AN INVESTIGATION OF ADVERTISING ON MEDIA, SOCIO ECONOMIC, GENDER, AND AGE RELATIONSHIP WITH OBESITY

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I. INTRODUCTION

Increasing the prevalence childhood obesity has encouraged public concern. Many researchers pointed that media has a significant contribution to overweight children problem. They argued that time which used engaging with media replaced time for doing physical activities. Advertising in media can increase request for unhealthy food since most of advertisings in children viewing hours were unhealthy food ads. The ads could also generate misleading perception of healthy food. However there were some researchers who believed that media was not a significant factor lead to obesity in children. They found that watching television did not have strong relationship with obesity.

Beside high media use, other factors which should be argued associated with childhood obesity are: socioeconomic, gender and age. The arguable theories for this case are high media does not have strong relationship with obesity, children at lower economic status tend to want to eat more than those at higher socioeconomic status,
young girls have more attention for healthy food compare to boys and increasing age will increase possibility of overweight circumstance.

II. EXISTING THEORIES ON MARKETING’S ROLE IN OVERWEIGHT AND OBESE CHILDREN

Many researchers acknowledged that media play important role for the increasing in the number of childhood obesity. However some researchers did not agree with this opinion and argued that media did not have strong relationship with overweight children.

Researchers who argued that the growth of the prevalence childhood obesity is partly attributable to media, highlighted that the increasing in the number of time spent using media was a significant factor to the problem. Children spent time engaging with the media approximately five and a half hours per day (Robert & Foehr 2004). For television alone, Australian Bureau of Statistic revealed that children aged range from five to twelve years old watch it regularly (ABS 2001); they spent two to three hours per day watching it (AC Nielsen 2001). Dietz & Gortmaker (1985) argued that the prevalence of obesity among children aged twelve to seventeen years old increased by 2% for each additional hour of spent viewing television. It had occurred even after controlling for other variables such as: prior obesity, race, and socioeconomic status. In addition, a study by Stanford University researchers in 1996-1997 found that there was possibility to decrease body weight by reducing time spent using media (Robinson 1999). Another study based on data from the National Health and Nutrition Examination Surveys in 1988-1994 found that children aged eight to sixteen years old who spent much time watching television had greater body fat and higher BMIs than kids who watched less than two hours per day (Anderson et al. 1998). From the data also found that television viewing had positive relationship with obesity among girls. It had happened even after control other factors such as age, race, socioeconomic status, physical activities and energy intake. However, it was not found for boys (Crespo et al.).

Several types of media that often used by children are television, videos, video games, magazines, computer and internet. The media elaborates advertising which target children as potential customers. For television alone, Neville, Thomas & Bauman
(2005) found that proportion of food advertisement were 31.1% of all advertisement on Australian metropolitan television shows. The biggest proportion was 37%. It occurred in the weekday afternoon. The majority proportion of advertised food were confectionery, fast food restaurant and dairy products, they accounted for 17%, 13% and 10% respectively. It is estimated that around 40,000 advertisements were watched by child a year (Kaiser Family Foundation 2004). To attract children attention, marketers also promoted their products by featuring it on cartoon character such as happy meal Mc Donald on the Teletubbies series and Burger king on Teletubbies, Rugrats, Shrek, Pokemon and Sponge Bob (Center for Science in The Public Interest, 2003). Marketers also employed internet to promote their brand. They provide advergames on internet which is designed for children. Brand message was embedded into the games in colorful, fun, and fast-paced adventure which were created to promote a brand (Moore 2006). In 2003, US Department of Education stated that around 64% of children aged five to fourteen years old who had accessed internet, played the games.

Advertising in media was a significant alternative to influence children behavior. Taras et al. (1989) found that the amount of time watching television was significantly related to caloric intake and request advertised food they saw on television. Researchers also believed that television ads can generate misconception about health benefit of food. Donahue, Meyer & Henke (1978) acknowledged that among children aged six to eight years old, 70% of them perceived that fast food were more nutritious that home-cooked food. In addition, according to Leiber (1998) and Fischer et al. (1991) cartoon character has been effectively assist children to recall and identify the products.

Conversely, some researchers argued that watching television was not a significant factor to childhood obesity. Proctor et al. (2003) highlighted that by controlling other factors (i.e. child body fat measure, parents BMI and education) television watching did not have strong relationship with the change in children’s BMI. In addition the number of time spent viewing TV was negatively associated with 6th and 7th grade girls’ level of physical activities, however the relationship constituted less than 1% of the variance and there was no correlation with body weight (Robinson et al. 1993).
III. THE PROPOSED THEORIES

In order to investigate the issue of relationship media with prevalence childhood obesity, several theories are proposed, namely:

- High media use does not have relationship with children intention to consume food.

- Socioeconomic status influence children consumption behavior where children from lower socioeconomic status tend to have higher intent to eat food than children in higher socioeconomic status.

- Young girls consume more healthy food and have less intention to eat food than boys.

- Increasing age will increase desire to consume food.

To support analysis, data from Mallinckrodt survey which investigated children behavior after playing advergame; are used to examine the proposed theories. Significance of the difference between categories is measured by t-test analysis from SISA (available from http://www.home.clara.net/sisa/t-test.htm ). The analysis uses 95% of Confidence Interval. In addition, the analysis also employs data from New South Wales School Physical Activity and Nutrition Survey (SPANS) 2004 and Roy Morgan Research.

3.1. High Media Use

Most children (approximately 73.9%) could answer correctly all of the questions about what kind of food that good for their health. Result of chi-square analysis for children who spent up to two hours and more than two hours per day watching television for p is 0.115037. Meanwhile, Chi-square analysis for children who spent up to two hours and more that two hours per day using internet generates p=0.162460. Since these figure less than 0.05, it means there was no significant difference among children who spent less or more time using media in their knowledge of the healthy food.

Most children in experimental group who played advergame prior to the survey could answer the all of the questions. 72.9% of them answered correctly the questions. Meanwhile, proportion of children who did not play the game before survey (control group) who could answer correctly was 75.9%. Chi-square analysis generates p=0.090102. It means there was no significant difference among children who played
and did not play the game before survey was conducted in their knowledge of the healthy food.

When they asked a question about what they want most to do after play **advergame**, 44.5% children wanted to eat food and 41.7% wanted to learn. The proportion of children who spent from no time to up to three hours watching television ranged from 42% to 56%. However proportion of children who watched more than three hours a day was only 25%. Analysis of chi-square for children who spent up to three hours and more than three hours generates \( p=0.092755 \). This figure explains that there was no significant difference among children who spent less or more time viewing television in their intention to eat food after played the game.

Proportions of kids spent time using internet from no time to more than three hours a day who wanted to eat food ranged from 44% to 67%. Analysis of chi-square analysis for children who spent up to two hours and more than two hours generates \( p=0.091597 \). It means there was no significant difference among children who spent less or more time using internet in their intention to eat food after played the game.

The proportion of respondent who wanted to buy cereal after played the game were 50%, 53.7%, 50.6%, 53.1% and 58.3% for those who spent no time, up to one hour, up to two hours, up to three hours and more than three hours a day respectively watching television. Result of chi-square analysis for children who spent up to two hours and more than two hours per day watching television generates \( p=0.128782 \). It means there was no significant difference among children who spent less or more time watching television in their intention to buy cereal after played the game.

Most kids wanted to buy cereal after played the game even they had different number of time spent using internet. Proportion of kids based on time spent using internet who wanted to buy cereal ranged from 44.4% to 68.8%. Chi-square analysis for children who spent up to two hours and more than two hours per day using internet generates \( p=0.166420 \). It means there was no significant difference among children who spent less or more time using internet in their intention to buy cereal after played the game.

Data from Roy Morgan in its article no.326 June 2004 revealed that children aged six to thirteen years old most likely to spent time viewing television in the past seven days. 94% of them spent time watching television as a popular indoor activity.
Reading magazine and listening to the radio were the other popular activities. These activities accounted for 67% and 53% of children. Survey also found that in the past four weeks, 56% of respondents had accessed the internet. However, 88% of kids liked to do sport activities. 60% enjoyed swimming, 52% cycling, 42% playing soccer, 35% playing cricket and 20% playing netball. It means beside using media, children also spent a sufficient number of time doing physical activities.

Based on NSW SPANS 2004 data, among children who spent more than two hours per day, those in different BMIs circumstances spent fluctuated number of time for small screen recreation. Small screen recreation includes activities of watching television, video, DVD and using computer for fun. There was no significant difference among children with different BMI categories (i.e. healthy weight, overweight, obese) except among overweight year ten girls in their number of time spent using media.

Overall, high media use did not influence children knowledge about healthy food, their intent to eat and buy food. Beside spent time using media, children also enjoyed their time in outdoor activities. Body Mass Index among children was not a significant factor for the number of time they spent using media.

3.2. Socioeconomic Status

73.9% children could answer correctly all of the questions about what kind of food that good for their health. The proportion of children at higher and lower socioeconomic school who could answer correctly the questions were 77.3% and 70.3% respectively. Result of chi-square analysis for p is 0.034513. It means their knowledge about healthy food was significantly different. Children at higher socioeconomic school status knew more than those who studied at lower socioeconomic school. However, based on NSW SPANS 2004 data, there was a fluctuation in fruit consumption among children in different socioeconomic status. In other words socioeconomic status did not determine children consumption of healthy food.

After played advergame, 54.8% children at higher socioeconomic school wanted to eat food compare to 30.9% those at lower socioeconomic school. Analysis of chi-square generates p=0.000209. This figure depicts that there was a significant difference in children intention to eat food after played the game. Children who studied at higher socioeconomic school had more intention to eat than those who studied at lower socioeconomic school.
After played *advergame*, 65.3% children at higher socioeconomic school wanted to buy cereal compare to 36.2% those at lower socioeconomic school. Result of chi-square analysis generates $p=0.000011$. It means their intents to eat was significantly different. Intention to buy cereal of children who studied at higher socioeconomic school was higher than those who studied at lower socioeconomic school.

Overall even though children at higher economic school status had more knowledge than those at lower socioeconomic, there was no significant difference in their fruit consumption pattern. However children at higher socioeconomic status had greater intention to eat food and buy cereal than those at lower socioeconomic status after play the game.

### 3.3. Gender

Most kids could answer correctly all of the questions about what kind of food that good for their health. Proportions of boys and girls who could answer correctly all the questions were 67.9% and 78.4% respectively. Result of chi-square analysis for $p$ is 0.009987. It means their knowledge was significantly different. Young girls knew more than young boys about healthy food.

After played *advergame*, 44.5% kids wanted to eat food and 41.7% wanted to learn. Proportions of boys and girls who wanted to eat food were 54.7% and 36.6% respectively. Analysis of chi-square generates $p=0.003122$. This figure explains that intention to eat food between girls and boys was significantly different. Boys intended to eat more than girls after played the game.

After they played advergame, 50.5% boys and 54.5% girls wanted to buy cereal. Result of chi-square analysis for $p$ was 0.092097. It means there was no significant difference among boys and girls for intention to buy cereal after played the game.

Overall boys and girls were significantly different in their knowledge of healthy food and their intention to eat, except intention to buy food. The girls knew more about the healthy food and they had less intention than boys to eat food after play *advergame*.

### 3.4 Age

Most kids aged 5, 6, 7 and 8 years old could answer correctly all of the questions about what kind of food that good for their health. The proportions of them were 72.5%, 74.2%, 72.6% and 77% respectively. Chi-square analysis for children age five and six years old compare to those age seven and eight years old generates $p=0.100095$. It
means there was no significant difference among children with different age in their knowledge of the healthy food.

After played *advergame*, 45.5% and 41% children aged five and six years old wanted to eat food. Meanwhile proportions of children aged seven and eight years who wanted to eat were 46.3% and 45.2% respectively. Result of chi-square analysis for these data generates p=0.096628. It means there was no significant difference among children aged five to six and seven to eight years old in their intention to eat food after played the game.

30.3% children aged five years old wanted to buy cereal after play the game, however proportion of kids aged six, seven and eight years old who wanted to buy cereal were 63.9%, 50% and 59.5% respectively. Chi-square analysis for these data generates p=0.003012. It means their intention to eat food after played the game was significantly different. Children aged six, seven and eight years old had more intention to buy cereal than those aged five years old. However chi-square analysis between children aged five to six and children aged seven to eight years old generates p=0.107492. This figure describes that there was no significant difference between children aged five to six and seven to eight years old in their intention to buy cereal.

Overall, age was not a significant factor for children knowledge of healthy food and their intent to eat and buy food after play the game. The difference was significant only for children aged five in their intention to buy cereal.

**IV. CONCLUSION**

Analysis of the proposed theories found that high media use is not a significant factor which leads to overweight children. This analysis is contrary with many researchers' opinion who argued that media have significant contribution for increasing childhood obesity. Socioeconomic status is a significant factor for the behavior that can lead to be overweight children. Even though children at higher economic school status have more knowledge of healthy food, they have greater intention to eat food and buy cereal than those at lower socioeconomic status after engaged with game. Gender could be a significant factor associated with obesity. Young girls have more knowledge of healthy food and have less intent to buy food than young boys. Age is not a significant factor for children knowledge of healthy food and their intent to eat and buy food.
The analysis of the proposed theories can be beneficial for marketers to evaluate their marketing strategy. Since media is not a significant factor, to increase sales they can employ the other strategies to promote their brands. Since many children also love doing outdoor physical activities, may be sponsorship could be a good alternative to exploit such activities to attract children attention to buy products. Marketers can also focus on young boys at higher socioeconomic status since they have great intention to buy food.

To keep children in healthy weight, it is better for parents to keep or increase their children knowledge of healthy food and their perception of advertised unhealthy food. They could also provide health home cooked food to reduce request to unhealthy food.

Since media is not a strong determinant factor, the concern of public policy should be move toward from advertising to the root cause of the childhood obesity problem. It is better to educate parents to feed children with healthy food. Parents should also show and guide the healthier life style. They could be a good example for their children in their consumption pattern associated with healthier life style.

References

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T-test online, available from http://home.clara.net/sisa/t-test.htm