
Recall and Recognition on Minimalism.

A Replication of the Case Study on the Apple Logo

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Abstract: The present research aims to better understand the impact of brand exposure and brand perception on logo recall and recognition. Building off of prior work that has examined surprising impairments in visual memory for the Apple logo (Blake, Nazarian and Castel, 2015), a comparative analysis is developed by comparing computer science and social science becoming specialists. The Apple logo is used as a case study due to its minimalism. The data reveal that only a small amount of the subjects can recall and recognize the Apple logo correctly. The recognition phase, in comparison with the recalling one, seems to be an easier task for the subjects. However, although the stylized features of the logo are often overlooked, each subject manages to recognize a large amount of details of the logo. Contrary to expectations, regardless of being a man or a woman, owning an Apple device, or developing a very positive emotional attachment to the brand are not significant variables that can determine a higher level of recall and recognition. Nevertheless, having a strong background in the technological domain can increase the probability of paying much attention to the details of a technical brand.

Keywords: logo recall; logo recognition; Apple; brand exposure; brand perception; minimalism.

1. Background

In a world characterized by an inflation of visual inputs, creating and using a minimalist symbol for a brand might be an efficient ingredient in marketing. One might claim that the more minimalistic an element is, the more recalled and recognized it becomes. This paper presents a comparative study between social and computer science students, aiming to assess the level of recall and recognition of Apple logo, one of the simplest brand symbols. This study is a replication of the study conducted in 2015 by Adam B. Blake, Meenely Nazarian, and Alan D. Castel, namely *The Apple of the Mind's Eye: Everyday Attention, Metamemory, and Reconstructive Memory for the Apple Logo*, published in *The Quarterly Journal of Experimental Psychology*. The original research has as starting point the puzzle based on which some scholars are saying that multiple exposure to a certain stimulus can induce an accurate recall, while other are arguing the contrary (Blake, Nazarian, Castel, 2015). In this particular sense, the stimulus is the Apple logo, an extremely simple, memorable, and recognizable visual information (Farnham, 2013 in Blake, Nazarian, Castel, 2015). Thus, it is expected that this logo can be remembered in detail.

Considering that the original study underlines the inability to draw and recognize the minimalistic Apple logo, and thus emphasizing a considerable memory issue, a replication with a new sample, in a dissimilar country – Romania aims to provide insights into the robustness of effects of the used variables. The replication can show whether there are significant similarities between perceptions, regardless of the economical, social, and technological context.

Although developed economies (United Nations, 2017), Romania and the United States of America (USA), the latter being the location of the original experiment, differ. Considering the topic of the present paper, a relevant dissimilarity between the two countries is related to income. While the USA is considered to be a high income country, Romania is an upper middle income one (United Nations, 2017). In addition, the purchasing power parity (PPP) is of 18.56 trillion dollars for the USA and 441 billion dollars for Romania (GFP, 2017). The gross domestic product (GDP) is another indicator that differentiates the two countries; measured in US dollars, the American GDP is 17.348.072 million, while the Romanian one is 199.045 million (United Nations, 2016). Whereas the mobile-cellular subscriptions index per 100 inhabitants is 105.9 units in Romania in comparison with 98.4 units in the USA, the individuals using Internet amount up to 54.1% in Romania and 87.4% in the USA (United Nations, 2016). Strongly related to the case study in this paper, one significant information estimates that iPhone sales to end users, in 2016, are 62.9 million in the USA and 34.6 million in Europe (Dunn, 2017)¹. Based on the above comparative data, a possible assumption could be that the recall and recognition on a technological high-end brand, such as Apple, would be lower in the case of Romania.

In contrast with the original study, the present research adds two new variables to the existing ones, namely the sex of the subjects and the specialization. Thus, the paper compares men and women, and the social and computer science becoming specialists. On the one hand, after studying gender differences, Maccoby and Jacklin claim that there are distinctions between the abilities of men and women. While men tend to excel in visual-spatial and mathematical abilities, women tend to perform better at verbal abilities (Herlitz, Nilsson, Bäckman, 1997: 801). On the other hand, Cattaneo, Postma and Vecchi (2006: 905) stress that “gender differences apply only to selective dimensions of spatial functioning.” In addition, there are studies that underline that women have a better spatial and object identity memory (Voyer *et al.*, 2007) and have a greater ability for tasks, among others, as recall of pictures,

¹ Official data related to iPhone or any other Apple devices sales in Romania are not available.

word recognition, object location etc. (Herlitz, Nilsson, Bäckman 1997: 808). Regarding the specialization comparison, to our knowledge, there are no research studying the relationship between technical or social expertise and memory recall and recognition. The choice of computer science and social science becoming specialists relies on the aim to study two opposite groups in terms of background. However, future research can enlarge the number of specializations.

Since it is still believed that 70% of all the purchase decision are made in store (Van Grinsven, Das, 2016), using a recognizable logo might become an important visual element in marketing. Thus, simple logos, that take little time and little brain capacity to be recognized, are preferred (Van Grinsven, Das, 2016). As simplicity is considered one of the most important principles in design, it involves the process of removing any unnecessary element (Eytam, Tractinsky, Lowengart, 2017).

Logos are considered an important visual variable which connects the consumer to the brand and to the emotional perceptions (Park, Eisingerich, Pol, Park, 2013). In a market context in which the number of logos increases, the individuals' attention toward brands decreases (Rotfeld, 2006 in Sääksjärvi et al., 2015). In this respect, researchers studying logo design emphasize the importance of its simplicity and minimalism in order to create a higher level of recall and recognition (Pimentel and Heckler 2003 in Sharma, Varki, 2017). The literature assumes that simple elements are easier to be remembered due to their low level of attention required and less processing capacity (Van Grinsven, Das, 2016). By studying the specific of logo design on brand recognition, Henderson and Cote (1998 in Van Grinsven, Das, 2016) claim that, for a higher rate of recognition, a logo should have a natural and harmonious design. Logos are associated with familiarity, identity, meaning, and likeability (Pimentel and Heckler 2003 in Sharma, Varki, 2017), and are responsible for cognitive and affective coding processes in linking the somatic markers to the brand (Sharma, Varki, 2017). Starting from the concept of *polarizing brands* (Monahan, Espinosa, Ortinau, 2017), Apple can be considered a brand that is either hated or loved.

Prior exposure to a stimulus, a logo for instance, predisposes an individual to that stimulus at a later time (Janiszewski and Meyvis, 2001). The processing fluency/attribution model claims that repeated exposure to a stimulus leads to a representation of the stimulus in the memory. Thus, at a later time, the memory will facilitate the encoding process and will make it more fluent, effortless, and unconscious (in Janiszewski and Meyvis, 2001: 19).

Considering the large amount of messages to which a consumer is exposed every day, all the received information is impossible to be consciously processed. Thus, attention becomes an expensive and limited resource (Milosavljevic, Cerf, 2008; Teixeira, 2014). Murray *et al.* (2013) claim that "attention, when directed to items already encoded in memory, improves the probability of their recall but does not increase the precision with which they are represented." In this respect, the Apple logo can be considered minimalistic and easy to be remembered and recognized.

Referring to the concept of mental effort, Kahneman (2011) believes that, in most cases, it can be considered non-comfortable. Therefore, individuals prefer to rely on intuition, attaching a high degree of trust to it. One of the most well-known experiments is the bat-and-ball puzzle. Shane Frederick, together with Kahneman (2011), has conducted an experiment in which the subjects have to solve a very simple math problem. As expected, more than 50% tend to give an intuitive incorrect answer. One of the explanation refers to the fact that people choose intuition over rationality, mainly because the task seems to be too simple (Kahneman, 2011). The same context can hold up in the case of the Apple logo, which is perceived as one of the simplest logos. In the same respect, increased exposure can lead to an increased level of recognition (Van Grinsven, Das, 2016). While talking about the preference for simplicity, the level of involvement of the individual should be brought into discussion. A person owning an

Apple product, or wishing for one, is perhaps more likely to pay more attention to a detail regarding the brand logo.

Based on the above literature, the present paper begins from the following hypotheses:

H1, H2: *Males, in comparison with females (H1), and computer science, in comparison with social science becoming specialists (H2), are more likely to develop a better recall and recognition of the Apple logo.*

As stated above, there is a puzzle in the literature regarding whether recall and recognition abilities can be better performed by men or women. Thus, assuming that men are more interested in technology and are more visually oriented, we claim that men will better recall and recognize the stimulus.

In the same respect, considering the everyday context, computer science students are believed to pay much more attention to technology and to its details. By being interested in state-of-the-art technology, it is assumed that computer science students own Apple devices to a higher degree than social science ones or are more keen on them. Thus, by being in contact with an Apple device more often, computer science becoming specialists might recall the logo more accurately.

H3, H4: *Individuals owning an Apple device (H3) and individuals loving the Apple brand (H4) are more likely to remember (recall and recognition) the logo of the brand correctly.*

In this case, we expect that by being exposed to the Apple logo more often than non-users, the users will be more capable of drawing and recognizing the logo correctly. Moreover, by developing a positive emotional association with the brand, individuals are considered to pay much more attention to the details of the brand.

H5, H6: *The confidence level for the recall and recognition phases is higher in the case of Apple owners (H5) and of the lovers of the brand (H6).*

Owning an Apple device, thus being more connected with a logo, individuals are believed to be more self-confident when recalling and recognizing the Apple logo.

This study can be considered a preamble for further attempts to analyze the impact of brand exposure and brand perception on recall and recognition. At the same time, taking into account the case study of the minimalist Apple logo, further research can comparatively investigate a larger number of brands' logos, and can emphasize the importance of simplicity for creating business visual identity.

2. Methodology

2.1 Participants

The experiment was conducted on a number of 198 subjects, out of which 78 are social science students from the Babes-Bolyai University of Cluj-Napoca, Romania (communication, public relations, advertising, and journalism) and 120 computer science students from the Technical University of Cluj-Napoca, Romania. Out of the total sample, 119 are female subjects. Age range is 18-27, $ME=22.4$. From the total number of respondents, 27.8% own an iPhone, 5.6% own a Mac, 2.5% own an iPad, and 2.5% own an iPod. Only 5 respondents are strictly Apple users, in the sense that they own both an iPhone and a Mac device.

2.2 Procedure

From a methodological standpoint, the present paper is a slight replication of the article entitled *The Apple of the Mind's Eye: Everyday Attention, Metamemory, and Reconstructive Memory for the Apple Logo* (Blake, Nazarian, Castel, 2015).

The original study employs two different experimental designs. The first experiment has the following steps: drawing the logo of the Apple brand on a blank sheet of paper, rating the confidence level of the accuracy of the drawing on a scale from 1 to 10 (where 1 is low level of confidence and 10 high level of confidence), identifying the right Apple logo from a set of 8 figures, and rating the confidence level of the choice on a scale from 1 to 10 (where 1 is low level of confidence and 10 high level of confidence). The second experiment is similar to the first one, with the exception of asking the subjects to rate the confidence of being able to draw the logo before drawing it as well (Blake, Nazarian, Castel, 2015).

As the main above described steps have been followed in the present study, the main differences from the original paper are the following. First, a single experimental design is employed, one that implies the evaluation of the confidence level both before and after drawing the logo, and after the identification of the right logo from the given figures. The reason for choosing this design relies on the aim of analyzing in a more complex manner the metacognitive changes in the participants. Second, considering the task in which the subjects are asked to recognize the right logo from a given set of figures, there have been used 12 situations, instead of 8. Thus, the goal is that of creating an even more difficult context. Third, after the experiment, the subjects were asked to answer to a more enlarged set of questions for assessing the perception over the Apple brand. The main steps followed in the present experiment are described in more detail in the subsequent phases.

Recall phase

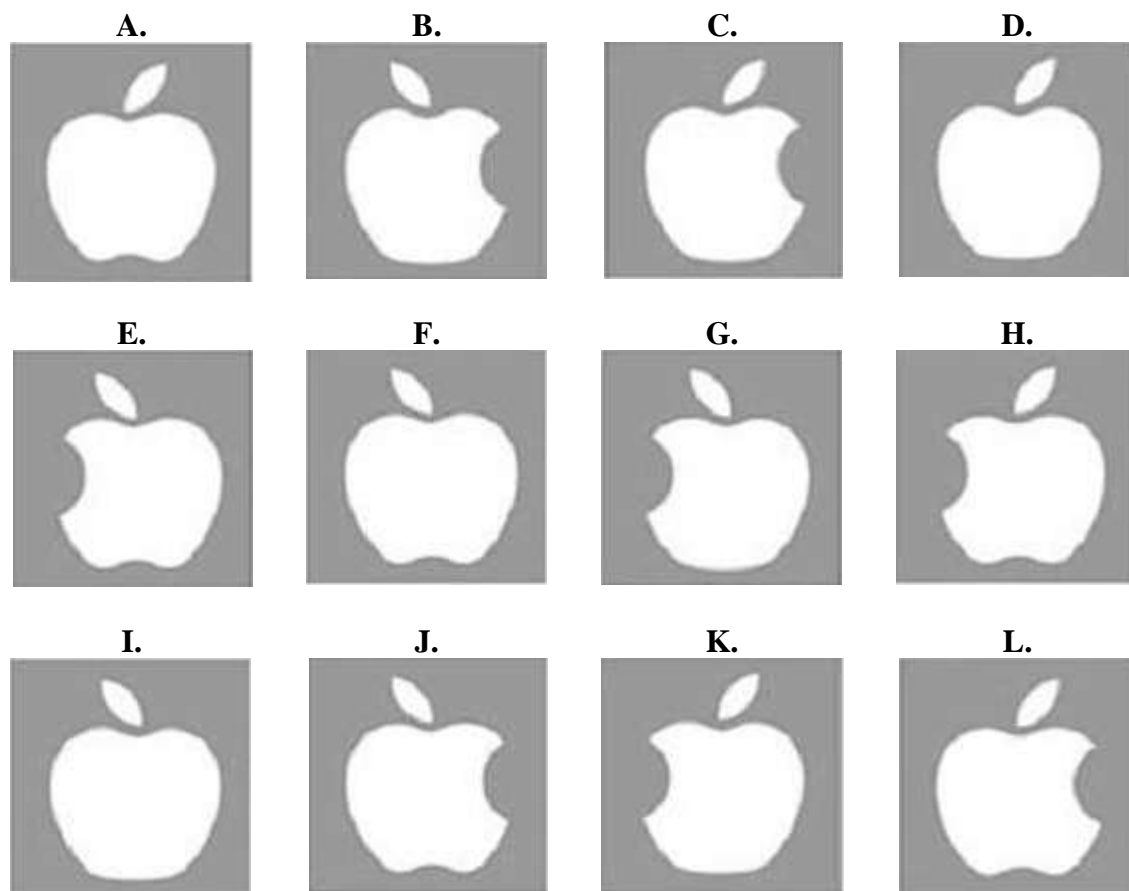
In this phase, the subjects were asked to solve three tasks. First, with no visual connection to any Apple device or other identification pattern, the subjects, faced with the imaginary situation of drawing the Apple logo, had to rate their level of confidence that they would draw it accurate. A scale from 1 to 10 was used (where 1 is low level of confidence and 10 high level of confidence) to this purpose. Second, without being exposed to the previous given rating, the subjects were asked to draw the shape of the Apple logo. Finally, they were asked to evaluate their level of confidence regarding the drawing on a scale from 1 to 10 (where 1 is low level of confidence and 10 high level of confidence).

Recognition phase

In the second phase, the subjects were asked to choose the right Apple logo shape from a given set of 12 figures. One set of used figures is presented in the following table. Similarly to the original study, there were no logos around the experiment room, and the location of the correct

logo in the given set of figures was different each time. After the recognition task, the subjects assessed the level of confidence for their choice on a scale from 1 to 10 (where 1 is low level of confidence and 10 high level of confidence).

Table 1. The variations of Apple logos used in the experiment (in this case, the last one is the right logo)



Use of the brand

The third phase of the experiment refers to the use of the Apple devices. Thus, the respondents were asked to name the brand of their phone and computer. At the same time, they were asked whether they own other Apple devices, such as iPad, iPod or Apple Watch. Another question refers to the situation in which the subject does not own an iPhone; they were asked if they ever owned an iPhone. The data show that there are only few subjects that own other Apple devices than the iPhone. Therefore, in the data analysis, the idea of owning an iPhone is much more considered than owning other Apple devices.

Perception of the brand

The last phase completes the above information with the perception of the Apple brand in order to correlate it with brand recall and recognition. Thus, the main questions refer to the first word coming to mind when hearing the name of the Apple brand, to what degree they would like to own Apple devices (iPhone, Mac, iPad, iPod, and Apple Watch), to what degree they love the Apple brand, and how satisfactory they find several aspects related to Apple products (innovation, quality, security, affordability, technical support, size of the device, design of the device, technical performance, battery life, and connection – available posts).

2.3 Results and discussions

Within the *recall phase*, there were initiated three tasks to be completed: self-evaluation of the level of confidence before drawing the logo, the logo drawing, and self-evaluation of the level of confidence after drawing the logo. The most important task is that of drawing the Apple logo, from memory, without any visual influence. In this respect, 18.8% (37 respondents) of the individuals manage to draw the logo perfectly². The entire range of the drawing criteria are presented in the table below.

Table 2. Recall of the Apple logo for each drawing criteria

	General (%)	Females (% from the total females)	Males (% from the total males)	Social science (% from the total social science)	Computer science (% from the total computer science)
The drawing is correct	18.8	14.2	25.6	12.9	22.5
General shape					
Bottom not smooth	57.4	53.7	62.8	58.4	56.6
Top not smooth	91.9	91.5	92.3	89.6	93.3
A leaf present	99	99.1	98.7	100	98.3
No stem present	99	100	97.4	100	98.3
Stylized features					
Bite					
Bite present	96.4	96.6	96.1	92.2	99.1
Bite size	80.7	75.6	88.4	64.9	90.8
Bite on the right	83.2	82.3	84.6	74	89.1
Absence of teeth marks	97	95.7	98.7	93.5	99.1
Leaf					
Leaf shape	74.6	73.1	76.9	66.2	80
Leaf orientation	57.4	52.9	64.1	46.7	64.1
Absence of vein in leaf	99	98.3	100	98.7	99.1
Leaf floating	60.4	57.1	65.3	64.9	57.5










As the above data show, the respondents do remember separate details of the logo pretty clearly, but they do not manage to put all of them together. While almost all of the subjects remember that there is leaf and a bite present, and that the top of the logo is not smooth, only

² When claiming that the logo was drawn perfectly, it means that all the components of the logo were correctly considered. In most of the cases, the logo does not totally overlap with the original shape, due to different drawing procedures or talents. However, all these drawings were regarded as correct, because they meet all the established criteria.

around half of them manage to represent a nonsmooth bottom. Regarding the bite, more than 80% remember the size of the bite and the fact that it is placed on the right side of the logo. Considering the leaf, while more than 70% manage to draw the leaf correctly, a little bit more than half remember the orientation and that fact that it is floating. Therefore, it can be said that although there are very few individuals that manage to remember the entire logo correctly, there is an unexpectedly high amount of respondents that remember many details.

The following table presents a sample of the drawings.

Table 3. Sample drawings from the recall phase and the level of confidence before and after the drawing

		
Before drawing = 10 After drawing = 10	Before drawing = 10 After drawing = 4	Before drawing = 10 After drawing = 6
		
Before drawing = 5 After drawing = 5	Before drawing = 9 After drawing = 9	Before drawing = 9 After drawing = 8
		
Before drawing = 6 After drawing = 9	Before drawing = 6 After drawing = 2	Before drawing = 8 After drawing = 6

As the table shows, the drawing features vary significantly. For all the subjects, it is clear that the logo of the Apple brand represents an apple. However, based on the individual talent and level of recall, the features are different. In addition, the above sample show the way the level of confidence evolves from the moment before the drawing to the moment after the drawing. There can be mentioned several situations: the level of confidence stagnates, the level of confidence increases or the level of confidence decreases. Nonetheless, it is interesting to observe how the level of confidence fluctuates, taking into account the way the logo is drawn. There are cases in which the logo is meaningfully biased, but the level of confidence is very high. In the same respect, there are cases in which the logo is almost perfectly drawn, but the level of confidence is very low or decreases.

Although there is indeed a higher percentage of men drawing the logo correctly, when it comes to details, the differences between the two sexes are minimal. Pretty significant differences can be observed only in the case of the smoothness of the bottom, of the bite size,

of the leaf orientation, and of the leaf floating. Yet, this does not mean that the hypothesis is validated.

A pretty similar situation resides in the case of specialization. Although the expectation shows that a computer science background would lead to a better recall of the details of technological symbol, the differences between social and computer science are not significant. While computer scientists have better capacity to recall the bite size and location, the leaf shape and orientation, the social scientists better recall the idea of a floating leaf. It can be emphasized that computer science specialists might be more keen on visual identities belonging to technology. However, this hypothesis must be further tested.

In order to assess a broader overview on the data, the capacity of drawing the logo correctly is correlated with other variables as well. Thus, while correlated with the level of confidence before drawing the logo, only 4 individuals (10.8%) rate themselves with the grade 10, 8 individuals with 9 (21.6%), and 7 with 8 (18.9%). The majority of the people drawing the logo perfectly rate themselves with 7 (24.3%). However, a correlation between these two variables is not significant.

Starting from the premise that the level of confidence can grow after the drawing execution, the data show that, this time, the majority of respondents drawing the logo perfectly rate themselves with the grade 8 (27%). The ones graded with 10 are only 3 (8.1%), the ones graded with 9 are 6 (16.2%), similar with the case of grade 7 (Contingency Coefficient=.275, sig.=.064).

Out of the people that drew the logo perfectly, 81.1% chose the right logo among the given figures (Phi=.402, sig.=.000). Interestingly, 43.2% out of those drawing a perfect logo rate themselves with the grade 10 for the level of confidence after choosing the logo. However, we cannot talk of a strong correlation between these two variables.

Regarding the brand of the phone they own, 27% from the ones that draw the logo perfectly own an iPhone, while 37.8% own a Samsung³. Thus, one cannot say that owning a device from a certain brand does necessarily imply remembering the details of the logo in all its details. In the same respect, the level of love for the brand has no significant correlation with the recall of the logo. More than half of the participants drawing the logo perfectly (56.7%) claim that they love the Apple brand only to a small degree or not at all.

Concluding, one cannot infer that there is a certain mix of variables that determine the capacity of recalling a simplistic logo perfectly. Moreover, while there is no emphasized detail, one cannot predict which details are going to be better remembered. The data also show that there is no relevant correlation between the recall and recognition of the logo and the level of satisfaction with the brand.

Considering the *recognition phase*, from the total number of subjects, 39.9% manage to choose the right logo from the given alternatives. Comparing this percentage with the one reflecting the subjects drawing the logo correctly, one can notice a significant increase. Thus, it can be admitted that, while having a visual aid, although there is a wide range of incorrect alternatives, the choice is easier. Most probably, through existing visual comparison, the subjects do recall several features better.

Table 4. Recognition of the Apple logo

	General (%)	Females (% from the total females)	Males (% from the total males)	Social science (% from the total social science)	Computer science (% from the total computer science)
The choice is correct	39.9	42	36.7	40.2	40

³ The rest of the specified brands do not have significant percentages. That is the reason why only Apple and Samsung are mentioned in the analysis.

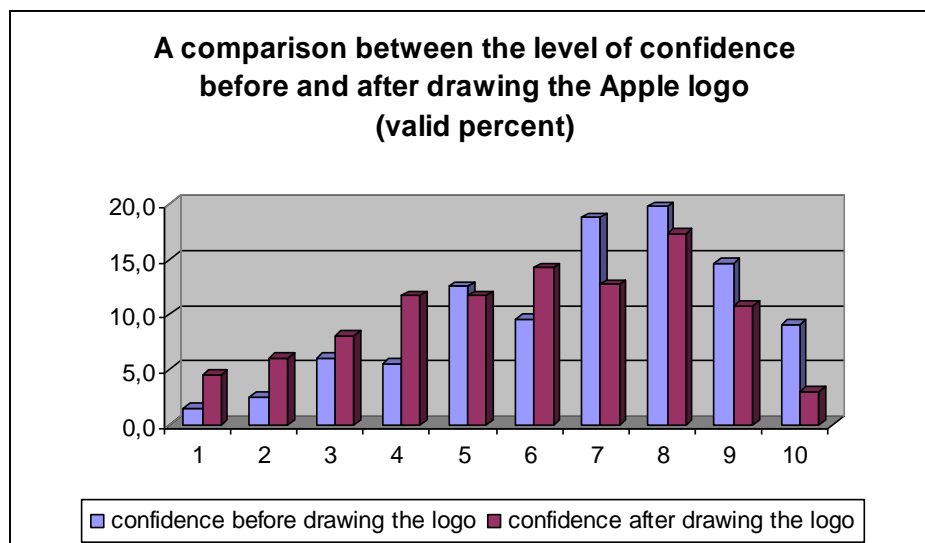
When correlating the recognition phase with sex and specialization, the data show a similar situation as in the case of recall. However, a pretty important difference resides in the fact that women tend to better recognize the Apple logo. When it comes to specialization, almost the same percentage of social and computer scientists choose the right logo.

The capacity to recognize the correct logo is not significantly correlated with the level of love for the brand. It can only be said that 34 (17.17% from the total number of the subjects) from the ones choosing the right logo love the brand to a high and very high degree. In the same respect, although expecting a different result, owning an iPhone does not predict a better recognition capacity.

Comparing the logo recall and the logo recognition phases, the data show that out of the total number of subjects, 37 draw the correct logo and choose the right one at the same time. Moreover, 10 individuals recall the logo correctly, but do not recognize the right one.

Besides recall and recognition, the *level of confidence* is an important variable that can generate knowledge on human behavior. The level of confidence was tested in three different moments of the experimental approach: before drawing the Apple logo, after drawing the Apple logo and after choosing the Apple logo. The following figure shows, in a comparative manner, the fluctuation of the level of confidence in the recall phase.

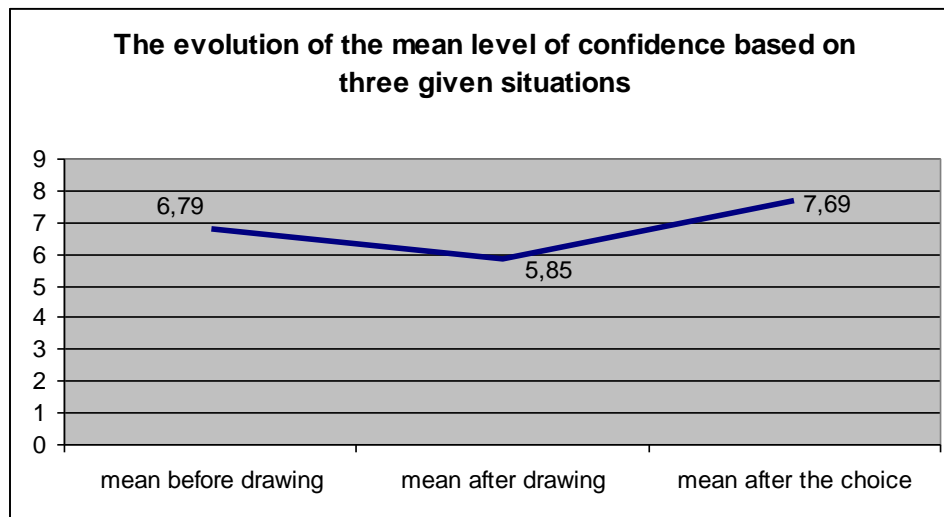
Figure 1. A comparison between the level of confidence in the recall phase (before drawing the logo and after drawing the logo)



There is a higher number of individuals that rate themselves within the top part of the confidence scale (grades between 7 and 10). In the case of the level of confidence before the drawing, the grades are, in general, higher than in the case of the level of confidence after drawing the logo. This situation can be explained through a higher level of desirable self trust before knowing that one is going to be asked to perform a task than after seeing the results of the task (the drawing *per se*).

In the case of the level of confidence in the recognition phase, the average grade is even higher than in the case of the recall phrase, as it can be seen in *Figure 2* (ME before drawing = 6.79, SD= 2.197; ME after drawing = 5.85, SD=2.388; ME after the choice = 7.69, SD=1.974).

Figure 2. A comparison between the average confidence grades for the recall and recognition phrases



The explanation might be at least dual. On the one hand, after passing the first task of drawing the logo, individuals might become self-trustier. On the other hand, being able to actually see the logo variations, although being exposed to eleven incorrect alternatives, the subjects might believe their choice is accurate, especially in comparison with other given logo alternatives.

The level of confidence before drawing the logo is positively and strongly correlated with the level of confidence after drawing the logo (Spearman=.742, sig.=.000). It implies that individuals tend to be consistent with the grades they have used for assessing the recall of the logo before and after drawing it. A similar situation seems to be present when it comes to correlating the recall levels of confidence with the recognition level of confidence. While the correlation between the level of confidence before drawing and the level of confidence after the choice has the coefficient Spearman of .614 (sig.=.000), the correlation between the level of confidence after drawing and the level of confidence after choosing has the coefficient Spearman of .556 (sig.=.000). The respondents do not seem to be significantly biased when being shown variations of the logo. They tend to assess themselves in the recognition situation in a similar manner as in the case of the recall situation.

When the “*love for the brand*” variable is introduced in the analysis, the data show that it is significant, but poorly correlated with the level of confidence before the drawing (Spearman=.184, sig.=.010) and after the choice (Spearman=.163, sig.=.022). Therefore, the cult for the brand does not necessarily imply a high level of confidence on recalling and recognition of the Apple brand.

Although the data show no significant correlation between owning an iPhone and the level of confidence before drawing the logo, one can emphasize that there are 72.7% iPhone owners with confidence levels higher than 7, by contrast to only 58% non-owners with the same

confidence level. In this case, it might be said that, rarely, owning an Apple device gives a user the confidence that they recall the details of the logo properly.

However, regarding the level of confidence after drawing the logo, owning an Apple device does not make the difference. The same amount of individuals (43.6%) from each category (owners and non-owners) has a level of confidence higher than 7. Contrary to expectations, there are no significant correlations between the levels of confidence, before and after drawing the logo, and the sex and specialization of the respondents.

3. Conclusion

The original study finds that although there is a poor level of recall and recognition, the subjects seem to be confident in their performance, probably due to the simplistic perception of the Apple logo. Thus, usually, the individuals tend to think that they will perform better than they actually do (Blake, Nazarian, Castel, 2015). Although there has been introduced a wider range of variables (as sex or specialization), the present study comes to similar conclusions. There is a small amount of individuals that are able to correctly recall and recognize the logo of Apple brand. However, although there are very few individuals that manage to remember the entire logo accurately, there is an unexpectedly high amount of respondents that remember many features of the logo.

The level of recognition is higher than the level of recall. A possible explanation might be that, while visualizing a set of varieties of the same logo, although almost all incorrect, the probability to recall features of the original logo increases.

Another interesting result shows that the average level of confidence decreases in the first two moments of the experimental approach. Thus, on a scale from 1 to 10, it evolves from 6.79 before drawing to 5.85 after drawing. In this respect, after being asked to actually draw the Apple logo, and after seeing it is not an easy as expected task, it is likely that the subject will become more self-conscious. In the case of the recognition phase, the average level of confidence is even higher than initially (7.69), meaning again that, if the logos are visible, although incorrect, the self-trust is higher.

Although it was expected that men and computer scientists would perform better in both recall and recognition phases, the data show no significant correlation between these variables (H1 and H2 are invalidated). The same situation fits for the owners of Apple devices and lovers of the brand (H3 and H4 are invalidated). They do not seem to have better competencies in drawing and recognizing the Apple logo. However, there is a slight positive correlation between Apple owners and lovers and the level of confidence (H5 and H6 partially validated). This implies that by owning an iPhone for instance, the subjects develop a higher level of self-confidence related to the features of the owned brand.

If we were to extrapolate these specific conclusions, one might say that, in the case of a minimalist element, whether it is a marketing symbol or something else, the combination of variables that can lead to recalling and recognizing those elements should be further investigated in a wider range of contexts. The premise stating that the level of minimalism of an element is positively correlated with recall and recognition needs supplementary analysis. For instance, by increasing the number of analyzed logos, the relevance of minimalism in marketing, especially for marketing specialist and logo designers, can be more comprehensively assessed.

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