L’Oreal Print Ad Designs with Eye-Movement Data

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Executive Summary

This memo reviews our critical findings on assessing the brand L'Oréal's effectiveness of print ad designs and providing recommendations for improvement. To create convincing suggestions for L'Oréal, our team used generalized linear models (GLM) with brands categorized by industries and derived variables. Compared with other brands, our team concluded that L'Oréal is underperforming in terms of print ads designs' effectiveness. Our analysis revealed that placing ads on latter pages with right-position and increasing the size of elements could contribute to the design's effectiveness.

Introduction and Background

Nowadays, many magazines dedicate more than half of their pages for ads, but it becomes more difficult to attract consumers' attention to the brand's enduring memory. To achieve this goal, advertisers need to understand how consumers pay attention to print ads and how different factors contribute to the advertised brands' memory.

In the provided dataset, inconsistent fixations and the time and accuracy of recall towards different brands make it challenging to capture respondents' physiological activities to conclude brand improvement recommendations. We created eight joint-effect variables to capture the interactions among each related variable and by using the predictions metrics to drive the final decisions.

Data and Methodology

The *printads* dataset provides the subjective data of how 88 respondents reacted *(brand_fix, pic_fix, recall_accu, recall_time)* and objective data of the 35 brand ads size and placement *(page_num, page_pos, brand_size, pic_size).* Summary statistics were acquired via a series of means and correlation procedures in SAS. The team compared L'Oréal to those of the entire set of brands as well as those of its product category, personal care brands.[1]

Brand Fixations. We used a Poisson regression model to describe the effect of various variables on brand fixations, or the number of times a viewer focuses on the brand elements (e.g., logo). This model addressed key variables L'Oréal can optimize in their advertising to achieve greater brand fixations. We tested the following variables: surface size of the brand element, page positioning, fixation count of the pictorial element, page number that the ad appears on, interaction of page position and pictorial fixation, interaction of page number and page number (an acceleration metric), and interaction of page number and pictorial fixation. After testing many variables, our best model resulted in a BIC of 11847.29.[2]

Pictorial Fixations. A Poisson distribution model can also be applied to the data to better comprehend the effects of the different ad components on pictorial fixations. We started with a basic model to capture variables such as surface size of the pictorial element, page number where the ad appears and page position of the ad. Then, we added in the interactions between page number with page number, brand size with brand fixation count, page position with brand

[1] See appendix 1 for information on the dataset and select descriptive statistics.

[2] See appendix 2 for model results and a predicted probability example.

fixation count, as well as adding in a dummy variable that indicates if the brand is categorized under personal care. Using these variables, our best model yielded a BIC of 20158.76.

Brand Recall. We fit a binary logit model to brand recall to better understand what drives accurate recall. We compared the mean of respondents' recall time of all brands to observe variations in recall across brands. Then we coded a binary model to address key variables that L'Oréal can optimize in improving their brand recall accuracy. We tested the following variables: the respondents' fixation in terms of brand and pictorial elements, page positioning, the joint effect of brand size and page positioning, and the joint effect of page number and page positioning. Similar models were compared on the BIC criterion, with this present model returning the lowest BIC of 4076.88.

Key Findings

Within its category, as well as overall, L'Oréal ranked below average in all relevant metrics. The average pictorial fixations for L'Oréal ads was 2.69, whereas the average in ads for personal care brands was 5.26, and the average for all brands was 4.90. L'Oréal had an average number of brand fixations of 0.56, while personal care brands had 1.56 fixations and the overall average was 1.71. Finally, L'Oréal ads had a brand recall rate of 18.2% whereas the average rate for personal care brands was 46.7% and the overall average recall rate was 51.4%. In terms of the time of brand recall, among the 16 participants who accurately recalled L'Oréal, it took 3.13s to answer this question, far longer than other brands. These findings suggest that the L'Oréal brand elements were not clearly communicating the brand.

Personal care brands had a higher average pictorial size (70.3 sq in) than the average of all brands (67.5 sq in), which gave them, on average, higher numbers of pictorial fixations. A larger pictorial size is supposed to increase pictorial fixations (confirmed in models discussed here), as well as the relationship between the variables, which was positive and moderately strong (coefficient 0.20). Similar to the relationship between pictorial size and pictorial fixations, a larger logo size improves brand fixations, as explained by their strong correlation (coefficient 0.35), and lightly increases brand recall (coefficient 0.12). Personal care products had, on average, smaller logo sizes on their ads which is why they had lower brand fixation counts and lower brand recall.

Brand Fixations. We concluded that increasing the surface size of the brand element, additional pictorial fixations and further back of magazine ad placement all contribute to increased brand fixations. One variable that stood out as having the greatest impact on increasing brand fixations was positioning ads on the right side of the page rather than the left, this resulted in an 84% increase in brand fixations.

Pictorial Fixations. We see that when the picture size increases by 1 square in in surface size, pictorial fixation from the customer increases by 1.02%. Though this is smaller in magnitude than the roughly 7% increase in brand fixation with every additional square in surface size of the brand element, there is still a slight positive impact of increasing pictorial size on the page.

Brand Recall. Greater pictorial fixations drove higher recall, as did the joint effect of page number and page position and the joint effect of page number and page position; each of these

effects incrementally improved recall accuracy (5% and 1% higher odds, respectively). It is important to note that this model alone suggests left-hand page ads result in 40% higher odds of recall, though this does not align with earlier results. Given the significant effect of right-hand ads on brand fixations, and these fixations' role in recall, right-hand ads are still preferred.

Conclusions and Recommendations

We recommend L'Oréal expand the size of their ad, stretching the pictorial size beyond the existing 52.58 sq in and the branding elements beyond the current 4.38 sq in size. There is a relatively strong correlation between elements' size and the corresponding fixations and the current ad does not prominently display the imagery that produces accurate brand recall. In fact, generating more brand fixations would also increase the fixations on pictorial elements and vice versa, generally increasing the time viewers spend looking at the ad. In fact, competitors with larger logos and images (e.g., Nivea) benefited from these investments because their ad memorability rates were higher.

L'Oréal should consider placing their ad further back in the magazine. In addition to its small size, the current ad is hindered by its early placement (on page 5). Despite its right-hand placement, the ad only resulted in a maximum of 5 brand fixations and 15 pictorial fixations. Brand fixation model results demonstrate the importance of a right-hand placement, highlighting that right-hand ads increase brand fixations by 84% over left-hand ads. Accordingly, L'Oréal must ensure future ads are on the right hand side. This decision will result in significantly higher brand fixations which will offset the minor improvement in recall observed among left-hand ads.

Specifically, we recommend the brand consider placing the ad on page 105. Even if L'Oréal keeps the same size ad as the current magazine, and only changes its page number, recall would rise to 88% (compared to its current predicted recall of 67% on page 5). Recall would exceed this example rate if L'Oréal also accounts for our other recommendations of increasing the brand and pictorial elements' size. Taken together, these recommendations demonstrate numerous ways L'Oréal can improve upon their existing advertisement and maximize impact.

Appendices: Tables, Exhibits, Figures

Appendix 1: Data Set and Descriptive Statistics

Variable	Description
RESPONDENT_ID	Number of a respondent
AD_ID	Number of an ad
BRAND	Brand name of the product in an ad
PAGE_NUM	Page number in the magazine where an ad appears
PAGE_POS	Right-side (1) vs left-side position (0)
BRAND_FIX	Fixation count of the brand element
PIC_FIX	Fixation count of the pictorial element
BRAND_SIZE	Surface size of the brand element (in^2)
PIC_SIZE	Surface size of pictorial element (in^2)
RECALL_ACCU	Accurate (1) vs inaccurate (0) recall of brand
RECALL_TIME	Time it takes a respondent to answer brand recall
interaction1	Derived: page_pos*pic_fix
interaction2	Derived: page_num*page_num
interaction3	Derived: brand_size*brand_fix
interaction4	Derived: page_pos*brand_fix
interaction5	Derived: brand_size*page_pos
interaction6	Derived: page_num*page_pos
interaction7	Derived: page_num*pic_fix
interaction8	Derived: pic_size*page_pos
personal_care[3]	Derived: dummy variable for personal care brands (Astnor, ClearBlue, Dali, Gilette, Kapper, LOreal, Lancaster, Lancome, Nivea,VanderBilt)

Variable	Mean	Std Dev	Sum	Minimum	Maximum
brand_fix	1.71	2.73	5278	0	32.00
pic_fix	4.91	4.96	15131	0	59.00
brand_size	6.88	5.69	21193	1.82	25.17
pic_size	67.51	13.41	207941	24.02	88.09
page_num	56.80	40.62	174944	2.00	127.00
page_pos	0.57	0.49	1760	0	1.00
recall_accu	0.51	0.50	1584	0	1.00

Pearson Correlation Coefficients	brand_fix	pic_fix	brand_size	pic_size	page_num	page_pos	recall_accu
brand_fix	1.00	0.31	0.35	0.05	0.05	0.21	0.14
pic_fix	0.31	1.00	-0.05	0.20	0.07	0.03	0.11
brand_size	0.35	-0.05	1.00	0.07	0.05	0.15	0.12
pic_size	0.05	0.20	0.071	1.00	-0.07	-0.08	-0.03
page_num	0.05	0.07	0.05	-0.07	1.00	0.08	0.19
page_pos	0.21	0.03	0.15	-0.08	0.08	1.00	0.07
recall_accu	0.14	0.11	0.12	-0.03	0.19	0.07	1.00

[3] Brands were grouped into 8 categories based on our best understanding of these brands. The other 7 dummy variables were not included in the final analysis.

Appendix 2: Model Statistics and Predicted Probability

Model 1: Brand Fixations			BIC: 11847.2921	
Parameter	**Est**	**Exp(b)**	**SE**	**Prob**
Intercept	-1.16	0.31	0.05	<.0001
brand_size	0.07	1.07	0.00	<.0001
page_pos	0.61	1.84	0.04	<.0001
pic_fix	0.08	1.08	0.00	<.0001
page_num	0.02	1.02	0.00	<.0001
interaction1	-0.01	0.99	0.00	0.02
interaction2	0.00	1.00	0.00	<.0001
interaction7	0.00	1.00	0.00	0.48
Scale	1.00	2.72	0.00	*NA*

Model 2: Pictorial Fixations			BIC: 20158.7639	
Parameter	**Est**	**Exp(b)**	**SE**	**Prob**
Intercept	-0.01	0.99	0.06	0.84
pic_size	0.02	1.02	0.00	<.0001
page_num	0.01	1.01	0.00	<.0001
brand_fix	0.17	1.19	0.01	<.0001
interaction3	-0.01	0.99	0.00	<.0001
interaction4	-0.03	0.97	0.00	<.0001
interaction2	0.00	1.00	0.00	<.0001
personal_care	0.10	1.11	0.02	<.0001
Scale	1.00	2.72	0.00	*NA*

Model 3: Recall Accuracy			BIC: 4076.8818	
Parameter	**Est**	**Exp(b)**	**SE**	**Prob**
Intercept	-0.32	0.73	0.07	<.0001
brand_fix	0.06	1.07	0.02	0.0003
pic_fix	0.03	1.03	0.01	0.0003
page_pos	-0.91	0.40	0.12	<.0001
interaction5	0.05	1.05	0.01	<.0001
interaction6	0.01	1.01	0.00	<.0001
Scale	1.00	2.72	0.00	*NA*

Predicted Probability of Recall Example		
Parameter	Sample value	Contribution to linear predictor
intercept	1	-0.32
brand fixations	5	0.32
pictorial fixations	15	0.46
left page	0	0
right page	1	0
brand size*page position (interaction 5)	4.38	0.22
page number*page position (interaction 6)	105	1.32
Linear predictor		2.00
Predicted probability of recall (expected odds)		88%