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Subliminal Advertising:

New experimental data on the power of sexual embeds

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*I*ndex

*A*bstract

There is an ongoing debate regarding the effectiveness of subliminal advertising. In order to participate in the controversy and have a say in the topic we conducted an experiment in which we tested the following hypothesis: sexually aroused people will feel more attracted by the images containing sexual subliminal messages. We showed half the people in our sample 5 advertisements with sexual content with the purpose to increase their arousal; the other half watched 5 neutral advertisements. After that, all participants chose the image they liked most from each of the 7 pairs. The images were identical, except for the fact that one image had a sexual embed, and the other did not. Although the results are not statistically significant except for one case, they show a trend towards our predictions. We conclude that the experiment is worth to be repeated and we describe some implications.

*I*ntroduction

Imagine the word *sex* was hidden in a print advertisement at the shelter at your usual bus stop. Would it have any effect on you? Could it affect your preferences in choice? Would your mind be tricked and influence your purchasing decisions? These questions serve as motivation for our project.

In this paper we aim to take part in the numerous studies in the field of subliminal persuasion and contribute to the growing literature with our own empirical research. Moreover, we can realise that all the previous studies position themselves as trying to show that subliminal stimuli are effective in inducing a response on the individual which may have a marketing application, or as trying to show that subliminal stimuli do not have any effect on consumer behavior. 57 years have passed since Vicary's experiment, and there is still nowadays no general agreement on the issue.

By looking at previous papers, we realised that some of them discussed the effect of sexual embeds and discovered many real examples of subliminal advertisements with sexual stimuli. This encouraged us to research on this topic with the purpose to test if sexual subliminal messages determine individuals' choices when they are aroused.

The project is structured in three sections. First, we are going to find some theoretical concepts relating subliminal stimuli and advertising. Next, we are going to present how sex appears in subliminal advertising and reason why marketers may use sexual embeds. Finally, we are going to connect subliminal messages and sex to design our experimental research, which has sexual embeds as a focus, and we are going to illustrate the experiment's purpose, methodology, results, discussion and conclusion.

1. A quick glimpse of subliminal advertising

Before going into the experimental work, we should get the scoop about the issue in question. Therefore in this section we aim to clarify some theoretical concepts, which will help us understand what subliminal stimuli and subliminal advertising are, as well as outline related information that will be useful in future sections.

1.1 What is subliminal advertising?

What comes to your mind when you hear the word *subliminal*? If having heard of the concept, one will very likely relate it to subliminal advertising and to Vicary's famous experiment in 1957, which tried to influence the purchase of popcorn and Coca-Cola in a New Jersey's theatre by showing "Eat Popcorn" and "Drink Coke" subliminally on the screen during a film (Pratkanis, 1992 cited by Karremans, Stroebe, & Claus, 2006).

By **subliminal stimuli**, we understand stimuli which are shown under the threshold or consciousness perception level and are only noticed by the unconscious mind, that is, without the person being aware of it. In fact, the word subliminal has its origin in the Latin language, and by decomposing the word we get to the meaning of the concept: "sub" means "below" and "limen" means "threshold" (O'Barr, 2005).

According to Dijksterhuis, Aarts, and Smith (2005), we should differentiate between the objective and the subjective threshold. The former deals with the sensory system, the latter with conscious awareness. Therefore, a stimuli will be subliminal if it passes the objective threshold but not the subjective one. Dijksterhuis et al. (2005) continue to say that we should note that the subjective threshold is not the same for everybody. Therefore, what may be subliminal for some, may not be for others. Moore

(1982) states that a person's threshold may vary continuously, and that it may greatly differ from that of other people. Hence, the importance of taking this into account when presenting subliminal stimuli.

Following the definition above, **subliminal advertising** is a technique used by marketers which consists of embedding subliminal stimuli in advertisements in order to make advertising more effective and influence consumer's purchasing behavior without them being aware of it (Rogers & Smith, 1993; Trappey, 1996).

1.2 Origin and controversy

1957 appears to be an important year for subliminal advertising, with both the publishment of *The Hidden Persuaders* by Vance Packard, who first wrote to the public about the persuasive use of subliminal techniques, and Vicary's experiment which turned to increase sales by 18% and 58% of Coke and popcorn respectively. Although Vicary admitted that he cheated the experiment, it triggered people's attention to this matter (Pratkanis, 1992 cited by Cooper & Cooper, 2002; Zanot, Pincus, & Lamp, 1983). From that moment on, further research has increased aiming to discover whether it is true that marketers place subliminal messages in advertisements, and whether these work (Bermeitinger et al., 2009).

In addition, studies researching the public perception of subliminal advertising conclude that most lay individuals are aware of the concept, and they believe that this practice is used in advertisements with the objective of influencing their consumption choices, being marketers successful on the purpose (Rogers & Smith, 1993; Zanot et al., 1983).

Many experts have contributed on the study of subliminal questions but there

exists controversy in their opinions. While some claim that subliminal stimuli techniques do have a significant impact on individuals, others disregard the effect of these practices. Most of the debate is based on the effectiveness of subliminal stimuli in affecting behavior. Indeed, it may be accepted that exhibiting subliminal stimuli can have an effect on the individuals' attitudes (Krosnick, Betz, Jussim, & Lynn, 1992), and on the individuals' affective response to the subliminal stimuli (Kunst-Wilson & Zajonc, 1980 cited by Moore, 1982). Nonetheless, there is much reaction when researchers talk about subliminal stimulation conditioning purchasing behavior and choices (Moore, 1982).

Generally, authors that defend the capability of subliminal stimuli have based their opinion on the relevance from the results of their experiments, such as Byrne (1959, cited by Dijksterhuis et al., 2005), whose experiment will be explained in section 1.4. Cooper and Cooper (2002) also state that subliminal stimuli affect motivational states; in their experiment, participants' level of thirst increased after being stimulated with subliminal thirst-related words. A relevant finding suggests that the effectiveness of subliminal stimuli is dependant on whether the individual presents a need and the messages are need-oriented (this is proved in Bermeitinger et al., 2009; Karremans et al., 2006; Strahan, Spencer, & Zanna, 2002). Karremans et al. (2006) experimented with the need of thirst, and concluded that participants chose the brand which they had been subliminally primed provided that they were thirsty. Similar experiments were conducted by Strahan et al. (2002) and Bermeitinger et al. (2009) applied to the needs of thirst and sadness and tiredness respectively. This suggestion is particularly important for the performance of subliminal advertising, and these researchers argue that other experiments have not been able to show the power of subliminal persuasion because

their subjects did not have a motivation (Strahan et al., 2002).

On the other hand, Vokey and Read (1985) reject the idea that subliminal messages affect behavior. In the same line, Trappey (1996) concluded the ineffectiveness of subliminal advertising by performing a meta-analysis of several studies from the field. Moore (1982) also suggests that marketing applications of subliminal advertising and the possibility of influencing consumer behavior are low.

1.3 Ways for subliminal stimuli to influence behavior

Experts believe that there are three channels for placing subliminal stimuli through which they may affect behavior. These are visual stimuli, subaudible stimuli and sexual embeds (Moore, 1982). Below we are going to explain in what consists each of these, following Moore's explanation.

Subliminal visual stimuli. This kind of stimulation is perceived through the sense of sight by the individual's unconscious mind. Stimuli are usually flashed on a screen very quickly, which makes it impossible for the person to be aware of them. These stimuli may be used in films and screen ads with the aim to influence people's behavior.

Subliminal audible stimuli. Stimulation occurs through an audio recording in such a way that a louder sound covers this audio so as to make it imperceptible by the conscious mind. A special type of subliminal audio stimuli is the so called backmasking, which consists of an audio piece that is recorded backwards with the intention of influencing the listener when played forwards (Vokey & Read, 1985). These messages are particularly embedded in music songs and self-help audio tapes.

Sexual embeds. This technique consists of placing erotic pictures and words in

images, in such a way that they do not pass the subjective threshold. These stimuli can be particularly found in print advertising and products' packages. One of the leaders in claiming the existence and efficiency of sexual embeds is Wilson Bryan Key. We are going to use these kind of stimuli in our experimental research.

1.4 Applications of subliminal stimuli in consumer behavior

As mentioned before, the fact that consumers' purchases can be driven by subliminal persuasion is not only one of the most argued topics by experts in the field, but also one of the greatest fears of the public. Making a reference to Dijksterhuis et al. (2005), there are three applications through which subliminal stimuli can exert an influence on consumer behavior.

First, subliminal stimuli may affect **basic physiological needs**. The authors use two experiments to explain this: the first was performed by Byrne (1959), who proved that after presenting the words "beef" subliminally, participants were hungrier. However, this study did not show a clear marketing application, given that participants did not have a preference for the beef sandwich, although having been exposed to it subliminally and having become hungrier (Moore, 1982).

Second, subliminal stimulation may affect **behavior**. Again, Dijksterhuis et al. (2005) point out an experiment which demonstrates the effect on drinking behavior. In the study by Strahan et al. (2002), participants exposed subliminally to the words "thirst" and "dry" drank significantly more than those in the control group.

Third, subliminal persuasion may have an effect in a marketing context by influencing consumers' **choices**, that is, inducing individuals to choose a particular product. Dijksterhuis et al. (2005) comment that this may not work alone by subliminal

stimulation, but it may be helpful that the individual has a need and some supraliminal information about the product.

After presenting the origins of subliminal advertising, the controversy related to the topic, the types of stimuli and the purposes of subliminal messages, we will concentrate in sex in advertising.

2. Sex in advertising

In this section we are going to gather information regarding the origin of sexual advertisements. We will talk specifically about sex in subliminal advertising. A discussion of the purpose will follow as well as an analysis of the efficiency of using this practice.

There is evidence of the implementation of advertising campaigns which started using sex as means to attract consumers at the end of the 19th century. They were not explicit when portraying the sexual message but they rather contained some erotic suggestions and left the rest to the imagination (O'Barr, 2011). We can highlight sex as being used as a tool and in fact it is one of the most recoursed topics in advertising. Since these initial steps, sex in advertising has evolved and eroticism has become more and more explicit.

Within the field of advertising, we find sex especially in subliminal advertising. Several researchers state that the word *sex* or other sexual stimuli are embedded in advertisements (Widing II, Hoverstad, Coulter, & Brown, 1991). For instance, Wilson Bryan Key (2000) claimed that even if these stimuli are not noticeable at the conscious level, they are highly present in daily American life.

The use of sexual embeds is due to individuals' high susceptibility for sex. Thus, it is believed that people will be influenced unconsciously through such stimuli, since it is easy to catch their attention with this topic (Vockey & Read, 1985). For example, Saegert (1987, cited by Beatty & Hawkins, 1989) stated that "sexual embeds would increase viewers' attention because of an unconscious wish for sexual intimacy" (p. 5).

The practice of including sexual subliminal messages in advertisements, thanks

to humans' high response to sex, is seen as a way of attracting consumers and thus, being able to sell more. According to Key (2000), marketers use sexual subliminal stimuli in order to influence consumers' decisions unconsciously and stimulate them to buy the product advertised. Moreover, marketers may be interested in the practice because sexual stimuli are thought to increase the memorability of the advertisement (Key, 1976 cited by Moore, 1982).

Regarding the efficiency of advertisements, we can not generalize that sex in advertising always helps to increase consumers' attention and enhance sales, while it may be effective in some cases, it may not in others (Reichert, 2003 cited by O'Barr, 2011). At the same time, there are researchers that claim that subliminal sexual stimuli in advertising are effective to some extent (Wiging II et al., 1991), while others, such as Key (2000), really support its power.

We found that most subliminal advertisements contain sexual content, which is an issue that really intrigued us. Thus, we have dedicated a section to talk about sex in subliminal advertising. Now we will turn to the empirical research, in which we have used sexual subliminal messages.

3. Empirical research

In the following section we are going to develop the experimental research we designed, we are going to collect the results, as well as go through a general discussion and conclusion.

3.1 Purpose of the study

Since the topic in question is still open to discussion, we thought it could be engaging to conduct a research study in the field of subliminal persuasion and contribute to the numerous studies done in the past years. We were particularly interested in the link between subliminal advertising and sex, due to the diverse examples of subliminal messages containing sexual embeds.

We wanted to test if sexually aroused individuals would be more attracted by images incorporating subliminal messages with sexual stimuli. In other words, we aimed to assess if sexual subliminal messages exert a greater influence on sexually excited individuals. Our intuitions were that this would be the case, so we formulated the following hypothesis: sexually aroused people will feel more attracted by the images containing sexual subliminal messages.

In order to test the hypothesis, we conducted an experiment with two conditions: the experimental condition and the control condition. The difference between the two was that in the experimental condition we increased participants' interest for sex so that they were sexually aroused, while in the control one we did not exert such influence.

3.2 Method

Subjects

The sample consisted of fifty-two individuals, who were randomly assigned to

the two groups: 26 individuals in the experimental group (13 women, 13 men) and 26 individuals in the control group (13 women, 13 men). The mean age was 25 years and 5 months old. We contacted participants by means of Facebook; they were relatives and friends willing to help, so we expressed them our gratitude at the end. All of them had normal or corrected to normal vision. Participants were not aware of the purpose of the experiment.

Materials

The materials used consisted of TV advertisements for different consumer goods and seven pairs of images. The TV advertisements were different for each condition. The five advertisements displayed in the experimental group showed high levels of sexuality (sensual, sexy people, intimating couples, naked parts of the body) as their purpose was to increase participants' arousal. The advertisements chosen that complied with these requirements were a Martini's ad, two perfume commercials: Endless Euphoria by Calvin Klein and Dior Homme, an underwear advertisement by Victoria's Secret and a jeans commercial by Armani Jeans. Regarding the control group, the set of advertisements played were five neutral videos with no sexual purpose. The brands advertised were Volkswagen Passat, M&M, Pringles, Mercedes-Benz and Rexona.

Concerning the images that both the control and experimental groups had to choose from, there were seven pairs. Apparently, each pair of pictures was identical, but in fact one of the images had a subliminal message with sexual stimuli embedded. The subliminal stimuli was not appreciated at first glance, but if pointed out individuals could notice it. The pictures were taken from images or real print advertisements available on the Internet. They were slightly modified with Photoshop so as to eliminate the subliminal message but, at the same time, trying not to make significant and

noticeable differences. The seven images with their respective subliminal messages were the following: a Kent's print advertisement (the word *sex* can be found in the smoke of a cigarette), a picture of an Axe's shampoo bottle (we can observe on the package an *S* shape which is combined with the name of the product, displaying the word *sex*), a Jantzen's print advertisement (it plays with the shadow, the position of the man's fingers and the seam of his t-shirt so as to form the word *sex*), a Coke's print advertisement (in the ice cubes two people can be seen having sex), a Palmolive's print advertisement (the arm embracing the woman's knees is a man's arm), a Gilbey's Gin print advertisement (in the ice cubes the word *sex* and other erotic symbols can be observed), an illustration of Flowers (between the spaces of the flowers the word *sex* is formed).

(These pictures are enclosed in Annex 1)

Procedure

We sent the experiment to participants in form of a survey to be filled electronically, run on the Google Drive form tool. The only difference between the two groups was the video with the five TV ads, yet participants were not aware of the group to which they belonged. At the beginning of the survey, there were written the instructions which they had to follow.

The experiment consisted of two phases: in the first phase they watched a video composed of five advertisements. The respective running times of the ads were 3:15 minutes for the experimental group and 3:11 minutes for the control one. In the second phase, the two images were located next to each other and each of the pairs was presented one by one. We labelled each image with a letter to help individuals identify them: A (right-side image), B (left-side image). The images containing the subliminal

messages were alternately placed in the following order: B, A, A, B, B, A, A. Each pair appeared in a video format which lasted 14 seconds. This was the exact time individuals could look at both images, since we asked them to play the videos just once. After the video, they had to answer the following question: "Which image do you like most?", it was a multiple choice answer with two options: A or B.

Considering that this could be difficult to understand just by reading the instructions, we included an example below them, which had to be answered before starting the experiment. In the example, there was a neutral pair of images with no subliminal message, although we minimally photoshopped one of them to replicate the fact that one image would differ the other in the following steps. They were asked the same question they would find afterwards, and had to make a choice between image A or B.

After the completion of the part related to images, we asked them if they had noticed any significant difference between the pictures of each pair. We left a blank space for them to explain if that was the case. Next, there was a multiple choice question to control the randomness of their answers, we asked if they had answered randomly most of the times and they could choose between yes and no. Finally, there were demographic questions such as age, sex and nationality.

3.3 Results

Next, we are going to present the results from the described experimental research. First, we are going to pay attention to the information collected in Table 1, where we can observe the percentage choice between subliminal and neutral images in each of the two groups. We can notice that the percentages of subliminal images chosen

are in most cases higher than those of the neutral images for both the experimental and the control conditions. However, this is not true for all the pairs.

On the one hand, in the experimental condition, Axe's results are the same for both the subliminal and neutral images, and in the Gilbey's Gin case the percentage for the neutral image is higher.

On the other hand, in the control group there is again a tie, this time in the Kent's. In addition, there are two cases in which participants chose more neutral images than subliminal ones: in Jantzen and Gilbey's Gin. We observe that subliminal images were chosen more times generally but the difference with the neutral images chosen is only by one or two participants. Thus, these results in which the subliminal percentage is greater than the neutral has little relevance.

In conclusion, we could claim that these percentages fulfill our predictions. This means that participants who watched the video aimed at increasing their interest for sex were more attracted by images with a subliminal sexual message. Nevertheless, we performed a one-tailed Z test to assess the statistical significance of the results between the subliminal images' percentages of both conditions, and we can see that the results fail to reach statistical significance in six out of seven cases. However, in the Jantzen case it is statistically significant ($p < .05$).

(see graphs in Annex 2)

	Experimental group, %		Control group, %		One tail probability		
	Subliminal image	Neutral image	Subliminal image	Neutral image	Z	p-value	significance
Kent	65.4	34.6	50	50	1	0.13136	N.S.
Axe	50	50	53.85	46.15	-0.2778	0.38974	N.S.
Jantzen	65.4	34.6	42.3	57.7	1.6707	0.04746	<0,05
Coke	65.4	34.6	53.85	45.15	0.8488	0.19766	N.S.
Palmolive	57.7	42.3	57.7	42.3	0	0.5	N.S.
Gilbey's gin	42.3	57.7	46.15	53.85	-0.2795	0.38974	N.S.
Flowers	73.1	26.9	73.1	26.9	0	0.5	N.S.

Table 1. Choices between image with/without subliminal message, experimental and control groups (self-provided).

We have also obtained results from the images that were preferred in the case of men and women specifically. In order to observe the particular differences in choice between sexes we can look at the data in Table 2.

In general, focusing on the experimental group, we find that more female participants felt attracted by the subliminal image compared to males, who in some cases liked more the neutral images. Moreover, in the cases in which males did like the subliminal, they liked them less relative to their counterparts.

We may speak now about some striking cases. For instance, focusing on the Axe picture, we find that in the experimental condition 69.2% of male participants chose the neutral image, but it was just the opposite for female participants as 69.2% of them chose the subliminal image. Other examples are the Kent and Jantzen cases in which women liked more the subliminal than men by large, or the Coke and Flowers pictures in which male and female participants show very similar preferences, preferring the subliminal image.

Turning to the control condition, we find that males follow a similar trend to that

of the experimental condition but females' choices diverge. In the control group, females show a similar pattern to males' preferences. We have highlighted before the case in the experimental group in which women's results showed a stronger preference for the subliminal image in Kent and Jantzen. Nevertheless, in the control group the case is reversed, especially for Jantzen, as women liked more the neutral image.

(see graphs in Annex 2)

	Experimental group, %				Control group, %			
	Males		Females		Males		Females	
	Subliminal image	Neutral image	Subliminal image	Neutral image	Subliminal image	Neutral image	Subliminal image	Neutral image
Kent	53.85	46.15	76.9	23.1	53.85	46.15	46.15	53.85
Axe	30.8	69.2	69.2	30.8	46.15	53.85	61.5	38.5
Jantzen	46.15	53.85	84.6	15.4	53.85	46.15	30.8	69.2
Coke	69.2	30.8	61.5	38.5	30.8	69.2	76.9	23.1
Palmolive	53.85	46.15	61.5	38.5	61.5	38.5	53.85	46.15
Gilbey's gin	38.5	61.5	46.15	53.85	46.15	53.85	46.15	53.85
Flowers	69.2	30.8	76.9	23.1	76.9	23.1	69.2	30.8

Table 2. Males and Females' choices between image with/without subliminal message, experimental and control groups (self-provided).

We have analysed the data in a way that we can observe the total subliminal images and the total neutral images chosen out of the total images. Here we can see that again the percentage for subliminal is higher than the percentage for neutral, and in turn, this percentage is greater in the experimental than in the control condition. As we can see in Table 3, 59.9% of the times participants chose the subliminal image in the experimental condition, while it was 53.85% of the times in the control. Thus, our hypothesis would be fulfilled. However, these percentages are not significantly different by Z test.

(see graphs in Annex 2)

	Experimental group, %	Control group, %	One tail probability		
			Z	p-value	significance
Subliminal images	59.9	53.85	0.4405	0.32997	N.S.
Neutral images	40.1	46.15			

Table 3. Total images chosen with/without subliminal message,
experimental and control groups (self-provided).

We also tested each of these results with the average expected result, which would be 50% of the cases. The results can be seen in Table 4. By doing a one-population proportion Z test, we obtained that the results are not statistically significant, and so the difference obtained does not have relevance.

	Subliminal images chosen, %	Expected value, %	One tail probability		
			Z	p-value	significance
Experimental group	59.9	50	1	0.1563	N.S.
Control group	53.85	50	0.4	0.3473	N.S.

Table 4. Significance test comparing with the 50%,
experimental and control groups (self-provided).

In addition, we have collected information about the amount of images chosen by females out of their total possibilities, and the amount of images chosen by males out of their total possibilities, for both conditions. We can see the figures in Table 5.

Regarding females, more subliminal images were chosen by women than men in both conditions, being this preference more obvious in the experimental group (68.3% vs 54.95%).

Regarding males, in both conditions more subliminal images were chosen, although the percentages are close to the 50%. However, the results are a little bit contradictory to what we expected as we see that there are more subliminal images chosen in the control group (52.75%) than in the experimental group (51.65%).

	Experimental group, %		Control group, %	
	Males	**Females**	**Males**	**Females**
Subliminal images	51.65	68.13	52.75	54.95
Neutral images	48.35	31.87	47.25	45.05

Table 5. Males and Females' total images chosen with/without subliminal message,
experimental and control groups (self-provided).

Now we will test if the results of the difference between sexes is significant. Therefore, we have compared the times women and men chose the subliminal image over the neutral in the experimental group, and the same for the control group. As we can observe in Table 6, we reach the conclusion that the results obtained are not statistically significant.

(see graphs in Annex 2)

	One tail probability		
	Z	**p-value**	**significance**
Females vs Males Experimental group	0.8573	0.19489	N.S.
Females vs Males Control group	0.1125	0.4562	N.S.

Table 6. Significance test comparing sexes,
experimental and control groups (self-provided).

It is also interesting to pay attention to how many subliminal images out of seven each person chose. We can examine Figures 1 and 2 that collect the number of people in each of the ranges, i.e. 11 people chose 5 subliminal images out of 7 in the experimental condition, while 8 people chose 5 out of 7 in the control condition. Looking at the information in percentages, we see that in the experimental group 42.31% chose 5 images out of 7. On the other hand, in the control group less people chose nearly all the subliminal images, it was a 30.77%. As a difference to highlight, in the experimental condition 23.08% of the participants chose 6 out of 7 images, while in the control condition it was only 3.85%, meaning that in the experimental group more

people chose a larger amount of images containing the subliminal message. As we can see, no one chose all the 7 subliminal images.

Besides, we can also look at the lower ranges where we notice that both in the experimental and control groups, 5 people chose 2out of 7 subliminal images. Therefore, in both cases 19.23% of the participants chose 2.

In conclusion, while in the lower tail we obtain the same number of people who chose 2 subliminal images in the two conditions, in the upper tail there are more participants choosing more subliminal images in the experimental group, which means that the percentage of people in the middle ranges is superior in the control condition.
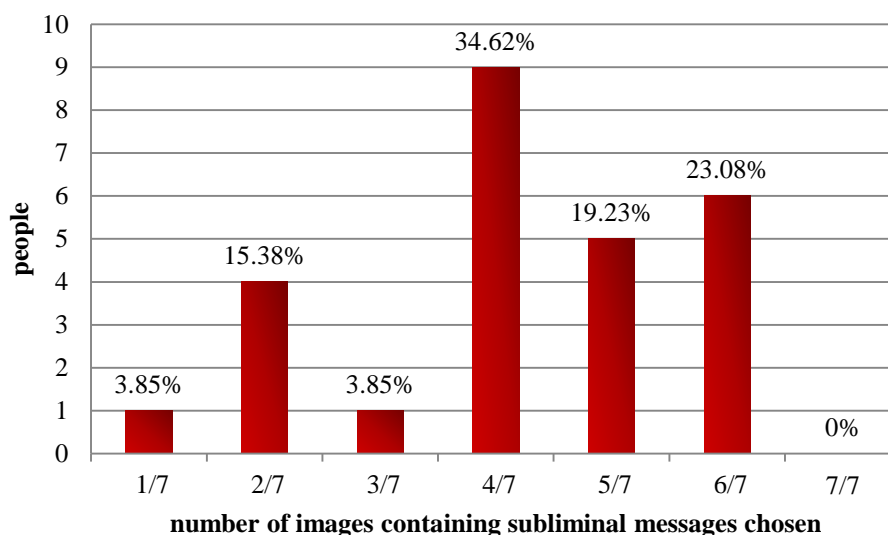
Figure 1. Images with sexual subliminal messages out of 7 chosen by each participant, experimental group (self-provided).
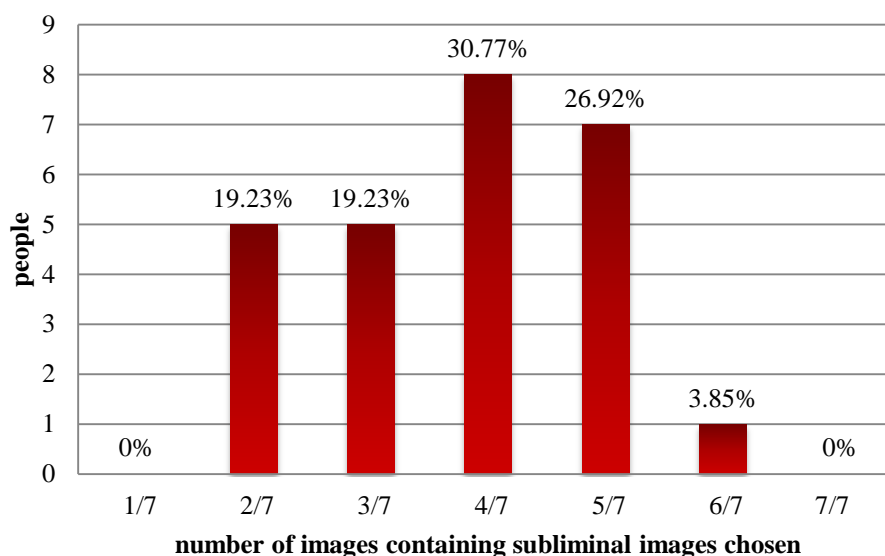
Figure 2. Images with sexual subliminal messages out of 7 chosen by each participant, control group (self-provided).

Focusing on the replies to the question that the subjects were asked in order to know if they had noticed any significant differences between the pictures in each pair, the general opinion was that they could not distinguish between them. In addition, those who replied that they had observed a difference, they centred their attention to brightness, sharpness or colour, features that we did not modify.

Finally, what we have left to comment is the randomness of participants' answers. We find here an interesting difference, given that in the experimental condition half of the people claimed to have answered randomly and the other half did not. On the contrary, in the control condition 73% of the participants said to have answered randomly and 23% did not.

(see graphs in Annex 2)

3.4 Discussion

We are going to discuss the results presented above. After analysing each pair of

pictures, we notice that the results are close to our expectations. That is, the images containing the sexual subliminal message were usually more preferred to those without subliminal message, after stimulating participants with erotic advertisements. However, after testing the results we obtained that these differences between the experimental and control conditions are not statistically significant, except for the Jantzen case.

Focusing on the reasons why the Jantzen picture is statistically significant, differing from the others, we may say that it is due to the fact that in the picture a couple can be observed, while it is not the case in any of the other pairs of photographs. We could argue that the layout of the image may help the subliminal message to be transmitted in a more effective way and be better perceived by the unconscious mind.

Another interesting result is observed in the image with flowers. This case shows the highest percentage of preference towards the image with sexual subliminal content (73.1% in both the experimental and control groups). The reasoning may come from the fact that this picture is the simplest, clearest one with a plain drawing. Thus, that may help the unconscious mind perceive the subliminal message in a clearer way.

The reasoning for the non-significance is because of the limitations of the experiment per se. As a first limitation, the sample is formed by 52 people, and having 26 people in each group may not be enough. So the small sample may not be enough to correctly accept or reject the hypothesis. Second, we may also need more pairs of images in order to have more examples to observe. Another limitation is that the images were taken from the Internet and their definition was not the best one, which could lead to the unconscious not perceiving well the subliminal message. What is more, the experiment was conducted on the computer without direct supervision, which may not be the best medium, since we would have liked to have bigger images with a better

quality image, and manage the experiment ourselves. Moreover, there was a lack of control over the degree of sexual arousal prior to the experiment and after watching the five advertisements in both conditions. We expect participants in the experimental group to have had a higher degree of arousal than others in the control group. Nevertheless, we do not have data on how neutral participants were in the control group.

Analysing the results for women and men, we notice that women felt more attracted by the subliminal message when being previously sexually aroused. However, for men there was not such a big difference between having been aroused or not. From stereotypes, we may have thought that men would show greater preference for the sexual subliminal messages in the experimental condition, due to the topic in question and the eroticism in the videos that increased the interest for sex. This was not the case. We should take into account that women are also attracted by the idea of sex and these results may imply that women's unconscious mind could be more influenced by sexual subliminal messages than men.

With respect to images, participants found no significant difference between the two ones of each pair, which means that they did not notice the sexual messages in the pictures, which actually makes them subliminal.

Regarding the randomness of the answers, in the control condition most participants felt that they had answered randomly in most of the choices they made between the pairs of images, so they did not feel that their answers were driven by anything. Nevertheless, in the experimental condition 50% participants did not answer randomly, so they noticed they liked more one image than the other even if they did not really know what was driving their preference, and had answered that they had not seen any significant difference between the two.

3.5 Conclusion

We think that the experiment may be worth to be repeated taking into account the limitations explained above and improving them. The experiment should have a larger, more representative sample of the population. It should be based on more pairs of subliminal and neutral images, so as to have access to more cases to analyse. Related to images, these should be printed in a larger size so that all the details can be observed, and be of high quality. In addition, there should be some control of the sexual arousal of participants in the course of the survey. The experiment is most suitable to be performed personally, that is, researchers and participants being face-to-face to better supervise that they do the experiment correctly, controlling for the time they are allowed to see the pairs of images and assist them if they have doubts.

If the experiment is done under these conditions, we expect to see more reliable results. We may see that our hypothesis is fulfilled, and that sexual subliminal messages are more liked when being sexually aroused. In fact, we have observed this tendency, although the results are not statistically significant. However, we may also see opposite effects.

By repeating the experiment, we could notice if there are real differences between males and females' choices, and if so, if it would follow the tendency we have found, being females more attracted to the sexual subliminal messages when sexually aroused, or it would be the other way around. It would be interesting to address in further investigation what leads men and women to have different results, analysing the trends of their preferences and why they differ in their choices depending on the image shown.

Our results may have implications for marketers. First of all, they should take

into account that the experiment should be repeated in order to get reliable data. Nonetheless, if we focus on the trend our results have shown, we may conclude that in order to improve the functionality of the subliminal message, the participants should be stimulated in such a way that their motivations are aligned with the message. This is a possibility derived from our results. Yet, we cannot strongly conclude this because our data were not inconclusive. This possible implication is supported by some studies. For instance, Strahan et al. (2002) claimed that "being primed with goal-relevant cognitions will only lead to enhanced effectiveness of an ad that targets the goal in situations in which they are motivated to pursue the goal" (p. 557). Karremans et al. (2006) also concluded that the participants in their experiment chose to drink the product from the brand that was subliminally exhibited to them but it only had such an effect provided that they were thirsty. In the experiment of Bermeitinger et al. (2009) we also find the same concept, that is, for subliminal messages to work we should apply need-related subliminal stimuli and individuals should face that particular need. Turning to our study, if the empirical results were the expected ones, we could conclude that subjects will have a preference for the advertised product with the sexual subliminal message embedded providing that they are sexually aroused (we can notice here the function of the previous advertisements in ensuring participants' interest for sex).

This proposition may have implications for the real world. As Rogers & Smith (1993) expressed, 72.2% of the people who knew what subliminal advertising was already thought that marketers' practice worked and that they were being manipulated without them realising at the conscious level. People who are concerned with the possibility of being influenced, should note that nowadays there is still no empirical support that backs that subliminal persuasion will always be effective. Following the

findings mentioned above, it depends on other factors and circumstances that may have an effect on the efficiency of the subliminal message.

This paper takes part in this controversial topic in question. With this experimental study, we hope to have contributed to the research papers in the field of subliminal advertising in a positive way despite the non-clear results.

*C*onclusions

Our purpose was to conduct an experimental research in the field of subliminal advertising. We have accomplished this goal and have contributed to some extent to the controversial topic, which was an enthralling ambition for us. However, after taking the limitations of our experiment into account, we think that it should be redesigned in order to obtain more precise results.

In line with our experiment, we have shown that the results, although not statistically significant, follow a trend that supports our initial predictions. Therefore, we may suggest that there is some indication that sexual embeds work if the individuals are predisposed to sex. In other words, when individuals are sexually aroused, sexual subliminal messages are more likely to have an effect on the individuals compared to a non-aroused state. However, this should not be taken for granted since our data was not conclusive.

Within the debate on this particular topic, we were supporting the group of researchers backing the idea that subliminal messages are relevant for consumer behavior, since we claimed that aroused individuals exposed to subliminal messages would be more attracted by images with embedded messages than by neutral ones. However, after observing our results we cannot position ourselves in any of the two sides because, even if there exists a trend towards one of the sides, it is not very representative and we would need a second experiment to contrast.

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Videos used in the experiment

Experimental group:

Calvin Klein. (2014). *Endless euphoria Calvin Klein*. Retrieved April 24, 2014, from

https://www.youtube.com/watch?v=seQgrWGwuaM

CARJAM TV. (2011). *Charlize Theron Sexy Martini Commercial*. Retrieved April 24,

2014, from https://www.youtube.com/watch?v=pRi6NfLr5yc

Christian Dior. (2013). *Dior Homme 'The Film' - The Bedroom*. Retrieved April 24,

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Rihanna. (2012). *Rihanna + Armani*. Retrieved April 24, 2014, from

https://www.youtube.com/watch?v=49lEbCb_x-I

VICTORIASSECRET. (2013). *Victoria's Secret Dream Angels*. Retrieved April 24,

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Control group:

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"Chicken"*.   Retrieved   April   24,   2014,   from

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Heather Zeller. (January 27, 2014). *Pantene Pro-V teams up with Olympic swimmer*

     Nathalie Coughlin. Retrieved April 18, 2014, from

     http://blog.aglamslam.com/2012/01/27/pantene-pro-v-teams-up-with-olympic-

     swimmer-natalie-coughlin/

*A*nnexes

Annex 1: Images used in the experiment

Figure 3. Kent (Subliminal Manipulation, 2011).

Figure 4. Axe (AXE, 2014).
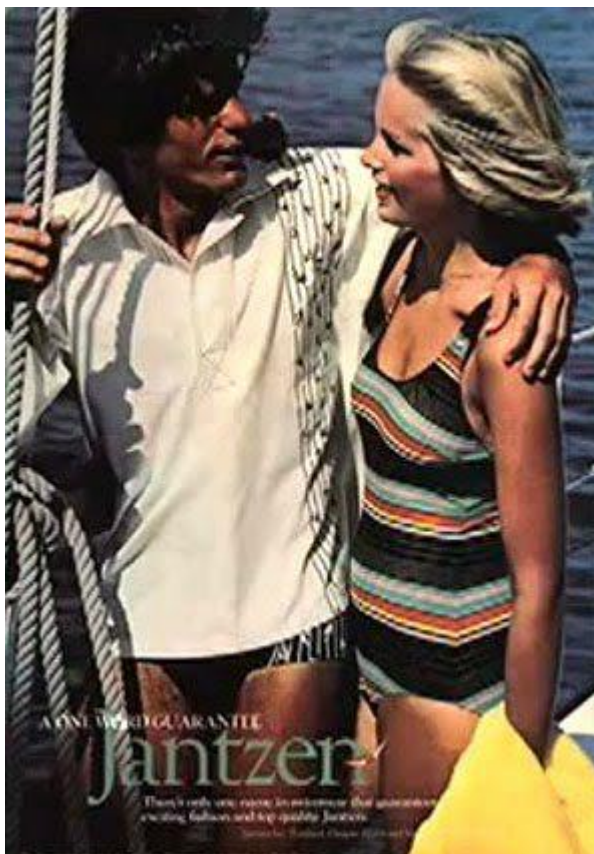
Figure 5. Jantzen (Subliminal Manipulation, 2011).

Figure 6. Coke (Subliminal Manipulation, 2011).

Figure 7. Palmolive (Subliminal Manipulation, 2011).
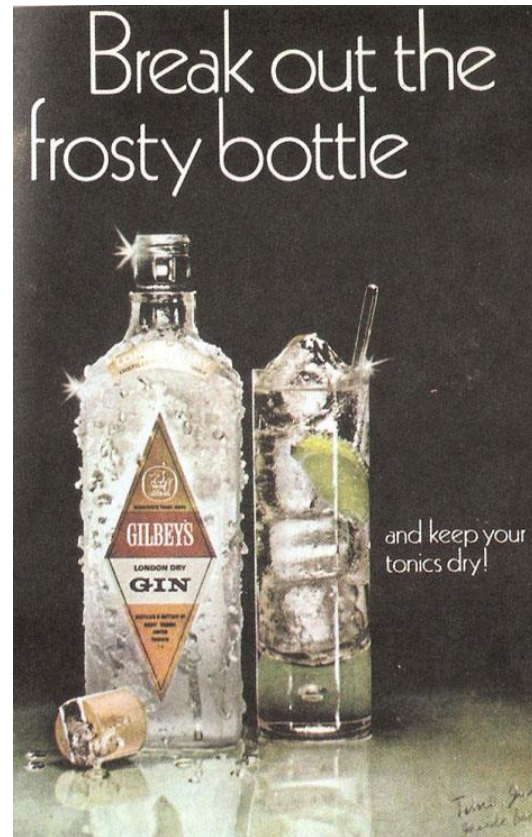
Figure 8. Gilbey's Gin (Subliminal Manipulation, 2011).

Figure 9. Flowers (Subliminal Manipulation, 2011).

Figure 10. Pantene Pro-V: example (Heather Zeller, 2014).

Annex 2: Graphs from the experiment's results
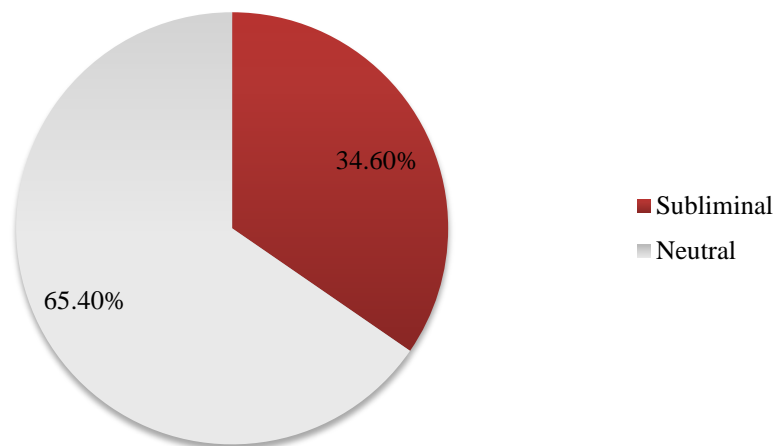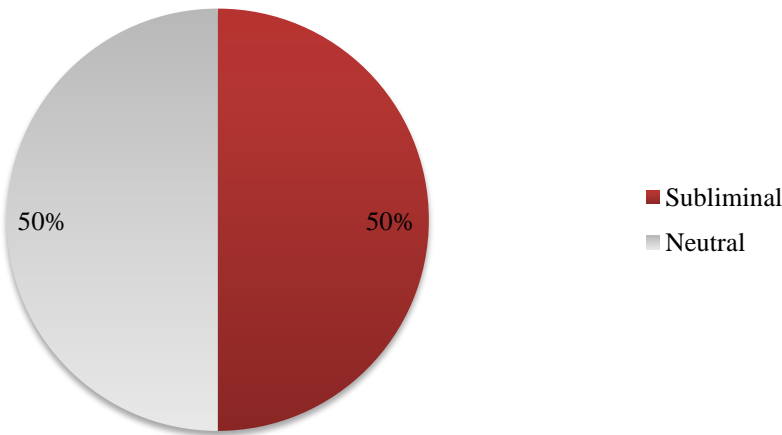

Figure 11. Preferences for image with/without subliminal message Kent, experimental group (self-provided).
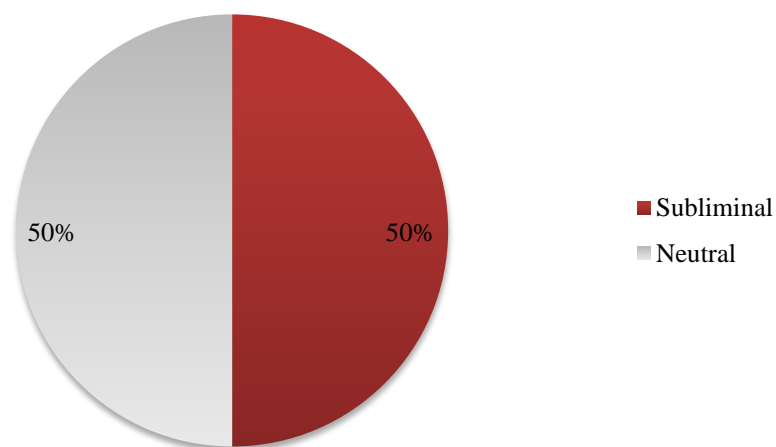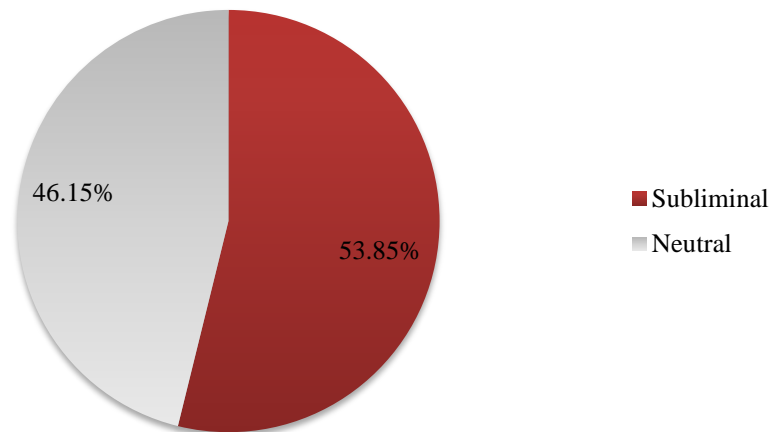

Figure 12. Preferences for image with/without subliminal message Axe, experimental group (self-provided).
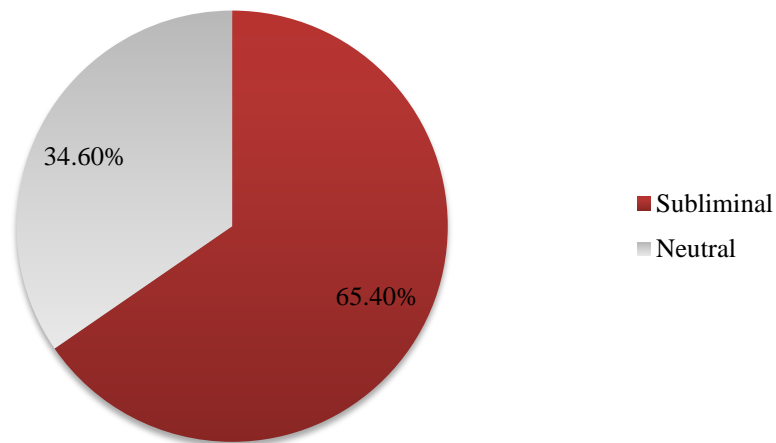
Figure 13. Preferences for image with/without subliminal message Jantzen, experimental group (self-provided).
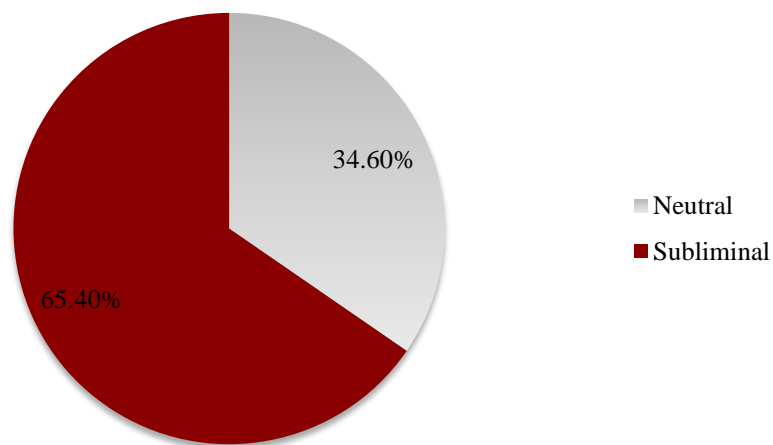
Figure 14. Preferences for image with/without subliminal message Coke, experimental group (self-provided).
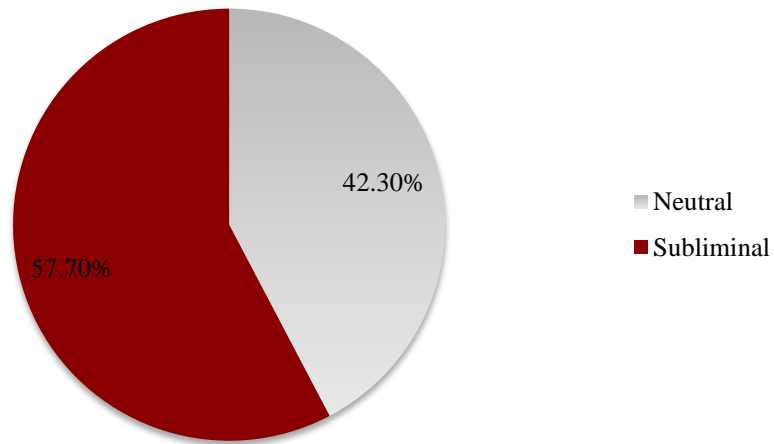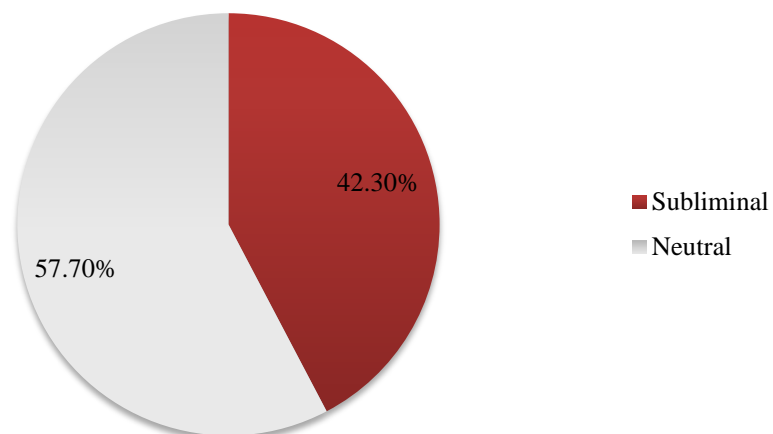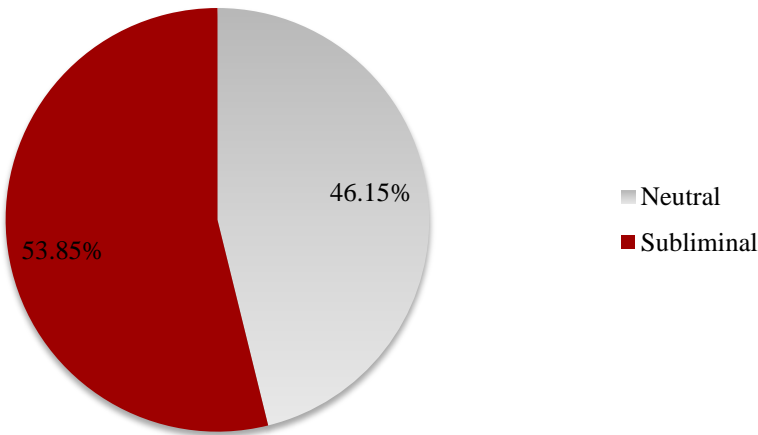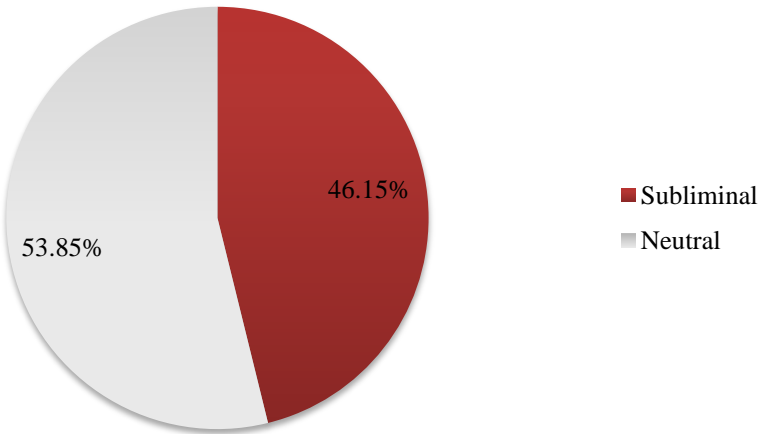
Figure 15. Preferences for image with/without subliminal message Palmolive, experimental group (self-provided).
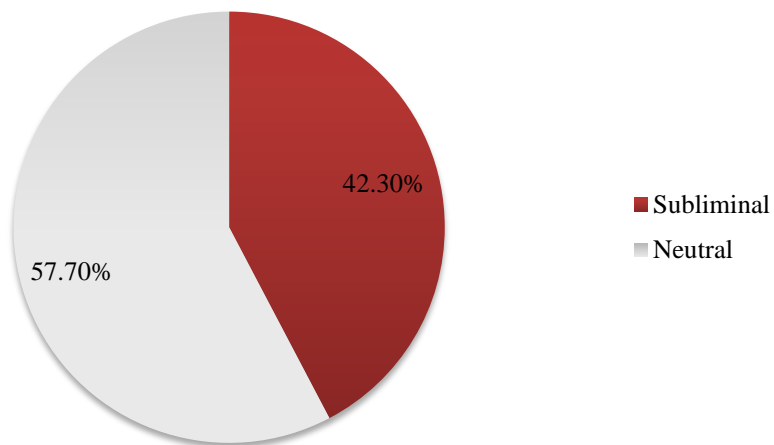
Figure 16. Preferences for image with/without subliminal message Gilbey's Gin, experimental group (self-provided).
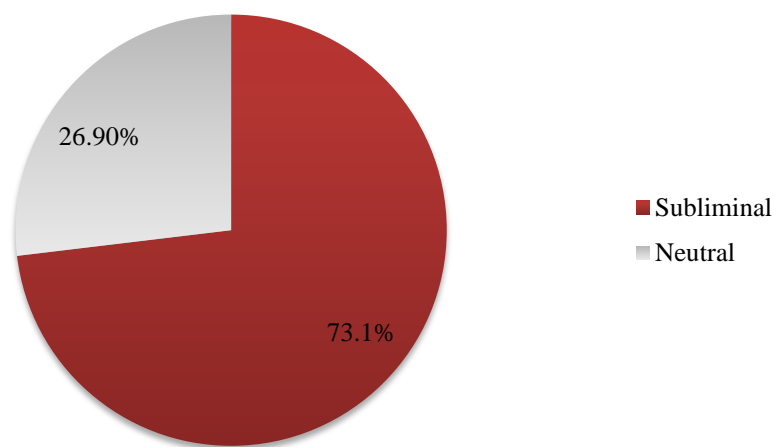
Figure 17. Preferences for image with/without subliminal message Flowers, experimental group (self-provided).
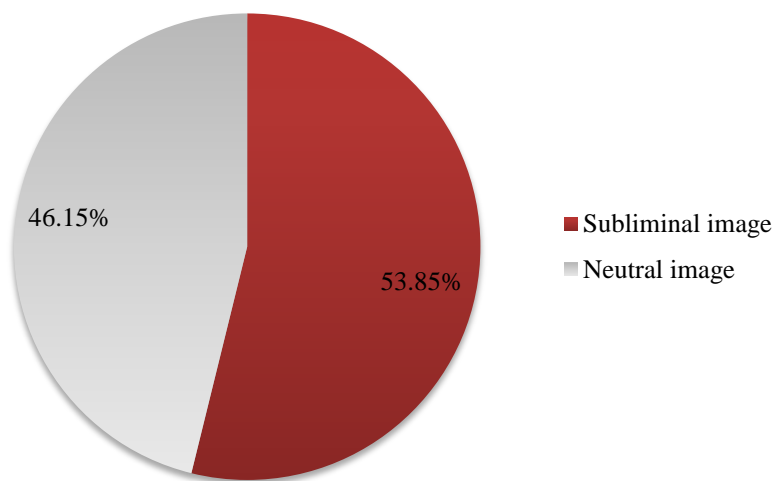
Figure 18. Males' preferences for image with/without subliminal message Kent, experimental group (self-provided).
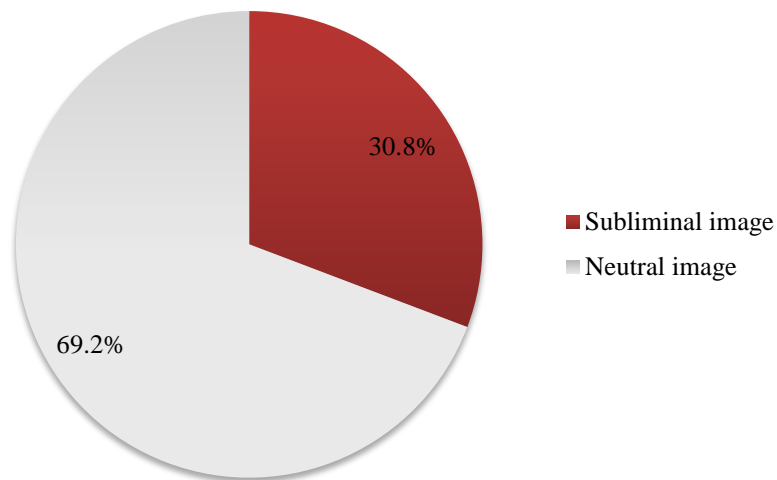
Figure 19. Males' preferences for image with/without subliminal message Axe, experimental group (self-provided).
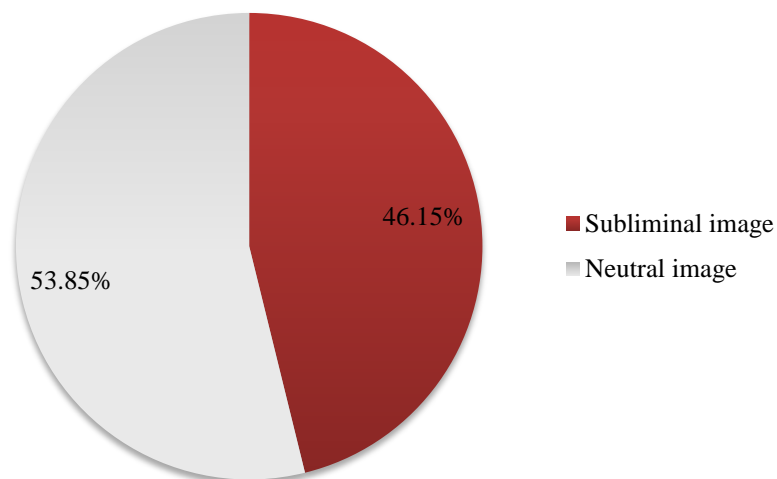
Figure 20. Males' preferences for image with/without subliminal message Jantzen, experimental group (self-provided).
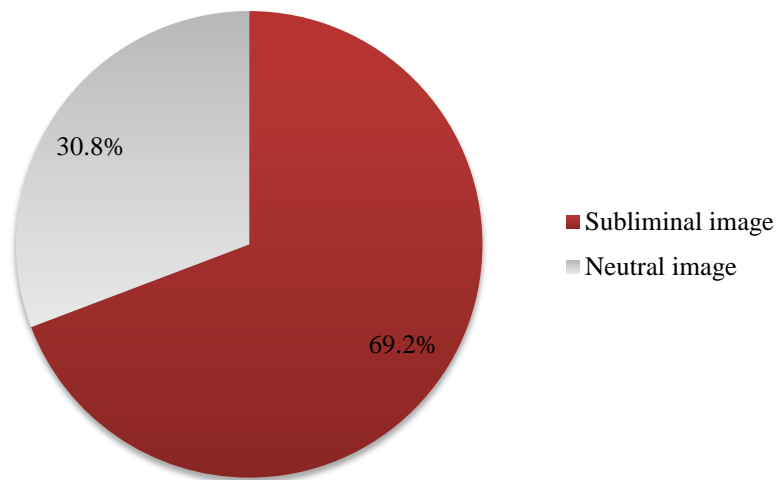
Figure 21. Males' preferences for image with/without subliminal message Coke, experimental group (self-provided).
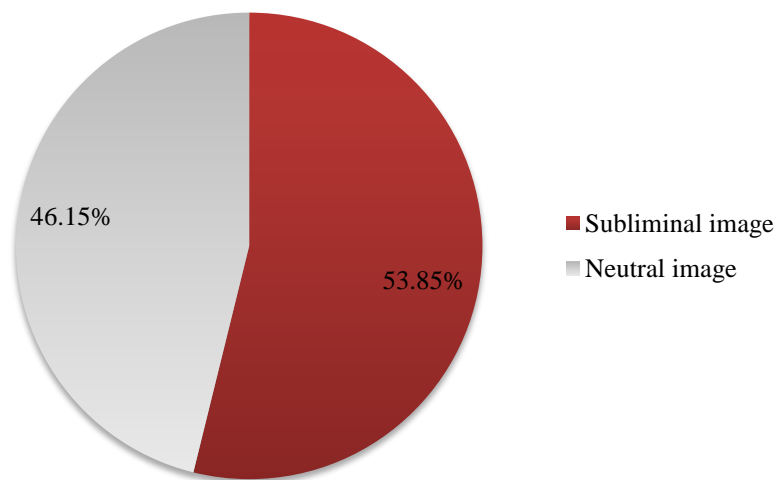
Figure 22. Males' preferences for image with/without subliminal message Palmolive, experimental group (self-provided).
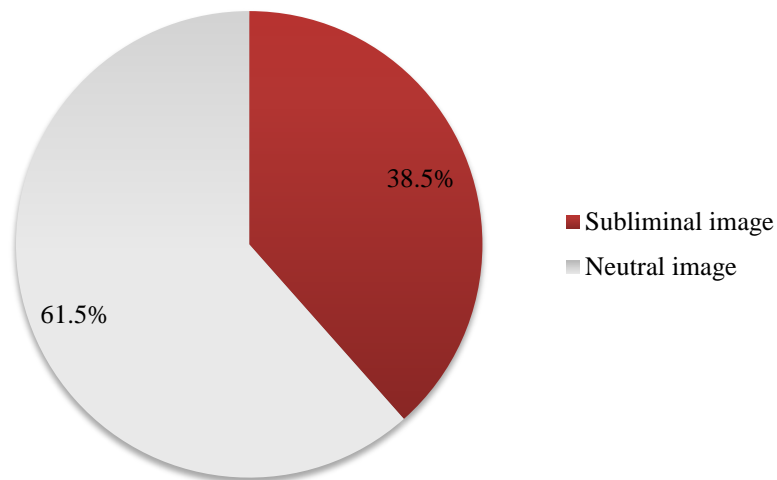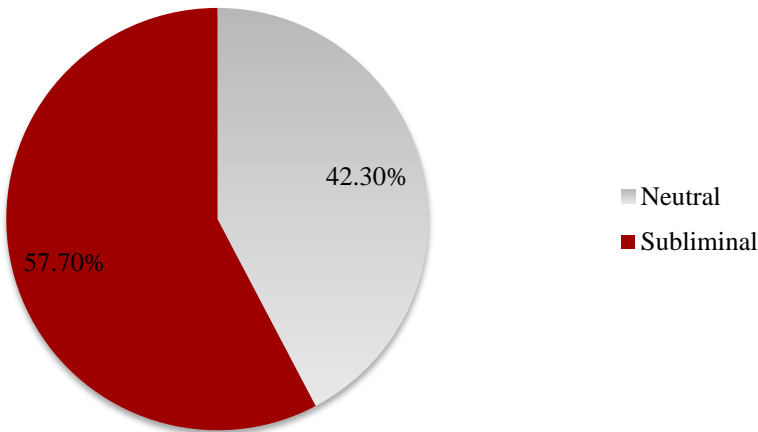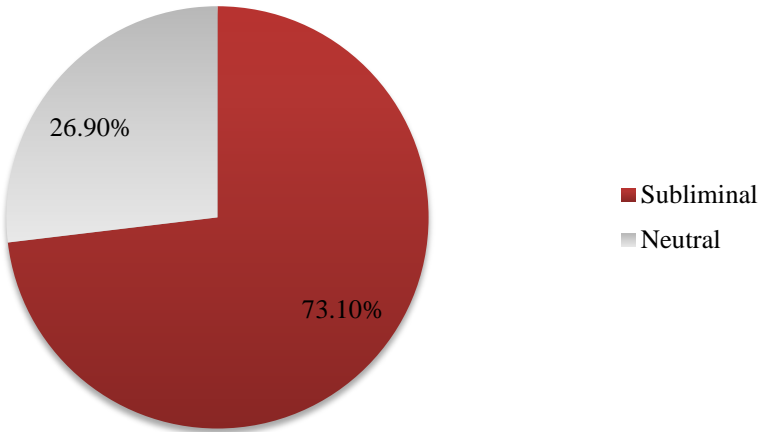
Figure 23. Males' preferences for image with/without subliminal message Gilbey's Gin, experimental group (self-provided).
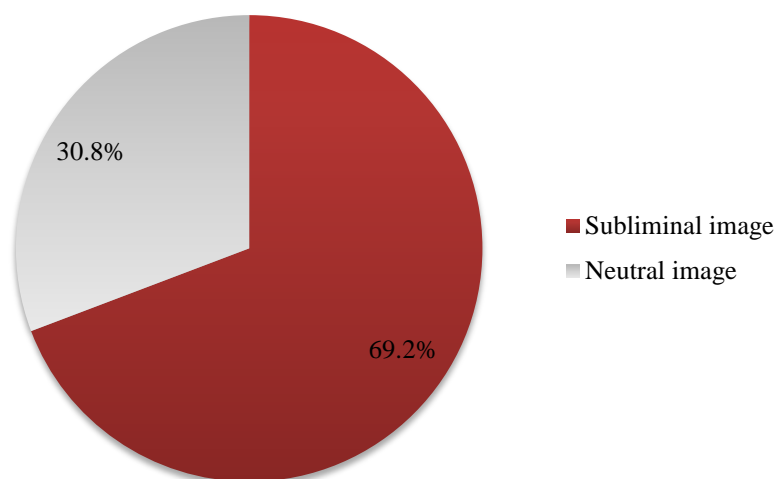
Figure 24. Males' preferences for image with/without subliminal message Flowers, experimental group (self-provided).
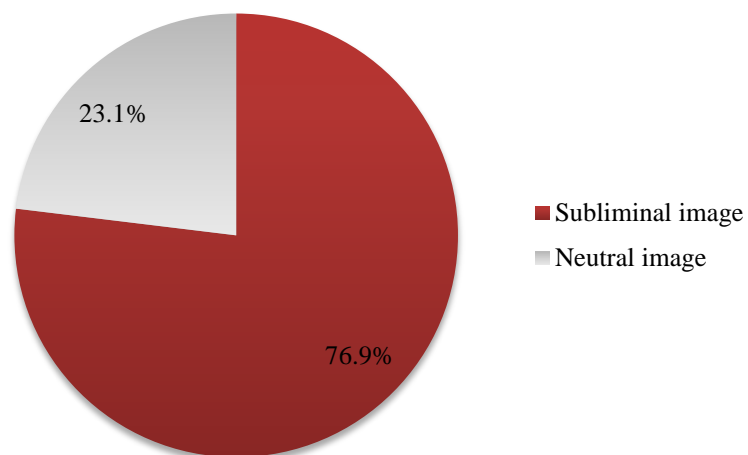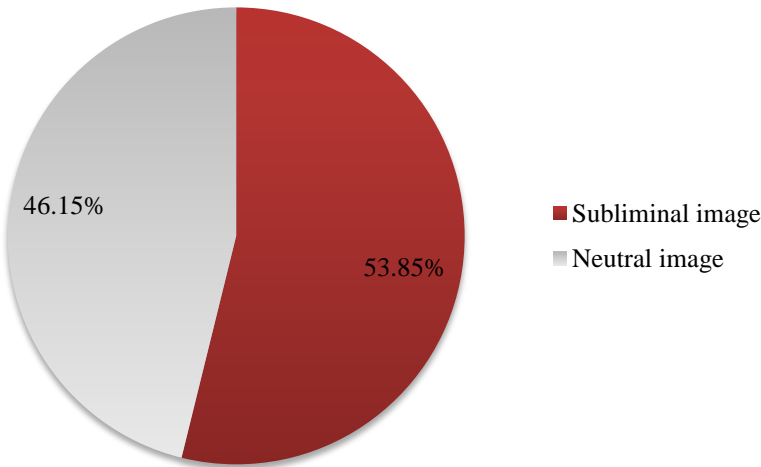
Figure 25. Females' preferences for image with/without subliminal message Kent, experimental group (self-provided).
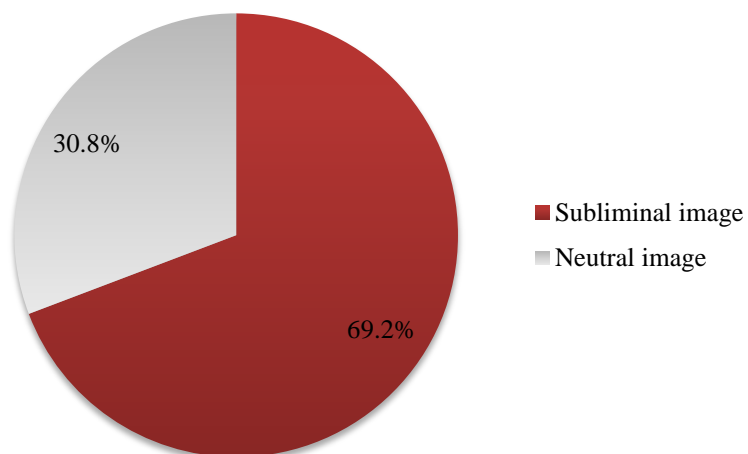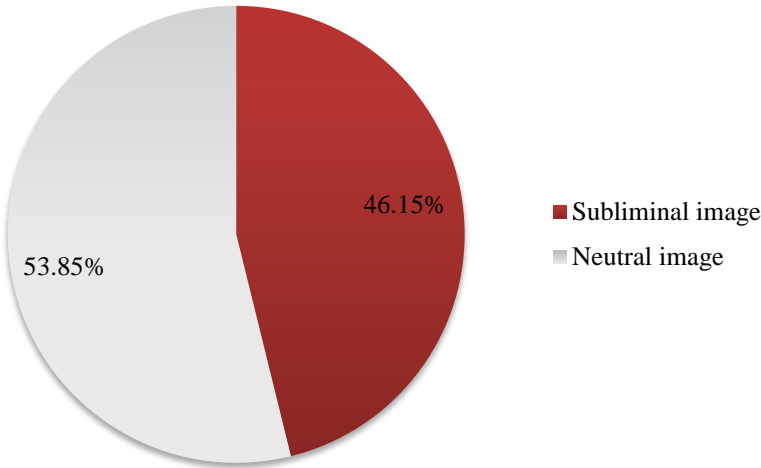

Figure 26. Females' preferences for image with/without subliminal message Axe, experimental group (self-provided).
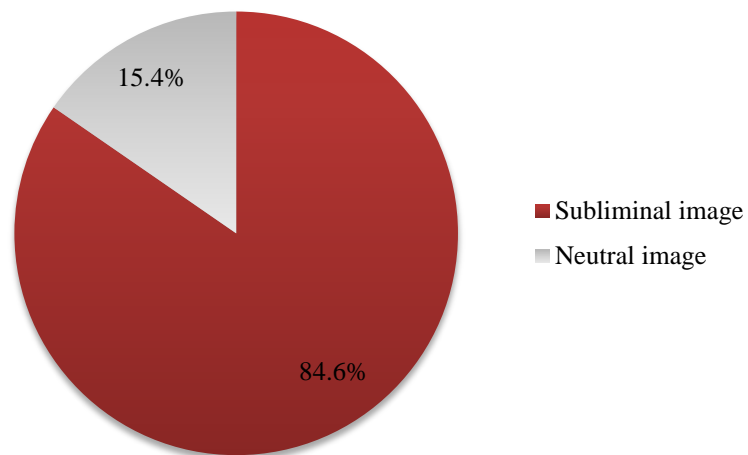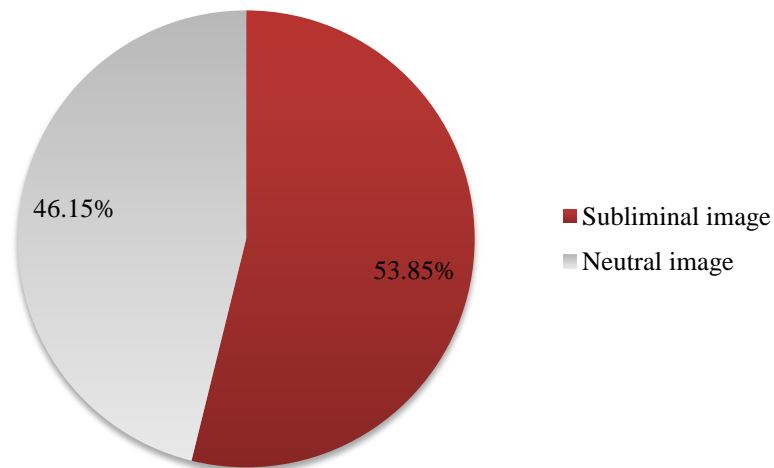
Figure 27. Females' preferences for image with/without subliminal message Jantzen, experimental group (self-provided).
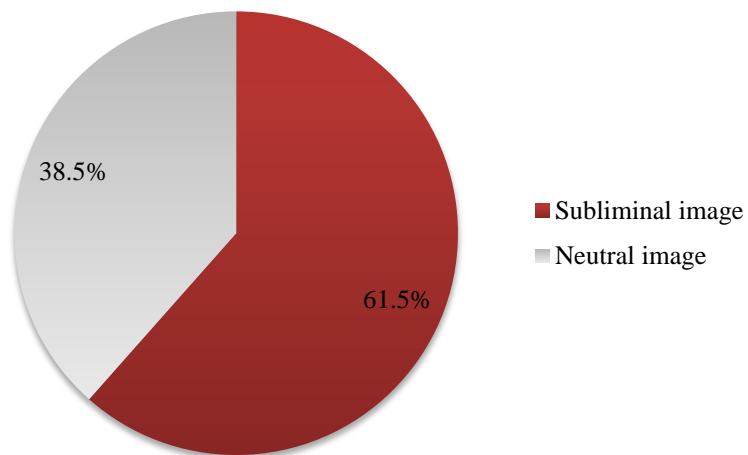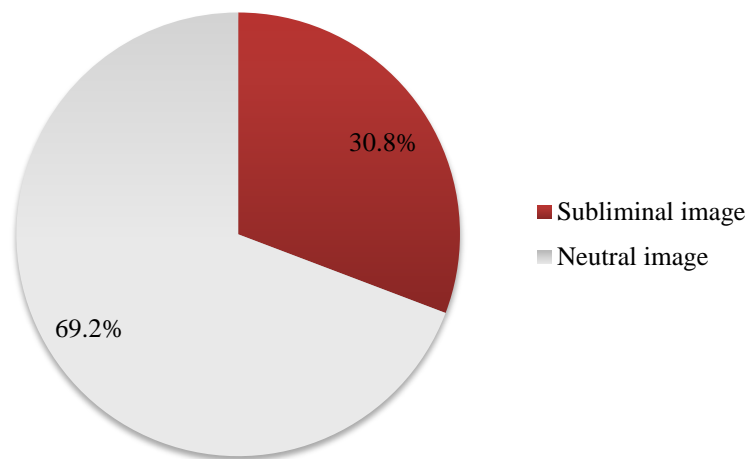

Figure 28. Females' preferences for image with/without subliminal message Coke, experimental group (self-provided).
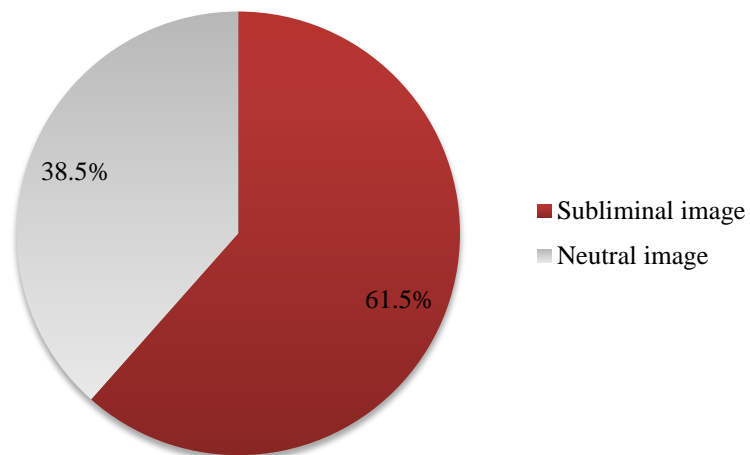
Figure 29. Females' preferences for image with/without subliminal message Palmolive, experimental group (self-provided).
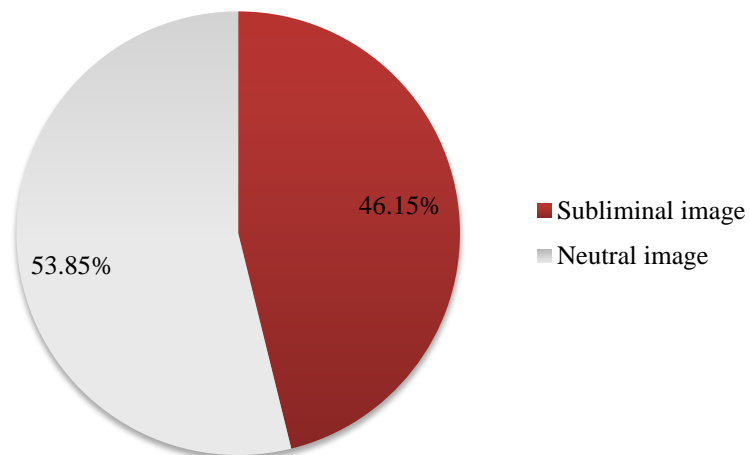
Figure 30. Females' preferences for image with/without subliminal message Gilbey's Gin, experimental group (self-provided)*.*
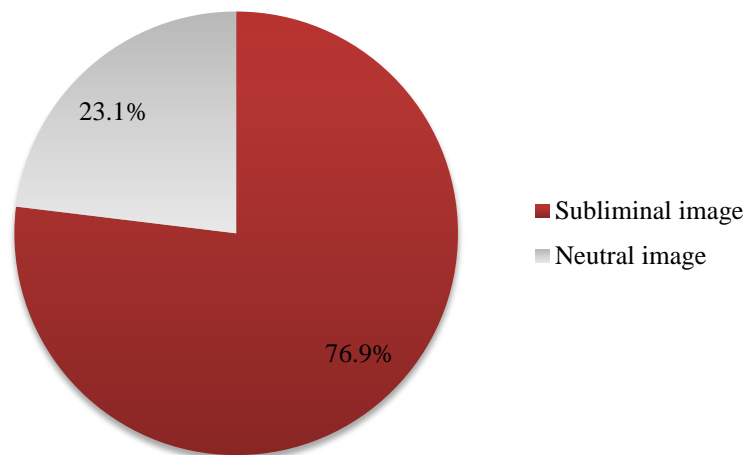
Figure 31. Females' preferences for image with/without subliminal message Flowers, experimental group (self-provided).
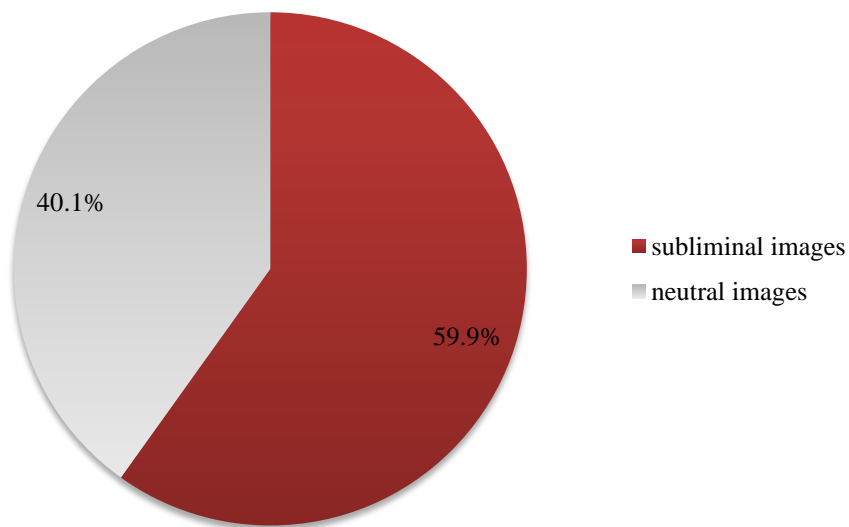
Figure 32. Total images chosen with/without sexual subliminal messages, experimental group (self-provided).
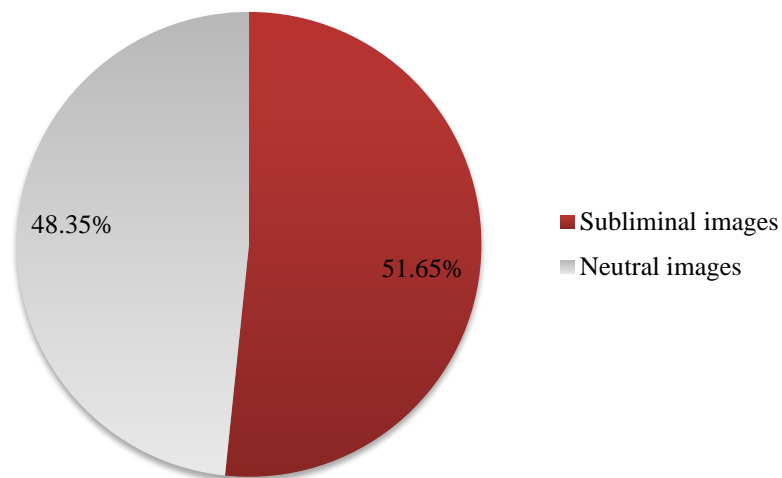
Figure 33. Males' total images chosen with/without sexual subliminal messages, experimental group (self-provided).
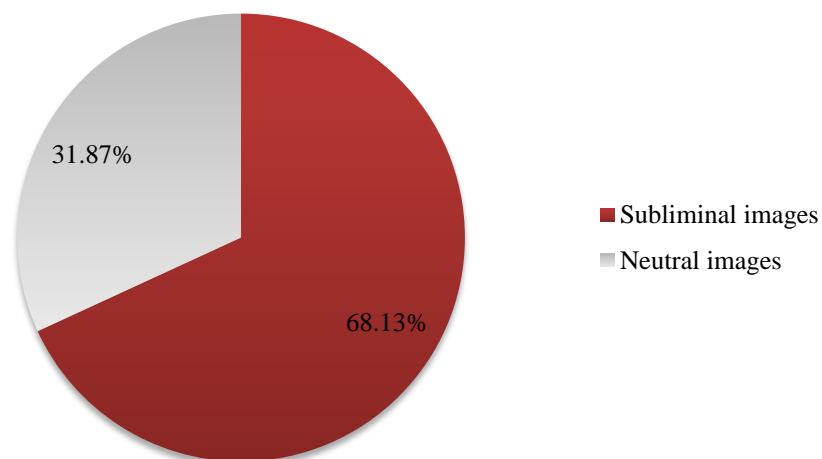
Figure 34. Females' total images chosen with/without sexual subliminal messages, experimental group (self-provided).
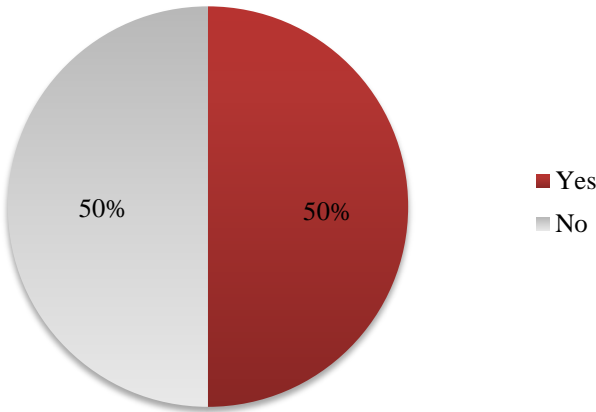
Figure 35. Randomness of participants' answers,
experimental group (self-provided).

Figure 36. Preferences for image with/without subliminal message Kent,
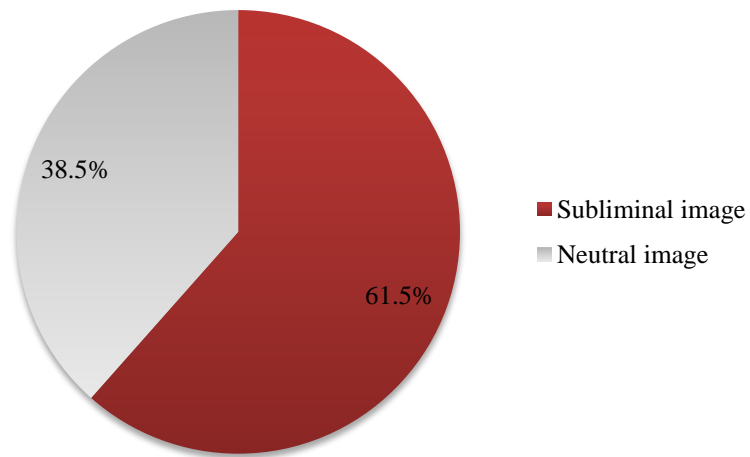control group (self-provided).

Figure 37. Preferences for image with/without subliminal message Axe, control group (self-provided).

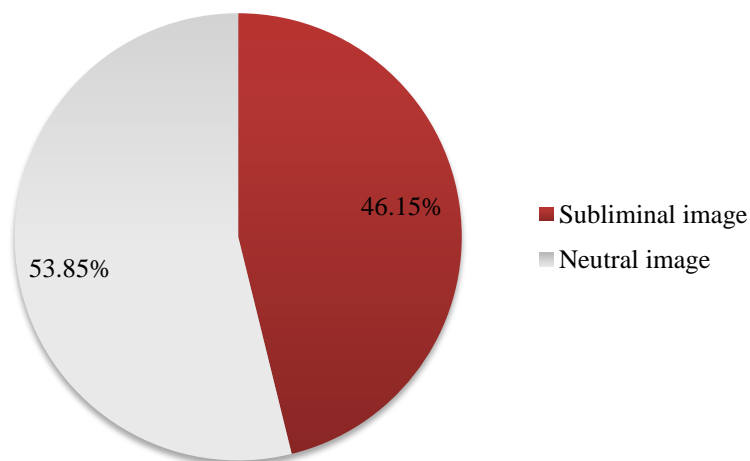**Figure 38.** Preferences for image with/without subliminal message Jantzen, control group (self-provided).

Figure 39. Preferences for image with/without subliminal message Coke, control group (self-provided).

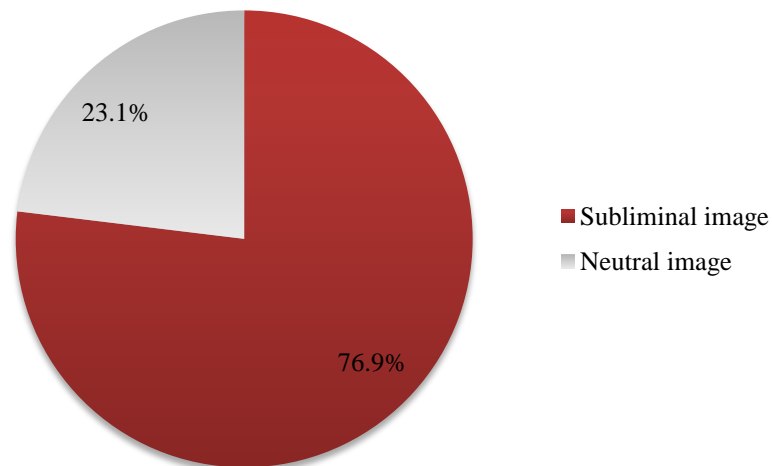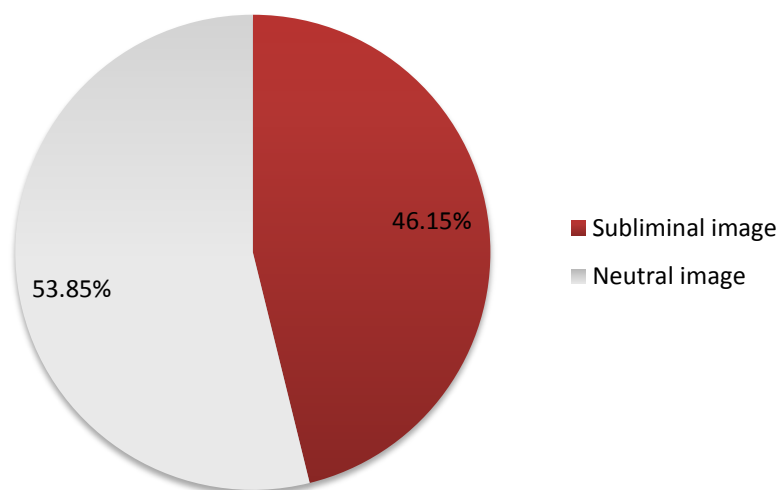**Figure 40.** Preferences for image with/without subliminal message Palmolive, control group (self-provided).

Figure 41. Preferences for image with/without subliminal message Gilbey's Gin, control group (self-provided).

Figure 42. Preferences for image with/without subliminal message Flowers, control group (self-provided).

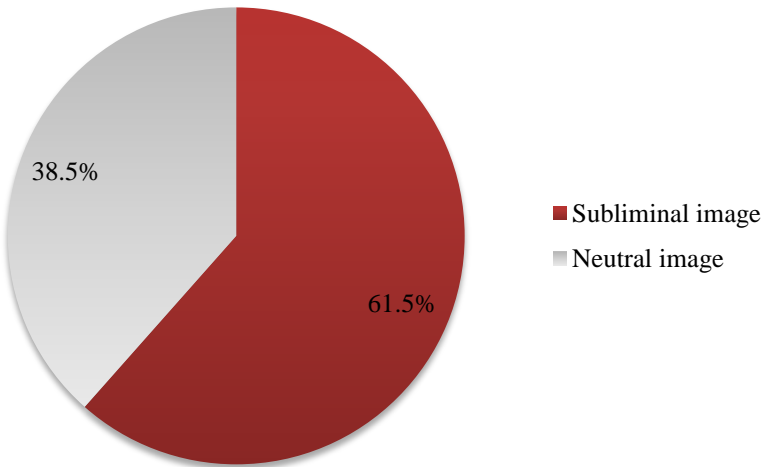**Figure 43.** Males' preferences for image with/without subliminal message Kent, control group (self-provided).

Figure 44. Males' preferences for image with/without subliminal message Axe, control group (self-provided).
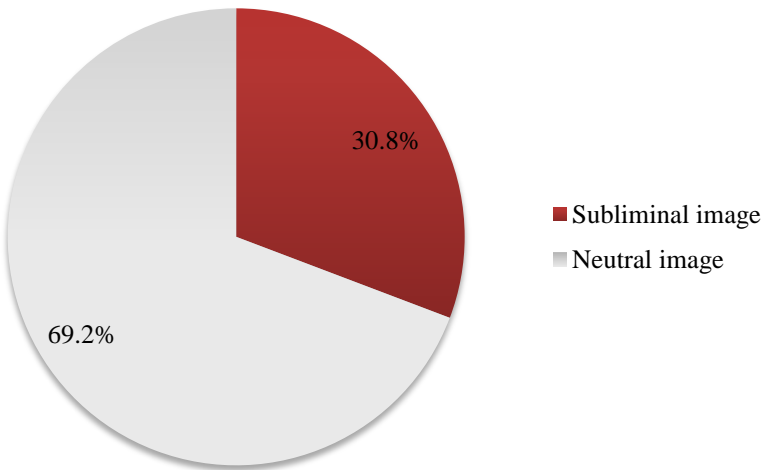
Figure 45. Males' preferences for image with/without subliminal message Jantzen, control group (self-provided).
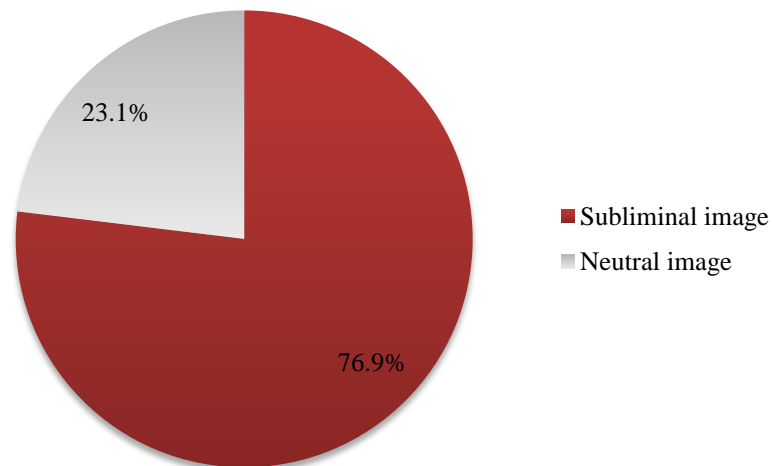

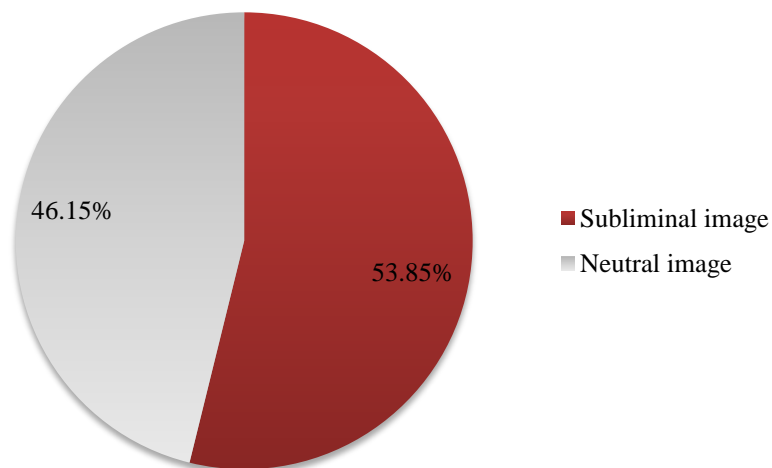**Figure 46.** Males' preferences for image with/without subliminal message Coke, control group (self-provided).

Figure 47. Males' preferences for image with/without subliminal message Palmolive, control group (self-provided).

Figure 48. Males' preferences for image with/without subliminal message Gilbey's Gin, control group (self-provided).

Figure 49. Males' preferences for image with/without subliminal message Flowers, control group (self-provided).

Figure 50. Females' preferences for image with/without subliminal message Kent, control group (self-provided).

Figure 51. Females' preferences for image with/without subliminal message Axe, control group (self-provided).
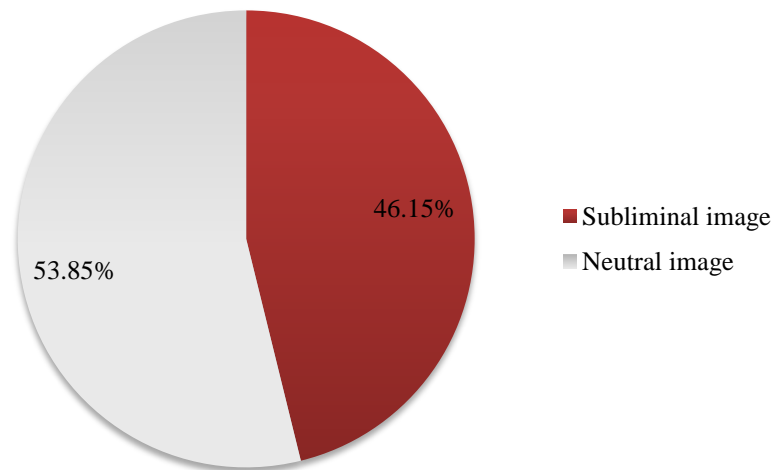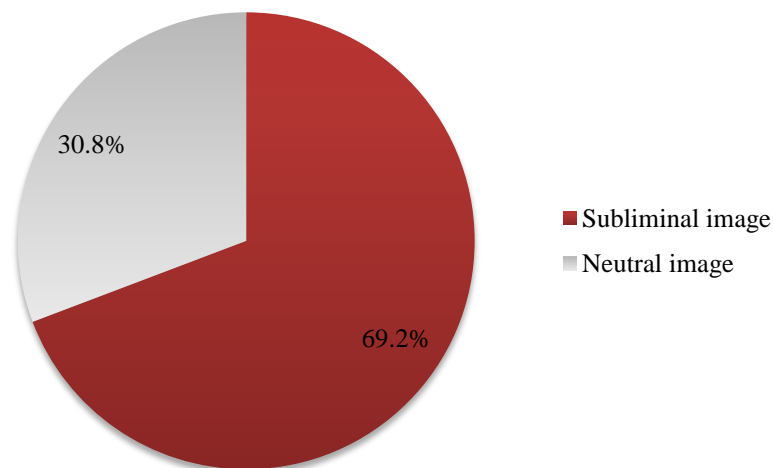

Figure 52. Females' preferences for image with/without subliminal message Jantzen, control group (self-provided).

**Figure 53**. Females' preferences for image with/without subliminal message Coke, control group (self-provided).

Figure 54. Females' preferences for image with/without subliminal message Palmolive, control group (self-provided).

Figure 55. Females' preferences for image with/without subliminal message Gilbey's Gin, control group (self-provided).

Figure 56. Females' preferences for image with/without subliminal message Flowers, control group (self-provided).
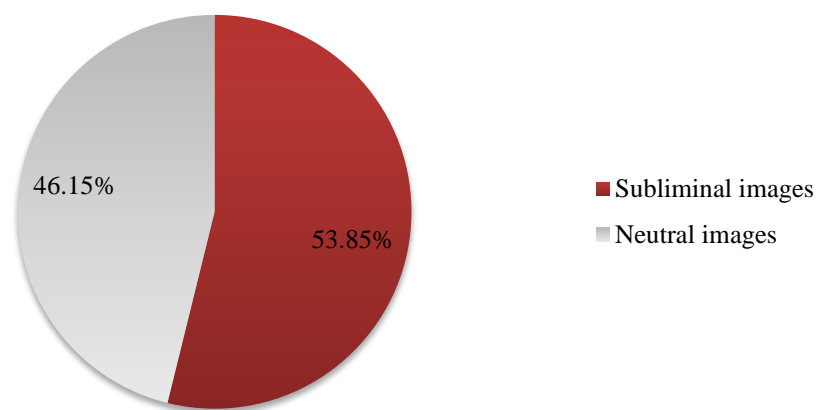
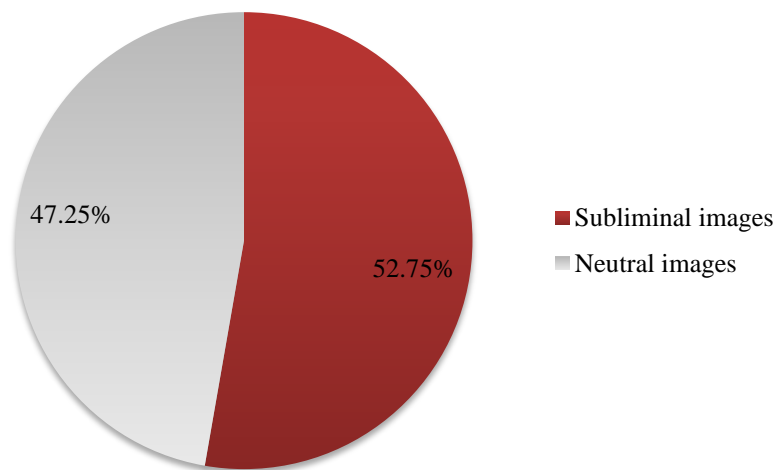**Figure 57.** Total images chosen with/without sexual subliminal messages, control group (self-provided).

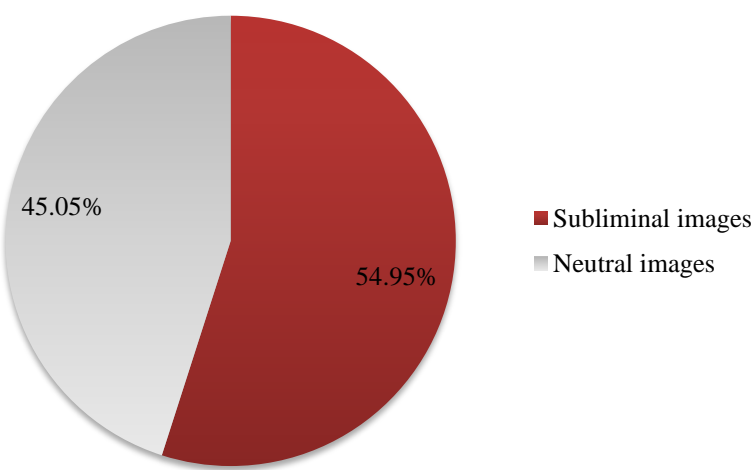**Figure 58.** Males' total images chosen with/without sexual subliminal messages, control group (self-provided).

Figure 59. Females' total images chosen with/without sexual subliminal messages, control group (self-provided).
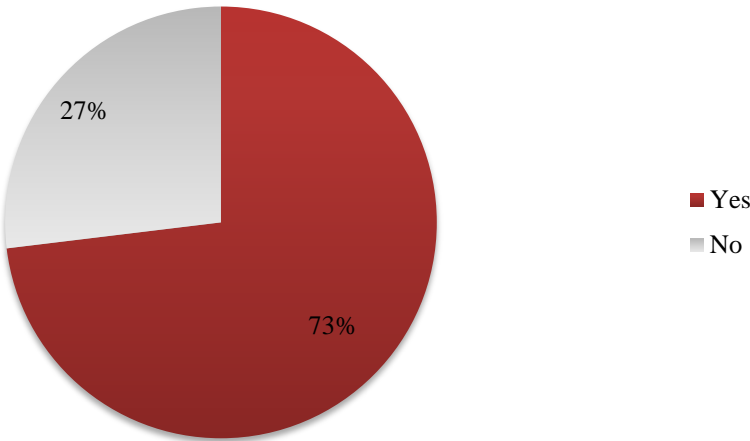

Figure 60. Randomness of participants' answers, control group (self-provided).