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Department of Economics and Finance

EF 4485 Experimental Methods in Economics/Finance

Term Paper Cover Sheet

Topic	**TO WHAT EXTENT CAN SCENT ENHANCE MEMORIZATION OF BRAND INFORMATION**
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TO WHAT EXTENT CAN SCENT ENHANCE MEMORIZATION OF BRAND INFORMATION

Recently, using aroma as one of their promotion strategies has become a trend for many brands. Various studies suggested that ambient scent could positively influence brand evaluations, enhance the recall and recognition of brand information. In this study, based on the previous studies, we examined the impact of scent on strengthening the memory of the brand names and attached information, no matter pros and cons. In addition, we strived to distinguish the effect of ambient and non-ambient scent on memorization of brand information. The results showed that ambient scent can enhance one's memory on information even after exposing to that scent more than twenty-four hours. Nevertheless, we also find that perceived less pleasant scent has impact on the process of encoding.

I. INTRODUCTION

In recent years, more and more retailers, restaurants and hotels adopt fragrance diffusion as their marketing strategy. For instance, the American boutique, Abercrombie and Fitch, has been hiring specific salespersons to spray their own-featured fragrance in every corner of the shop, every day before and after operation in hopes of inspiring customers when they first step in; certain bakeries and restaurants emit the scent of food to stimulate consumers' appetite; hotels emit some kind of relaxing aroma in lobbies and other public area as they wish their customers would connect the sense of relax and great customer experience to their exclusive aroma.

Adoption of scent as a marketing tool has been justified by several studies. The first reason is that an ambient scent improves brand evaluations, particularly for unfamiliar brands, it also enhances the recall and recognition of unfamiliar brand name (Morrin and Ratneshwar, 2000). Moreover, some studies have found scent helps improving one's mood (Lawless, 1991). The presence of ambient scent can positively influence the intentions of subjects to visit a store, purchase, and the time spent in the store (Spangenberg, Crowley, and Henderson, 1996). The result of this study has been further confirmed by another field experiment conducted by Gueguen and Petr (2006), that an obvious increase in the amount of shopping time and purchase by the customers was observed when lavender aroma was diffused in a restaurant.

Morrin and Ratneshwar (2003) examined the effect of ambient scent on the enhancement of brand memory, they suggested that, firstly, an ambient scent that is congruent with the brand's product category (e.g. lemon aroma with toilet cleaner) would not result in significantly more attention nor an improvement in brand memory than an incongruent scent. Secondly, the performance of subjects on brands recall and recognition was better when they were exposed to certain ambient scent. However, since the time interval between the stage of exposure of brand names and scent to the subjects, and the stage of brand recall and recognition was just twenty-four hours, our group therefore tested whether the facilitation of recall and recognition of brand information by presence of scent could extend to more than a day. Furthermore, as most of the studies were focused on the effect of ambient scent[1], we examined the effect of scent, both ambient and non-ambient scent on the brand memory.

As the results of previous studies suggested that there is a positive relationship between the presence of ambient scent and performance of brand recall and recognition, hence we have hypothesized that ambient scent could positively influence of memorization of brand information by the subjects, so as the performance of recall and recognition.

The remainder of this study is organized as follows. Section II presents the experiment design, which was dissected into three separate tasks, to test the effect of scent on one's memory. Section III discusses the methodology and results, also captures with the implications of the experiment. Section IV concludes the findings of the article. Section V is the appendix of this study containing other materials and results of the experiment. Section VI includes the list of references used in this paper.

[1] Refers to the scent that is accepted, liked or appreciated by subjects.

II. Experimental Design

The study consisted of a 3 (brands of hand cream) × 3(brand familiarity) mixed-model experiment. In total 34 students of City University of Hong Kong were recruited to participate in the experiment. The experiment was made up of three different tasks, in the later part of this paper, we would name them as Task 1, Task 2 and Task 3. In task 1, subjects were exposed to the hand cream of three different brands, namely Johnson's, Kamill, and Bath & Body Works. These three brands represent three degrees of brand familiarity to subjects, ranging from lowest familiarity to highest familiarity. Johnson's signifies the highest familiarity, Kamill is of medium familiarity, and Bath & Body Works as the least familiarity.

Familiarity in this paper is defined by the ease of purchase of the product in Hong Kong. Highest familiarity means that people can easily purchase the product in local supermarkets (e.g. PARKnSHOP, Wellcome) without search cost. Medium familiarity refers to the product that can be purchased in certain stores in Hong Kong, although people can still be able to buy it, they need to search for it. Lowest familiarity goes to the product that is not available for sale in Hong Kong, people are not able to search for the product even they search for it here.

Each participant could receive a show up fee of HKD 20, a bonus of HKD 5 for each correct brand names, as well as an additional amount of HKD 5 if he could correctly match at least three of the shown captions with the corresponding brand name. Altogether 34 students attended in five sessions, which last for 30 minutes each, on 25th and 27th of April. These students also completed the by filling up a Google form on 4th and 6th of May. The details of the tasks are as follows. Throughout the whole experiment, no communication between participants were allowed.

Task 1

Before the task began, each subject was provided with a worksheet, for the details of the worksheet, please refer to the Document 1 of the Appendix. A series of pictures together with captions of the three brands were shown consecutively to the subjects on PowerPoint slides. We introduced the subjects with the brand name, brand

logo and generalized captions of the hand cream of *Kamill* in the first round. The generalized captions shown included both pros and cons views, namely no artificial colors, naturally care for skin, dermatologically approved, and taste of soap. Meanwhile, the experimenter distributed the sample of the hand cream from Kamill, in the size of a 10-cent coin on test papers, to subjects. Figure 1 and 2 demonstrate the brand logo and hand cream we deployed of Kamill in the experiment.

After exposing subjects to the information and scent of the hand cream Kamill, we introduced them with the brand information and scent of *Johnson's*, following the procedures mentioned above. The generalized captions of Johnsons' are classic baby fresh scent, specially formulated, noticeably softer, stereotyped formula. Figure 3 and 4 illustrate the brand logo and hand cream used from Johnson's.

Brand information and scent of Bath & Body Works were shown to subjects following Johnson's, with the procedures we had previously adopted. The generalized captions of Bath & Body Works are 24-hour moisture, non-greasy formulas, luxurious fragrance, and artificial scent. Figure 5 and 6 illustrate the brand logo and hand cream we used in the experiment.

Figures 1 and 2: Brand logo and hand cream from Kamill
(Representative of medium familiarity)

Figure 3 and 4: Brand logo and hand cream from Johnson's

(Representative of highest familiarity)

Figure 5 and 6: Brand logo and hand cream from Bath & Body Works

(Representative of lowest familiarity)

After distributing the sample of each hand cream, subjects were asked to rate the pleasantness of scent from 1 to 10 according to the scent of the sample and put their answers on the worksheet provided, while 1 represents the least pleasant and 10 represents the most pleasant. A point to note here is that we concealed the bottles of the three-hand cream with single-line paper through the distribution progress, as we wished the subjects to focus on the scent instead of the design of the product. Apart from the rate of pleasantness, they were also asked to rate the willingness to buy the product with such smell and the reasons behind, yet this set of questions was designed purely to avoid subjects from *experimenter demand effect*, their answers would not be taken into account when we examined the effect of scent on memorization of brand information.

Task 1 ended when the worksheet of Task 1, and the three sets of test papers were collected after subjects had filled in the answers.

Task 2

Subjects were given 5 minutes to rest after the sheets and test papers of Task 1 were removed, during this interval, they did not expose to any scent and brand information. Next, we distributed the work sheet of Task 2 to the subjects (please refer to the Document 2 in Appendix). On the sheet, firstly, they were required to choose the brand names that we had shown them in Task 1, from a list of brand names that included both the previously mentioned brand names, as well as several unrelated brand names. Secondly, subjects had to match the brand names with the corresponding captions that we had shown them in Task 1, from the list of captions, which was also composed of captions that were formerly displayed and various irrelevant captions.

As subjects would be awarded for an additional amount of HKD 5 if they could match at least three correct captions with the corresponding brand name, they might attempt to answer more than the total number of captions we shown in Task 1, hence, a punishment scheme was initiated to avoid subjects from answering more than four captions. We had explicitly instructed the subjects the way to calculate the number of correct captions would be *Number of Correct Captions- Number of wrong answers* before commencement of Task 2. To give a better understanding, let's consider a case if a subject answers altogether four captions, with three of them correct and the remaining one incorrect, he would be awarded with HKD 5 as he did not answer more than four captions, and at the same time fulfilled the requirement that at least three of the captions were correct. However, if a subject selected five captions in total, with three of them correct and the remaining two incorrect, his number of correct captions would be 3-2=1, thus he would receive no bonus for his answers.

Task 3

An email attaching the link of an online questionnaire was sent to each participant, after one week of the laboratory sessions, completion of the online

questionnaire deemed as the completion of the whole experiment. They did not have time limit to complete the questionnaire, however, they were not allowed to modify their choices, or re-submit the questionnaire again after they had submitted once. Moreover, as our experiment was designed to examine the effect of scent on memorization of brand information after one week, subjects had to complete the questionnaire on the day we sent, failure to complete the questionnaire within the day deemed as failure of the whole experiment and would not be rewarded. For the details of the online questionnaire, please kindly refer to Document 3 in Appendix.

Subjects were first required to fill in their name and email for identification. In Q1, they were asked to select the brand names that they had seen in Task 1 from a list, which was composed of shown brand names and also irrelevant brand names. Then, they were asked to rate the pleasantness of scent of the brand names that they opted in Q1. In order to test subjects' memorization of brand information, in Q2- Q7, subjects had to choose at least three of the captions for the brand names they opted in Q1, for the questions asking about brand names they did not select, they could choose "NA". For example, Q2 was "based on your choice of Q1, for Jurlique, please choose at least 3 captions mentioned in the Task 1", choices opened for subjects included naturally care for skin, no animal testing, specially formulated, 24-hour moisture, noticeably softer, dermatologically approved, and NA. If subjects selected "Jurlique" in Q1, they hence chose at least three captions in Q2, on the contrary, if they did not choose it in Q1, they opted NA. Once again, for attempt of more than four captions, the calculation of bonus: *Number of Correct Captions- Number of Wrong Captions*. In Q8, subjects indicated the brand names of hand cream that they had previously purchased among the list, they could choose "NA" if they did not purchase any of them. The questionnaire ended after they indicated their gender.

III. Results and Interpretation

	Task 2	Task 3 (Conducted one week after Task 2)
Brand names recall	100% (mean=3)	96.0784%(2.882353)
Brands' information recall	64.7059% (1.941176)	70.5882%(2.117647)

Table 1: Experiment outcomes

The outcomes of the correct answers of brand names and corresponding captions out of three objects are shorted out in Table 1. In Task 2, since the time interval between subjects learnt about the smell plus brands' information of the hand cream and requirement to recall the memory was five minutes, which was rather short, it is not surprising that all subjects can remember all of the three brand names correctly. For the information recall session, in average, each subject could correctly recall 64.7059% of the shown captions, which was the information of almost two (1.941776) brands. In other words, participants could accurately match at least three correct captions with the corresponding brand name for around two brands out of three.

For Task 3 that was conducted a week after Task 2, the correct answers for brand names slightly declined, from 100% correctness to 96.0784% correctness. However, in general, most of the subjects could still remember roughly three (2.882353) brands they had learnt one week before. This outcome fits our hypothesis that ambient scent could positively influence the memorization of brand information, as the percentage of successful recall is significant. In light of this, we suggest that scent can help enhancing the memorization, even more than one day after exposure to that scent. For the captions recalling session, the result was surprising. The number of correct answers has increased from Task 2 to Task 3, from 64.7059% correctness to 70.5882% correctness. Ordinary assumption of memorization is that memory fades with time, effort has to be made for recall memory. Referring to the Iceberg Theory of

Sigmund Freud, most of the memories would rest from conscious mind to preconscious mind; so that people are able recall the memories when they wish to. However, some of the memories would be stored in the unconscious mind, which recalling becomes impossible. However, in our study, when subjects were exposed to scent in Task 1, their performance of brand information memorization in Task 3 has improved compared to Task 2, even after one week. This result may suggest that scent can enhance memorization of brand information, in the sense of strengthening one's memory in the encoding session, thus it would be easier for one to recall the information as the period it stays in preconscious mind is lengthened.

Dependent Variables			
# of correct match of captions – Task 2	# of correct brand name- Task 3	# of correct match of captions – Task 3	**Independent Variables**
-0.05136	0.185507	-0.10071	PK
-0.15114	0.405622	-0.14313	PJ
-0.15507	0.320782	-0.00355	PB
-0.03506	-0.03536	0.271475	Gender

Table 2: Correlation between dependent variables and independent variables

Notes: Pi represent the pleasantness of independent variables (i= K/J/B)

Table 2 exhibits the correlation between different variables. For dependent variables, "# of correct match of captions – Task 2" is the number of correct match of captions with the corresponding brand names in Task 2, given that at least three correct captions out of four captions was treated as a correct match. The same applied for "# of correct match of captions – Task 3". "# of correct brand name- Task 3" refers to the number of correct brand names selected by subjects in Task 3. For independent variables, "PK", "PJ" and "PB" are the pleasantness rated by subjects for the scent of Kamill's hand cream, Johnson's hand cream, and Bath & Body Works' hand cream respectively. For gender, we set it as a dummy variable and indicated that female =1 and male =0. As we assume that ladies are more sensitive to scent and would have a stronger impact if scent does takes up the effect.

The pleasantness of the three brand rated in Task 2 are 6.828 on average. (With mean of PK =6.8676, PJ =6.9265, PB =6.6912). This shows that subjects did not have strong preference for one over another and preferred to accept the scent in general. There is a positive relation between the pleasantness and the correct answers of brand names in Task 3. Johnson's (0.405622) accounted for the most significant impact of scent on memorization of brand information, which also has the highest rating of pleasantness on average. We can conclude that ambient scent can help lengthen subjects' memory more than twenty-four hours.

In terms of the number of correct match of captions, in both Task 2 and Task 3, the results show a negative correlation between of correctness and the pleasantness of scent. Negative correlation means that by increasing the rate of pleasantness by 1, the correct match of captions will decline by the amount shown in table 2. For instance, if the rate of pleasantness for Kamill goes up by 1, the number of correct match of captions in Task 2 will decrease by 0.05136. In light of this, subjects generally can perform better and memorization for the objects that have a scent they perceived as less attractive. In contrast to the prevailing studies, we find that not only ambient scent can help on recalling information, but also perceived unpleasant scent can help recalling more information learnt before.

In addition to the pleasantness of a scent, we also evaluate the effect of gender, to capture other possible factor that may affect our hypothesis. According to our experiment, male participants performed slightly better in recalling short memory, as there is a negative relationship between the number of correct match of captions in Task 2, while 1= Female and 0=Male. Furthermore, male participants were slightly better than female in Task 3, when they were asked to recall the brand names, even after one week. However, when it comes to recalling the brand captions, female did 27.1475% better than male. We would thus say that female are better at recalling more detailed information, as female generally relatively pay more attention on the details of information than male.

(REVISED***)

Furthermore, we investigated whether subjects demonstrated "selective

memory", which is the tendency to remember some facts while at the same time apparently forget other facts. We examined the relation between the number correct recall of negative caption and the corresponding brand familiarity level. Please refer to Document 5 in Appendix for the comprehensive dataset. Table 3 below summarizes the dataset.

	Total Correct recall of negative captions (correct=1; incorrect=0)		
Total Number of Subjects	Johnson's **(Highest Familiarity)**	Kamill **(Medium Familiarity)**	Bath & Body Works **(Lowset Familiarity)**
34	18	22	28

Table 3: Relation between total correct recall of negative captions and levels of brand familiarity in Task 3

There were in total 34 participants in our study, 18 of them correctly recalled the negative captions for Johnson's (Highest familiarity); 22 of them could recall the negative captions for Kamill (Medium familiarity); and 28 of them could accurately recall of negative captions of Bath & Body Works (Lowest familiarity). It is obvious that the lower the level of brand familiarity, the higher the total number of correct recall of negative captions. The reason for this phenomenon could be that when people first encounter the product from an unfamiliar brand, they will from their impression towards the product based on the idea of the others. That is, when subjects were introduced with the information of Bath & Body Works, they formed a negative impression regarding this product when we mentioned it contained "artificial scent". Consequently, when they were asked to recall the captions in Task 3, they would immediately recall the negative side of the product. The opposite is true for brand with high familiarity. Subjects had formed their own impression and idea towards the brand product, so they might disagree with the negative caption we shown them, thus when they might fail to recall the correct negative captions due to denial in the first place.

As for the statistically significance, we have also ran the regressions for each number of correct answer of brand name and caption (Please refer to Appendix – Document 6 for the details of the regression analysis result).

In terms of the correct answer of brand names, in task 2, we can find that the independent variables, pleasantness of both Bath and Body Works (0.0015) and that of Kamill (0.0077) are statistically significant, with p-value lower than the significance level of 5%. Furthermore, in Task 3, the pleasantness of Bath and Body Works (0.0719) and that of Johnson's (0.0653) are significant, which also have an F-statistics (0.031212) smaller than 5%, indicated the significance in the overall. This may conclude that scent do takes effect in the brand names recalling process, though the effect may not be powerful as generally the changes is just too low. For the caption recalling session, in both Task 2 and 3, the regression conducted are not statistically significant. The p-value of all explanatory variables and probability of the overall significance is larger than 5%. Therefore, we unable to conclude that the pleasant of a scent can help the memorization of information. However, we still find an interesting observation that subjects are able to memorize a significant numbers of captions, and the percentage of correct answers are even more than they have did by refreshing their short term memory, although it takes one week after they learnt the information. This violate our traditional acknowledgement that memory will fade out with time.

Limitation

For analysis, we have also run a regression and have similar explanation on the dependent variables (the number of correct answers) to the correlation in table 2. However, some of the explanatory variables are not statistically significant. This may due partially a relatively small sample group, and also the lack of comparison of a control experiment. Although we have made our hypothesis of the study based on previous studies that scent is helpful for brand memory, the effect of scent on lengthening memory may not be fully explained when we do not directly compare our results to the unscented control experiment. Therefore, if time and budget is allowed, an unscented control experiment should be run. Subjects for the control experiment

will be introduced with the brand information of another three-hand cream, but test papers with samples of hand cream will not be distributed to them in Task 1.

Furthermore, there is a need to modify the way to conduct Task 3. Initially, we invited subjects to complete the online questionnaire through email. However, a few subjects reflected that they did not receive the email due to system failure or other issues. Since they reflected to us the problem they faced when Task 3 had expired, the number of participants of the overall experiment is reduced. For the online questionnaire, as subjects were given the freedom to complete it at home, they might communicate with other subjects when they filled in the form. According to the submission time of the questionnaires, although there was no obvious collusion of subjects, in terms of close submission time of two or more subjects, there was is risk. In addition, we could hardly invite the subjects to have another laboratorial experiment for Task 3 due to time limit. So we had held Task 3 in a form of online questionnaire to obtain data instead. Although responses were collected, we do not reject any possibility that subjects might search for the related brand information by different means, for getting more bonuses.

IV. Conclusion

Ambient scent has been used as a marketing weapon in recent years. However few can assure the effect of ambient scent on brand memory. Previous studies have shown ambient scent could enhance brand memory in twenty-four hours, yet there was no answer for whether it is a long term or short term effect. In light of this, our study strived to test whether the effect of scent of brand memory was limited to twenty-four hours, and distinguish the effect of ambient and non-ambient scent on memorization of brand information.

All in all, this paper suggests that ambient scent can enhance memorization of brand information, in the sense of lengthening one's memory of the brand recognition. The results of our study show that, as illustrated in Table 1, for even more than twenty-four hours, subjects are still possible to recall brands information. Moreover, from Table 2, we also find that the pleasantness of the scent has a negative relation to the recall of brand information, this may lead to a surprising observation that people are better to remember information if the scent is less pleasant.

V. Appendix

Document 1 - Worksheet used in Task 1

Instructions

Welcome to our experimental study on decision-making. You will receive a show-up fee of HKD 20 **upon completion** of three separate tasks. The first two task commence after you have read the instructions carefully, while you are asked to complete an online questionnaire after 1 week in task three, individually. Each task will last no longer than 30 minutes. In addition, you can gain more money as a result of your answers in the experiment.

You will be given a subject ID number. Please keep it confidentially. Your decisions will be anonymous and kept confidential. Thus, other participants won't be able to link your decisions with your identity. You will be paid in private, using your subject ID, and in cash after the experiment.

When you have any questions, please feel free to ask by raising your hand, one of our assistants will come to answer your questions. Please DO NOT communicate with any other participants.

Subject ID number: _____

Please remember to write down your subject ID number. In the coming task, a series of pictures and captions of the brands will be shown. Meanwhile, one of our assistants will distribute the sample of the cream to you. According to the scent of different sample, you are required to

1) Rate the pleasantness of scent from 1 to 10 (1= most unpleasant; 10= most pleasant)
2) Rating of the willingness to purchase product with such smell (1= least willing to pay; 10= most willing to pay). Briefly explain the ground for your rating.

Object	Rating of pleasantness	Rating of willingness to buy	Reason
A			
B			
C			

Document 2 - Worksheet used in Task 2

Subject ID number:

For the second task, you have 5 minutes to fill in the below blanks. Please choose from the given information below and (1) write down the brand name of the cream that you have tried in the first part, (2) write down the **FOUR** corresponding captions mentioned on the same column. For each correct brand name, an additional HKD 5 will be awarded. Furthermore, extra HKD 5 will be awarded as well for the each correct match of brand name and captions (correct matching for at least 3 captions).

The list of brand names is as follows,

Jurlique	Kamill	The Body Shop
Aesop	Johnson's	Bath & Body Works

The list of captions is as below,

Naturally Care For Skin	Non-Greasy Formulas	Taste of Soap	Absorbs Quickly
Artificial Scent	Classic Baby Fresh Scent	No Artificial Colors	24-Hour Moisture
Dermatologically Approved	No Animal Testing	Specially Formulated	Stereotyped Formula
Luxurious Fragrance	Natural Ingredients	Noticeably Softer	Signature Collection

Brand Name	Captions

Document 3 - Google form used in Task 3

Experiment Two (Task 3)

This online questionnaire serves as Task Three of the decision-making experiment, completion of the task refers to the completion of the whole experiment. You will be contacted shortly for the payment after we receive your response.

For each correct brand name, an additional HKD 5 will be awarded. Furthermore, extra HKD 5 will be awarded as well for the each correct match of brand name and captions (correct matching for at least 3 captions).

***For attempt of more than the number of choices required, the calculation of bonus: Number of Correct Captions- Number of Wrong Captions.

*必填

Name *

Email you provided *

Session you have attended for the laboratory experiment *

Please choose the session you was initially assigned to.

繼續 »

已完成 20%

Experiment Two (Task 3)

*必填

Experiment Two (Task 3)

Q1. Please choose three brand names that have been tested in the first task. *

- ☐ Jurlique
- ☐ Kamill
- ☐ The Body Shop
- ☐ Aesop
- ☐ Johnson's
- ☐ Bath and Body Works
- ☐ 其他：

Please rate the pleasantness of scent of the following brands (1=most unpleasant; 10=most pleasant) *

For the brands you did not choose in Q1, please choose NA.

	NA	1	2	3	4	5	6	7	8	9	10
Jurlique	○	○	○	○	○	○	○	○	○	○	○
Kamill	○	○	○	○	○	○	○	○	○	○	○
The Body Shop	○	○	○	○	○	○	○	○	○	○	○
Aesop	○	○	○	○	○	○	○	○	○	○	○
Johnson's	○	○	○	○	○	○	○	○	○	○	○
Bath & Body Works	○	○	○	○	○	○	○	○	○	○	○

« 返回　繼續 »

已完成 40%

Experiment Two (Task 3)

*必填

Experiment Two (Task 3)

In the following questions, for the brands that you did not choose in Q1, PLEASE CHOOSE "NA".

***For attempt of more than the number of choices required, the calculation of bonus: Number of Correct Captions- Number of Wrong Captions.

Q2. Based on your choice of Q1, for Jurlique, please choose at least 3 captions mentioned in the Task 1. *

If you did not choose Jurlique in Q1, please choose NA.

- [ ] Naturally Care for Skin
- [ ] No Animal Testing
- [ ] Specially Formulated
- [ ] 24-Hour Moisture
- [ ] Noticeably Softer
- [ ] Dermatologically Approved
- [ ] NA

Q3. Based on your choice of Q1, for Kamill, please choose at least 3 captions mentioned in the Task 1. *

If you did not choose Kamill in Q1, please choose NA.

- [ ] No Artificial Colors
- [ ] No Animal Testing
- [ ] Naturally Care For Skin
- [ ] Absorbs quickly
- [ ] Dermatologically Approved
- [ ] Taste of Soap
- [ ] NA

Q4. Based on your choice of Q1, for The Body Shop, please choose at least 3 captions mentioned in the Task 1. *

If you did not choose The Body Shop in Q1, please choose NA.

- [ ] Natural Ingredients
- [ ] Luxurious Fragrance
- [ ] Noticeably Softer
- [ ] Signature Collection
- [ ] Non-Greasy Formula
- [ ] Artificial Scent
- [ ] NA

Q5. Based on your choice of Q1, for Aesop, please choose at least 3 captions mentioned in the Task 1. *

If you did not choose Aesop in Q1, please choose NA.

- [ ] Natural Ingredients
- [ ] No Artificial Color
- [ ] 24-Hour Moisture
- [ ] Naturally Care for Skin
- [ ] Dermatologically Approved
- [ ] Stereotyped Formula
- [ ] NA

Q6. Based on your choice of Q1, for Johnson's, please choose at least 3 captions mentioned in the Task 1. *

If you did not choose Johnson's in Q1, please choose NA.

- [ ] Classic Baby Fresh Scent
- [ ] Specially Formulated
- [ ] Noticeably Softer
- [ ] Stereotyped Formula
- [ ] No Animal Testing
- [ ] Taste of Soap
- [ ] NA

Q7. Based on your choice of Q1, for Bath & Body Works, please choose at least 3 captions mentioned in the Task 1. *

If you did not choose Bath & Body Works in Q1, please choose NA.

- [ ] Luxurious Fragrance
- [ ] Non-Greasy formulas
- [ ] 24-Hour Moisture
- [ ] Artificial Scent
- [ ] Signature Collection
- [ ] Absorbs Quickly
- [ ] NA

« 返回 繼續 »

已完成 60%

Experiment Two (Task 3)

Q8. Please indicate the brand(s) of hand cream that you have purchased *

- [ ] Jurlique
- [ ] Kamill
- [ ] The Body Shop
- [ ] Aesop
- [ ] Johnson's
- [ ] Bath and Body Works
- [ ] NA

« 返回 繼續 »

已完成 80%

Experiment Two (Task 3)

Gender *

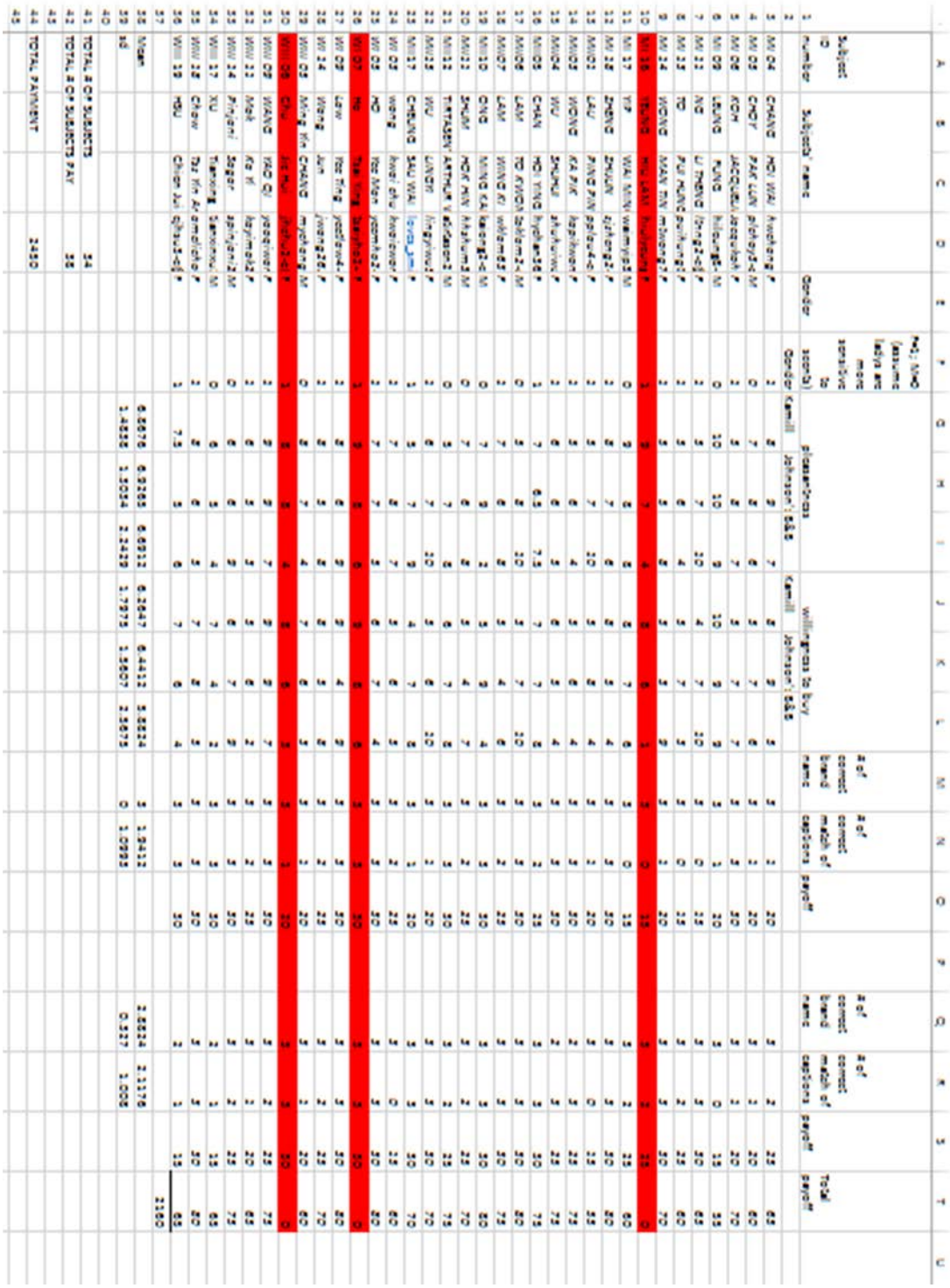
- ( ) Female
- ( ) Male

« 返回 提交

100%：恭喜完成！

請勿透過 Google 表單送出密碼。

Document 4 - excel sheet of the observations



Document 5 - Relation between correct recall of negative captions and level of brand familiarity

	Correct recall of negative captions (correct=1; incorrect=0)		
Subjects	Johnson's (Highest Familiarity)	Kamill (Medium Familiarity)	Bath & Body Works (Lowset Familiarity)
1	1	1	1
2	1	0	1
3	0	0	1
4	0	0	1
5	1	1	1
6	1	1	1
7	1	1	1
8	1	1	1
9	0	1	1
10	0	1	1
11	0	0	0
12	1	1	1
13	0	0	1
14	1	0	1
15	0	0	1
16	1	1	1
17	1	1	1
18	1	1	1
19	0	1	1
20	0	0	0
21	0	1	1
22	0	1	1
23	0	1	0
24	0	0	1
25	0	0	1
26	1	1	1
27	1	1	1
28	1	1	1
29	1	1	1
30	1	1	0
31	0	1	1
32	1	0	0
33	0	1	1
34	1	0	0
Total Number of correct negative captions	18	22	28

Document 6 – Regression analysis for each correct answer in both Task 2 and 3

With Y = number of correct brand name in Task 2

Dependent Variable: __OF_CORRECT_BRAND_NAME_
Method: Least Squares
Date: 05/20/15 Time: 18:15
Sample: 1 34
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PB_B	-4.32E-16	1.24E-16	-3.488151	0.0015
PJOHNSON_S	0.000000	2.28E-16	0.000000	1.0000
PKAMILL	5.77E-16	2.02E-16	2.856913	0.0077
C	3.000000	1.85E-15	1.63E+15	0.0000

Mean dependent var	3.000000	S.D. dependent var	0.000000
S.E. of regression	1.55E-15	Sum squared resid	7.20E-29
Durbin-Watson stat	1.800000		

With Y = number of correct brand name in Task 3

Dependent Variable: __OF_CORRECT_BRAND_NA01
Method: Least Squares
Date: 05/20/15 Time: 18:17
Sample: 1 34
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PB_B	0.044271	0.023732	1.865459	0.0719
PJOHNSON_S	0.083594	0.043686	1.913517	0.0653
PKAMILL	0.023404	0.038687	0.604950	0.5498
C	1.846388	0.353488	5.223334	0.0000

R-squared	0.252238	Mean dependent var	2.882353
Adjusted R-squared	0.177462	S.D. dependent var	0.327035
S.E. of regression	0.296601	Akaike info criterion	0.517271
Sum squared resid	2.639160	Schwarz criterion	0.696843
Log likelihood	-4.793615	Hannan-Quinn criter.	0.578511
F-statistic	3.373238	Durbin-Watson stat	1.666723
Prob(F-statistic)	0.031212		

With Y = number of correct caption in Task 2

Dependent Variable: __OF_CORRECT_MATCH_OF_CA
Method: Least Squares
Date: 05/20/15 Time: 18:11
Sample: 1 34
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PB_B	-0.071759	0.090246	-0.795145	0.4328
PJOHNSON_S	-0.106027	0.166127	-0.638229	0.5282
PKAMILL	-0.019722	0.147118	-0.134053	0.8943
C	3.291164	1.344227	2.448369	0.0204

R-squared	0.043070	Mean dependent var	1.941176
Adjusted R-squared	-0.052623	S.D. dependent var	1.099344
S.E. of regression	1.127898	Akaike info criterion	3.188719
Sum squared resid	38.16462	Schwarz criterion	3.368291
Log likelihood	-50.20823	Hannan-Quinn criter.	3.249959
F-statistic	0.450086	Durbin-Watson stat	1.295116
Prob(F-statistic)	0.719094		

With Y = number of correct caption in Task 3

Dependent Variable: __OF_CORRECT_MATCH_OF01
Method: Least Squares
Date: 05/20/15 Time: 18:13
Sample: 1 34
Included observations: 34

Variable	Coefficient	Std. Error	t-Statistic	Prob.
PB_B	0.000206	0.083614	0.002464	0.9981
PJOHNSON_S	-0.094810	0.153918	-0.615973	0.5426
PKAMILL	-0.036172	0.136306	-0.265371	0.7925
C	3.021379	1.245440	2.425954	0.0215

R-squared	0.022909	Mean dependent var	2.117647
Adjusted R-squared	-0.074800	S.D. dependent var	1.007989
S.E. of regression	1.045009	Akaike info criterion	3.036058
Sum squared resid	32.76129	Schwarz criterion	3.215630
Log likelihood	-47.61299	Hannan-Quinn criter.	3.097298
F-statistic	0.234459	Durbin-Watson stat	2.123927
Prob(F-statistic)	0.871635		

VI. Reference

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