number of Ads	46	77	36	-	-
Automated readability index	4.90	4.33	4.39	1.110	.332
Coleman Liau Index	8.15	7.32	7.7	1.472	.233
Gunning Fog Index	11.37[b]	9.13[a]	10.40	7.779	.001
Complex Words	10.91[b]	8.62[a]	9.86	3.225	.043
Words Per Sentence	7.59[b]	6.58[a]	7.13	3.350	.038

Age - from 7 to 9 years old	**Ads for Boy**	**Ads for Girls**	**Ads for Boys and Girls**	**F**	**Sig**
Number of Ads	79	83	59	-	-
Automated readability index	5.63[bc]	4.20[a]	3.58[a]	16.898	.000
Coleman Liau Index	9.12[bc]	7.29[a]	6.53[a]	17.329	.000
Gunning Fog Index	12.04[bc]	9.71[a]	9.31[a]	19.358	.000
Complex Words	13.61[bc]	9.93[a]	9.62[a]	13.049	.000
Words Per Sentence	7.33[b]	6.49[ac]	7.53[b]	6.388	.002
Age - above 10 years old	**Ads for Boy**	**Ads for Girls**	**Ads for Boys and Girls**	**F**	**Sig**
Number of Ads	29	23	20	-	-
Automated readability index	5.49	4.53	5.10	.888	.416
Coleman Liau Index	8.95	7.76	8.24	1.041	.359
Gunning Fog Index	12.17[b]	9.95[a]	11.14	3.218	.046
Complex Words	13.43[b]	9.65[a]	12.00	2.923	.061
Words Per Sentence	7.66	7.17	7.38	.246	.783

Source: Data Analysis

Results from the age analysis (Table 3) indicate that younger children's results are similar to the previous analysis, meaning that ads for boys are more complex than ads for girls and ads for a mixed audience (boys and girls). For children over 10, this difference in complexity tends to disappear. If we take into account the problems in age classifying the ads, we cannot ascertain a specific age for when these differences in complexity start to disappear, but we can argue that at some point, the ads for boys and the ads for girls will have the same level of complexity. We can also say Ads for a mixed audience are also less complex than ads for boys and hold similarities with girls' ads. Results for the mixed audience were inconclusive compared with ads for girls because we did not identify any significant differences in the ANOVA analysis, and the absolute averages are sometimes higher for girls and sometimes are higher for boys and girls.

To understand gender stereotypes in advertising it's important to understand the dynamics of this industry. The advertising industry is permeated with gender issues, including gender discrimination against women, a gender pay gap, and a glass ceiling effect barring women from top executive positions (Stein, 2016). This situation is fueled by the prevalence of male directors in creative positions (Maheshwari, 2017). To combat these gender issues in developed countries, several organizations have been organizing initiatives. For instance, the Association of National Advertisers launched the GEM™ (Gender Equality Measure) to assess realistic and accurate portrayal of girls and women in advertising and media (Kerr, 2018; Lacy, 2017). Additionally,

Steinberg (2018) reports on big advertising agencies from Madison Avenue agreeing on presenting more accurate portrayals of women and girls by the year 2020. These are initiatives that need to be extended to developing countries to diminish the extensive use of gender stereotypes in advertising.

5. Conclusion

Ads for girls are made more simply. Why is that? Since widespread knowledge would say that girls develop earlier, the opposite would be expected, even considering that these differences are small (Ardila et al., 2011; Hyde; Linn, 1988). Ads for a mixed audience (boys and girls) are also made simpler. Having ruled out that differences in development could explain this, we suppose that the male-dominated advertising industry has been doing so in an unconscious way. Gender stereotypes are so incorporated into advertising professionals' mindset that they transpose this to the advertising copy of ads.

These results show that advertising professionals are not only disregarding scientific knowledge about childhood development, but they are also doing a poor job in understanding their target audience and developing optimal work. When we take child development theories into account, we have evidence that girls develop earlier. Therefore, simpler ads for girls have two consequences: they are not well suited for their target audience, and they reinforce gender stereotypes that ultimately hinder girls' development (Bian; Leslie; Cimpian, 2017; Mckenney; Bigler, 2016).

Additional studies are needed to confirm our analysis, mainly because we can only ascertain that ads for boys are more complex than their counterparts based on our results. There have been movements trying to increase women's participation in this area, particularly the 3% Movement, which claims to have fueled the growth of women participation from 3% to almost 10% (Maheshwari, 2017).

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