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Male and Female Differences on Performance for Food Rewards

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Eating is an element of human survival that occurs in one’s everyday life. Although there has been a small amount of literature concerning food cravings, the idea that it is a signal of bodily needs is a widespread belief (Weingarten & Elston, 1991). Individuals tend to prefer sweet and salty foods as opposed to other food groups. When it comes to gender there has been a clear difference in preference towards various food groups. It has been found that females prefer sweet foods and males prefer salty foods (As cited by Zeller et al. 1999). This idea has been contributed to many factors including the innate preference in males and females towards various food groups. It was hypothesized that men would outperform women when it came to performance on a word search task for a food reward. Conversely it was hypothesized that women would perform worse on the word search task with the food reward than the sticker reward. Results indicated that females performance means (M = 13.4, SD = 3.67) were also significantly higher than males performance means (M = 9.00, SD = 2.75) in the food reward condition t (18) = 3.04, p < .05, d= 1.36. An independent samples t-test indicated that there was no significant difference between females in the food group versus the sticker reward group t (18) = -.61, p > .05. Women’s performance in the sticker reward group (M = 14.5, SD = 4.43) was slightly higher than in the food reward group (M = 13.4, SD = 3.67).

Food has and continues to be a vital aspect of human’s everyday lives. According to Weingarten & Elston (1991), cravings are a signal of bodily needs. When one craves chocolate it has been attributed to a magnesium deficiency (Lafay et al, 2000). The concept of women attributing their food cravings to their menstrual cycle also delineates the idea of cravings being a result of bodily needs (Weingarten & Elston, 1991). The idea of women attributing their cravings to their menstrual cycle was tested with the use of surveys (Weingarten & Elston, 1991). Although it has been found that food cravings are a
result of specific experiences it would be unfair to limit these cravings to particular circumstances (Weingarten & Elston, 1991). Food cravings are seen as normative experiences that are just as common as hunger and satiety (Weingarten & Elston, 1991). The food craving experiences are a key component when it comes to human survival. The cravings that individuals tend to indulge in are seen as a result of environmental influence.

The common theory for the basis of food cravings is that cravings have a homeostatic function (Pelchat, 1997). This is the idea that food cravings surface when one is experiencing a nutrient or caloric deficit (As cited by Zeller et al. 1999). Others tend to attribute food cravings to neurochemical variables. Pelchat (1997) carried out a study to examine food cravings in both young adults and children. The objective of this study was to create data that could be used in future studies on mechanisms of food cravings. Fifty young-adults and 48 elderly adults participated in a structured interview study focused on food cravings. For this study food cravings were described as “an intense desire or London to eat a particular food” (Pelchat, 1997). In line with the common belief, elderly subjects were less likely than young adults to report any cravings. If cravings were reported the elderly subjects reported a small number of different cravings. The types of foods craved changed according to the subject’s gender and age. Like many other studies there was a significantly higher craving amongst women for sweets as opposed to men. One aspect that caught the researcher’s eye was that as age increased the craving for sweets decreased. Although there was a decrease in the cravings for sweets, the overall craving for sweet was higher in female subjects than in male subjects.
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It has been found that food choices are a direct result of one's culture (As cited by Zeller et al. 1999). Although the importance of one's culture in food preference has been evident Psychology has paid little to no attention to the liking of different foods in different cultures (As cited by Zeller et al. 1999). Different cultures like different foods for a variety of different reasons. In the Psychology world, the main focus has been on liking for basic taste stimuli instead of liking the food itself (As cited by Zeller et al. 1999). As stated in the Zeller et al. 1999 article, it was found that Indian laborers who drank diet sour tamarine as their dominant drink flavor, found that sour tastes were more appealing to the palate than did Americans or Indian medical students whose exposure to sour foods was significantly less. This is a key example of a study done that looked at liking for specific taste and not the food overall (As cited by Zeller et al. 1999).

Zeller et al. 1999 carried out another study to examine the idea of food liking and craving cross culturally. The participants included 151 Spanish females, 89 Spanish males, 90 American females and 88 American males, all of which were volunteers. Each subject was tested at their home universities, usually in a classroom setting. Each participant completed a questionnaire and was then free to leave the study. Each participant rated how much he/she liked three common sweets and three common beverages listed on the questionnaire (As cited by Zeller et al. 1999). The participants were also asked to rate which food or drink elicited the strongest craving. Overall, it was found that females craved sweet foods more often than savory foods. On the contrary, males craved savory foods more frequently than females. This gender difference, for sweet and salty foods, occurred both in the Spanish and American participants. When the sweet cravers were examined, females as opposed to males craved chocolate more than
any other sweet. This gender difference, for chocolate was only seen in the American culture. There was no gender difference amongst the Spaniards. The results indicated that the difference in sweet and savory cravings was a result of a physiological basis, whereas the chocolate cravings argued against the idea of physiological craving. The findings indicated that, there might be an innate reason as to why females prefer sweet foods and males prefer salty foods (As cited by Zeller et al. 1999). Although these findings indicated an innate preference for different types of food, the origin of food cravings is unknown (Weingarten & Elston, 1991).

Consistent with the studies discussed above the Weingarten and Elston (1991) data delineated that both males and females experienced food cravings quite often. After distributing questionnaires amongst 1000 male and female undergraduate students, as a way of collecting self-reports regarding food cravings, Weingarten and Elston (1991) found that more females experienced food cravings than males. Weingarten and Elston (1991) found that 97 percent of women and only 68 percent of men reported food cravings. Just like many of the other studies, chocolate was reported to be the food craved most often. As seen in the Zeller et al (1999) study chocolate and sweet cravings were experienced more by females than males. Overall, the subjects tended to respond to the food cravings half of the time. Although many try and correlate food cravings with bodily needs it was found that only 32 percent of women believed that their food cravings were related to their menstrual cycle. Along with the idea of food cravings and the types of foods craved, the overall emotion of indulging in food cravings was assessed. Weingarten and Elston (1991) found that women experienced more negative emotions when
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indulging in their cravings as opposed to men. This was not related to any environmental constraints. The study found no increase in food cravings with dietary constraints.

The notion of dieting being a direct cause of food cravings was tested in a study done by Lafay et al (2000). From this study, similar to other studies, females experienced more food cravings than males. For this particular study, there were 28 percent of women and 13 percent of men that were defined as food cravers. It was found that women, more often than men, were concerned about their weight than the non cravers. Although both men and women indulged in their cravings just as often, women reported more negative feelings than men who actually reported positive feelings. The findings of this study indicated that the food cravings in men and women are associated with mood but differently among the two sexes (Lafay et al, 2000).

Many studies have been carried out to examine this notion of environmental conditions and food cravings. The results have indicated that female’s indulge more in food cravings than in males. One study, carried out by a former Huron University College student, looked at the differences between sex and performance for food reward. This particular study, contrary to predictions, found that when it came to obtaining a food reward women significantly outperformed males. For the present study it has been hypothesized that men would outperform women when it came to performance on a word search task for a food reward. Conversely it was hypothesized that women would perform worse on the word search task with the food reward than the sticker reward. These hypotheses were made based on the knowledge that females attribute more negative emotion towards food than males. Other hypotheses about gender, performance and reward were examined.
Method

Participants

This study took place in London, Ontario, Canada. For this current study a student from Huron University College, a university affiliated with the larger University of Western Ontario, distributed a survey to 40 different individuals. Twenty of the participants were males and the other 20 subjects were females. Each of the participants was between the ages of 18 and 24. The majority of the participants were Caucasian; middle class individuals form generally urban areas.

Materials

Every participant was given four sheets of white 8.5" x 11" computer paper. The first sheet was a letter of information. This informed each of the subjects of the study they were being asked to take part in. The second form was the consent form. This was a sheet that indicated the individual was willing to participate in the particular study. The third sheet was the word search task. This was the heart of the study. A 19-item word search, titled “Winter Olympic Sports Word Search Puzzle” was obtained from the Print Activities Website. Each individual word search was photocopied onto a piece of 8.5" x 11.0" white computer paper. The word search itself was 19 cm x 18 cm in dimension. As for letters, the word search was 15 letters x 15 letters. The word search was 5 cm from the left and right side of the page. Both the word search letters and the words in the word list were in size 11 Times New Roman font. The 20 words, to be found by the subjects, were placed at the bottom of the word search. The title “Winter Olympic Sports Word Search Puzzle” was bold, size 11 Times New Roman font. For the word list there was
also a title that read “Winter Olympics Sports Word List”. This title was not only Times New Roman, size 11 font and bold it was also underlined. At the very top of the page there was a gender question this read: Sex: Male or Female. The gender question was bold, size 24, Times New Roman font. See Appendix A for a copy of the word search.

For every word found, by the participants, there were two different types of reward that could have been received. Subjects in the sticker reward case were awarded a sticker for every word they found within the 5 minute allotted time period. These stickers were small in size and ranged in color. The second reward was for those in the food reward group. Each subject was awarded a piece of bubble gum. The pieces of bubble gum were typical pieces often found in gumball machines. They ranged in a variety of colors. For every two gumballs there were 15 calories, 0 grams of fat, 0 milligrams of sodium, 3 grams of carbohydrates, 3 grams of sugar and 2 grams of protein.

Participants were timed, 5 minutes, with a stop watch on an 8GB Rogers iPhone.

Procedure

Participants were recruited from all over the University of Western Ontario campus. Individuals were first asked, by the experimenter, to participate in a Psychology study. Each participant was informed that their participation was voluntary and they were able to refuse to participate and/or withdraw from the study at any time. Once the participant read and signed the consent form, the research handed the participant a copy of the 19-item Olympic word search. The participant was then informed that he/she was going to be given 5 minutes to complete the word search. Depending on which group the participant was in, he/she was told that for each word he/she found he/she would be given
either a piece of bubble gum or a sticker. The participant then began to look for words, in
the word search, that were listed in the word list. After finding a word listed in the word
list, the participant crossed it out and went on to find another word. After the 5 minute
period was completed, the experimenter asked the participant to stop working, and each
word that was circled was counted. For every word found by the participant, the
appropriate reward was given. Upon receiving the reward, the client was given a
debriefing form and thanked for his/her participation. The word search, used in this
particular study, was not used in another study about motivation. As a result there word
search had no reliability. There was also no validity when it came to the assumption
between performance on the words search task and the motivation for reward

Results

A 2 x 2 between subjects ANOVA was conducted with words found as the
dependent variable and reward group (food/stickers) and gender (males/females) as the
independent variables. The results indicated that there was a significant main effect for
gender, F(1, 36) = 28.94, p < .05, partial η² = .45, where females (M = 13.95, SD = 3.99)
found significantly more words than males (M = 7.95, SD = 3.02). There was no
significant main effect for group, F(1,36) = .20, p > .05. There was also no significant
gender by group interaction F(1,36) = 2.06, p > .05. An independent samples t-test
indicated that there was no significant difference between females in the food group
versus the sticker reward group t(18) = -.61, p > .05. Women’s performance in the sticker
reward group (M = 14.5, SD = 4.43) was slightly higher than in the food reward group
(M = 13.4, SD = 3.67). Another independent samples t-test showed that there was also no
significant difference between males in the food group versus the sticker group t(18) =
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1.62 p > .05. Contrary to the results found for the women, males performed better in the food reward group (M = 9.00, SD = 2.75) than in the sticker reward group (M = 6.90, SD = 3.03). Conversely to predictions, it was found that females performance means (M = 13.4, SD = 3.67) were also significantly higher than males performance means (M = 9.00, SD = 2.75) in the food reward condition t(18) = 3.04, p < .05, d= 1.36. Women’s performance means (M = 14.5, SD = 4.43) were significantly higher than males performance means (M = 6.90, SD = 3.03) in the sticker condition t(18) = 4.48, p < .05, d= 2.00. For a graphic representation of the results please consult figure 1. For an ANOVA summary table please see Appendix B.

Discussion

Contrary to the hypothesis that men would outperform women on the word search task, for a food reward, it was found that women performed significantly higher than men. This idea is contrary to the idea, found in the literature, which males will perform better when a food reward is given a motivation. This was surprising due to the knowledge by Lafay et al (2000) that females tend to attribute more negative emotions towards food than males.

The desire for the food reward may have accounted for the difference in performance between men and men. Based on research by Weingarten and Elston (1991), women tend to enjoy foods that are sweet whereas males prefer salty foods. In this particular study, both men and women were motivated to complete the word search task as best they could by virtue of gum balls used as a reward stimulus. According to literature gum balls, being a sweet food, tend to be more appealing for the female
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Figure 1. Summary graph with the solid line indicating the sticker reward group and the dotted line depicting the food reward group.
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subjects. In fact, some of the participants in the study chose not to take the reward despite meeting the requirements. Supplementary studies, may want to have more of a variety when it comes to the food rewards. As indicated above, males prefer salty foods versus sweet foods. It might be a wise decision to have something sweet like chocolate and something salty like pretzels. Also gum balls, as used for the study, could be seen in the eyes of some as not being food. As a result, the motivation to perform for some food reward, like chocolate, might be more beneficial and create more significant results.

Another explanation for these significant findings, contrary to the researcher’s predictions, could be a result of the fact that women tend to indulge in more cravings than men. As a result, women may have seen the gum balls and craved something sweet therefore their motivation was increased thus resulting in increased performance over males.

One area that is extremely important in psychological experiments is representative sampling. For this study the sampling population included 20 male and 20 female subjects, all enrolled in secondary education. The participants in this study attended either the University of Western Ontario or Huron University College. Being a university student, the temptations to eat craved foods are evident. As a result, the engagement in food cravings might occur more often than not. Due to the limited sample, the results may only be generalizable to university students and not the greater population.

The current study seems to replicate the findings of a former Huron University College student by the name of Margaret Leitch, that women outperformed men
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regardless of the reward they were given. The performance, for this test, was indicated by
the amount of words each subject found in a word search puzzle.

As discussed earlier there was no reliability over all. For this particular study,
there was no inter-rater reliability tested. The researcher felt that the reliability of one’s
performance, on the word search task, was irrelevant to the next person. If the study were
going to be replicated however, instead of being rewarded for each word one was
rewarded for his/her overall performance on the word search task, testing the word search
task before hand may be a wise decision.

The word search task may have been vulnerable to other confounding variables.
For many of the participant’s the study was carried out in a group setting. As a result,
there was an increased sense of competition amongst individuals that seemed to be close
friends. Also, a few of the subjects made the comment concerning previous involvement
with word search tasks. Subjects made comments such as “I was never good at these
things”. The preconceived notion towards the inability to perform well may have been a
result of lack of motivation and therefore decreased performance. Initially, the word
search task seemed to be a measure that could be used to measure motivation. After
completing this study, in further studies, it may be helpful to use a valid test to measure
one’s motivation.

In order for the research to find enough participants she needed to expand her
experimental conditions. As a result, subjects were recruited from all over the Huron
University College Campus and the University of Western Ontario Campus. The
researcher found her subjects in libraries, classrooms and activity centers. In all of these
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conditions there was no control when it came to extraneous variables. The sound level in the rooms ranged from quiet to somewhat loud. The mere presence of sound may have distracted the subjects therefore possibly skewing the results. If the study were to be carried out again, researchers may want to recruit all 40 subjects at one time, in one environment, in order to control these variables. By recruiting the subjects at the same, it would also control the time of day. Carrying the study out during various times of the day may have resulted in a variety of performance levels. As noted in Pelchat (1997), the time of day affects cravings. Not only would testing help with this matter but it would also help control what subjects have eaten. If a subject has just indulged in a large meal he/she may be less motivated to perform better in order to obtain a food reward. Further studies, should consider controlling the environment in order gain more control resulting in more significant results.

The knowledge of motivation and its effects on different genders can be applied to various situations. One area that would highly benefit from this knowledge would be school systems. If teachers chose to motivate children with the use of a reward, the knowledge of what type can be gained from this study and many others. Based on past research, and the findings of this study, teachers can gain knowledge that a stimulus, such as a sticker, is more appealing to the females than a food reward.

Although the knowledge of food reward versus sticker reward and its effects on motivation cannot be generalized toward the population, the findings can spawn more research to be done with a larger sampling population. These findings may one day result in the development of a stimulus to induce high levels of motivation. They results from this study can also facilitate further research in the areas of food, cravings and gender.
References

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Appendix A

Sex: Male OR Female

Winter Olympics Sports Word Search Puzzle

WINTER OLYMPIC SPORTS WORD LIST

AERIALS
BIATHLON
BOBSLEIGH
CROSS COUNTRY
CURLING
DOWNHILL SKIING
FIGURE SKATING
GIANT SLALOM
ICE DANCING
ICE HOCKEY

LUGE
NORDIC COMBINED
SHORT TRACK
SKELETON
SKI JUMPING
SLALOM
SNOWBOARDING
SPEED SKATING
SUPER-G
Appendix B

Table 1

ANOVA Summary Table for Words Found in A Word Search Task

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