The effectiveness of health messages in countering advertising of unhealthy food : the role of regulatory fit

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**THE EFFECTIVENESS OF HEALTH MESSAGES IN
COUNTERING ADVERTISING OF UNHEALTHY FOOD:
THE ROLE OF REGULATORY FIT**

YEO SU LIN

WEE KIM WEE SCHOOL OF COMMUNICATION AND INFORMATION

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A thesis submitted to the Nanyang Technological University in partial fulfillment of
the requirement for the degree of Doctor of Philosophy

2013

Abstract

Food consumption is a major contributing factor to the rise of obesity, with poor dietary patterns persisting despite public education on the importance of eating healthily. Health researchers have attributed the continued consumption of high-caloried foods to the cumulative exposure of television viewers to unhealthy food advertising. This has led some governments to impose regulations requiring unhealthy food advertisements to carry health messages. This research seeks to investigate the effectiveness of these health messages on attitudes and intentions related to unhealthy food consumption. A pre-study was first conducted to assess the amount of food advertising content on prime-time television in US, China and Singapore. A theoretical framework guided by the Regulatory Fit Theory was subsequently developed from the findings of the pre-study. It informed two quasi-experimental studies that tested two different formats - simultaneous and sequential - each presenting two sets of health messages alongside an unhealthy food commercial. The health messages were crafted to match either the individuals' prevention or promotion regulatory orientation. Study 1 tested the effects of fit when both sets of health messages were presented in a simultaneous format; while Study 2 introduced an additional variable (message positioning) and tested the same sets of health messages in a sequential format. Results of Study 1 showed significant two-way interaction effects only for promotion-fit but not for prevention-fit on intentions to eat healthily. Study 2, on the other hand, found significant three-way interaction effects for both prevention- and promotion-fit and provides support for the moderating influence of message positioning on regulatory fit. Findings from the studies together with strategic considerations for health authorities are discussed. This research highlights the importance of regulatory fit and presentation formats of health messages on intentions to eat healthily and presents their implications for public health policy and intervention. It is hoped that the research findings will inform health practitioners in designing better public health campaigns.

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Table of Contents

Abstract	iii
Acknowledgements	iv
Table of Contents	v
List of Tables	vii
List of Figures	ix
Chapter 1: Introduction	1
Background	1
Balancing Negative Influence of Food Advertising and Commercial Interests	3
Effectiveness of Health Messages	5
Purpose of Research	6
Research Contributions	8
Chapter 2: Literature Review	10
Obesity – Epidemic of the 21st Century	10
Media and Obesity	17
Regulating Food Advertising on Television	22
Importance of Message Effectiveness in Health Campaigns	25
Regulatory Fit Theory	30
Significance of Study	35
Chapter 3: Pre-Study	37
Content Analysis and Media Effects Research	39
Sample	40
Measurement of Content Variables	41
Coding Scheme	43
Findings and Discussion	48
Chapter 4: Theoretical Framework and Hypotheses	59
Development of Theoretical Framework	59
Extending the Base Framework	63
Chapter 5: Study 1	69
Method	69
Results	83
Discussion	91
Chapter 6: Study 2	95

Method	96
Results.....	105
Discussion	118
Chapter 7: General Discussion and Conclusion.....	120
Appendices.....	129
Appendix A: Pre-study Coding Sheet.....	130
Appendix B: Pre-Study Codebook.....	134
Appendix C: Pre-Study Inter-Coder Reliability Indices (Ir)	139
Appendix D: Screenshots of Study 1, Condition 1	140
Appendix E: Screenshots of Study 1, Condition 2	141
Appendix F: Screenshots of Study 2, Condition 1.....	142
Appendix G: Screenshots of Study 2, Condition 2	143
Appendix H: Screenshots of Study 2, Condition 3	144
Appendix I: Screenshots of Study 2, Condition 4.....	145
Appendix J: Setup of Computer Laboratory	146
Appendix K: Part 1 Questionnaire	147
Appendix L: Part 2 Questionnaire	155
Appendix M: Items and Results of Exploratory Factor Analysis for Study 1	159
Appendix N: Items and Results of Exploratory Factor Analysis for Study 1.....	160
Appendix O: Items and Results of Exploratory Factor Analysis for Study 2.....	161
Appendix P: Items and Results of Exploratory Factor Analysis for Study 2	162
Appendix Q: Comparison of Findings Computed Based on GRFM Scale by Lockwood et al. (2002) and BIS/BAS Scale by Carver and White (1994)	163
References.....	164

List of Tables

Table 1 <i>Sample Overview</i>	41
Table 2 <i>Overview of Coding Matrix and Procedure</i>	46
Table 3 <i>Percentage of Ads According to Major F&B Groups</i>	51
Table 4 <i>Percentage of Specific F&B Ads</i>	52
Table 5 <i>Percentage of Fast Food & Dine-In Ads on Television</i>	54
Table 6 <i>Explication of the Impact of Fit and NonFit on Attitudes towards Unhealthy Food Consumption and Intentions to Eat Healthily</i>	63
Table 7 <i>Cronbach's α, Means and Standard Deviations of Regulatory Orientation Scales</i>	79
Table 8 <i>Hierarchical Regression Analysis for Individuals' Prevention Orientation Scores and Health Message Focus Predicting Attitudes toward Unhealthy Food Consumption and Intentions to Eat Healthily</i>	85
Table 9 <i>Hierarchical Regression Analysis for Individuals' Promotion Orientation Scores and the Health Message Focus Predicting Attitudes toward Unhealthy Food Consumption and Intentions to Eat Healthily</i>	86
Table 10 <i>Study 1 Bivariate Correlations Among the Independent and Dependent Variables</i>	89
Table 11 <i>Cronbach's α, Means and Standard Deviations of Regulatory Focus Scales</i>	102
Table 12 <i>Study 2 Bivariate Correlations among the Independent and Dependent Variables</i>	107
Table 13 <i>Hierarchical Regression Analysis for Individuals' Prevention Orientation Scores, Health Message Focus and Message Positioning Predicting Attitudes toward Unhealthy Food Consumption and Intentions to Eat Healthily</i>	108
Table 14 <i>Hierarchical Regression Analysis for Individuals' Promotion Orientation Scores, Health Message Focus and Message Positioning Predicting Attitudes toward Unhealthy Food Consumption and Intentions to Eat Healthily</i>	109
Table 15 <i>Hierarchical Regression Analysis for Individuals' Prevention Orientation Scores and Health Message Focus Predicting Intentions to Eat Healthily when the Health Message is Positioned Before and After the KFC Commercial</i>	113

Table 16 *Hierarchical Regression Analysis for Individuals Promotion Orientation Scores and Health Message Focus Predicting Intentions to Eat Healthily when the Health Message is Positioned Before and After the KFC Commercial*..... 114

List of Figures

Figure 1. Blueprint for healthy eating revised in 2011 by the US Department of Agriculture	16
Figure 2. Comparison of F&B ads across countries	49
Figure 3. Comparison of F&B and non-F&B Ads.....	49
Figure 4. Percentage breakdown of unhealthy food ads and other types of food ads on US, China and Singapore television	56
Figure 5. Study 1 Conceptual framework linking individual orientation, health message focus and effects of regulatory fit or nonfit on attitudes toward unhealthy food consumption and intentions to eat healthily.	60
Figure 6. Study 2 Conceptual framework linking individual orientation, health message focus and effects of regulatory fit or nonfit, moderated by positioning of the health message, on attitudes toward unhealthy food consumption and intentions to eat healthily.....	64
Figure 7. Prevention orientation scores and message focus on intentions to eat healthily when health message is presented in a simultaneous format.	90
Figure 8. Promotion orientation scores and message focus on intentions to eat healthily when health message is presented in a simultaneous format.	90
Figure 9. Prevention orientation scores and message focus on intentions to eat healthily when health message is positioned <i>before</i> the fast food commercial.	116
Figure 10. Prevention orientation scores and message focus on intentions to eat healthily when health message is positioned <i>after</i> the fast food commercial.	116
Figure 11. Promotion orientation scores and message focus on intentions to eat healthily when health message is positioned <i>before</i> the fast food commercial.	117
Figure 12. Promotion orientation scores and message focus on intentions to eat healthily when health message is positioned <i>after</i> the fast food commercial.	117

Chapter 1: Introduction

Health authorities in many parts of the world are beset with a growing health problem – the relentless rise in obesity among their populations. Declared a global epidemic by the World Health Organization (WHO) in 1997, obesity is the fifth leading global health risk responsible for more deaths than underweight. Each year, close to three million adults die from illnesses linked to overweight and obesity (World Health Organization, 2012).

Associated with many chronic diseases capable of inflicting ill-health and premature death, obesity has doubled worldwide since 1980. In 2008, there were approximately 1.4 billion overweight and 500 million obese adults in the world. These numbers are expected to reach 2.3 billion and 700 million respectively in 2015. Children are not spared either with more than 40 million children under the age of five already obese in 2010 (World Health Organization, 2012). The disease discriminates no one – affecting males and females, adults and children across all races and socioeconomic groups in both developed and developing countries.

Background

Among the many factors responsible for the rise in obesity, food consumption is a major contributor. Essentially, people are consuming large amounts of energy-dense food and not expending that energy through physical activity (World Health Organization, 2012). Coupled with a sedentary lifestyle that comes with economic development and modernization, millions of people are gaining weight and putting their health at severe risk. This convergence of modern living with its labor-saving devices and the consumption of cheap energy-dense food have created what health researchers term an ‘obesogenic’ environment (King & Thomas, 2007).

Concerned health authorities have therefore been attempting to reverse the escalating trend by implementing various course of action. In the US, efforts have poured in since 1999 to fund support and run programs to educate individuals on the importance of eating healthily and the need to adopt a balanced lifestyle (Flegal, Carroll, Ogden, & Curtin, 2010). The Centres for Disease Control and Prevention (CDC), for example, funds 25 states to run campaigns and programs to arrest the problem of obesity and chronic diseases. State-wide efforts were further co-ordinated to ensure that nutrition and physical activity strategies are adopted to create environmental changes that will improve the health of Americans (Centers for Disease Control and Prevention, 2012).

However, in spite of extensive health programs and recommendations aimed at encouraging the public to adopt a lifestyle that incorporates healthy eating and exercise, poor dietary and sedentary lifestyles continue to persist among Americans. There has been a dramatic increase in obesity in the US in the past 20 years. In 2010, 35.7% of the adult population in the US have been identified as obese. The increase has been particularly severe among children and teenagers, with 17% of all American children and teenagers classified as obese in 2010, an increase of three-fold from 1980 (Centers for Disease Control and Prevention, 2012). According to Dave, An, Jeffery and Ahluwalia (2009), the continued prevalence of obesity may be due to individuals not associating the frequency of fast food intake with perceived “unhealthfulness” of fast food. The authors suggested that public education alone on eating healthily may not be that effective in reducing the consumption of unhealthy food.

Balancing Negative Influence of Food Advertising and Commercial Interests

Among the reasons explaining why people continue to consume energy-dense food high in fats and sugar despite knowing that such foods are unhealthy, many health researchers “blame” the mass media for their role in the obesity epidemic. They argue that the mass media contribute to the increase in obesity by being an influential vehicle for commercial marketing and advertising of high-calorie food (Boyce, 2007). A significant number of studies discovered high percentages of unhealthy foods such as fast food, soda, candy and snacks high in fat, sugar and sodium advertised on television (e.g., Chapman, Nicholas, & Supramaniam, 2006; Henderson & Kelly, 2005). These foods were found to be poor in nutritional content and fail to meet nutritional guidelines provided by health authorities (Mink, Evans, Moore, Calderon, & Deger, 2010).

Researchers contend that cumulative exposure to such foods on television promotes positive beliefs and attitudes towards the advertised foods among television viewers. These attitudes and beliefs formed are thought to mediate advertising exposure resulting in eating behaviour being positively related to advertising exposure (Dixon, Scully, Wakefield, White, & Crawford, 2007). With many studies showing the association between the depiction of food on television and the negative consequences on food preferences and dietary habits, health advocates are calling for a range of public health initiatives, including government’s intervention to curb the extent of food advertising on television (Harris & Graff, 2012).

Some governments have indeed responded to this call. Sweden and France, for example, imposed restrictions on food television advertising in 1991 and 2007 respectively (Associated Press, 2007; Veerman, Van Beeck, Barendregt, & Mackenbach,

2009). While government regulations vary, two common forms of restrictions are banning unhealthy food advertisements on children's television and imposing a mandatory law requiring all unhealthy food advertisers to carry health messages in their advertisements on television. Except for France, the majority of countries that regulate unhealthy food advertising on television have chosen the former course of action. The common argument is that children need to be protected from the subtle and often misleading techniques that advertisers use because children are incapable of deciphering advertising messages as compared to adults (Story & French, 2004). France, on the other hand, decided to focus on the general population instead. A mandatory law was passed in 2007 requiring all fast food advertisers wishing to broadcast on French television to devote 7% of televised advertisement space to health messages on exercise and consumption of fruits and vegetables. Food advertisers who refuse to co-operate are allowed to exclude the health message on the condition that they donate 1.5% of their advertising budget to a fund for government health campaigns (Mercer, 2007).

Both intervention approaches have drawn mixed reactions from public health scholars. Some were of the view that banning televised food advertisements alone without an integrated effort to restrict other marketing avenues is inadequate and may not be effective (e.g., Dehghan, Akhtar-Danesh, & Merchant, 2005). They argued that children can still be exposed to unhealthy food advertisements in international children's programs beamed via satellite or during prime-time and adult programs as well as via outdoor advertising platforms.

As for the French government's decision to counter fast food commercials with health messages on television, some consumers were skeptical that such a measure is

sufficient to change the public's dietary patterns (Mercer, 2007). The argument was that many television viewers will not notice the health messages and for those who do, memory retention of the health messages will last for at most a few weeks. Another contention appeared to be the wording of the health messages with some groups advocating for positive lifestyle messages, asserting that strong warnings may backfire (Associated Press, 2007). This tactic of making fast food advertisers to carry health messages has been used to address other health issues such as smoking (Ron Borland, Chapman, Owen, & Hill, 1990) and alcohol consumption (San Miguel Brewery, 2010), but is a novel strategy in the realm of fast food advertising. More research is, however, needed to examine the effectiveness of these measures.

Effectiveness of Health Messages

The concern that health messages should be worded to effect changes deserves greater attention from communication researchers. With many health authorities pouring large amounts of money, resources and time into health campaigns annually, many scholars question the effectiveness of campaign messages. In the US, the average campaign succeeded in changing only between 5% and 8% of the targeted population's behavior positively (Snyder, 2007). While the good news offered by scholarly evidence suggested that health campaigns have some positive impact on the public health behaviors, by most accounts however, the recorded effects have been small.

One possible reason for this could be that many of these campaigns were carried out without empirical evidences provided by established health communication theories (Myhre & Flora, 2000). The importance of using theory to inform campaign message development has been highlighted by several campaign scholars as an important element

in the design of any health behavior-change intervention. Theory serves as a conceptual foundation which can locate and identify key behavioral determinants from which a campaign message can focus on (e.g., Cappella, Fishbein, Hornik, Ahern, & Sayeed, 2001; Noar, 2006; Slater, 1999). The current lack of theory-based interventions in health campaign scholarship may have resulted in recommendations that lack the necessary details required to design impactful campaigns (Abraham & Michie, 2008). It further makes replication difficult and hampers the development of scientific and evidence-based knowledge to guide health practitioners on message techniques needed to effectively address issues on public health (Bartholomew, Parcel, Kok, & Gottlieb, 2006). Health messages that were eventually crafted did not align and fit with the way members of the public view the health problems (Dale & Hanbury, 2010; Michie et al., 2008).

There have been calls to incorporate behavioral theories in the development of campaigns to promote healthy or prevent unhealthy behaviors (Fishbein & Cappella, 2006). Health messages that are most likely to influence behavioral changes are often those written with individual characteristics in mind and based on theories in social psychology (Ko, Campbell, Lewis, Earp, & DeVellis, 2011). However, reviews of scholarly works on the impact of the interactions of message tactics and individual characteristics revealed that more studies are needed in health research (Punam Anand Keller & Lehmann, 2008).

Purpose of Research

In view of the lack of empirical research on the effectiveness of presenting viewers with health messages alongside unhealthy food advertisements, such as the French government's strategy of making fast food advertisers carry health messages, this research

aims to investigate the effectiveness of health messages in countering unhealthy food advertising on television. Television is picked as the medium for examination because in many countries, such as US (Nielsenwire, 2009), China (CMM Intelligence, 2009) and Singapore (AC Nielsen Singapore, 2009), television continues to be the dominant platform used to influence food consumption behaviors among consumers. This is in spite of the emergence of new media and the explosion of commercial messages via other forms of media.

Guided by the Regulatory Fit Theory, the research will examine the impact of health message tactics and individual characteristics on attitudes toward unhealthy food consumption and intentions to eat healthily. The overarching research questions are as follows:

1. How much of unhealthy food and beverage (F&B) advertising are viewers in US, China and Singapore exposed to on prime-time television in a month?
2. How effective are health messages in countering unhealthy food advertisements?
3. What are the types of health messages and which presentation formats are most persuasive?

In order to address these questions, three studies comprising a pre-study and two experimental studies were conducted.

Pre-study. The pre-study seeks to assess and establish the current level of food advertising on prime-time television in US, China and Singapore. These three countries are selected for two main reasons. First, they face similar challenges of having to tackle health problems arising from the prevalence of obesity among their respective populations.

Second, the legislation on food advertising in these countries is largely unregulated. Hence, it is useful to explore and compare the amount and types of food advertised on television where no airtime constraints are imposed on food products. The results of this pre-study then served as a rationale and helped to identify gaps which led to the development of a theoretical framework guided by the Regulatory Fit Theory. Two experimental studies were subsequently conducted to examine the relationships among the various variables conceptualized in the model.

Study 1. Anchored by the Regulatory Fit Theory, Study 1 was carried out to investigate the effectiveness of a health message at countering an unhealthy food commercial on attitudes toward unhealthy food consumption and intentions to eat healthily if the health message was presented in a simultaneous format. This study is explicated in Chapter 5; while Chapters 2 and 4 review literatures and provide a detailed description of the Regulatory Fit Theory and the development of the theoretical framework respectively.

Study 2. Building on the outcomes of Study 1, Study 2 (discussed in Chapter 6) extends the theoretical framework by investigating another intervention approach in countering unhealthy food advertising on television. It introduces an additional variable and presents the same health message this time in a sequential format with an aim to determine again the effectiveness of the health message on the same set of dependent variables.

Research Contributions

In the current increasingly obesogenic environment, there is a need for more research to examine ways to counter commercial food advertising that has often been

shown to be associated with negative dietary patterns. This research is therefore significant on four fronts. First, this is the first study to assess the amount of food advertising on prime-time television in China and Singapore. Second, it is one of few studies to provide empirical evidence on persuasive approaches that can effectively counter messages for unhealthy food choices. Third, it is the first to extend the testing of the Regulatory Fit Theory to include additional conditions that have not been tested before. Finally, as the study has been designed to confer high external validity, it offers applied relevance with implications for health campaigns and public policy in health.

Chapter 2: Literature Review

Literature from food advertising and public policy, health communication and social psychology are reviewed in this chapter to demonstrate (1) the influence of advertising on the rise of obesity, and (2) the importance of understanding the relationship between individual's regulatory orientation and message characteristics in health messages in persuading television viewers to eat healthily. The review opens with a discussion on obesity as a global major health issue and the influence of food advertising on unhealthy eating patterns. It is followed by a discussion on attempts by governments at regulating food advertising on television and describes the importance of message effectiveness in health campaigns. The latter discussion is informed by the Regulatory Fit Theory and the persuasiveness of fit as opposed to nonfit on attitude change towards unhealthy food consumption and behavioral intentions to eat healthily.

Obesity – Epidemic of the 21st Century

The prevalence of obesity is increasing at an alarming rate in both developed and developing nations. It affects men, women and children across all ages, races and socioeconomic groups. According to the World Health Organization (2012), obesity has reached epidemic proportions with one in 10 adults in the world classified as obese. In 2008, there were approximately 1.4 billion overweight adults of which 500 million were obese. These numbers are expected to reach 2.3 billion and 700 million respectively by 2015. The problem of obesity is also rife among children. In 2010, over 40 million children under the age of five were overweight. Each year, close to three million adults die from illnesses linked to being overweight and obese. A health problem once confined

to high-income countries, obesity is also rapidly on the rise in low- and middle-income countries, in particular among the population living in the cities.

At the heart of this problem of excess weight is a “homeostatic biological system, struggling to cope in a fast-changing world, where the pace of technological revolution outstrips human evolution” (Jebb, Kopelman, & Butland, 2007, p. vi). Modern living, with its labor-saving devices, sedentary work and physical inactivity, abundance of cheap energy-dense food and the association of eating with indulgence, has resulted in what health researchers call an ‘obesogenic’ environment (King & Thomas, 2007)..

Unlike infectious diseases or illnesses that can be diagnosed and directly treated, obesity is a chronic disease that requires lifelong management. A high risk factor that leads to serious health consequences, it is associated with increased risk of cardiovascular diseases, diabetes, stroke, hypertension and certain types of cancers (World Health Organization, 2012). Obesity is therefore capable of worsening existing illnesses or triggering other health problems; and will only inflict significant disadvantages and immeasurable costs on the individual and the society. It increases not only the risk of disease and premature death in both the young and old but also reduces their social status and quality of life. This is the result of fewer employment opportunities and income depletion due to the treatment costs of long-term health care (Butland et al., 2007; Swinburn, Caterson, Seidell, & James, 2004). The rise in obesity is so prevalent that culturally-diverse countries such as the US, China and Singapore are not spared from this worldwide epidemic.

Obesity in the US. No stranger to obesity, the US is one of the fattest nations in the world (Freitas, Liberman, & Higgins, 2002). A first world and highly developed

country, many attempts have been made to arrest this health problem. American health authorities started monitoring the rising obesity trend as early as 1963 but were unable to stop the rise in numbers (Centers for Disease Control and Prevention, 2012; Ogden & Carroll, 2010). Today, 32.2% of men and 35.5% of women in the US are obese; while 14% of children below the age of five and 19% between ages six to eleven are classified as obese (Flegal, et al., 2010; Grier, Mensinger, Huang, Kumanyika, & Stettler, 2007). The increase in obesity among adults was faster than that in children and quicker among women than men. If the trends are allowed to continue, it is predicted that by 2030, 86.3% of American adults will be either overweight or obese. The prevalence of obesity among children, on the other hand, will double by 2030 (Y. F. Wang, Beydoun, Liang, Caballero, & Kumanyika, 2008).

If obesity is not arrested early, the costs to the individual and the society will be tremendous. Not only does being obese exact social, psychological and financial strains on the individuals, treating obesity is also expensive as it requires long-term medical attention. In 2008, the US government spent some US\$147 billion treating obesity and obesity-related diseases (Centers for Disease Control and Prevention, 2012). The total healthcare costs are expected to double every decade to almost US\$957 billion by 2030. This amount will then account for a whopping 16% to 18% of the total US healthcare costs (The Lancet, 2004; Y. F. Wang, et al., 2008).

Obesity in China. Across the globe culturally different from the US, China is likewise waging a war against obesity. Considered a national crisis, the world's most populous country now has more than 90 million obese citizens and another 200 million overweight (Chen, 2008). In 2002, 22.8% of Chinese were overweight and another 7.1%

obese - an increase of 40.7% and 97.2% from 1992 respectively. In large cities such as Beijing and Shanghai, for example, there was almost a threefold increase in childhood obesity and overweight among children between seven and 12 years old from 1985 to 1995. The prevalence of overweight for children in China was estimated at 27.7% for boys and 14.1% for girls (Cheng, 2007; Iwata, Hara, Okada, Harada, & Li, 2003). The number of obesity cases, in fact, is expected to exceed 200 million by 2015 (Cheng, 2007).

The prevalence of obesity could actually be higher because Asians tend to have a lower body mass index (BMI) cut-off values for overweight and obesity. Health risks among the Chinese are therefore higher when compared to Americans with the same BMI value (a proxy index based on an individual's weight and height). This may also explain the ballooning medical costs in treating chronic diseases which eventually accounted for 85% of all deaths in China (Chen, 2008) (Chen, 2008; Zhao et al., 2007). Translating these figures to monetary value, the Chinese government spent a massive 21.1 billion yuan (RMB) in 2003 treating obesity-related illnesses, accounting for 3.7% of the national total medical costs that year (Chen, 2008; W. Zhao et al., 2008). Just like the US, the Chinese government is also finding the cost of overweight and obesity an enormous burden on the country

Obesity in Singapore. The cosmopolitan city-state of Singapore is not spared from obesity either. Despite having launched the National Healthy Lifestyle Program to arrest the rise of obesity in Singapore over two decades ago in 1992, Singaporeans' waistlines have continued to expand. Available obesity figures in 2010 showed that one in nine Singaporeans aged 18 and 69 years old were obese (National Health Survey, 2010). Prevalence of obesity was higher among males (12.1%) than females (9.5%); while the

age group with the highest prevalence of obesity was between the ages 30 and 39 years old (12.3%) (National Health Survey, 2010).

Treating obesity was estimated to have cost the Singapore government almost 7% of total healthcare costs in 2004 (National Health Survey, 2004). Although the Singapore government started rolling out programs in 1992 to prevent childhood obesity from worsening, Singaporeans continued to adopt a diet rich in fats and calories (Chang, 2010). Excess energy intake coupled with a busy lifestyle leaves little or no time for exercise and Singapore still faces a mounting challenge to reduce the increasing obesity trend (National Health Survey, 2004).

Changing food consumption patterns and public health programs. With rising incomes and globalisation, people now have the financial means and opportunities to swap diets. Once containing high amounts of complex carbohydrates, diets are now being traded for more varied ones with higher proportions of fats and sugar (Butland, et al., 2007). A large proportion of diets are now “dominated by higher intakes of animal and partially hydrogenated fats and lower intakes of fiber” (Popkin, 2006, p. 289); while the increased amount of energy intake is not expended as activity at work, home and leisure now require less energy than they used to. Increased food portions, eating out and higher consumption of calorically sweetened beverages are other eating patterns that accompany the pace of economic growth (Bray, Nielsen, & Popkin, 2004; Nielsen & Popkin, 2004; Nielsen, Siega-Riz, & Popkin, 2002).

In China, the consumption of animal-source foods increased proportionately with increase in incomes. Adults’ diets comprising more than 30% of fat intake increased from

15% to 44% between 1989 and 2000 (Popkin, 2006; Popkin & Du, 2003). This has inevitably led to rising obesity and the emergence of new diseases and disabilities.

A recent study by Odegaard, Koh, Yuan, Gross and Pereira (2012) showed that frequent consumption of Western-style fast food by Easterners contributes to a dietary pattern that mirrored poor cardiometabolic health in the US. These calorically dense foods are high in sodium and cholesterol, and have been linked to heart diseases and diabetes. The researchers found that Chinese Singaporeans who consumed Western-style fast food more than twice a week have an increased risk of developing diabetes and fatal heart diseases as compared to their peers who reported consuming less or no fast food at all. With fast food becoming more common in developing and recently developed countries in Asia, the study advocated the need to examine the shift in eating patterns and global dietary acculturation brought on by globalization (Odegaard, et al., 2012).

Increased consumption of energy-dense foods which offer little nutrition combined with reduced physical activity hence appears to be a key underlying factor for the rise in obesity in both developed and developing countries (Butland, et al., 2007). Recognising the urgent need to change people's food consumption behaviours, health advocates in the US and other Western countries where obesity is more pronounced, have been urging their governments to take decisive actions and implement major policies to arrest further increase in obesity (Ebbeling, Pawlak, & Ludwig, 2002; Klein & Dietz, 2010).

American health authorities have been proactively taking measures to educate their citizens on how to eat healthily. The CDC, for example, funds 25 states to run campaigns and programs to address the problem of obesity and chronic diseases. State-wide efforts were being co-ordinated to ensure that nutrition and physical activity

strategies are adopted to create environmental changes that will improve the health of Americans (Centers for Disease Control and Prevention, 2012). In 1992, the U.S. Department of Agriculture (USDA) was created the Food Guide Pyramid to provide advice on the components of a healthy diet. This blueprint for healthy eating was subsequently revised and replaced by MyPyramid in 2005 and MyPlate in 2011 which advocated a diet rich in fruits and vegetables (Choosemyplate.gov, 2012a).

Figure 1. Blueprint for healthy eating revised in 2011 by the US Department of Agriculture

Essentially, MyPlate encourages Americans to fill their daily meals with 50% of fruits and vegetables with the other 50% making up of food rich in grains and proteins (Choosemyplate.gov, 2012a). It advises the public to avoid food and drinks which contain calories from solid fats and added sugars which are found mostly in processed foods such as cakes, cookies, pizzas, cheese, pizzas, sausages, ice-cream and sodas (Choosemyplate.gov, 2012b). However, going by the increasing numbers of people who continue to be overweight and obese in the US, it remains uncertain if existing public health programs will succeed in changing behaviours.

In China, community-based interventions to reduce overweight and obesity were introduced in the 1990s when the rate of obesity started to climb in the 1980s (Bell, Ge, &

Popkin, 2002; Wu, 2006). These programs were, however, launched sporadically in different parts of the country and independently from one another. Of concern here is that there were no conclusions as to whether these efforts succeeded in creating awareness of the ills of obesity (Gao, Griffiths, & Chan, 2008). The fast developing China faces a nutrition paradox when it comes to feeding its population. While trying to ensure that the poor in the rural areas have sufficient to eat, it is also burdened with having to manage those in the richer cities who overeat. Attempts to address the issue of obesity in China will be tougher and trickier in the years to come (Doak, Adair, Bentley, Zhai, & Popkin, 2002; Prentice, 2006).

In Singapore, health authorities embarked on nationwide campaigns to curb the rising rate of obesity by implementing major health promoting policies from 1992 to 2004. The Health Promotion Board developed dietary guidelines and formulated comprehensive health promotion programs to encourage the adoption of healthy lifestyles in schools, workplaces and communities. The limited success was however thwarted by many other environmental, social and cultural challenges and Singapore continues to face a rising trend in obesity with its associated diseases (Soon, Koh, Wong, & Lam, 2008).

Media and Obesity

In spite of existing recommendations to the public by the governments of the US, China and Singapore, poor dietary and lifestyle habits persist in these countries. Attempts at trying to encourage individuals to adopt a changed lifestyle incorporating healthy eating with exercise appear to have mixed results. The research suggests that public education on eating healthy alone may not be enough to curb unhealthy food consumption (Dave, et al., 2009).

The ability of the mass media to convince people to behave in a certain manner or even just talk about a topic through generating content representing certain interest groups make it “seemingly impossible to ignore mass media’s influence on any except the most remote communities on earth” (Giles, 2003, p. 2). As such, the media is often accused for “causing” weight gain among consumers and research has suggested links between media consumption and obesity (Boyce, 2007). According to Viswanath, Ramanadhan and Kontos (2007), the media is a powerful tool of persuasion which defines our worldviews and shapes our behaviours. Due to its extensive ability to reach large numbers of people, the mass media is regarded as highly influential and possess the power to impact lives. The media is also prevailing enough to influence the social contexts and communities within which individuals operate.

Samuels, Craypo, Lawrence, Lingas and Dorfman (2007) reiterated this view by suggesting that the media assist in forming and communicating social and cultural norms. It provides images, knowledge and avenues for understanding about politics, family, education and health. As the media relies heavily on advertising to subsidize operating costs, channels are created for food and beverage advertising and promotion. Sedentary lifestyles are formed partly due to the nature of mass media which is often consumed while sitting down. The ways mass media contribute to an increase in obesity include “commercial marketing and advertising of high-calorie foods and beverages, portrayals of eating, drinking, and body image in both advertising and program or story content, consumption of excess calories during television viewing, and reduced levels of calorie expenditure during periods of inactivity associated with media use” (p. 209).

Advertising therefore has tremendous persuasive power which impacts the health of individuals and its influence cannot be overemphasized. Viswanath, et al. (2007) outlined three ways that advertising is capable of influencing an individual's health. First, it directly influences what people consume through the promotion of food and beverage products. Second, advertising indirectly changes people's perception on health or consumption of certain types of food even if the food and beverage are of low nutritional value. Third, advertising helps to fund the production of media content which may not necessarily be conveying messages aimed at promoting public health.

Many studies have been conducted to examine media influence on people's dietary habits and preferences. In view of the rising trend of obesity, scholars were particularly concerned about the effects of food advertising on vulnerable audiences such as children and adolescents. These individuals are seldom capable of differentiating foods which are high in nutrition and those which are of little nutritional value (Caroli, Argentieri, Cardone, & Masi, 2004). Constant exposure to unhealthy food advertisements tends to increase their indulgence in such foods. Since food preferences established from young are carried on to adulthood, a diet comprising of energy-dense foods without an engagement in physical exercises may lead to weight gain and even ill health later in life (Dietz & Gortmaker, 1985; Robinson, 1999; Robinson, 2001).

Television and effects of food advertising. Although the internet and other digital media are increasingly gaining popularity in the US, television continues to be the dominant and favourite medium for media consumers. A report in 2009 found a significant increase in the time spent on computer and mobile phone, but their emergence was not at the expense of television viewership (Nielsenwire, 2009). The average

American television consumption remained at an all-time high compared to other forms of media with 141 hours of television viewing per person per month. As Americans continue to spend substantial amount of time watching television, there were also the presence of more television sets than individuals in each home with an average of 2.86 television sets compared to 2.5 individuals per household. Television, capable of reaching as many as 95% of American adults daily, therefore remained the favourite form of medium for most Americans.

In China, television reaches almost 400 million households representing 97% of the total population. In 2008, not only was television the most popular media form, it also captured the largest slice of the advertising expenditure of US\$63 billion (CMM Intelligence, 2009). However, these figures are expected to be challenged by the high rate of internet consumption in China which recorded a significant increase of 42% of people going online in 2008.

In Singapore, online media has widened its reach among the adults with three in five adults going online on a daily basis (AC Nielsen Singapore, 2009). Television, however, captured eight out of 10 adult viewers on a daily average. The growing popularity of the internet has not occurred at the expense of traditional media (Channel NewsAsia, 2009).

With television continuing to be the dominant media form in many parts of the world, there is little surprise that television is the most examined medium for research examining media influence on obesity (Boyce, 2007). Much attention has been placed on the abundance of food advertising on television and its influences on food preferences, purchase habits and perception of social norms on food consumption. One argument was

that televised food advertisements entice viewers to consume the advertised food and encourage them to include these foods as part of their diet. Such media messages are a persuasive vehicle and they have the power to shape the environments governing health behaviour (Caroli, et al., 2004; Grier, et al., 2007; Mink, et al., 2010).

Studies examining the nutritional content of televised food advertisements have found a high percentage of products consisting of unhealthy foods such as fast food, soda, candy and snacks (Chapman, et al., 2006; Henderson & Kelly, 2005). The foods, which are high in fat, sugar or sodium, were found to be poor in nutritional content and fail to meet the nutritional guidelines provided by health authorities (Mink, et al., 2010; Powell, Szczypka, Chaloupka, & Braunschweig, 2007). Cumulative exposure to these foods on television tends to promote positive beliefs and attitudes towards the heavily advertised foods among television viewers. These are thought to mediate advertising exposure resulting in consumers' eating behaviour being positively correlated to advertising exposure (Dixon, et al., 2007). Food marketers' use of psychological techniques through implicit messages presented in advertising are capable of triggering powerful responses in viewers, which mislead viewers into thinking that consuming the advertised food is good for them (Derbaix & Bree, 1997; Livingstone & Helsper, 2006; Te'eni-Harari, Lampert, & Lehman-Wilzig, 2007).

With the depiction of food on television consistently linked to negative consequences on food preferences and dietary habits, scholars have called for a range of public health initiatives to curb unhealthy food advertising on television (e.g., Harris & Graff, 2012). They contended that efforts must be undertaken to ensure the public is protected against large scale marketing of unhealthy food on television.

Regulating Food Advertising on Television

The need to make aware the benefits of healthy eating in order to counter and reduce the influence of unhealthy food content advertised on television has therefore led some scholars (e.g., Chou, Rashad, & Grossman, 2008) to voice their support for tougher measures such as an outright ban on fast food advertising targeted at children and adolescents or the elimination of tax deductibility for errant advertisers. With studies revealing that the marketing of unhealthy dietary practices are intensifying through multiple techniques and channels (Matthews, 2008; Story & French, 2004), public interest groups appear to have grown impatient with the developments of self-regulation among trade groups whose business interests are constantly in conflict with their moral obligation to protect the public health. As the US, China and Singapore mull over the implementation of tighter statutory advertising regulation on television, other countries such as France, Korea, Norway, Sweden and the United Kingdom (UK) have proceeded to impose restrictions for televised advertising of food high in fat, sugar and salt (Mink, et al., 2010).

Banning unhealthy food advertisements on children's television. Governments around the world have adopted different intervention techniques in countering televised messages from unhealthy food advertisers. The most common form of restriction is the banning of unhealthy food advertising on children's television which countries such as Sweden, Norway, UK, Belgium and Australia have decided to implement (Higgins, Roney, Crowe, & Hymes, 1994) The Swedish government, for example, views the use of subtle and misleading persuasive techniques in advertising to influence children's behavior as immoral and unethical, and since 1991 has banned all television and radio

advertising targeted at children under the age of 12. Regulators argued that children are incapable of deciphering advertising messages from other modes of communication and should therefore receive greater protection (Higgins, et al., 1994).

In the UK, food regulators commissioned studies which established the correlation between weight gain among children and advertised food on television. The scientific evidence gathered subsequently led to the ban of unhealthy food advertisements on children's television programs in 2007 (Gutierrez, 2008). Although this was fiercely contested by commercial food and advertising bodies, regulators contended that while causes for the high rate of childhood obesity in the UK is multi-faceted, unhealthy food advertised on television is a key contributory factor (Garde, 2008; Hastings et al., 2003; Sonia Livingstone, 2005). In Belgium, food advertisers are forbidden to broadcast commercials during children's programs as well as five minutes before and after the programs; while Australia does not permit the broadcasting of food commercials during television programs targeted at preschoolers (Story & French, 2004).

Such intervention approaches have drawn mixed reactions from scholars. Some were of the view that banning televised food advertisements alone without an integrated effort to restrict other marketing avenues is inadequate and may not be effective (e.g., Dehghan, et al., 2005). A case in point is Sweden where, despite banning unhealthy food advertisements on children's television for over a decade, young viewers are still able to access television programs from other countries via satellite television. This could have inadvertently diluted the impact of the ban in Sweden (Dehghan, et al., 2005). Children are also likely to be exposed to unhealthy food advertisements during prime-time and adult programs, as well as through outdoor advertising platforms such as billboards etc.

Some scholars, on the other hand, showed that almost 35% of obese children in the US might be healthier if there was a ban on unhealthy food advertisements on television (Veerman, et al., 2009). They argued that the absence of unhealthy food advertisements on television will drastically reduce the prevalence of obesity among American children and call for tougher statutory actions to limit children's exposure to energy-dense food on television.

Countering unhealthy food advertisements with health messages on television.

Instead of an outright ban on unhealthy food advertising on children's television, another approach was adopted by the French government. A mandatory law was passed in 2007 which required all unhealthy food advertisers wishing to broadcast on television to allocate 7% of the televised advertisement space to health messages on promoting exercise and the consumption of fruits and vegetables (Mercer, 2007). This includes other media channels such as radio, billboards and the internet. Unhealthy food advertisers are mandated to choose one of the four pre-designed health messages aimed at persuading viewers to adopt a balanced diet and lifestyle (MailOnline, 2007). The four health messages are "For your health, avoid snacking between meals"; "For your health, avoid eating too much fat, too much sugar and too much salt"; "For your health, undertake regular physical exercise"; and "For your health, eat at least five fruits and vegetables a day".

It is stipulated that one of these four health messages has to be carried on all broadcast and print food advertisements, including fast food advertisements. Food advertisers wishing to opt-out are allowed to drop the health message on the condition that they donate 1.5% of their advertising budget to a fund for government health campaigns.

Most advertisers are, however, reluctant to subject themselves to the latter option which they interpret as additional taxes (Hall, 2007). This approach is seen as trying to balance the interests of commercial groups and health advocates.

France is the only country so far to adopt this intervention in its campaign against obesity (Jardine, 2005), although governments in many parts of the world have long implemented this approach to address other health issues. Examples include health advisories on televised alcoholic beverages in Philippines (San Miguel Brewery, 2010); and health warnings on cigarette packaging in Canada (Nimbarte, Aghazadeh, & Harvey, 2005-2006) and Australia (R Borland et al., 2009).

While some French consumers welcome the move, others were skeptical. The contention appeared to be the wording of the health messages. Some argued that strong warnings may backfire and suggested using positive lifestyle messages instead. Others contended that the measure is insufficient to change the public's dietary patterns. They argued that television viewers will not notice the health messages and for those who do, they will not remember them after a few weeks (Associated Press, 2007). The concern that health messages should be worded to effect change is an insightful observation that deserves attention from communication scholars.

Importance of Message Effectiveness in Health Campaigns

Each year, new health campaigns are launched to change public health behaviors. Newly launched campaigns enter a media environment already saturated with competing messages from a myriad of sources (Randolph & Viswanath, 2004). Public health practitioners face the challenge of not only having to ensure that the health messages are not drowned out, but that they are motivating enough to change health behaviors which

are often entrenched in the individual's lifestyle (Noar, 2006). Considering that large amounts of money, resources and time are poured into public health campaigns annually, scholars question the effectiveness of these campaign messages in changing the public's attitudes, intentions and behaviors towards positive health outcomes (Abroms & Maibach, 2008).

Reviews of public health campaigns literature showed that in the US, the average campaign succeeded in changing only between 5% and 8% of the targeted population's behavior constructively. Snyder's (2007) meta-analyses of the effectiveness of health campaigns, for example, found that on average health campaigns affects the intervention community by only about 5%; while Snyder and Hamilton (2002) reported an 8% positive change in behaviors. Nutrition campaigns advocating higher fruits and vegetables consumption, and breastfeeding registered greater success than other health topics; and campaigns that utilized the traditional mass media channels such as television were found to be more effective in changing health behaviors than other communication avenues (Derzon & Lipsey, 2002; Palmgreen, Lorch, Stephenson, Hoyle, & Donohew, 2007). While the good news offered by scholarly evidence suggested that health campaigns have some positive impact on the public's health behaviors, by most accounts however, the recorded effects have been small and insignificant.

Theories on persuasive health messages. A review of mass media campaigns through 1998 found that many of them were conducted without a theoretical foundation (Myhre & Flora, 2000). The importance of using theory to inform campaign message development has been highlighted as an important element in the design of any health behavior-change intervention (e.g., Cappella, et al., 2001; Noar, 2006; Slater, 1999).

The lack of theory-based interventions has therefore resulted in campaigns that were seldom impactful (Dale & Hanbury, 2010; Michie, et al., 2008). It further makes replication difficult and hampers the development of scientific and evidence-based knowledge to guide health practitioners on message techniques needed to effectively address issues on public health. Health messages that were eventually crafted were not aligned with the way the public views the health problems (Abraham & Michie, 2008; Bartholomew, et al., 2006). Public health campaigns has also been largely limited to the use of unpaid public service announcements (PSA) and low-cost advertising strategies, resulting in campaigns that are incapable of inducing and sustaining positive health behavior change among target audiences (Hornik, 2002).

There have therefore been calls by behavioral and campaign scholars to incorporate behavioral theories in developing health campaigns (Fishbein & Cappella, 2006). Behavioral scholars argued that behavioral theories help predict and identify critical beliefs underlying people's intentions to perform or not perform a given behavior. This knowledge is pertinent as it complements the work of scholars in their investigation on the effectiveness of campaign messages capable of increasing or reducing the strength of those beliefs.

Studies have found that health messages that are most likely to influence behavioral change are those crafted with individual characteristics in mind and based on social psychological theories which provide a basis for determining those characteristics (Ko, et al., 2011; Skinner, Campbell, Rimer, Curry, & Prochaska, 1999). However, reviews of the impact of message tactics and individual characteristics interactions revealed that this topic has been largely ignored and there is no common guide to

designing segment-focused health messages (Abrams, Mills, & Bulger, 1999; Punam A. Keller, 2006; Punam Anand Keller & Lehmann, 2008).

Theory-based health messages. Although newer campaigns are beginning to utilize theory to better understand the key factors in health message design, few explored the use of theories that provide insights into the relationship between message tactics and personality on behaviors. The theories employed by these newer campaigns have largely been applied to specific groups based on shared concerns, values and behaviors. One way these studies were conducted was by segmenting audience profiles according to gender, race, age groups, income groups, educational levels and behaviors (Snyder, 2007; Wilson, 2007). One such theory is message tailoring (Kreuter, Farrell, Olevitch, & Brennan, 2000).

Message tailoring in health communication refers to the process of individualizing communication by putting together health information or strategies customized to meet the unique needs of an individual (Rimer & Kreuter, 2006). It is proposed that tailoring enhances the relevance of the health information to the individual, thereby leading to a more positive response to the communication. Studies on message tailoring have shown strong support that tailored interventions are more effective than non-tailored ones (Noar, Benac, & Harris, 2007). However, some researchers questioned if message tailoring is a practical communication strategy for all situations (Rimer & Kreuter, 2006) as there are limits to the effectiveness of message tailoring in any large-scale intervention. Successful individualization requires the arduous task of identifying all the factors that motivate or constrain an individual with respect to the outcome goal. Message tailoring is even more complicated with the massive amounts of resources needed to create individualized messages for populations (Hawkins, Kreuter, Resnicow, Fishbein, & Dijkstra, 2008).

It is important to go beyond personalization and targeting of socio-demographic variables when creating messages fitting for mass impact (Punam Anand Keller & Lehmann, 2008). The key is in understanding how message tactics interact with personality to boost the intentions to comply with the recommended health behavior. In providing information on health risks, health messages should be crafted to align with types of personality among populations to motivate the masses to engage in positive health behaviors. A theory that may shed light on how people understand and interpret target health behaviors when evaluating the influence of health messages is the framing postulates of the prospect theory (Tversky & Kahneman, 1981).

The framing postulates of the prospect theory suggest that people respond differently to information depending on how the messages are framed (Tversky & Kahneman, 1981). In health communication research, loss-framed messages that emphasize costs and indicate the presence of diseases resulting from risky behaviors, and gain-framed messages that emphasize benefits in engaging in health behaviors deemed to have little risk have been found to be persuasive (Rothman & Salovey, 1997). This prediction has been supported in a variety of contexts such as HIV testing (Apanovitch, McCarthy, & Salovey, 2003) and Pap testing (Rivers, Salovey, Pizarro, Pizarro, & Schneider, 2005).

However, a meta-analysis on message framing effects revealed that there was no significant difference in the persuasiveness of gain- and loss- framed messages for a large number of prevention health behaviors (O'Keefe & Jensen, 2007). The scarcity of robust evidence of mediational processes in framing studies has led to differing views on how the framing effect operates (Bartels, Kelly, & Rothman, 2009). Some researchers are

convinced that “an individual’s tendency to orient his or her behavior toward favorable or unfavorable outcomes” (Latimer, Salovey, & Rothman, 2007, p. 647) or individual characteristics, could be moderating the framing effect. In other words, a match between the message frame and the characteristics of the individual may lead to a sense of “fit” which facilitates cognitive processing, resulting in the perceived persuasiveness of the message (Bartels, et al., 2009). One such theory that explains this process is the Regulatory Fit Theory (Higgins, 2000).

Regulatory Fit Theory

The regulatory fit theory posits that people pursue goals in a manner that “*fits*” their regulatory orientation which can be either prevention- or promotion focused (Higgins, 2000). When they make decisions using strategies that are in sync and compatible with their regulatory orientation, they “feel right” about what they are doing. This “feeling right” experience leads to an increased motivation and enhanced perception of the goal value, and people find themselves more engaged in pursuing the goal (Aaker & Lee, 2006). The increased motivational intensity from “feeling right” is then transferred to subsequent decisions, choices or evaluations which Higgins (2000) termed as “value from fit” (p. 1218).

Value from fit is explained as a motivational experience that has a directional force that pushes people either towards or away from an object (Higgins, 2007). When people experience something as having positive value, the tendency is for them to move towards it. On the other hand, experiencing something with negative value corresponds to experiencing repulsion and the tendency is to move away from it (Higgins, 2007). Hence, when people experience a regulatory fit, they become more motivated with the task at

hand and their attraction towards or away from the target object become more pronounced as well (Higgins, 2006; Idson, Liberman, & Higgins, 2000). This form of self-regulation in goal pursuit serves as a fundamental driver of attitudes and behaviors and plays an important role in directing people's attention to information that fits an individual's regulatory orientation (J. Wang & Lee, 2006).

Higgins' (1997) earlier theory, the regulatory focus theory (RFT) maintains that there are two distinct and independent types of regulatory orientations that people use to pursue their goals - prevention and promotion focused orientation. When people pursue goals in the manner that sustains their regulatory orientation, their motivation towards that goal is heightened. An extension of the hedonic principle asserting that people seek pleasure and avoid pain, RFT is essentially a theory of self-regulation. It is concerned with the way people regulate their behaviors when they pursue goals which occurs in relation to desired and undesired end states (Higgins, 1998).

According to Higgins (2000), individuals with a strong promotion focus orientation are concerned with hopes, wishes, achievements and aspirations. Their fundamental need is for growth and advancement. These are often people who have "strong ideals". In contrast, individuals with a strong prevention focus orientation are concerned with reflecting beliefs about their duties, obligations, and responsibilities. Their fundamental need is for security and protection and they often have "strong oughts" (Higgins, 2000). When pursuing goals, individuals with a promotion orientation approach their goals with eagerness because they are sensitive to gains and non-gains so as to ensure the presence and absence of positive outcomes. Conversely, individuals with a prevention orientation approach their goals with vigilance as they are sensitive to losses

and nonlosses so as to ensure the absence and presence of negative outcomes (Higgins, 2000).

According to RFT, chronic differences between promotion and prevention focus orientation are associated with socialization processes from young (Higgins, 1997, 1998; Lee, Aaker, & Gardner, 2000). The antecedents of self-regulatory orientations are related to parenting styles and the relationships between child and caregiver. Children whose parents adopt a parenting style that focused on accomplishing ideal goals and fulfilling aspirations are likely to develop a self-regulation that is promotion-focused; while children whose parents adopt a critical parenting style that focused on attaining safety and meeting obligations are likely to develop a self-regulation that is prevention-focused (Higgins & Silberman, 1998; J. Keller, 2008).

Proponents of RFT often suggest that in independent cultures, such as in North America, the individual is defined in terms of attributes that make every individual in that society separate and unique from others. Hence their regulatory orientation is more consistent with promotion focus since the goals of the independent self are aligned with autonomy and achievement. As such, individuals from independent cultures are more persuaded by promotion-focused messages as these individuals tend to focus on the positive features of the self and potential gains in situations (Aaker & Lee, 2001; Briley & Aaker, 2006; Lee, et al., 2000). In contrast, interdependent cultures, such as China and Latin America, the individual is taught to define the self in the context of relationships and group memberships. The individual in these societies is defined by those around them rather than being distinct from others (Aaker & Lee, 2001; Lee, et al., 2000). The regulatory orientation these individuals exhibit is therefore likely to be more consistent

with prevention focus. Here, the goals of the interdependent self are seen as compatible with the need to fit in harmoniously with others, fulfilling social obligations and roles. As such, individuals from interdependent cultures tend to be persuaded more by prevention-focused messages (Briley & Aaker, 2006). The tendency for these individuals is to focus on the negative information of the self so that efforts can be taken to improve one's weaknesses resulting in a more unified part of the collective whole (Heine & Lehman, 1999).

Momentarily situations can also induce individuals' regulatory focus. As children are raised from young to respond favorably to attain desired end-states, individuals' promotion or prevention orientation can be temporarily induced in situations that emphasize achievement of gains or the avoidance of losses (Aaker & Lee, 2001; Lee, et al., 2000). This can occur during performance feedback or when given task instructions that communicate concerns with the presence or absence of positive outcomes (bringing on promotion concerns), or the absence or presence of negative outcomes (bringing on prevention concerns) (Higgins, Idson, Freitas, Spiegel, & Molden, 2003). Regulatory focus is therefore a state that can be investigated either as a chronic tendency or a situationally induced focus (Cesario, Grant, & Higgins, 2004).

Regulatory fit theory and persuasion. It has been found that target audiences experience a natural fit when advertisements framed messages of behavioral consequences that are compatible to their regulatory orientation (G. Zhao & Pechmann, 2007). The fit experience, as opposed to nonfit, in turn boosts the persuasiveness of the advertisement (Aaker & Lee, 2006). When a message is framed to describe gains, it creates a fit for individuals whose regulatory orientation is promotion-focused, whereas a

vigilant message that is framed to describe nonlosses creates fit for individuals who are prevention-focused (Cesario, Higgins, & Scholer, 2008).

In consumer psychology, regulatory fit has been shown to impact attitudes, brand preferences and the willingness to pay. It influences persuasion through the “feeling right” and engagement strength mechanisms (Lee & Higgins, 2009). When message recipients “feel right” about the goal advocated in the message, they develop a more favorable attitude toward the goal. This “feeling right” experience about the message lead them to consider the arguments put forth to be more persuasive. It further leads to greater intensity in their reactions resulting in positive attitudes becoming more positive and negative attitudes becoming more negative (Cesario, et al., 2004).

Studies have examined the interaction between message framing and personality resulting in regulatory fit or nonfit on health behaviors such as fruit and vegetable consumption (Cesario, et al., 2004; Spiegel, Grant-Pillow, & Higgins, 2004), physical activity (Latimer et al., 2008), exercise and cholesterol screening (Wlaschin, Rothman, Bartels, & Bachnick, 2006), and advertisements for grape juice and sunscreen protection for skin (Lee & Aaker, 2004). Results from these experimental studies have largely validated the support for regulatory fit theory and the importance of matching health messages to individual characteristics on attitudes and behavioral intentions (Fransen, Reinders, Bartels, & Maassen, 2010; Uskul, Sherman, & Fitzgibbon, 2009).

However, although the regulatory fit theory has been applied to health domains found mostly in consumer psychology and shown to be relevant for consumer researchers and practitioners wishing to motivate healthy behavioral change, there is a dearth of regulatory fit research in health communication scholarship. Very little work has been

done to apply this theory on attitudes toward unhealthy food consumption (fast food) and intentions to eat healthily. Furthermore, past studies have largely overlooked the possible influence of other factors such as presenting competing messages from unhealthy food advertisements alongside health messages on the effects of fit. This study therefore seeks to contribute to existing literature on regulatory fit by closing these gaps.

Significance of Study

This research utilizes the framework anchored in the Regulatory Fit Theory to investigate the persuasiveness of health messages. Unlike past studies, it aims to examine the effects of fit in a context that resembles a real life situation where television viewers are exposed to competing messages, i.e., health message and message from unhealthy food advertisement.

Except for limited research conducted on the impact of alcohol warnings (Slater, Karan, Rouner, Murphy, & Beauvais, 1998) and those placed on cigarette packaging (Hammond et al., 2007), few studies have attempted to measure the effectiveness of such strategies. As for fast food advertisements on television, little attempt has been made to empirically investigate the effectiveness of counter advertising. Further, although many studies have been conducted to test the effects of regulatory fit, few studies investigated it under conditions where individuals are exposed to the health message in the presence of competing messages.

This thesis will first present findings from a pre-study to assess the level of unhealthy food advertising on television in selected countries. Through content analysis of televised food advertisements, the primary objective is to establish if food promoted on prime-time television is consistent with dietary guidelines advocated by health authorities.

It further aims to provide evidence on the presence of health messages in the form of PSAs. The three countries selected for this pre-study - US, China and Singapore - were picked to allow televised food advertisements to be compared across different cultures.

The results of the pre-study subsequently serve as a foundation for studying the effectiveness of health messages aimed at countering the intensity of unhealthy food advertising on television. Guided by a theoretical framework anchored in Regulatory Fit Theory, two experimental studies were conceptualized to utilize two different presentation formats – simultaneous and sequential – as countering strategies. Study 1 carried out an experiment to determine the effects of regulatory fit when health messages are presented in a simultaneous format; and Study 2 extends the theoretical framework by introducing an additional variable and presenting the health messages in a sequential format on the same set of dependent variables. Findings from these studies will offer insight to health authorities so that they can make a more informed decision when it comes to customization of televised health messages and how to present them to achieve the intended effect.

It is hoped that the three studies will provide empirical evidence toward understanding communication aimed at enhancing the public's dietary patterns. In terms of theoretical contributions, this research is significant as the conceptual framework has been designed to extend the testing of the Regulatory Fit Theory to include additional conditions that have not been tested before. It is also applied relevant as the knowledge generated has policy implications for public health; and seeks to use theory to guide practice so as to better equip health practitioners with effective “road maps” for implementing programs aimed at protecting the health of the public.

Chapter 3: Pre-Study

The purpose of the pre-study is to examine the types of food and beverages (F&B) promoted on prime-time television in US, China and Singapore. The food items shown on screen are further analyzed using the healthy blueprint MyPlate to determine its consistency with dietary guidelines advocated by the USDA. Another aim is to provide evidence on the presence or absence of health messages in the form of public service announcements (PSA) in countering unhealthy food content on television. The research questions are as follows:

1. What types of F&B are being advertised and how different are they in each country?
2. Are health messages present in the form of PSAs to warn viewers of health risks if they over-indulge in unhealthy F&B or to encourage healthy food consumption?

There are several reasons for choosing US, China and Singapore. First, the food advertising landscapes in these countries are largely unregulated, allowing food advertisers in these countries to have a “free rein” to advertise their food products on air. Second, despite being culturally different, all three countries face the problem of increasing obesity rates. This makes it interesting for cross-cultural comparison.

While fast foods and other highly processed foods may have originated from the US and are very much a part of the American diet and identity (Schlosser, 2001), the Chinese diet, on the other hand, was usually low in fat. The traditional form of cooking was using the freshest possible ingredients and home-cooked meals were deemed to be most nutritious. The preoccupation with fresh food was such an obsession that the idea of

having food produced in the factory was unthinkable (Anderson, 1988). However, China's decision to embark on capitalist reforms brought American fast food, such as *McDonalds* and *Kentucky Fried Chicken*, to its shore (Cheng, 2007). A burgeoning economy also meant a faster pace of life and urban Chinese today cannot find time to prepare their meals and exercise. Instead, they find themselves just like their Americans counterparts – consuming fast food as a way of saving time and also the association with a Western culture which many young Chinese deemed as “cool” and “trendy” (Cheng, 2007).

Singapore, modern and cosmopolitan city-state, is no stranger to the Western culture as it borrows much of its education and business ethics from the West (Central Intelligence Agency, 2010), while balancing to keep its Asian values and roots. Over the past decade, the country faced an uphill task with obesity with national figures showing that 11% of Singaporeans aged between 18 and 69 are obese which is an increase of almost 4% from 2004 (National Health Survey, 2010).

With the US having a culture that tends to nurture an independent self-view; the Chinese brought up on interdependent self-views (Aaker & Lee, 2001); and Singapore exhibiting a mix of both, the choice of these three countries makes for an interesting study. The cross-cultural comparison towards understanding the types of food advertised on television in each country will also provide deeper insights into the global obesity challenge. Finally, although numerous studies have been conducted on F&B promoted on US television, little is known about the amount of food advertising in China and Singapore as compared to US. Empirical evidence regarding these two Asian countries will contribute to existing literature on obesity and health communication.

Content Analysis and Media Effects Research

The strength of content analysis lies in its adaptability and applicability to examine a myriad of communication factors. Whether they are texts, images or sound, content analysis has been employed to investigate human interactions, TV commercials, films, novels, political speeches or news coverage for over five decades (Krippendorff, 2009; Neuendorf, 2002).

Defined as the “systematic, objective, quantitative analysis of message characteristics” (Neuendorf, 2002, p. 1), content analysis has four advantages, especially when employed for quantitative content analysis of manifest content. First, content analysis is a non-interfering and non-reactive measurement technique, allowing researchers to examine messages without involving communicators or receivers. Second, it can be used for longitudinal studies as it can “outlive” its production and consumption timeframe, including surviving beyond the life spans of the communicators, audiences and events. Third, if properly executed, the coding processes are capable of reducing large amounts of data into meaningful numbers for explanations; and fourth, the technique is almost unlimited in its applicability to diverse and countless research questions (Riffe, Lacy, & Fico, 2005).

This quantitative tool is hence often used by researchers with media effects perspectives. Communication content has been found to have an effect on individuals, and media content is often scrutinized for specific variables that are assumed to influence people who are exposed to the messages (Riffe, et al., 2005). Content analysis was therefore employed here. Three popular television channels in each country were analyzed,

making a total of nine channels. Data were collected in Austin (US), Beijing (China) and Singapore.

Sample

A convenience sample was obtained for the exploratory pre-study. Over a four-week period, three channels per day were analyzed for each country. This comprised four hours of prime-time television per channel (see Table 1). A two-week period is considered sufficient for a research of this nature (Weerakkody, 2009), hence this sampling frame provides more than adequate advertising time for data analysis. Ideally, stratified probability sample should be used so the data can be generalized to a broader population. An example will be a sample with random prime-time advertisements selected based on weekly or monthly time-slots throughout the year. However, due to limited resources, this approach is difficult to carry out for the current cross-cultural study involving three countries.

Prime-time television on top rated television channels was chosen. This time-belt usually chalks up the highest audience viewership and attracts the largest number of advertisers (Murphy, Wilkin, Cody, & Huang, 2009). The time-belts selected for this study were 6 p.m. to 10 p.m. for the US, 7 p.m. to 11 p.m. for China, and 7 p.m. to 11 p.m. for Singapore. The four-hour timeframe was recorded continuously and analyzed.

Table 1 *Sample Overview*

Category	US	China	Singapore
Channels	ABC NBC CBS	BTV1 BTV6 CCTV6	Channel 8 Channel 5 Channel U
Time-belt	6 p.m. – 10 p.m.	7 p.m. – 11 p.m.	7 p.m. – 11 p.m.
Recording period	1 – 28 Feb 2010	1 – 28 Mar 2010	19 Feb – 18 Mar 2010
Recording city	Austin	Beijing	Singapore
Number of TV hours	336 TV hours	336 TV hours	336 TV hours

Table 1 shows the three channels with the highest viewership in each country. For the US, they were the highly popular national networks - ABC, NBC and CBS. These three channels are major national networks and are heavily viewed by most Americans across the country (Bryd-Bredbenner, Finckenor, & Grasso, 2008). As for China, the three channels comprised the heavily viewed and highly popular BTV1, CCTV6 and BTV6 (CMM Intelligence, 2009). For Singapore, channels 5, 8 and U which have the highest viewership were selected (AC Nielsen Singapore, 2009). All recordings were completed within two months from February to March 2010 resulting in a total of 1008 television hours collected.

Measurement of Content Variables

As this study involves the examination of manifest content, the units of analysis were prime-time advertisements and grouped into the following units:

1. Food and beverage (F&B) advertisements
2. Health authority advisory or warnings in the form of PSAs
3. All other non-food advertisements

F&B advertisements, in particular, are the dominant units of analysis as the content elements such as the frequencies and types of F&B advertisements are critical to the key messages examined in this study. Frequency and type of health message were captured for PSAs or health authority warnings, while only frequency was noted for non-food advertisements.

The definition of F&B advertisements refer to consumable products such as meat, biscuits, chocolates, health supplements, pharmaceutical drugs, non-alcoholic and alcoholic drinks. In total, eight coding variables were associated with this unit of analysis: (1) Country Channels; (2) Date of Broadcast; (3) Major F&B Groups; (4) Specific F&B; (5) Fast food and Dine-In Restaurants; (6) Length of Advertisement; (7) Health Claims; and (8) No Claims & General Claims. Other than the last two variables on “Health Claims” and “No Claims & General Claims”, the other eight variables have a list of values ranging from a minimum of seven to 33. The categories of each variable are listed in Appendix A.

The first variable, “Country Channels”, has nine categories and was assigned “0” to “8”. “Date of Broadcast”, was divided into three sub-categories because it is neater to keep the list of dates of the three countries separate from one another. The values assigned to the three sub-categories were “0” to “33” for Singapore; “0” to “27” for the US; and “0” to “28” for China. The reason for assigning different numbers of values to each country was the presence of systematic bias in the content due to unexpected factors. This was most pronounced in the case of Channel U in Singapore. Technical errors rendered four-days’ worth of recordings as spoilt data. As such, data collection for this channel had to be extended by another four days. Systematic bias also occurred on one recording day for both Singapore’s Channel 8 and China’s BTV1 due to uncontrollable errors where the

recording machine broke down and the broadcast station suffered a two-hour black-out respectively. Both sets of data were duly compensated with an additional day of recording each.

“Major F&B Groups” has eight categories and was each assigned “0” to “7”; while “Specific F&B” has 22 categories and given values from “0” to “21”; “Fast Food and Dine-In Restaurants” has 22 values from “0” to “21”; and “Length of Advertisement” has seven categories and assigned values ranging from “0” to “6”. “Health Claims” and “No Claims and General Claims” have 19 and 11 categories respectively where each category was assigned two values, “0” or “1” denoting their absence of presence. This is due to the possibility of F&B having multiple health or general claims. Being nominal level variables, the coding categories were ascertained to be exhaustive and mutually exclusive. The variables were also checked that they do not overlap each other so that each observation belongs only to one category.

Coding Scheme

Selection of coders. A total of four coders were recruited and trained to code all nine channels. Only coders who were effectively bi-lingual in English and Mandarin were shortlisted. Eventually, four second-year undergraduates who met the stringent criteria were selected. In addition to possessing a high command of English, the coders were also proficient in Mandarin scoring A’s for both subjects at advanced level examinations at pre-university. Having more than two coders allowed the splitting of the daunting task of coding a total of 1008 hours of TV time, thus decreasing the effects of fatigue. The use of multiple coders further ensured that the successful application of the coding scheme is not

limited to only two coders, thus enhancing the confidence in the data being able to be replicated.

Coding process. Two trial sessions were conducted over one and a half days for the four coders. All four coders understood with ease the prescribed content elements that were needed to be identified as the units of analysis are naturally occurring, and the content phenomenon manifest, and the definition of the coding categories easily comprehensible. Demonstrations were conducted during the trials on what the coders were to look out for in the F&B advertisements. Each coder was then given three trial Digital Video Discs (DVDs), each containing several hours of recorded prime-time television of Singapore's Channels 5, 8 and U recorded outside the 28 days designed for the study. Coders were asked to practice coding the first five F&B advertisements from each DVD. This exercise tested the inter-coder reliability for the same set of F&B advertisements.

At the end of each training session, all queries on the ambiguity of variables and categories and their differing interpretations were discussed. Conflicting views were sorted out and consensus was reached among the coders. The coding sheet was revised as a result of these discussions. Eventually, only one coding sheet was used to capture all prescribed content elements. The categories for each variable were emergent coding categories as the coding sheet had to contain all variables with their accompanying categories. Although the variables were stable and required only minor revisions, novel categories were subsequently added throughout the coding process whenever new observations emerged from the content analysis. These included minor changes such as revising the terminology of "Non-Health Claims" to "No Claims & General Claims". The

coding sheet was therefore revised several times to accommodate the inclusion of new categories. The codebook was revised accordingly with each revision made to the coding sheet.

The categories of some variables, in particular those of “Specific F&B”, “Health Claims” and “No Claims & General Claims” were fine-tuned after the trial sessions and three reliability tests (one for each country). This was necessary and expected as countries are culturally different and new content emerged from the various channels. However, the frequency of amendments decreased with each revision and towards the end, only slight amendments had to be made. The codebook used in this study can be found Appendix B.

Inter-coder reliability. Although four coders were recruited and trained, only coded data from three coders were used as it was easier to split three channels per country among three coders. Having a backup coder also ensured that the coding process could proceed in the event that one coder was unavailable for any reason. The three coders rotated among themselves and took turns to code a country during the actual data coding process as consistency can be ensured for each channel. This resulted in all three coders eventually coding all nine channels. Inter-coder reliability exercises were conducted three times, once for each country. Ten percent of the full sample per country was determined as the reliability sub-sample, i.e., 36 TV hours out of 336 TV hours per country. Table 2 shows the overview of the coding matrix and procedure.

Table 2 *Overview of Coding Matrix and Procedure*

Category	Coder 1	Coder 2	Coder 3	Coder 4
Training	x	x	x	x
Coding US Channels				
Inter-coder reliability exercise	standby	x	x	x
Actual coding		x	x	x
Coding for China Channels				
Inter-coder reliability exercise	x	x	standby	x
Actual coding	x	x		x
Coding Singapore Channels				
Inter-coder reliability exercise	x	x	x	x
Actual coding	x	x	x	x

One of the challenges concerning the reliability and validity of multi-item quantitative scales in content analysis is the quality of judgment-based data which often relies on the evaluation of two or more independent coders. This issue has given rise to much debate among content analysis scholars, some of whom were of the view that the commonly used measure of simple percentage of agreement between two (or more) judges can be misleading.

This is because this measure takes into consideration only the convergence of the judges' evaluations and such simple statistics based on percent agreement can be heavily influenced by the number of coding categories (Cohen, 1960; Neuendorf, 2002; Perreault Jr & Leigh, 1989). According to Perreault and Leigh (1989), quality of judgment-based data which also includes inter-judge reliability, greatly depends on the (1) skill and motivation of the judges; (2) adequacy of the classification of the variables; and (3) the operational definitions and the directions given to guide the coding process. The authors elaborated that although some inconsistencies are bound to occur when coding a large number of categories and while this is to be expected in any scientific research related to content analysis, "agreement among judges on how to code any individual observation

does not ensure that the observation is coded correctly” (Perreault Jr & Leigh, 1989, p. 137). As such, it was advocated that the researchers need to have some indicative measures in place on a sub-set of data early in the coding process to determine if improvements have to be made to the overall coding scheme. And it is only when a satisfactory level of reliability is achieved can the prescribed coding process continues with the actual data sets.

Although there are a few commonly used approaches for estimating the reliability of inter-judge data in content analysis research such as Cohen’s *kappa* (Cohen, 1960), and Scott *pi* (Scott, 1955), this study has decided to use Perreault & Leigh’s (1989) measure of reliability indicated by I_r . This proposed reliability index, according to the authors, is a more appropriate measure of reliability for marketing researchers as it allows the “introduction of new categories to accommodate responses that do not fit logically into the a priori classification scheme ... and identify sets of classifications that tend to be confounded or ambiguous” (Perreault Jr & Leigh, 1989, p. 147). The reliability index is as follows:

$$I_r = \sqrt{\{(F_o / N) - (1 / k)\} [k / (k-1)]} \text{ or}$$

$$I_r = \sqrt{(P - \frac{1}{c}) (\frac{c}{c-1})}$$

where P = percentage of judges’ agreements and c = categories

Using this index, the inter-coder reliability achieved for all three sets of country data was high with most categories attaining $> .8$ except for four categories which had reliability ranging from .74 to .78 (see Appendix C). These four are not key categories with three of them pertaining to “Others” where it comprises ambiguous observations that did not fit into any of the mutually exclusive categories; while one was the “Great Taste”

category belonging to “No Claims & General Claims” variable. A stringent approach was also adopted to ensure convergence and reliability among the three coders. As long as one coder disagreed with an observation, that judgment was considered as non-compliant and eliminated from the calculation of agreement percentages among the coders. In short, only observations involving 100% percentage from all three coders were included in the agreement percentage used for the inter-coder reliability.

Findings and Discussion

This section reports on the results relevant to the objectives of the pre-study. The objectives are to assess the level of food advertising by examining the types of food promoted on prime-time television in US, China and Singapore; as well as to determine the presence or absence of PSAs. The findings reported here thus provide evidence on the current level of food advertising on prime-time television; types of food being promoted and if they are consistent with the dietary guidelines advocated by the U.S Department of Agriculture; and the presence or absence of PSA health messages in countering the unhealthy food content on television.

Unique versus all F&B advertisements (ads) in US, China and Singapore. For F&B unique ads, US has the highest number with 570; Singapore is second with 171 and China, the lowest with only 77 unique ads. However, China has the highest number of F&B ads on television with 2948, followed by US with 2837 and Singapore, 2220. This shows that although China has the least number of unique ads, the repeat of ad frequency was very high, while the reverse is true for the US. Figure 2 shows the breakdown between all F&B ads and unique F&B ads across the three countries.

Figure 2. Comparison of F&B ads across countries

F&B ads compared to all ads. As shown in Figure 3, China television also has the highest percentage of F&B ads, i.e., 32.8% when compared with all types of ads aired during prime-time. Of the 8975 ads aired, 2948 ads were F&B. This was followed by Singapore with 24.9% and the US with 20.4%. Compared with Singapore and US, Chinese audiences are exposed to more F&B ads. China thus has the highest level of food advertising on prime-time television.

Figure 3. Comparison of F&B and non-F&B Ads

However, in terms of total ads aired during prime-time, US has the highest number with 13,927 ads followed by China with 8975 and Singapore with 8907. In essence, there are a lot more advertisements on American television during prime-time compared to China and Singapore although in terms of percentage of F&B ads, Chinese prime-time television contains more F&B ads compared to Singapore and the US.

Types of F&B Ads. This section describes the food groups representations during prime-time in each country. It follows closely to the food pyramid classification but has added several other categories such as medication/drugs and beverages so that all F&B ads are represented.

Major food groups. Table 3 shows the breakdown in percentage of ads according to the major F&B groups across the three countries. For US, the highest percentage was “Others” with 42%, followed by “Medication/Drugs” with 22%, and “Beverages” with 16%. The lowest was vegetables followed by fruits. “Others” here represents food advertisements which show a variety of food such as McDonald’s value meal comprising a burger, fries and a drink or restaurants and supermarkets where a variety of food is being promoted. These F&B ads do not belong to any of the major food groups and were thus included in the “Others” category.

Table 3 *Percentage of Ads According to Major F&B Groups*

	US (n = 2837)	China (n = 2948)	Singapore (n = 2220)
Rice & Alternatives	3	5	5
Meat & Alternatives	3	0	2
Vegetables	0.1	0	0
Fruits	0.3	0	0
Fats, Oil, Sugar & Salt	14	27	31
Medication/Drugs	22	21	8
Beverages	16	34	34
Others	42	13	20
Total	100	100	100

For China, the food group that has the highest percentage was “Beverages” with 34%, followed by “Fats, Oil, Sugar & Salt” with 27%, and “Medication/Drugs” with 21%. Three food groups were absent on prime-time – “Meat & Alternatives”, “Vegetables” and “Fruits”. For Singapore, the highest was also “Beverages” with 34%, followed by “Fats, Oil, Sugar & Salt” with 31%, and “Others” with 20%. Two food groups were absent – “Vegetables” and “Fruits”. Two types of food – vegetables and fruits – which contain high nutritional value and strongly recommended by health and medical practitioners for dietary consumption are conspicuously absent in all three countries.

Specific F&B ads. Table 4 shows the breakdown in percentage of specific F&B ads. Of the 22 specific F&B ads categories, candy & chocolates, fast food & dine-ins as well as non-alcoholic sugared drinks are among the five top advertised F&B ads across all three countries. For US, the top advertised F&B ads are fast food and dine-ins with 32%. Fast food and dine-in refers to the likes of McDonald’s, Kentucky Fried Chicken, Pizza joints, and all types of restaurants. It is followed by drugs/pharmaceutical products with 20% and non-alcoholic sugared beverages, 13%. The fourth and fifth were quite far with candy and chocolates with only 8% and canned and preserved food with 4% respectively.

Table 4 *Percentage of Specific F&B Ads*

	US (n = 2837)	China (n = 2948)	Singapore (n = 2220)
Meat/poultry/eggs/seafood	0.6	0	1
Grain food	1	0	0.6
Cereals/biscuits	2	0	0.5
Breads and dairy	2	0	0
Fats and oil	0.2	0	0
Desserts/salty snacks/ice-cream/chips/jello	4	9	9
Candy/chocolate	8	17	22
Dressings/sauces/gravy/seasonings	1	0.6	0
Vegetables and fruits	0.4	0	0
Frozen food	3	0	0
Health supplements	2	1.5	0.8
Drugs/pharmaceutical products	20	19	6
Instant noodles	0	5	3
Chinese herbal products	0	0	1
Canned food/preserved food	4	0	0.1
Fast food & Dine-Ins	32	13	17
Supermarket & other food clusters	3	0	0.1
Others (food)	0.3	0	4
Milk/infant formula	0.4	15	8
Health drinks	0.4	0	0.5
Soft drinks/soda/isotonic/drinks/coffee/tea/juices	13	18	16
Alcoholic drinks	2	1.5	10
Other beverages	0	0	0
Total	100	100	100

For China, drugs and pharmaceutical products top the list with 19% followed closely by non-alcoholic beverages with 18% and candy and chocolates, 17%. The fourth is infant milk formula with 15% and fifth is fast food and dine-ins with 13%. The highest percentage of F&B ads in Singapore was candy and chocolates with 22%, followed by fast food and dine-ins with 17% and non-alcoholic beverages with 16%. Alcoholic drinks came in fourth taking up 10% of all F&B ads for Singapore.

It is interesting that fast food and dine-ins F&B ads dominate the US television by a third. The rest were quite far from this food category and gaps between the top five and the others were rather wide. However, the US has almost every food type represented on

television except for instant noodles and Chinese herbal products. China, on the other hand, did not have a dominant food type on television. The bulk of the F&B ads were shared by the top five food types which were really close to one another. However, China has less variety of F&B ads represented on television overall as many food categories were absent on television. Singapore showed a slightly better F&B representation although not as well represented as US. The top five food types still made up the majority of all F&B ads but compared to China, there was greater variety.

It is also interesting to note that certain types of food are seen on prime-time television in specific country and not in the other two. The US, for example, is the only country that has breads and dairy; fats and oil; vegetables and fruits; and frozen food ads on its television, although in very small percentages. Singapore, on the other hand, is the only country that has Chinese herbal products ads on its television.

Fast food and dine-ins. One of the culprits often accused of contributing to the obesity prevalence is fast food. Table 5 shows the breakdown in percentages of fast food and dine-in ads on television.

Table 5 *Percentage of Fast Food & Dine-In Ads on Television*

	US (n = 905)	China (n = 383)	Singapore (n = 380)
McDonald's	13	20	18
KFC	4	37	34
BK	2	0	0
Subway	7	0	4
Taco Bell	0.1	0	0
Popeye Fried Chicken	1	0	0
A&W	0	0	0
Sonic	5	0	0
Jack in the Box	4	0	0
Dairy Queen	3	0	0
Church's	5	0	0
Wendy's	6	0	0
Other Fast Food	4	0	0
Pizza Joints	19	43	40
Steamboat	0	0	0.5
Seafood	0	0	0
Chinese food	0	0	0.3
Western food	27	0	0
Indian food	0	0	2
Malay food	0	0	0
Fusion food / bar	0	0	2
Other Dine-Ins	1	0	0.5
Total	100	100	100

As shown in Table 5, US tops this category with 905 fast food and dine-in ads followed by China and Singapore. The two Asian countries have almost similar numbers with 383 and 380 respectively. The US in fact far surpasses China and Singapore with almost 2.4 times more of fast food and dine-in ads aired on television. The US also has the highest number of types of fast food compared to Singapore and China. China television, for example, is dominated by only three types of fast food – McDonalds, KFC and Pizza joints. Singapore television has a few more variety and it also has more representation of dine-ins than the other two countries. It is interesting to note that Pizza joints and McDonald's ads are rampant in all three countries. While KFC ads feature less prominently in the US, it is very visible on China and Singapore television.

Dietary guidelines and food advertised on television. The dietary guidelines promoted by the USDA advocate that a healthy diet comprises 50% of fruits and vegetables, and another 50% of grains and proteins. The findings in Table 4, however, showed that only an extremely small percentage of grain food (1%) and vegetables and fruits (0.4%) are advertised on the US television; an equally small percentage of grain food (0.6%) advertised on Singapore television; and none on China television. This pales in comparison to the amount of healthy food advocated in the dietary guidelines that make up a healthy diet drawn up by USDA.

On the contrary, as shown in Figure 4, the pre-study finds high levels of unhealthy food which are high in calories from solid fats and added sugars found mostly in processed food advertised on television across all three countries. Matching the USDA list of food to avoid (see Chapter 2), the foods are desserts/salty snacks/ice-cream/chips/jello (“snacks”); candy/chocolates (“candies”); cereals/biscuits (“cereals”); dressings/sauces/gravy/seasonings (“sauces”); canned food/preserved food (“preserved food”); fast food & dine-ins (“fast food”); and soda/isotonic/drinks/coffee/tea/juices (“sugared drinks”). Added together, the numbers account for 64% of unhealthy food ads on US television, 58% on China television, and 65% on Singapore television.

Figure 4. Percentage breakdown of unhealthy food ads and other types of food ads on US, China and Singapore television

The findings therefore support previous research that found high content of food poor in nutritional value advertised on US television (e.g., Chapman, et al., 2006; Henderson & Kelly, 2005). As for China and Singapore, this is the first study to shed light on the amount of unhealthy food advertised on Asian television. The results seem to indicate that the prime-time diets on China and Singapore television are fairly similar to US, and that they do not comply with the nutritional guidelines provided by health authorities.

Presence of PSAs. Only Singapore has PSAs regarding advice on food and beverage consumption on its prime-time television. The US and China did not have any on their television. However the 75 ads that ran over the 28 days on Singapore television all pertained to alcoholic drinks. The health authorities ran the ads to advise viewers not to

drink and drive during the festive period (Chinese New Year) which coincided with the period the data was collected in Singapore. While it can be argued that drinking too much alcohol may lead to weight gain (Laitinen, Ek, & Sovio, 2002), the primary message here is really to make sure viewers do not get into accidents if they drink and drive. The concern here is not about adopting a healthy lifestyle to keep Singaporeans' weight in check. As such, the PSAs cannot be considered as health advisories aimed at countering unhealthy food content on prime-time television. In sum, the answer to the third research question for the pre-study is that there were no health messages in the form of PSAs to warn viewers of health risks if they over-indulge in unhealthy F&B or to encourage health food consumption.

The findings from this pre-study thus concurred with past studies (e.g., Harrison & Marske, 2005; Mink, et al., 2010) that found high levels of television advertising of foods poor in nutrition. Almost two-thirds of F&B advertisements shown on US, China and Singapore television were identified to be high in calories from solid fats and added sugar found mostly in processed food. The diets shown on prime-time television across the three countries hence do not comply with the dietary guidelines provided by the USDA.

This pre-study also revealed the absence of health messages on prime-time television. No PSAs were identified in any of the three countries to advise viewers of the health risks of over-indulging in unhealthy food nor any to promote healthy food consumption. In the US, China and Singapore where the regulations on food advertising are fairly relaxed, this meant that food advertisers have access to prime-time television to advertise their products without governmental restraints. Considering that research has often shown that foods advertised on television tend to suggest a diet associated with

chronic diseases, should policy makers therefore set limits or counter messages shown on food advertising on television? Is so, what strategies should be adopted to balance the interests of commercial advertisers and at the same time, safeguard public health?

Chapter 4: Theoretical Framework and Hypotheses

To advance our understanding on the effectiveness of strategies needed to counter the influence of extensive advertising of unhealthy food on television, two experimental studies have been designed with two presentation formats in mind. Applying the theory of regulatory fit, a framework was developed to investigate the effects of fit on attitudes toward unhealthy food consumption and intentions to eat healthily. The effects of fit will be examined under conditions that were not tested before in past studies, i.e., presenting promotion focused versus prevention focused health messages to counter an unhealthy food commercial utilizing a simultaneous format in Study 1 and a sequential format in Study 2.

Development of Theoretical Framework

Regulatory fit occurs when the framing of a message fits the regulatory orientation of the message recipient. Past research applied regulatory focus in the context of message framing and found that processing fluency mediates regulatory fit on persuasion (Lee & Aaker, 2004). It is argued that individuals who are more promotion oriented consider promotion-focused messages (gain-framed) easier to process than prevention-focused messages (loss-framed) and are more likely to be persuaded by the message that matches their regulatory orientation. Conversely, people who are more prevention-oriented process prevention-focused message easier than those who are more promotion-oriented.

Cesario, et al. (2004) explained that under the condition of fit, people “feel right” about what they are doing, resulting in them being more motivated and engaged when pursuing a goal. It is therefore hypothesized that when an individual’s regulatory orientation (i.e., prevention orientation or promotion orientation) is congruent with the

focus of the health message (i.e., prevention focus or promotion focus), individuals are more likely to be persuaded by the health message. This will then lead to more negative attitudes toward unhealthy food consumption and greater intentions to eat healthily. The proposed model is shown in Figure 5.

Figure 5. Study 1 Conceptual framework linking individual orientation, health message focus and effects of regulatory fit or nonfit on attitudes toward unhealthy food consumption and intentions to eat healthily.

Individual regulatory orientation. Higgins (1997) maintains that individuals who are promotion oriented process information and regulate their attention, attitudes and behaviors towards approaching gains and avoiding losses; while those who are prevention oriented process information and regulate their attention, attitudes and behaviors towards avoiding losses and approaching nonlosses. Playing an important role in determining how people make decision, an individual's regulatory orientation influences the persuasiveness

of health messages. It has been posited that people who are promotion oriented are persuaded by gain-framed messages and those who are prevention oriented are persuaded by loss-framed messages.

Health message focus. According to Tversky and Kahneman (1981), message framing (or message focus) refers to the presentation of information which can convey benefits as gains or losses with regard to a product or behavior. The health message is operationalized either by presenting the benefits positively or negatively to emphasize the gains and losses respectively. In other words, a positively framed health message pertains to the potential gains resulting from following what the message advocates; while negatively framed health message pertains to the potential losses resulting from not following what the message advocates.

Attitudes toward unhealthy food consumption. This viewers' response refers to psychological evaluations toward unhealthy food consumption. Many studies that examined the role of regulatory fit have demonstrated the effects of fit on attitude formation and change. Lee and Aaker (2004), for example, found a fit effect on participants' attitudes toward a grape fruit drink when they were presented with an advertising tagline that was framed to align with their regulatory orientation. Cesario and Higgins (2008), on the other hand, not only found participants' attitudes toward the message more positive in fit conditions, they also displayed greater intentions to behave in line with its recommendations.

Intentions to eat healthily. Finally, intentions to eat healthily relates to viewers' perceived likelihood to engage in the behavior of eating healthy. Similar to studies that have demonstrated the effect of fit on attitude change, other studies have also established

findings of fit effect on intentions. Fransen, et al. (2010), for example, found that messages that match consumers' regulatory orientation lead to greater willingness to buy genetically modified foods. Uskul, Keller and Oyserman (2008) also found in their study that fit correlated to readiness to engage in health care-taking behaviors.

In sum, the model proposes that when the health message adopts a simultaneous presentation format, i.e., stripped across and shown concurrently with an unhealthy food commercial, individuals who experience a regulatory fit will have more negative attitudes toward unhealthy food consumption and their intentions to eat healthily will increase.

Table 6 explicates the impact of Fit and NonFit on attitudes toward unhealthy food consumption and intentions to eat healthily. Hypotheses for Study 1 are thus as follows:

- H1a: When the health message is stripped across an unhealthy food commercial (simultaneous format), individuals who experience a regulatory fit, i.e., a match between their *prevention regulatory orientation* and the *prevention-focused health message*, will have attitudes that are more negative toward unhealthy food consumption compared to individuals who experience a nonfit.
- H1b: When the health message is stripped across an unhealthy food commercial (simultaneous format), individuals who experience a regulatory fit, i.e., a match between their *promotion regulatory orientation* and the *promotion-focused health message*, will have attitudes that are more negative toward unhealthy food consumption compared to individuals who experience a nonfit.
- H2a: When the health message is stripped across an unhealthy food commercial (simultaneous format), individuals who experience a regulatory fit, i.e., a match between their *prevention regulatory orientation* and the *prevention-focused health*

message, will have greater intentions to eat healthily compared to individuals who experience a nonfit.

H2b: When the health message is stripped across an unhealthy food commercial (simultaneous format), individuals who experience a regulatory fit, i.e., a match between their *promotion regulatory orientation* and the *promotion-focused health message*, will have greater intentions to eat healthily compared to individuals who experience a nonfit.

Table 6 *Explication of the Impact of Fit and NonFit on Attitudes towards Unhealthy Food Consumption and Intentions to Eat Healthily*

		Regulatory Orientation	
		Prevention Orientation	Promotion Orientation
Health Message	Prevention-Focused	<div>FIT</div> <div>H1a: Attitude_{morenegative}</div> <div>H2a: Intentions_{greater}</div>	<div>NONFIT</div>
	Promotion-Focused	<div>NONFIT</div>	<div>FIT</div> <div>H1b: Attitude_{morenegative}</div> <div>H2b: Intentions_{greater}</div>

Extending the Base Framework

Study 1 was designed to test the effects of fit on attitudes toward unhealthy food consumption and intentions to eat healthily when the health message is presented in a simultaneous format. Building on the outcomes of Study 1, Study 2 extends the theoretical framework by presenting the health message in a different format as shown in Figure 6. It

adopts a sequential format and introduces a moderating variable - message positioning - to determine the extent to which the influence of fit is moderated by the presence of primacy or recency effects on the same dependent variables. The aim is to test the effects of fit in another condition where individuals are presented the health message to counter an unhealthy food commercial in a sequential manner, whereby the health message is presented before or after the unhealthy food commercial.

Figure 6. Study 2 Conceptual framework linking individual orientation, health message focus and effects of regulatory fit or nonfit, moderated by positioning of the health message, on attitudes toward unhealthy food consumption and intentions to eat healthily.

Primacy and recency effects. Primacy and recency effects posit that the order in which a message is presented determines how much of the information is retained in the

memory and how reliably it will be recalled. According to literature on presentation order, when a message is presented first and highly influences an individual's opinion, a primacy effect is said to have occurred. On the other hand, if the message is presented last and seems to predominate, a recency effect is said to be present (Crano, 1977).

Evidence has been put forth to support both primacy and recency effects. Scholars contended that primacy effects occur because "items presented early may establish a cognitive framework or standard of comparison that guides interpretation of later items. Because of their role in establishing the framework, early items may be accorded special significance in subsequent judgments" (Krosnick & Alwin, 1987, p. 202). Further, items or messages that are presented early allow individuals to engage in deeper cognitive processing. This means that the mind will be occupied with thoughts generated from the early messages and messages presented later will not be less carefully considered (Hoch, 1984). However, items or messages which are presented last may also enjoy equal advantages because they may be more readily available in the short-term memory, resulting in recency effects (Crowder, 1976). As such, message order has been demonstrated in a variety of persuasion setting with strong evidence for the existence of both primacy and recency effects, although the psychological conditions responsible for each effect and the mechanisms underlying each outcome is different (Haugtvedt & Wegener, 1994).

Nevertheless, several decades of psychological research on both effects have shown that primacy effects are more probable (Hogarth & Einhorn, 1992). In advertising persuasion research, for example, studies conducted on consumers' memory for television advertising have demonstrated that given comparable costs and goal to maximize brand

recall, it is better to place the commercial first than placing it last (Pieters & Bijmolt, 1997). Holbert, Lambe, Dudo and Carlton's (2007) study on ordering effects also found main primacy effects for "national television news viewing on perceptions of the political gratifications associated with *The Daily Show*" (p. 34). The researchers discovered that the primacy effect of the fake news programme, which draws its comedy and satire from recent news stories, leads to weaker levels of political gratifications associated with the national television news. Consumer research studies have further found existence of primacy effect in consumers who would repeat and purchase their first brand bought more frequently than other brands even in the same purchase environment. One rationale provided for such behaviors is that if the brand experience is satisfactory, continuing to buy the first-brand bought helps the consumers to conserve cognitive efforts for other concerns (Woodside & Uncles, 2005).

Message ordering or positioning of a commercial on television is thus proving to be highly advantageous especially in today's cluttered media environment where advertisers are all competing for viewers' attention. Drawing evidence from primacy effects literature that suggested that it is better to place a message first than placing it last, this means that commercials that can first create an impression, viewers will pay more attention to the message. As such, if the health message is presented before the KFC commercial, individuals' minds will be occupied with thoughts generated from the health message, leaving messages that are presented after to be less carefully considered. More important, the experience of fit will be activated earlier resulting in individuals being more motivated and persuaded by the health message when the health message is presented before the KFC commercial. The description pertaining to the explication of the

impact of Fit and NonFit and Message Positioning (2 x 2 x 2) on attitudes toward unhealthy food consumption and intentions to eat healthily is essentially similar to those shown on Table 6 except for the inclusion of a third variable – message positioning. Study 2 thus predicts:

H3a: When the health message is presented *before* an unhealthy food commercial (sequential format), individuals who experience a regulatory fit (*prevention-fit*), will have more negative attitudes toward unhealthy food consumption compared to individuals who also experience a fit but view the health message after the unhealthy food commercial. In addition, individuals who experience a nonfit regardless of whether the message is presented before or after will have less negative attitudes toward unhealthy food consumption.

H3b: When the health message is presented *before* an unhealthy food commercial (sequential format), individuals who experience a regulatory fit (*promotion-fit*), will have more negative attitudes toward unhealthy food consumption compared to individuals who also experience a fit but view the health message after the unhealthy food commercial. In addition, individuals who experience a nonfit regardless of whether the message is presented before or after will have less negative attitudes toward unhealthy food consumption.

H4a: When the health message is presented *before* an unhealthy food commercial (sequential format), individuals who experience a regulatory fit (*prevention-fit*), will have greater intentions to eat healthily compared to individuals who also experience a fit but view the health message after the unhealthy food commercial.

In addition, individuals who experience a nonfit regardless of whether the message is presented before or after will have lesser intentions to eat healthily.

H4b: When the health message is presented *before* an unhealthy food commercial (sequential format), individuals who experience a regulatory fit (*promotion-fit*), will have greater intentions to eat healthily compared to individuals who also experience a fit but view the health message after the unhealthy food commercial. In addition, individuals who experience a nonfit regardless of whether the message is presented before or after will have lesser intentions to eat healthily.

Other Variables Influencing Attitudes and Intentions to Eat Healthily

A review of past studies indicated that prior attitudes, parental mediation and food restraint are important factors that may have an impact on attitudes toward unhealthy food consumption and intentions to eat healthily. Literature on prior attitudes, for example, suggested that prior attitudes influence responses to information about food (Frewer, Howard, & Shepherd, 1998; White, Pahl, Buehner, & Haye, 2003). Studies conducted on parental mediation or the extent to which parents shape their children's food consumption patterns, showed association between parents and children's food preferences (Anzman, Rollins, & Birch, 2010; Clark, Goyder, Bissell, Blank, & Peters, 2007); while past studies on food restraint found dietary restraint to be able to predict eating behaviors (Barnes & Tantleff-Dunn, 2010; Ouwens, van Strien, & van der Staak, 2003). Given the existing evidences that these three variables can be strong predictors on attitudes toward unhealthy food consumption and intentions to eat healthily, they were also measured to serve as control variables in all analyses and are not the focus of this study.

Chapter 5: Study 1

Given the need to counter the prevalence of unhealthy food content on television, Study 1 is undertaken to advance our understanding on the effectiveness of health messages appearing in unhealthy food commercials. Essentially, this study sets out to investigate the effects of regulatory fit on attitudes toward unhealthy food consumption and intentions to eat healthily when the health message is stripped across an unhealthy food commercial and simultaneously presented with messages from the food advertiser. This chapter describes the assessment of the following hypotheses:

H1a/b: When the health message is stripped across an unhealthy food commercial (simultaneous format), individuals who experience a regulatory fit (*prevention-fit and promotion-fit*) will have a more negative attitude toward unhealthy food consumption, compared to individuals who experience a nonfit

H2a/b: When the health message is stripped across an unhealthy food commercial (simultaneous format), individuals who experience a regulatory fit (*prevention-fit and promotion-fit*) will have greater intentions to eat healthily, compared to individuals who experience a nonfit.

Method

A quasi-experiment was designed to examine the effect of regulatory fit on attitudes toward unhealthy food consumption and intentions to eat healthily. The two predictors in this study are the individual's regulatory orientation (prevention orientation or promotion orientation) and the health message focus (prevention-focused or promotion-focused). These two factors were combined to create a regulatory fit or nonfit condition which then serves as a predictor for (a) attitudes toward unhealthy food consumption, and

(b) intentions to eat healthily. Designed as a two-part study to minimize any possible influences on responses that could stem from the regulatory orientation measures, individual regulatory orientation was measured in the first part. The stimuli were presented to the participants only in the second part where they were assigned to one of two conditions which screened either a prevention-focused or promotion focused health message stripped across a KFC commercial. The KFC commercial with the stripped health message is the only variable manipulated in the experiment. Five variables – age, gender, prior attitudes toward unhealthy food consumption, parental mediation and food restraint – were included as controls in all the analyses.

Participants. Students from Nanyang Technological University were selected for this study because they are likely to be one of the key targets of the food marketing industry. Studies have suggested that food marketers have intensified its targeting of the youth populations in an effort to influence the current and future consumption behaviors of young adults (Thomson, Spence, Raine, & Laing, 2008). Voluntary sampling was used. Mass email inviting undergraduates to participate were sent out to first and second year students from different academic disciplines in 2011. They were informed that the study consisted of two parts. After filling up a questionnaire in the first part, they would have to return on another day to complete the second part at the computer laboratory.

In total, 580 students completed both parts of the study (male = 43%; female = 57%). Approximately, about 93% were between the ages of 18 and 22. The rest were 23 years of age or older. The median for age was 20. There were 91.6% Chinese, 3.8% Malays, 3% Indians and 1.6% others. About 10.5% of the participants indicated that they were on a diet. Their body mass index (BMI) ranges from 14.61 to 34.53 ($M = 20.85$; SD

= 2.88). Using the BMI cut-off recommended by WHO for Asian populations, including Singapore, (Crowe & Higgins, 1997), more than 65% of the participants have a BMI that is within the healthy range (between 18.5 and 22.9). About 17% were underweight (below 18.5), 15% were overweight (between 23 and 27.4), and 3% were obese (27.5 and above). Seven cases were excluded from the analysis because they did not follow the instructions that they were not supposed to watch the video more than once. The final number of participants whose data were included in the analysis was 573.

Stimulus. Two video clips were created as stimuli to represent two conditions in this study. All video clips comprised three commercials which lasted a total of one minute and five seconds. To increase the external validity of the study, the three commercials were actual commercials broadcast on television. One of the commercials is a fast food advertisement produced by Kentucky Fried Chicken (KFC) to promote the consumption of its chicken wings. The KFC commercial was placed in the middle of the three commercials with the other two acting as fillers. The fillers were non-food commercials. One was a property advertisement and the other was advertising for a festival event. Both fillers only had background music, text and unsophisticated visuals. They were rather plain commercials and were chosen to avoid inducing or activating certain thoughts or emotions that may influence the effect of the stimuli. They were each placed at the start and at the end of the video stimuli to reflect the actual environment where television viewers are presented with different commercials during a commercial break. The fillers further acted to prevent the participants from being able to guess the purpose of the study.

A health message was also created for this study. To be presented to the treatment groups, the message was stripped across the KFC commercial which was 17 seconds in

length. The KFC commercial was chosen for several reasons. First, fried chicken wings such as those offered by KFC are generally perceived by consumers as high-caloried food which is unhealthy (Jefferson et al., 2010). Second, KFC advertisements are rampant on Singapore television (see Table 5). As shown in the pre-study, KFC has the highest number of advertisements (34%) among all fast food and dine-in advertised during prime time. Third, KFC has a total of 65 outlets in Singapore and their joints are well patronized by people of all ages, in particular, children and youth. Fourth, this particular KFC commercial selected as stimulus is an actual commercial which has been broadcast in US (but not in Singapore) - an important factor to help increase the external validity of the study. Fifth, it was one of the very few fast food commercials that promoted only the food and not lifestyles or other values such as romance, love, dating, filial piety or friendship.

The manipulated variable was the health message which was framed either with a prevention or a promotion focus. Participants were assigned to one of the two treatment groups which had a health announcement containing either a prevention-focused message or a promotion-focused message stripped across the KFC commercial. As prevention and promotion orientation are two distinct self-regulatory systems, the two health messages were deliberately crafted with regulatory oriented-congruent words specially chosen to reflect orthogonal contrasts. This is to ensure that the two health messages foster strategies congruent with participants' regulatory orientation so that regulatory oriented-congruent health message would motivate but regulatory oriented-incongruent health message would discourage.

The health announcement, comprising two sets, was carefully crafted so that they were framed to align with the recommended strategic means of vigilant versus eager. The

prevention-focused message was thus crafted to read as “Avoid illnesses and being overweight. Don’t eat processed and fatty food”; and the health announcement that had a promotion-focused message read as “Achieve good health and be trim. Eat fresh and nutritious food.” Message length and sentence structure for both sets of messages were kept constant, and were created with an aim to counter the message promoted by KFC and to promote healthy eating except that one health message emphasized the loss outcome and the other emphasized the gain outcome. The duration of the health message announcement was also kept constant at 10 seconds for both treatment groups. It appeared three seconds after the start of the KFC commercial and faded off four seconds before the end of the KFC commercial. Screenshots from the video clips can be found in Appendices D and E.

To ensure that the manipulation worked as intended, participants were asked to rate two sets of questions each comprising two questions. The questions were derived based on Higgins and colleagues’ extensive findings that the prevention-focused individuals tend to be more vigilant and cautious in goal achievement, whereas the promotion-focused individuals tend to be more eager and aspired (Crowe & Higgins, 1997; Freitas, et al., 2002; Higgins, et al., 1994; Shah, Higgins, & Friedman, 1998). Researchers who explored the effects of regulatory fit have used phrasings suggested in the literature to induce integral and incidental regulatory orientation in their studies. Previous research (Wan, Hong, & Sternthal, 2009) for example, asked participants to answer two questions, as a manipulation check. Participants were asked "To what extent did you focus on avoiding the negative outcome when writing down the academic strategies?" (prevention-

focused) and "To what extent did you focus on achieving the positive outcome when writing down the academic strategies?" (promotion-focused).

Accordingly, questions one and three asked the participants the extent to which they think the message was prevention-focused (e.g., "To what extent do you feel that the message makes you feel vigilant and cautious when it comes to taking care of your health?"); while questions two and four asked them the extent they think the message was promotion-focused (e.g., "To what extent do you feel that the message makes you feel eager and aspire when it comes to taking care of your health?"). These questions can be found in part 2 questionnaire in Appendix L.

The correlation between the two items measuring the prevention-focused is high ($r = .46$), and likewise for that of the promotion-focused ($r = .45$). Therefore, we averaged the two items measuring the prevention-focused, and those measuring the promotion-focused. The results showed that those who were presented with a prevention-focused message perceived the message to be more prevention-focused ($M = 4.10$, $SD = 1.38$), than promotion-focused ($M = 3.67$, $SD = 1.28$), $t(283) = 7.51$, $p < .001$. Similarly, those who were presented with a promotion-focused message perceived the message to be more promotion-focused ($M = 3.55$, $SD = 1.33$) than prevention-focused ($M = 3.45$, $SD = 1.29$), $t(288) = 1.81$, $p = .07$. These results indicated that message manipulation was successful.

Pilot study. A pilot study was conducted with 22 students from Nanyang Technological University to ensure that, procedurally, the experiment would run smoothly on the actual day. A convenience sampling was used to recruit participants for the pilot study. Hard copy questionnaires were given to the participants. After they have completed the first part, they were given a 15 minutes break before returning to view the video and

complete the second part. The pilot study also tested for recall and perception of the health message announcement i.e., whether the message was prevention-focused or promotion-focused. Most of the participants, 15 out of 22 were able to recall the health message and the manipulation of the focus of the health message was found to be successful. Feedback was also solicited to ensure that instructions and questions in the questionnaires were clear. Other feedback received included background color of the stripped health message and the font size of the written health message.

Procedures. The study was divided into two parts. The first part was conducted in the tutorial rooms at the Wee Kim Wee School of Communication and Information. Participants were asked to read and sign a consent form before they answered the questionnaire. They were informed that the study was about media and youth in Singapore. The scales in the questionnaire measured their regulatory orientation, media usage, attitudes toward unhealthy food consumption, parental guidance and self-restraint when it comes to eating. These scales can be found in part 1 questionnaire in Appendix K. The participants took about 15 to 20 minutes to complete the questionnaire. After submitting the questionnaire, participants were asked to indicate their preferred time slot for the second part of the study which took place on another day so as to minimize any possible influences on responses that could stem from the regulatory orientation measures.

The experiment, which was conducted in the second part of the study, was held in the computer laboratory located within the school. After registering for the second part, participants were given a number which randomly assigned them to one of the two conditions, i.e., prevention-focused health message stripped across the KFC commercial or promotion-focused health message stripped across the KFC commercial. Participants

were also given an envelope and informed that they were to open the envelope and complete the questionnaire only after they have watched the video clip. Each participant had their own monitor station which was partitioned and separated from one another so that they could not view the screens of their neighbors. They also had to put on headphones to watch the clip so that the volume is controlled for in the room (see screenshots of computer laboratory setup in Appendix J). After completing the questionnaire, participants were given S\$12 as cash incentives. A debrief explaining the objective of the study was sent to all participants via email a week later.

Measures. Measures were tested in the pilot test. Minor changes were made to the phrasing of the instructions and some of the items in the questionnaires based on the feedback given. Two finalized sets of questionnaires were then administered during the actual study. Both sets of questionnaires can be found in Appendices K and L.

The first set of questionnaire given out in the first half of the study comprised scales measuring (a) participants' regulatory orientation, (b) media usage (television consumption), (c) attitudes toward unhealthy food consumption, (d) parental guidance on their food consumption, and (e) self-restraint when it comes to eating (see Appendix K). The second questionnaire fielded questions that captured participants' (a) attitudes toward unhealthy food consumption; (b) intentions to eat healthily after being given the treatment; (c) perceived focus of the health message announcement; and (d) demographic information (see Appendix L).

Individuals' regulatory orientation. Over the years, regulatory focus theory has become very influential in the areas of psychology and marketing because of its ability to explain and predict a variety of psychological processes and behaviors. It is also

increasingly used in consumer research to explain a range of consumer phenomena (Pham & Higgins, 2005). As the body of research using this theory continues to grow, one issue that concerns scholars is the “diverse operationalizations of an individual’s chronic regulatory focus” (Haws, Dholakia, & Bearden, 2010, p. 3). Past studies have used at least five different measurements. However, only three are frequently used and they are the (a) Regulatory Focus Questionnaire (RFQ) developed by Higgins, et al., (2001); (b) the General Regulatory Focus Measure (GRFM) developed by Lockwood, Jordon and Kunda (2002); and (c) the BIS/BAS scale developed by Carver and White (1994).

Due to the wide range of measures used to capture individuals’ regulatory orientation, some scholars questioned the theory’s construct and its measurement (e.g., Haws, et al., 2010; Summerville & Roese, 2008). These scholars cast doubts that all the scales were measuring the same two concepts of regulatory focus. This is because the key prediction of regulatory focus theory concerns the needs outcomes of promotion and prevention focus with the difference between the two self-regulation systems being the manner in which goals are achieved. As promotion and prevention concerns are not end-points of a uni-dimensional, bipolar construct, both are therefore distinct concepts and orthogonal constructs (Higgins, 1997) – an interesting concept that Higgins (1997) contends as separate since one orientation can be more accessible over the other, yet capable of co-existing independently at the same time.

Results from Summerville and Roese’s (2008) study, which assessed and compared the RFQ and GRFM against the BIS/BAS measurement, showed that responses on RFQ and GRFM are largely uncorrelated. The scholars delivered a cautionary note, saying that “researchers should be aware that the reference-point-based GRFQ functions

much more like a measure of approach and avoidance (the BIS/BAS) than like the RFQ” (p. 253). Haws, et al. (2010) also concluded from their assessment of five different regulatory focus measures that there is a lack of convergence among the measures and variation in the scales performance according to “criteria of theoretical coverage, internal consistency, homogeneity, stability, and predictive ability” (p. 2). This has resulted in Haws, et al. (2010) to propose a sixth and alternative regulatory focus measure which they called the Composite Scale of Chronic Regulatory Focus (CSCRF). Such findings, suggestions and words of caution, however, did not stop studies from continuing to use the three scales, RFQ, GRFM and BIS/BAS which are billed as measures of individual differences in regulatory focus (e.g., Righetti, Finkenauer, & Rusbult, 2011).

Due to the unresolved controversies currently surrounding regulatory focus measurements, three different sets of regulatory orientation scales from past studies – the RFQ (Higgins, et al., 2001), the GRFM (Lockwood, et al., 2002) and BIS/BAS (Carver & White, 1994) - were used to measure participants’ regulatory orientation. They are all well-established scales used by different scholars. One reason for including all three scales was due to the controversies surrounding the reliability and validity of each scale. The other reason is because most participants whose regulatory orientation was measured for studies that explored phenomena through the lens of regulatory focus were mostly conducted in the US and participants were largely North Americans or Europeans. As studies have shown (e.g., Aaker & Lee, 2001; Lee, et al., 2000) that regulatory focus of individuals can also be distinguished along the lines of culture, it cannot be assumed that all the questions in the scales which are well comprehended by Westerners will be

interpreted and understood in the same context by Asians, particularly Singaporeans who are largely known to be bi-culture.

As such, since all three are validated regulatory measures, the aim is to select measures that are suitable for the target audience as well as are reliable. All three measures consist of two sub-scales with each sub-scale measuring participants' prevention and promotion orientation. All three scales can be found in Part 1 questionnaire in Appendix K. Table 7 presents the Cronbach's α , the means and the standard deviations of each sub-scale from the three measures.

Table 7 *Cronbach's α , Means and Standard Deviations of Regulatory Orientation Scales*

Scale	Cronbach's α	Mean	SD
RFQ by Higgins et al. (2001)			
Prevention-focused (5 items)	.71	3.17	.70
Promotion-focused (6 items)	.55	3.29	.51
GRFM by Lockwood et al. (2002)			
Prevention-focused (9 items)	.75	5.95	1.18
Promotion-focused (9 items)	.84	6.90	1.02
BIS/BAS by Carver and White (1994)			
Prevention-focused (7 items)	.76	3.08	.48
Promotion-focused (9 items)	.71	3.14	.36

Note: RFQ score was based on a 5-point Likert scale.
 GRFM score was based on a 9-point Likert scale.
 BIS/BAS score was based on a 4-point Likert scale.

Results from Table 7 show that both GRFM scale developed by Lockwood, et al. (2002) and the BIS/BAS by Carver and White (1994)¹ have acceptable internal

¹ BIS/BAS are two sub-scales empirically emerged from research to measure two general motivational systems that underlie regulatory behavior, i.e., avoidance and approach. While BIS comprises one set of avoidance items, BAS comprises three sets of items to measure activation. They are reward, responsiveness and fun seeking. Following the suggestion by scholars (Department of Psychology (University of Miami),

consistencies as indicated by their Cronbach's alphas for both sub-scales; whereas the promotion focused sub-scale of the RFQ by Higgins, et al. (2001) yielded a low Cronbach's α , and was therefore not employed in this study.

As for the GRFM scale developed by Lockwood, et al. (2002) and the BIS/BAS by Carver and White (1994), an exploratory factor analysis (EFA) was conducted to examine the factor structure. The results showed that two-factor structure representing prevention and promotion orientation was evident in both scales. For both scales, all factor loadings were statistically significant and satisfied the minimal level ($\pm .30$) for interpretation of structure for sample sizes of 350 or greater, albeit factor loadings of two items associated with Factor 2 for Lockwood, et al. (2002) prevention sub-scale came close to .30. The significance of these factor loadings is based on a .05 significance level (α), a power level of 80% and standard errors assumed to be twice those of conventional correlation coefficients (Hair, Black, Babin, & Anderson, 2010). Both scales also have one item each that cross-loaded on the other factor (see Appendices M and N). As both scales demonstrated reliability and adequate factorial validity, scores from GRFM scale developed by Lockwood, et al. (2002) was used for data analyses. This scale is deemed to be more suitable as participants in Study 1 are undergraduates from Nanyang Technological University and the GRFM scale "originated as an ad hoc scale in research on motivation, tailored to the participant population of undergraduate students emphasizing success and failure in academic" (Summerville & Roese, 2008, p. 249).

Attitude towards unhealthy food consumption (fast food). Eight items adapted from two scales were used to create a composite index to measure attitudes toward

2007) not to combine all three sets of BAS, especially Fun Seeking which is known to have elements of impulsiveness that are not contained in the other scales, only scores from rewards and responsiveness items were computed and used for this study.

unhealthy food consumption. Four items from one scale was adapted from Povey, Conner, Sparks, James and Shepherd (2000) and another four items from another scale was adapted from Kahn and Wansink (2004). These two scales can be found in Appendix K. Participants were asked to rate on a 7-point semantic differential scale their attitudes toward unhealthy food consumption. Some examples of the adjectives used were *Bad – Good*; *Unenjoyable – Enjoyable*; and *Not at all fun – Very fun*. This variable was measured twice: before ($M = 4.38$, $SD = 1.18$, Cronbach's $\alpha = .90$) and after the treatment ($M = 4.16$, $SD = 1.15$, Cronbach's $\alpha = .92$). The higher score indicates more positive attitudes toward unhealthy food consumption. As past studies have demonstrated the important role of prior attitudes on persuasion (e.g., Olson & Zanna, 1993; Petty & Cacioppo, 1990), attitudes toward unhealthy food consumption measured prior to participants being given the treatment was input into the model as one of the control variables.

A paired-sample t-test was used to compare both sets of samples and assess the difference between prior and post attitudes towards unhealthy food consumption. The results indicated that the difference was statistically significant, $t(572) = 6.97$, $p < .001$ ($M_{pre} = 4.38$, $SD_{pre} = 1.18$ vs. $M_{post} = 4.16$, $SD_{post} = 1.15$), suggesting that it is likely that the participants' attitudes became more negative toward unhealthy food consumption after being exposed to the health message.

Intentions to eat healthily. Two scales that measure intentions were combined to create a composite index to measure intentions to eat healthy food. One scale, which consisted of four items, was adapted from Keller and Block (1997) to focus on participants' expressed intentions in wanting to eat healthily after watching the video.

Participants rated their level of agreement on a 7-point Likert scale (e.g., “I am more likely to eat less processed and fatty food and eat more fresh and nutritious food now than before I watched the video.”). The second scale, which measured a person’s inclination and intentions to engage in a specified behavior, was adapted from Oliver and Swan (1989). It consisted of five items asking participants how likely they were to eat fast food and healthier food from now on. Again, participants rated their intentions on a 7-point Likert scale (e.g., “I plan to eat fast food in the next 1 week,” and “I plan to eat healthier food in the next 1 week.”) (see Appendix K). Results from factor analysis showed that all the items from the two scales loaded highly on only one factor; thus, all the items were averaged to make up a scale that measures intentions to eat healthy food. The higher score indicates greater intentions to eat healthy food ($M = 4.45$, $SD = .87$, Cronbach’s $\alpha = .75$).

Media usage. Participants were asked to indicate the number of hours they spent watching television per week ($M = 8.16$, $SD = 9.68$).

Parental mediation. As research has demonstrated that parents play a major role in determining children’s eating patterns by their feeding methods and personal food consumption attitudes and behaviors (e.g., Benton, 2004; Patrick & Nicklas, 2005), this variable was measured as well. A scale adapted from Bybee, Robinson and Turow (1982) and Lwin, Stanaland and Miyazaki (2008) were used to measure the extent to which parents give guidance on food consumption. Participants were asked based on ten items, how often their parents explain to them about the importance of eating healthily and tell them what they should eat (e.g., “How frequently do your parents explain to you why it’s important to eat healthily?” and “How frequently do your parents tell you what food you must eat without explaining why?”) (see Appendix K). The scale ranges from 1 (*Not at all*)

to 5 (*All the time*; $M = 2.95$, $SD = .58$, Cronbach's $\alpha = .69$). Parental mediation was input as a control variable in the analysis.

Food restraint. Past studies have also shown that food restraint is a strong influencing factor on food intake (Barnes & Tantleff-Dunn, 2010; Wardle, Steptoe, Oliver, & Lipsey, 2000); this variable was therefore measured as well. Using a scale adapted from van Strien, Frijters, Bergers and Defares (1986), participants were asked based on six items, how often they put restraint on their food consumption (e.g., “When you put on weight, do you eat less than you usually do?”). The scale ranges from 1 (*Never*) to 5 (*Very often*; $M = 2.67$, $SD = .93$, Cronbach's $\alpha = .88$). Food restraint was input as a control variable in the analysis.

Demographic variables. Questions on age, gender, diet, housing type, race, weight and height were placed at the end. Only age and gender were included as control variables.

Results

The findings showed that H1a, H1b and H2a were not supported but H2b was supported. Regulatory fit did not influence attitudes toward unhealthy food consumption. However, regulatory fit did have an influence on intentions to eat healthily but only in the condition of promotion-fit.

Regression analysis was used to test the hypotheses, with regulatory orientation and the health message focus as the independent variables; and attitudes toward unhealthy food consumption and intentions to eat healthily as the dependent variables. A total of four multiple regression models were computed with scores from prevention and promotion sub-scales analyzed separately as the theoretical concept of prevention and

promotion concerns are orthogonal. Predictors were thus prevention orientation scores ($M = 5.95$, $SD = 1.18$) and promotion orientation scores ($M = 6.90$, $SD = 1.02$) measured using a scale developed by Lockwood et al. (2002); focus of the health message (0 = prevention message and 1 = promotion message); and regulatory fit [established by multiplying pairs of standardized variables and interpreted using the Aiken and West (1991) method]. To create a measure of promotion fit, standardized promotion orientation scores was multiplied by focus of health message. To create a measure of prevention fit, standardized prevention orientation scores was multiplied by focus of health message. Tables 8 and 9 present the results from the hierarchical regression for the prevention and promotion orientation scores.

A correlational analysis was also conducted (see Table 10). Five variables, which were found to have a significant correlation with the dependent variables, were controlled for. They were age, gender, prior attitudes toward unhealthy food consumption, parental mediation, and food restraint.

Table 8 *Hierarchical Regression Analysis for Individuals' Prevention Orientation Scores and Health Message Focus Predicting Attitudes toward Unhealthy Food Consumption and Intentions to Eat Healthily*

Variable	Attitudes towards unhealthy food β	Intentions to eat healthily β
Block 1: Control variables		
Age	.01	-.02
Gender	-.01	-.02
Prior attitudes towards unhealthy food	.77***	-.25***
Parental mediation	.02	.15***
Food restraint	-.03	.27***
R^2	.62***	.21***
Block 2: Independent variables		
Prevention orientation scores	-.01	.09*
Health message focus	-.03	-.01
Δ in R^2	.00	.01
Block 3: Two-way interaction		
Prevention orientation scores X Health message focus	-.04	.08
Δ in R^2	.00	.00
Total R^2	.62***	.22***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 9 *Hierarchical Regression Analysis for Individuals' Promotion Orientation Scores and the Health Message Focus Predicting Attitudes toward Unhealthy Food Consumption and Intentions to Eat Healthily*

Variable	Attitudes towards unhealthy food β	Intentions to eat healthily β
Block 1: Control variables		
Age	.01	-.02
Gender	-.01	-.02
Prior attitudes towards unhealthy food consumption	.77***	-.25***
Parental mediation	.02	.15***
Food restraint	-.03	.27***
R^2	.62***	.21***
Block 2: Independent variables		
Promotion orientation scores	-.03	.13**
Health message focus	-.02	-.01
Δ in R^2	.00	.02**
Block 3: Two-way interaction		
Promotion orientation scores X Health message focus	-.00	.10*
Δ in R^2	.00	.01*
Total R^2	.62***	.23***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

As shown in Tables 8 and 9, the findings showed no significant association between regulatory orientation and attitudes toward unhealthy food consumption (prevention: $\beta = -.01$, $t(565) = -.45$, $p = .65$; promotion: $\beta = -.03$, $t(565) = -1.12$, $p = .26$), nor interaction effects of regulatory orientation and message focus on attitudes toward unhealthy food consumption. In other words, attitudes toward unhealthy food consumption do not depend on one's regulatory orientation or whether or not an individual's regulatory orientation matches the health message focus. i.e., prevention-fit

or promotion-fit, $\beta = -.04$, $t(564) = -1.19$, $p = .24$ and $\beta = -.00$, $t(564) = -.02$, $p = .98$ respectively. As there was no significant effect of regulatory fit (prevention-fit and promotion-fit) on attitudes toward unhealthy food consumption, H1a and H1b are not supported.

However, findings indicated a significant effect of regulatory fit on intentions to eat healthily. The association between prevention orientation and intentions to eat healthily ($\beta = .09$, $t(565) = 2.30$, $p < .05$); and promotion orientation and intentions to eat healthily ($\beta = .13$, $t(565) = 3.34$, $p < .01$) were significant, indicating that the more prevention oriented or the more promotion oriented the participants were, the stronger their intentions to eat healthily.

The results of the interaction effect were also examined. Figures 8 and 9 present the two sets of interaction effects between individual's regulatory orientation scores and the health message focus on intentions to eat healthily. Although the interaction effect for prevention orientation scores and prevention-focused health message was not significant ($\beta = .08$, $t(564) = 1.51$, $p = .13$), the interaction effect between promotion-oriented individuals and promotion-focused health message was significant ($\beta = .10$, $t(564) = 1.98$, $p < .05$)².

² The analyses were replicated using BIS/BAS scale. The association between promotion orientation and attitudes toward unhealthy food consumption was significant but not prevention orientation and attitudes toward unhealthy food consumption (promotion: $\beta = -.05$, $t(565) = -2.05$, $p < .05$; prevention: $\beta = -.02$, $t(565) = -.70$, $p = .49$). Similarly, the association between promotion orientation and intentions to eat healthily was also significant but not the association between prevention orientation and intentions to eat healthily (promotion: $\beta = .09$, $t(565) = 2.31$, $p < .05$; prevention: $\beta = .04$, $t(565) = 1.0$, $p = .32$). There were, however, no significant interaction effects between regulatory orientation and message focus on attitudes toward unhealthy food consumption (preventionXmessage: $\beta = -.02$, $t(564) = -.43$, $p = .67$; promotionXmessage: $\beta = -.03$, $t(564) = -.81$, $p = .42$) or intentions to eat healthily (preventionXmessage: $\beta = .05$, $t(564) = .89$, $p = .37$; promotionXmessage: $\beta = .03$, $t(564) = .56$, $p = .58$).

To further interpret the significant findings for promotion-fit, simple slope tests were performed on intentions to eat healthily when promotion orientation scores were centered at 1 standard deviation below the mean. As shown in Figure 8, when presented with the promotion-focused health message, individuals showed greater intentions to eat healthily when their promotion orientation scores are high than low, $F(1, 573) = 3.91, p < .001$. The prevention-focused health message slope was, however, not significant $F(1, 573) = 1.05, p = .29$. These findings supported H2b but not H2a; and show that regulatory fit is more likely to influence intentions to eat healthily for promotion-focused health message but not for prevention-focused health message.

Table 10 *Study 1 Bivariate Correlations Among the Independent and Dependent Variables*

	1	2	3	4	5	6	7	8
1. Prevention Orientation Scores	-							
2. Promotion Orientation Scores	.284**	-						
3. Attitudes toward Unhealthy Food Consumption	-.022	-.042	-					
4. Intentions to Eat Healthily	.127**	.141**	-.451**	-				
5. Age	-.040	-.016	.059	-.065	-			
6. Prior Attitudes toward Unhealthy Food Consumption	.048	.091*	-.785**	-.324**	.054	-		
7. Parental Mediation	.097*	.107*	.043	.177**	-.056	.040	-	
8. Food Restraint	.147**	.088*	-.271**	.364**	-.123**	-.306**	.119**	-

Note: $N = 573$; ** $p < .01$; * $p < .05$

Figure 7. Prevention orientation scores and message focus on intentions to eat healthily when health message is presented in a simultaneous format.

Figure 8. Promotion orientation scores and message focus on intentions to eat healthily when health message is presented in a simultaneous format.

Discussion

According to the theory of regulatory fit, people experience “fit” when the framing of a message matches the regulatory orientation of the message recipient. Under the condition of fit, people “feel right” about what they are doing, resulting in them being more motivated and engaged when pursuing a goal. The purpose of Study 1 was conducted to investigate into the effects of fit on attitudes toward unhealthy food consumption and intentions to eat healthily. It tested the hypotheses that individuals who experienced a “fit” (prevention-fit or promotion-fit) will have more negative attitudes toward unhealthy food consumption and greater intentions to eat healthily even under the condition where individuals were simultaneously exposed to the health message and messages from an unhealthy food commercial.

The results showed that only the interaction between promotion-oriented individuals and promotion-focused message (promotion-fit) on intentions to eat healthily was significant. Interaction between prevention-oriented individuals and prevention-focused message (prevention-fit) on intentions to eat healthily was not significant. As to why regulatory fit is more likely to influence intentions to eat healthily when it is a promotion-fit rather than a prevention-fit, one possible reason could be due to the characteristic of prevention-focused health message which tends to communicate anxiety. Although studies (e.g., Uskul, et al., 2009) have shown that Asians are more prevention oriented and are more likely to be persuaded by loss-framed messages (which probably explains the significant association between prevention orientation scores and intentions to eat healthily), health messages that stir anxiety brings on cognitive dissonance in an individual (Aiken, 2002). This form of psychological reaction immediately prompts

attempts to reduce the anxiety level, which may lead an individual to perceive the health messages as being untrue. On the other hand, health messages positively crafted are more likely to promote positive behavior (Rothman, Salovey, Antone, Keough, & Martin, 1993).

This explanation could be true of the non-significant findings for prevention-fit. Considering that individuals were presented the prevention-focused health message simultaneously with messages from the unhealthy food commercial, the health message could have triggered anxiety. With no time given to resolve the inconsistency between belief and the call to action, this could have resulted in the inactivation of fit. Hence, the non-significant interaction effects for individuals presented with the prevention-focused health messages and high in prevention orientation scores.

This set of findings therefore does not completely concur with past studies which argued that fit violation feels wrong and that fit influences persuasion by increasing motivation towards goal pursuit when the message is framed to align with the individual's regulatory orientation. This is at least not so under the condition where individuals are simultaneously presented with the health message and competing messages from an unhealthy food commercial – a condition that past studies have not investigated.

As for the unfavorable results on attitudes toward unhealthy food consumption, the findings are inconsistent with past studies that showed the influence of regulatory fit in changing attitudes and attitude formation. This may be due to factors that relate to food preferences being a manifestation of attitudes to food, particularly fast food. This is because there is a lot more to food than nutrients. For many, indulging in fast food is a major source of pleasure and attitudes and ideas about such foods were learned over a long period of time (Rozin, 1990; Shepherd, 1989).

According to researchers in psychophysiology of human eating, sensory perception of food plays an important part in the selection of food to be consumed. It was found that human senses respond to sugar, fat and salt because they make food appetizing (Shepherd & Farleigh, 1989). When the mix of sugar, fat and salt is right which is usually the case in fast food like KFC, the food becomes stimulating and people end up craving for more of such foods. Over time, consumption of foods that stimulate alters the brain chemistry and a powerful drive for food high in sugar, fat and salt compete with people's resolve to turn away from them (Kessler, 2009). In the case of fast food, consuming such foods has become so much a part of the Western lifestyle and in recent decades, for Asians as well as "it has acquired an air of inevitability, as though it were somehow unavoidable, a fact of modern life" (Schlosser, 2001, p. 7).

Frequent consumption of fast food that stimulates apparently forms only part of the equation that contributes to the positive formation of beliefs and feelings towards an attitude object like fast food. Effects of advertising on attitudes literature further suggest that when viewers are repeatedly exposed to advertising messages on television, their attitudes toward the advertised food become more favorable. This is because attitudes formed from repeated advertising exposure are similar to those formed from direct experience due to easier recall and positive appeals in the marketing of the food (Berger & Mitchell, 1989; Perloff, 2010).

The non-significant results on attitudes toward unhealthy food consumption (fast food) are therefore thought-provoking. Considering that most if not all the participants would have indulged in KFC since they were children and have been exposed to KFC commercials numerous times over the years, it is unlikely to expect their attitudes toward

fast food to be altered with just a one-time exposure to the health message. This is particularly so under the condition where the health message was presented simultaneously with an actual familiar KFC commercial that was professionally produced to persuade.

Chapter 6: Study 2

Findings from Study 1 showed that regulatory fit only works under certain conditions when the health message is stripped across an unhealthy food commercial and simultaneously presented with conflicting messages from the food advertiser. The theory is able to predict intentions to eat healthily only for promotion-fit individuals. Study 2 tested another intervention approach which uses a different message presentation style. The health message in Study 2 was an independent advertisement and was presented sequentially, i.e., either before or after the KFC commercial. A third variable was also introduced in the form of message positioning to investigate the extent to which regulatory fit is moderated by primacy or recency effects. The chapter describes the assessment of the following hypotheses:

H3a/b: When the health message is presented *before* an unhealthy food commercial (sequential format), individuals who experience a regulatory fit (*prevention-fit and promotion-fit*), will have more negative attitudes toward unhealthy food consumption compared to individuals who also experience a fit, but view the health message after the unhealthy food commercial. In addition, individuals who experience a nonfit regardless of whether the message is presented before or after will have less negative attitudes toward unhealthy food consumption.

H4a/b: When the health message is presented *before* an unhealthy food commercial (sequential format), individuals who experience a regulatory fit (*prevention-fit and promotion-fit*), will have greater intentions to eat healthily compared to individuals who also experience a fit, but view the health message after the unhealthy food commercial. In addition, individuals who experience a nonfit regardless of

whether the message is presented before or after will have lesser intentions to eat healthily.

Method

A quasi-experiment was designed to examine the extent to which the influence of regulatory fit and nonfit between individuals' regulatory orientation and health message focus on attitudes toward unhealthy food consumption and intentions to eat healthily is moderated by primacy and recency effects. The three predictors in this study are the individual's regulatory orientation (prevention orientation or promotion orientation); the health message focus (prevention-focused or promotion-focused); and the health message positioning (before or after the KFC commercial). These two factors, i.e., the individual's regulatory orientation and the health message focus were combined to create a regulatory fit or nonfit condition. This condition and the health message positioning then serve as a predictor for (a) attitudes toward unhealthy food consumption, and (b) intentions to eat healthily. Identical to Study 1, this second study was also designed as a two-part study to minimize any possible influences from the individual regulatory orientation measures as this independent variable was measured in the first part. The stimuli were presented to the participants only in the second part where they were assigned to one of four conditions which screened either a prevention-focused or promotion focused health message positioned before or after a KFC commercial. The variables manipulated were the positioning of the KFC commercial and the framing of the health message. Also identical to Study 1, the same five variables – age, gender, prior attitudes towards unhealthy food consumption, parental mediation and food restraint – were included as controls in all the analyses.

Participants. Students from Ngee Ann Polytechnic, a pre-university institution, were selected for this study in 2011. Although students from the polytechnic are mostly younger by a few years in age than undergraduate students, they are also targets of food marketers. Convenience sampling was used. Students from various classes across different academic disciplines and levels were invited to participate. They were informed that the study consisted of two parts and after they filled up the questionnaire in the first part that took place during class hours, they would have to go to the library on another day to complete the second part. In addition to convenience sampling, those who came for the second half were also asked to invite their friends to participate and come for the first part of the study. The same set of instructions was given to the new participants, i.e., that they would have to return to the library to complete the second part of the study on another day.

In total, 510 students completed both parts of the study (male = 53%; female = 47%). Approximately over 90% were between the ages of 16 and 20. The rest were aged 21 or older. The median for age was 19. There were 80.2% Chinese, 11.3% Malay, 4% Indian and 4.5% others. About 14% of the participants indicated that they were on a diet. The students' BMI ranges from 15.04 to 48.98 ($M = 21.07$; $SD = 3.75$). Using the BMI cut-off recommended by WHO for Asian populations, including Singapore, (Crowe & Higgins, 1997), more than 54% of the participants have a BMI that was within the healthy range, i.e., between 18.5 and 22.9. About 24% were underweight, 16% overweight and 6% of the participants were considered obese. One case was excluded from the analysis because there were too many missing values. The final number of participants whose data were included in the analysis was 509.

Stimulus. Four video clips were created to operationalize the four conditions in this study. All video clips comprised four commercials which lasted in total one minute and 15 seconds. Three of the four commercials in the clip, i.e., the two fillers and the KFC commercial, were the same ones used in Study 1. The health message announcement (the same health message used in Study 1) was also deployed, except that instead of being stripped across the KFC commercial, it is now presented as an independent advertisement with only the health message presented in text with no accompanying music, visuals, sounds or characters. The idea was to ensure that viewers focused solely on the text which was in white and against a black background. This is to keep the same look and feel as the one stripped across the KFC commercial in Study 1. The same two fillers were each placed at the start and at the end of the video stimuli to reflect the actual environment where viewers are presented with different commercials during a commercial break. The fillers further acted to prevent the participants from being able to guess the purpose of the study. The other two commercials - KFC commercial and the health message announcement - were placed in between the two fillers.

The manipulated variables were (a) the health message which was framed either with a prevention or a promotion focus, and (b) the positioning of the health message, i.e., presented before or after the KFC commercial. Participants were assigned to one of the four treatment groups: (1) prevention-focused health message placed before the KFC commercial; (2) prevention-focused health message placed after the KFC commercial; (3) promotion-focused health message placed before the KFC commercial; and (4) promotion-focused health message placed after the KFC commercial.

The messages in the prevention-focused and the promotion-focused health announcement were the same ones used in Study 1, i.e., “Avoid illnesses and being overweight. Don’t eat processed and fatty food”, and “Achieve good health and be trim. Eat fresh and nutritious food” respectively. Message length and sentence structure were kept constant. Both messages were created with an aim to counter the message promoted by KFC and to promote healthy eating except that one health message emphasized the loss outcome and the other emphasized the gain outcome. To keep the exposure time duration consistent with Study 1, the health message announcement was also kept constant at 10 seconds for all four treatment groups. Screenshots from the video clips can be found in Appendices F, G, H and I.

To ensure that the manipulation worked as intended, participants were asked to rate two sets of questions each comprising two questions as identical to those used in Study 1. The correlation between the two items measuring the prevention-focused is high ($r = .51$), and likewise for that of the promotion-focused ($r = .53$). Therefore, we averaged the two items measuring the prevention-focused, and those measuring the promotion-focused. The results showed that those who were presented with a prevention-focused message perceived the message to be more prevention-focused ($M = 4.10$, $SD = 3.89$) than promotion-focused ($M = 3.89$, $SD = 1.47$), $t(260) = 3.61$, $p < .001$. Similarly, those who were presented with a promotion-focused message perceived the message to be more promotion-focused ($M = 3.84$, $SD = 1.37$) than prevention-focused ($M = 3.62$, $SD = 1.38$), $t(247) = 4.10$, $p < .001$. These results indicated that the message manipulation was successful.

Pilot study. A pilot study was conducted with 23 students at Nanyang Technological University to ensure that, procedurally, the experiment would run smoothly on the actual day. A voluntary sampling was used to recruit participants for the pilot study. Hard copy questionnaires were given to the participants. After they have completed the first part, they were given a 15 minutes break before returning to view the video and complete the second part. The pilot study also tested for recall and perception of the health message announcement i.e., whether the message was prevention-focused or promotion-focused. Most of the participants, 21 out of 23 were able to recall and distinguish the focus of the health message. Feedback was also solicited to ensure that instructions and questions in the questionnaires were clear.

Procedures. Following the same procedures in Study 1, Study 2 was also divided into two parts. However, unlike Study 1, the first part in Study 2 was conducted in the students' respective classrooms. Participants were asked to read and sign a consent form before they answered the questionnaire. Similar to the cover story presented to participants in Study 1, the students at the polytechnic were also informed that the study was about media and youth in Singapore. The scales in the questionnaire measured their regulatory orientation, media usage (television consumption), attitudes toward unhealthy food consumption, parental guidance on their food consumption, and self-restraint when it comes to eating (see Appendix K). As the questionnaire is similar to the ones used in Study 1, participants also took about 15 to 20 minutes to complete the questionnaire. After submitting the questionnaire, participants were asked to indicate their preferred time slot for the second part of the study which took place on another day to reduce any possible influence on responses that could stem from the regulatory orientation measures.

The experiment, which was conducted in the second part of the study, was held in the computer laboratory located inside the main library in the polytechnic. After registration, participants were given a number which randomly assigned them to one of the four conditions (i.e., prevention-focused health message placed before the KFC commercial, prevention-focused health message placed after the KFC commercial, promotion-focused health message placed before the KFC commercial, and promotion-focused health message after the KFC commercial). Similar to the manner that took place in Study 1, every participant was given an envelope containing a questionnaire (see Appendix L) and told to open it to complete the questionnaire only after they have watched the video clip. Every participant also had their own monitor station which was partitioned and separated from one another so that they could not view the screens of their neighbors. They further had to put on headphones to watch the video clip so that the volume is controlled for in the room (see Appendix J). After completing the questionnaire, participants were given S\$10 as cash incentives. A debrief explaining the objective of the study was sent to all participants via text messages on their mobile phones a week later.

Measures. The two sets of questionnaire given out in the first and second parts of the study were exactly the same as those administered in Study 1. The first set comprised scales measuring (a) participants' regulatory orientation, (b) media usage (television consumption), (c) attitudes toward unhealthy food consumption, (d) parental guidance on their food consumption and (e) self-restraint when it comes to eating (see Appendix K); while the second set fielded questions that captured participants' (a) attitudes toward unhealthy food consumption, (b) intentions to eat healthily after being given the treatment,

(c) perceived focus of the health message announcement and (d) demographic information (see Appendix L).

Individuals' regulatory orientation. The same three sets of regulatory focus measures from Study 1 were used to measure participants' regulatory orientation. Table 11 presents the Cronbach's α , the means and standard deviation of each sub-scale from the three measures.

Table 11 *Cronbach's α , Means and Standard Deviations of Regulatory Focus Scales*

Scale	Cronbach's α	Mean	SD
RFQ by Higgins, et al. (2001)			
Prevention-focused (5 items)	.62	3.05	.65
Promotion-focused (6 items)	.45	3.17	.49
GRFM by Lockwood, et al. (2002)			
Prevention-focused (9 items)	.77	6.00	1.25
Promotion-focused (9 items)	.84	6.82	1.12
BIS/BAS by Carver and White (1994)			
Prevention-focused (7 items)	.72	3.02	.50
Promotion-focused (9 items)	.72	3.16	.36

Note: RFQ score was based on a 5-point Likert scale.
GRFM score was based on a 9-point Likert scale.
BIS/BAS score was based on a 4-point Likert scale.

Results from Table 11 showed that, similar to Study 1, both GRFM scale developed by Lockwood, et al. (2002) and the BIS/BAS by Carver and White (1994) have acceptable internal consistencies as indicated by their Cronbach's alphas for both sub-scales. The promotion-focused sub-scale of the RFQ by Higgins, et al. (2001) yet again yielded a low Cronbach's α , and was therefore also not employed in Study 2.

Following the same procedure performed in Study 1, an EFA was conducted to examine the factor structures of the GRFM scale developed by Lockwood, et al. (2002) and the BIS/BAS by Carver and White (1994). The results showed that two-factor structure representing prevention and promotion orientation was evident in both scales. However, the GRFM scale developed by Lockwood, et al. (2002) has one item with a factor loading that is far below the minimal level ($\pm.30$) deemed necessary for the interpretation of factor structure. The BIS/BAS scale by Carver and White (1994), on the other hand, demonstrated reliability and factorial validity (see Appendices O and P). Moreover, as participants in Study 2 were polytechnic students and not undergraduates, this scale is deemed to be more suitable for a non-undergraduate sample (cf. Summerville & Roese, 2008). Hence, scores from BIS/BAS scale by Carver and White (1994) was used for data analyses in Study 2.

Attitudes toward unhealthy food consumption (fast food). Eight items adapted from two scales, identical to those used in Study 1, were used to create a composite index to measure attitudes toward unhealthy food consumption. Participants were asked to rate on a 7-point semantic differential scale their attitudes toward unhealthy food consumption. Some examples of the adjectives used were *Bad – Good*; *Unenjoyable – Enjoyable*; and *Not at all fun – Very fun*. This variable was measured twice: before ($M = 4.47$, $SD = 1.23$, Cronbach's $\alpha = .92$) and after the treatment ($M = 4.22$, $SD = 1.25$, Cronbach's $\alpha = .92$). The higher score indicates more positive attitudes toward unhealthy food consumption. Similar to Study 1, attitudes toward unhealthy food consumption measured prior to participants being given the treatment was input into the model as one of the control variables.

A paired-sample t-test was also used to compare both sets of samples and to assess the difference between prior and post attitudes toward unhealthy food consumption. The results indicated that the difference was statistically significant, $t(508) = 6.68, p < .001$ ($M_{pre} = 4.47, SD_{pre} = 1.23$ vs. $M_{post} = 4.22, SD_{post} = 1.25$), suggesting that it was likely that the participants' attitudes became more negative toward unhealthy food consumption after being exposed to the treatment.

Intentions to eat healthily. Similar to Study 1, two sets of items were combined to create a composite index to measure intentions to eat healthy food. Results from factor analysis for this study again showed that all the items from the two scales loaded highly on only one factor. As such, all the items were averaged to make up a scale that measures intentions to eat healthy food. A higher score indicates greater intentions to eat healthy food ($M = 4.45, SD = .98$, Cronbach's $\alpha = .81$).

Media usage. Participants were asked to indicate the number of hours they spent watching television per week ($M = 12.54, SD = 12.19$). Results showed that students from Ngee Ann Polytechnic spend more time watching television than do undergraduates at Nanyang Technological University by about three hours per week.

Parental mediation. Identical to Study 1, items in this scale adapted from two parental scales were used to measure the extent to which parents give guidance about food consumption. It was also input as a control variable in the analysis ($M = 3.00, SD = .62$, Cronbach's $\alpha = .73$) following empirical evidence that parents play a major role in determining children's eating patterns.

Food restraint. Also similar to Study 1, this scale comprising six items adapted from van Strien, et al. (1986) was also used to measure participants' ability to restrain

themselves when it comes to food consumption ($M = 2.58$, $SD = .91$, Cronbach's $\alpha = .87$). Food restraint was input as a control variable in the analysis.

Demographic variables. Questions on age, gender, diet, housing type, race, weight and height were placed at the end. Only age and gender were included as control variables.

Results

The findings showed that H3a and H3b were not supported but H4a and H4b were supported. Regulatory fit and message positioning had no significant effects on attitudes toward unhealthy food consumption. However, there was a three-way interaction among regulatory orientation, message focus and message positioning on intentions to eat healthily. The findings also showed that when the message was presented before (but not after) the unhealthy food commercial, there was a significant effect of regulatory fit (both prevention-fit and promotion-fit) on intentions to eat healthily.

To test for the hypothesized interactions, a hierarchical regression analysis was performed with attitudes toward unhealthy food consumption and intentions to eat healthily as the dependent variables between (a) regulatory orientation, (b) message focus and (c) message positioning. A correlational analysis conducted (see Table 12) showed the same five variables as having significant effect on the dependent variables and were therefore controlled for. They were age, gender, prior attitudes toward unhealthy food consumption, parental mediation, and food restraint.

A total of four multiple regression models were computed with scores from prevention and promotion sub-scales analyzed separately as the theoretical concepts of prevention and promotion concerns are orthogonal. Predictors were prevention orientation scores ($M = 3.02$, $SD = .50$, Cronbach's $\alpha = .72$) and promotion orientation scores ($M =$

3.16, $SD = .36$, Cronbach's $\alpha = .72$) measured from BIS/BAS scale developed by Carver and White (1994); focus of the health message (0 = prevention message and 1 = promotion message); and positioning of the health message (0 = before KFC commercial and 1 = after KFC commercial); and regulatory fit (either promotion fit or prevention fit); and the interaction between regulatory fit and message positioning. Two- and three-way interactions were examined by multiplying pairs of standardized variables and interpreted using the Aiken and West (1991) method. To create a measure of promotion fit, standardized promotion orientation scores was multiplied by focus of health message. To create a measure of prevention fit, standardized prevention orientation scores was multiplied by focus of health message. These multiplications result in two-way interaction terms. Regulatory fit (prevention-fit and promotion-fit) was then multiplied by message positioning to create three-way interaction terms. Tables 13 and 14 present the hierarchical regression results and the effects of the study variables on attitudes toward unhealthy food consumption and intentions to eat healthily.

Table 12 *Study 2 Bivariate Correlations among the Independent and Dependent Variables*

	1	2	3	4	5	6	7	8
1. Prevention Orientation Scores	-							
2. Promotion Orientation Scores	.106 [*]	-						
3. Attitudes toward Unhealthy Food Consumption	-.031	.040	-					
4. Intentions to Eat Healthily	.020	.093 [*]	-.463 ^{**}	-				
5. Age	-.049	.043	-.037	.151 ^{**}	-			
6. Prior Attitudes toward Unhealthy Food Consumption	.065	-.009	.773 ^{**}	-.366 ^{**}	-.029	-		
7. Parental Mediation	.019	.094 [*]	-.064	.175 ^{**}	.015	-.071	-	
8. Food Restraint	.172 ^{**}	.099 [*]	-.251 ^{**}	.368 ^{**}	.009	-.226 ^{**}	.141 ^{**}	-

Note: $N = 509$; ^{**} $p < .01$; ^{*} $p < .05$

Table 13 *Hierarchical Regression Analysis for Individuals' Prevention Orientation Scores, Health Message Focus and Message Positioning Predicting Attitudes toward Unhealthy Food Consumption and Intentions to Eat Healthily*

Variable	Attitudes toward unhealthy food β	Intentions to eat healthily β
Block 1: Control variables		
Age	-.02	.14***
Gender	.02	-.04***
Prior attitudes toward unhealthy food consumption	.76***	-.29***
Parental mediation	.00	.11**
Food restraint	-.07*	.28***
R^2	.60***	.25***
Block 2: Independent variables		
Individual's prevention orientation scores	.00	-.01
Health message focus	-.02	-.04
Message positioning	-.01	.03
Δ in R^2	.00	.00
Block 3: Two-way interaction		
Prevention orientation scores X Health message focus	.03	-.11*
Prevention orientation scores X Message positioning	.01	-.07
Health message focus X Message positioning	-.03	-.08
Δ in R^2	.00	.01
Block 4: Three-way interaction		
Prevention orientation scores X Health message focus X Message positioning	-.05	.12
Δ in R^2	.00	.01
Total R^2	.61***	.27***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 14 *Hierarchical Regression Analysis for Individuals' Promotion Orientation Scores, Health Message Focus and Message Positioning Predicting Attitudes toward Unhealthy Food Consumption and Intentions to Eat Healthily*

Variable	Attitudes toward unhealthy food β	Intentions to eat healthily β
Block 1: Control variables		
Age	-.02	.14***
Gender	.02	-.04
Prior attitudes toward unhealthy food consumption	.76***	-.29***
Parental mediation	.00	.11**
Food restraint	-.07*	.28***
R^2	.60***	.25***
Block 2: Independent variables		
Promotion orientation scores	.06*	.05
Health message focus	-.02	-.04
Message positioning	-.01	.03
Δ in R^2	.00	.01
Block 3: Two-way interaction		
Promotion orientation scores X Health message focus	-.05	.08
Promotion orientation scores X Message positioning	-.02	.10
Message positioning X Health message focus	-.03	-.07
Δ in R^2	.00	.01
Block 4: Three-way interaction		
Promotion orientation scores X Health message focus X Message positioning	.04	-.15
Δ in R^2	.00	.01
Total R^2	.61***	.27***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

The findings in Tables 13 and 14 showed only significant association between promotion orientation scores and attitudes toward unhealthy food consumption ($\beta = .06$, $t(500) = 1.99$, $p < .05$) but not between prevention orientation scores and attitudes toward unhealthy food consumption ($\beta = .00$, $t(500) = .00$, $p = 1.00$). In other words, only individuals who are more promotion oriented (but not prevention oriented) have a higher tendency to be persuaded by the health message. When the main effects of message focus and message positioning were computed together with prevention orientation scores, the results were not significant (message focus: $\beta = -.02$, $t(500) = -.63$, $p = .53$; message positioning: $\beta = -.01$, $t(500) = -.28$, $p = .78$). When the main effects of message focus and message positioning were computed together with promotion orientation scores, the results were also not significant (message focus: $\beta = -.02$, $t(500) = -.58$, $p = .56$; message positioning: $\beta = -.01$, $t(500) = -.26$, $p = .80$). These results suggest that there were no idiosyncrasies coming from the message characteristics. Attitudes toward unhealthy food consumption also did not vary according to whether the message was placed before or after the KFC commercial.

Findings further showed no significant two-way interaction effects between promotion orientation scores and message focus ($\beta = -.05$, $t(497) = -1.16$, $p = .25$); and prevention orientation scores and message focus ($\beta = .03$, $t(497) = .68$, $p = .50$) on attitudes toward unhealthy food consumption. These results suggested that regulatory fit does not influence attitudes toward unhealthy food consumption.

The three-way interaction effect of promotion orientation scores, message focus and message positioning was also found to be not significant ($\beta = .04$, $t(496) = .80$, $p = .42$) on attitudes toward unhealthy food consumption. Neither was there a significant three-way interaction effect of prevention orientation scores, message focus

and message positioning ($\beta = -.05$, $t(496) = -1.01$, $p = .31$). H3a and H3b are therefore not supported³.

As for intentions to eat healthily, the findings showed no significant association between promotion orientation scores and intentions to eat healthily ($\beta = .05$, $t(500) = 1.16$, $p = .25$), nor prevention orientation scores and intentions to eat healthily ($\beta = -.01$, $t(500) = -.28$, $p = .78$). When the main effects of message focus and message positioning were computed together with promotion orientation scores, the results were not significant (message focus: $\beta = -.04$, $t(500) = -1.12$, $p = .26$; message positioning: $\beta = .03$, $t(500) = .86$, $p = .39$). When the main effects of message focus and message positioning were computed together with prevention orientation scores, the results were also not significant (message focus: $\beta = -.04$, $t(500) = -1.14$, $p = .26$; message positioning: $\beta = .03$, $t(500) = .84$, $p = .40$).

Two-way interaction effects were however found to be significant only for prevention orientation scores and message focus ($\beta = -.11$, $t(497) = -2.00$, $p < .05$), but not for promotion orientation scores and message focus ($\beta = .08$, $t(497) = 1.58$, $p = .11$). Results indicated that regulatory fit was more likely to influence intentions to eat healthily for prevention-fit individuals.

Findings also revealed marginally significant three-way interaction effects of promotion orientation scores, message focus and message positioning ($\beta = -.15$, $t(496) = -1.95$, $p = .05$); as well as marginally significant effects of prevention orientation

³ The analyses were replicated using the regulatory orientation scores measured by the scale developed by Lockwood et al. (2002). Findings showed no significant association between prevention orientation and attitudes toward unhealthy food consumption ($\beta = -.02$, $t(500) = .28$, $p = .78$); only marginally significant association between promotion orientation and attitudes toward unhealthy food consumption ($\beta = .06$, $t(500) = 1.89$, $p = .06$). There were no two-way interaction effects between regulatory orientation and message focus (preventionXmessage: $\beta = .06$, $t(497) = 1.44$, $p = .15$; promotionXmessage: $\beta = -.04$, $t(497) = -1.07$, $p = .29$). There was, however, a significant three-way interaction effect among regulatory orientation, message focus and message positioning only for promotionXmessageXpositioning ($\beta = -.12$, $t(496) = -2.0$, $p < .05$) but not for preventionXmessageXpositioning ($\beta = -.01$, $t(496) = -.10$, $p = .92$) on attitudes toward unhealthy food consumption.

scores, message focus and message positioning ($\beta = .12$, $t(496) = 1.78$, $p = .08$)⁴. To investigate further into the nature of the three-way interaction effects, especially in relation to the positioning of the health message, further multiple regression analyses were performed.

As the aim of this study was to determine if regulatory fit is moderated by the presence of primacy or recency effects, the moderator (message positioning) was first input into SPSS data as spilt file (0 = before KFC commercial, 1 = after KFC commercial) before a hierarchical regression for main and two-way interaction effects was performed. Tables 15 and 16 present the hierarchical regression results for prevention and promotion regulatory fit and nonfit when health message was placed before and after the KFC commercial.

⁴ The analyses were replicated using the regulatory orientation scores measured by the scale developed by Lockwood et al. (2002). Findings showed a significant association between promotion orientation and intentions to eat healthily ($\beta = -.11$, $t(500) = 2.71$, $p < .01$) but not between prevention orientation and intentions to eat healthily ($\beta = .03$, $t(500) = .75$, $p = .45$). There were no significant two-way interaction effects between regulatory orientation and message focus (preventionXmessage: $\beta = -.08$, $t(497) = -1.46$, $p = .14$; promotionXmessage: $\beta = .02$, $t(497) = .29$, $p = .77$); nor three-way interaction effects among regulatory orientation, message focus and message positioning on intentions to eat healthily (preventionXmessageXpositioning: $\beta = .02$, $t(496) = .21$, $p = .83$; promotionXmessageXpositioning ($\beta = .02$, $t(496) = .30$, $p = .77$).

Table 15 *Hierarchical Regression Analysis for Individuals' Prevention Orientation Scores and Health Message Focus Predicting Intentions to Eat Healthily when the Health Message is Positioned Before and After the KFC Commercial*

Variable	Message positioning	
	Before β	After β
Block 1: Control variables		
Age	.09	.20***
Gender	-.02	-.06
Prior attitudes toward unhealthy food consumption	-.34***	-.24***
Parental mediation	.14*	.08
Food restraint	.25***	.30***
R^2	.26***	.26***
Block 2: Independent variables		
Prevention orientation scores	.06	-.07
Health message focus	-.00	-.09
Δ in R^2	.00	.01
Block 3: Two-way interaction		
Prevention orientation scores X Health message focus	-.20*	-.01
Δ in R^2	.02*	.00
Total R^2	.28***	.27***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

Table 16 *Hierarchical Regression Analysis for Individuals Promotion Orientation Scores and Health Message Focus Predicting Intentions to Eat Healthily when the Health Message is Positioned Before and After the KFC Commercial*

Variable	Message order	
	Before β	After β
Block 1: Control variables		
Age	.09	.20***
Gender	-.02	-.06
Prior attitudes towards unhealthy food consumption	-.34***	-.24***
Parental mediation	.14*	.08
Food restraint	.25***	.30***
R^2	.26***	.26***
Block 2: Independent variables		
Promotion orientation scores	-.02	.11*
Health message focus	-.00	-.09
Δ in R^2	.00	.02*
Block 3: Two-way interaction		
Promotion orientation scores X Health message focus	.18*	-.02
Δ in R^2	.02*	.00
Total R^2	.28***	.28***

Note: * $p < .05$; ** $p < .01$; *** $p < .001$

As shown in Tables 15 and 16, for the condition where the health message was presented before the KFC commercial, the results indicated significant two-way interaction effects between prevention orientation and health message focus ($\beta = -.20$, $t(246) = -2.60$, $p < .05$) as well as promotion orientation and health message focus ($\beta = .18$, $t(246) = 2.44$, $p < .05$). Figures 9 to 12 show that the effects of regulatory fit (both prevention-fit and promotion-fit) on intentions to eat healthily were only significant when the health message was presented before the KFC commercial.

To further interpret the findings of the significant interactions, simple slope tests were performed on intentions to eat healthily when prevention and promotion

orientation scores were centered at 1 standard deviation below the mean when the health message was presented before the KFC commercial. Figure 9 shows the prevention-focused health message slope to be significant, $F(1, 255) = 2.52, p = .01$ but not the promotion-focused health message slope, $F(1, 255) = -1.22, p = .23$. In other words, when presented with a prevention-focused health message, individuals showed significantly stronger intentions to eat healthily when their prevention orientation scores are high than low. Figure 11, on the other hand, shows the promotion-focused health message slope, $F(1, 255) = 1.40, p = .16$; and the prevention-focused health message slope, $F(1, 255) = -1.81, p = .07$ to be non-significant. This means that although individuals with higher promotion orientation scores showed greater intentions to eat healthily when presented with promotion-focused health message, the effects are weaker compared to prevention-fit. This perhaps also explains why earlier findings on two-way interaction effects were found to be significant only for prevention orientation scores and message focus, but not for promotion orientation scores and message focus. Nevertheless, the findings by and large showed significant three-way interaction effects and provided evidence for primacy effects for both prevention-fit and promotion-fit when health messages are presented before the KFC commercial. H4a and H4b are therefore supported.

Figure 9. Prevention orientation scores and message focus on intentions to eat healthily when health message is positioned *before* the fast food commercial.

Figure 10. Prevention orientation scores and message focus on intentions to eat healthily when health message is positioned *after* the fast food commercial.

Figure 11. Promotion orientation scores and message focus on intentions to eat healthily when health message is positioned *before* the fast food commercial.

Figure 12. Promotion orientation scores and message focus on intentions to eat healthily when health message is positioned *after* the fast food commercial.

Discussion

Study 2 was designed to test a different intervention approach using another form of health message presentation to counter messages from unhealthy food advertisers. Adopting a sequential presentation approach for this study, the health message was presented sequentially either before or after the KFC commercial. The purpose was to test for interaction effects, and to predict the moderating influence of message positioning on the effects of regulatory fit. The study tested the hypotheses that the effect of fit will be more pronounced for participants who experience a fit and when the health message was presented prior to viewing the KFC commercial. For these participants, it was predicted that they will have more negative attitudes toward unhealthy food consumption and higher intentions to eat healthily.

The findings supported H4a and H4b, and the moderating influence of primacy effects on intentions to eat healthily for individuals whose regulatory orientation matches the focus of the health message, i.e., prevention-fit and promotion-fit. It was found that the effects on fit were more pronounced when the health message appeared before the unhealthy food commercial. The results are therefore consistent with hypothesized predictions which demonstrated that regulatory fit influences persuasion in a way that when individuals “feel right” about the message, the fit experience contributes to processing fluency leading to greater motivation towards goal pursuit. The findings are also consistent with past studies on primacy effects which found that messages presented early established a cognitive framework from which later messages are interpreted. The moderating effects of message positioning on fit may be due to the experience of fit being activated earlier when the health message was presented first, resulting in participants being more motivated and persuaded by the health message. As such, by the time the participants were presented with the message

from the unhealthy food commercial that appeared later, the latter no longer has as much impact.

As for attitudes toward unhealthy food consumption (fast food), the results were similar to Study 1 - unfavorable with no significant interaction effects. As discussed in Study 1, it is interesting that Study 2 also yielded similar lack of findings on effects of health messaging, despite presenting the health message in a different format, on attitudes toward unhealthy food consumption. Considering that the lapse time in exposure between the health message and the KFC commercial was merely a fraction of a second, the influence of the health message is probably minimal despite the adoption of a sequential intervention approach. It can therefore be concluded that favorable attitudes formed towards fast food from repeated exposure to appealing food advertisements on television over a long period are unlikely to be altered with a one-time exposure to the health message.

Chapter 7: General Discussion and Conclusion

Prior research showed that cumulative exposure to unhealthy food advertised on television is associated with negative consequences on food preferences and dietary habits. In today's increasingly obesogenic environment, some governments have responded to the call for tighter measures to be taken against unhealthy food advertising on television. One new form of intervention is for food advertisers to carry mandatory health messages in their advertisements. Although this approach is not entirely novel as this strategy has been used to address other health issues like smoking and alcohol consumption, it is fairly innovative in trying to reverse the escalating trend in obesity. As no known study has yet surfaced to report on the effectiveness of such a strategy, this research was undertaken to investigate the effectiveness of health messages in countering commercial food advertising on television. The purpose of the research was achieved through conducting a pre-study to first establish the amount of unhealthy food advertising on US, China and Singapore television and two experimental studies guided by the regulatory fit theory.

The results of the pre-study showed that, over a period of four weeks (28 days), viewers in these three countries are exposed to very high amounts of unhealthy food advertisements on prime-time television. The content includes sugared beverages and processed food high in sugar, fat and salt. These foods constitute over half of all food advertisements in US, China, and Singapore, and far exceed the nutritional guidelines provided by health authorities. According to the USDA blueprint for healthy eating, half of daily meals should be made up of fruits and vegetables and another half, food rich in grains and proteins. These nutritious foods, however, only have insignificant representations on US and Singapore television, while China does not even have any of these healthy foods advertised on television. The pre-study findings support

numerous studies which found high imbalances of non-nutritious foods promoted on television.

The findings of the pre-study further confirmed the absence of televised PSAs to counter the high content of unhealthy food promoted on prime-time television in all the three countries. This means that television viewers are not being warned of the risks when they over-indulge in calorie-rich foods or be informed to avoid consuming excessive amounts of such foods and to adopt a diet make up of healthier foods. Two experimental studies were subsequently designed to examine the effectiveness of different presentation formats of televised health messages to counter the influence of messages from unhealthy advertisements. Applying the Regulatory Fit Theory, the theoretical framework was developed and the effectiveness of two presentation formats – simultaneous and sequential – were investigated on attitudes toward unhealthy food consumption and intentions to eat healthily.

Study 1 was an experiment to test the hypotheses that if the health message was stripped across an unhealthy food commercial and presented simultaneously with messages from the unhealthy food commercial, participants who experience a fit are likely to have more negative attitudes toward unhealthy food consumption and greater intentions to eat healthily. The findings showed significant interaction effects only for individuals who are promotion-fit but not prevention-fit on intentions to eat healthily. One explanation for the inactivation of fit could be attributed to the simultaneous presentation of the prevention-focused health message and messages from unhealthy food commercial. The arousal of anxiety coupled with no time given to resolve the cognitive dissonance created by both competing sets of messages probably resulted in the non-significant interaction effect for prevention-fit. This evidence indicated only partial support for regulatory fit.

Study 2 predicted that participants who experience a fit are likely to have more negative attitudes toward unhealthy food consumption and greater intentions to eat healthily if they are presented the health message before instead of after the unhealthy food commercial (sequential format). The results indicated significant interaction effects for both prevention-fit and promotion-fit participants on intentions to eat healthily when the health message is positioned before the KFC commercial, although the effects are greater for prevention-fit. This strong evidence provides support for the moderating influence of message positioning on regulatory fit. The findings are thus consistent with past studies on regulatory fit and the processing of persuasive appeals which suggest that when the message is presented first, it serves as a guide in interpreting subsequent messages. One possible explanation for the presence of primacy effects could be because participants are able to experience a fit earlier when the health message is presented first, thus reducing the persuasiveness of the messages from the unhealthy food commercial which appeared later.

However, contrary to hypothesized predictions on attitudes toward unhealthy food consumption, results from both Studies 1 and 2 indicated that the airing of health messages did not reduce the persuasiveness of the messages from the unhealthy food commercial. There were no significant interaction results on attitudes toward unhealthy food consumption regardless of presentation style. As individuals' positive attitudes and love for fast food are probably acquired over several decades of consuming the food and watching appealing food advertisements, attempts to alter attitudes will certainly need more than just one exposure to a health message.

Further, the utilization of health messages could be conceived as a direct challenge to the dominant messages in unhealthy food advertisement which viewers have come to like due to the "feel good" appeals of these advertisements. This may

have a boomerang effect similar to advertising strategies that have demonized the tobacco industry. The thought of having to deny the bodily cravings of unhealthy food probably proves too much for many individuals who grew up with such food. However, more research is needed to unravel the effects of health messages in changing attitudes.

The results could also be partly due to the measurement limitation of the study as the participants were only exposed to the health message once. As past studies have shown, frequency matters. Petty and Cacioppo (1996) reasoned that if viewers were “already motivated to think about a message, repeating the message several times ... would give people a greater opportunity to think about the implications of the message. If the message contained compelling arguments of some complexity, people might generate additional favorable implications of the arguments with each repetition” (p. 239). In other words, the more frequent viewers are exposed to the health messages on television, the more likely they are able to recall and think about the implications of the message to their health. With constant reminders to consume healthier food, viewers’ attitudes towards consuming unhealthy food may eventually alter. Hence, future researchers may wish to consider designing experiments to include the screening of a television program with several commercial breaks so that the health message gets to appear more than once.

Another limitation of this study is that intentions to eat healthily was measured instead of actual behavior. It is worthy to note that intentions and actual behaviors may be closely correlated but not necessarily the same. There may be other intervening variables that may affect intentions and actual behaviors. Also, given the arousal explanation for the null effect of prevention-fit in Study 1 is post hoc, future research

may wish to examine whether cognitive dissonance moderate the effect of regulatory fit on health message outcomes.

Considering that food advertisers are very creative in adopting different persuasive appeals in their advertisements, future studies may further wish to investigate the effects of fit using other types of stimuli that promote lifestyles or other values such as romance, love, dating, filial piety or friendship. One reason for choosing this particular KFC commercial as the stimuli for this study is because it promoted the consumption of its chicken wings. The results may have been different if other emotions were primed.

In addition, scores from two different sets of scales, the GRFM developed by Lockwood, et al. (2002) and BIS/BAS developed by Carver and White (1994), were used for data analyses for Studies 1 and 2 respectively. The rationale for using three different scales to measure participants' regulatory orientation was because few studies conducted in multicultural Singapore measured regulatory orientation of Singaporeans, many of whom are effectively bi-lingual in English and another Asian language. The decision to use several scales was to determine a suitable scale that best captures the prevention and promotion orientation of Singaporeans. Both studies were unable to employ the RFQ scale by Higgins, et al. (2001) due to a low Cronbach's α of its promotion orientation sub-scale. Future researchers may wish to use the GRFM developed by Lockwood, et al. (2002) for an undergraduate sample and the BIS/BAS developed by Carver and White (1994) for a non-undergraduate sample if they plan to conduct similar research in Singapore. Future studies may also wish to explore how culture, such as bi-culture or multi-culture populations, or certain personality traits could influence the efficacy of these different regulatory orientation measures.

The good news though is that, despite evidence not supporting attitude change, the results largely provided support for intentions to eat healthily. In other words, although individuals may be reluctant to alter their positive attitudes and love for unhealthy food, they have indicated their intentions and willingness to want to eat healthily. Results demonstrated that when the focus of the health message is framed to align with individuals' regulatory orientation, the experience of fit influences and motivate participants to want to pursue a healthy diet. However, given that the effect of regulatory fit may be unstable, it is important to take into consideration other factors that influence it. This study also identified presentation formats and order of message as key determinants of the message framing efficacy in personalizing health communication.

Applied implications. Designed to be applied relevant, the findings of this research highlight the importance of regulatory fit and presentation formats on intentions to eat healthily. There are also clear implications for public health policy and intervention. As the association of television viewing with obesity has long been recognized, policymakers in US, China and Singapore may wish to consider changing the food advertising environment to one where consumption of nutritious foods are effectively promoted and unhealthy food highly discouraged. For health authorities planning to curb the influence of unhealthy food advertising on television, two strategies can be considered. They can promote healthy eating or prevent consumption of unhealthy food by making unhealthy food advertisers carry mandatory health messages in their advertisements. Alternatively, they may wish to consider running PSAs containing health messages alongside unhealthy food commercials.

For either strategy, particularly from the theoretical lens of regulatory fit, health campaigns designed to persuade the public to eat healthily are more likely to be

successful if they focus on people's intentions to eat healthily and less on altering attitudes and their liking for unhealthy food. Results from this research showed that intentions are easier to change by achieving regulatory fit and varying presentation formats of the health message than attitudes. Past literature has also shown that it takes more effort and time to change attitudes. While people may be mindful that they need to eat healthily, changing their positive attitudes towards unhealthy food consumption (such as fast food) which have probably been formed over a long period of time may be more challenging. Campaigns to alter attitudes may therefore need to adopt a longer term perspective with repeated exposure to health messages that advocate healthy eating.

If the strategy is to make food advertisers carry mandatory health messages in their advertisements, health practitioners may wish to craft and frame the health message to emphasize gains and not nonlosses. Study 1 findings showed that stripping the health message across the unhealthy food commercial and presenting it in a simultaneous format, promotion-fit participants are more persuaded to want to eat healthily; whereas a nonloss frame may trigger anxiety with insufficient time given for individuals to resolve the cognitive dissonance created between belief and the call for action. This form of intervention, however, is controversial as it may mean having to manage strong reactions from food advertisers who would argue that such an approach jeopardizes commercial interests.

If health practitioners opt to adopt the strategy of presenting PSAs containing health messages to promote healthy eating in a sequential format, since regulation is a risky business, they may wish to craft two sets of messages. As the findings of Study 2 indicated, one set should be framed to emphasize gains for viewers who are high in promotion orientation and a second set to be framed to emphasize nonlosses for those

high in prevention orientation, and to alternate the running of both sets of messages. Equally important is to ensure that the PSAs come on early and at the start of the commercial break before the screening of any unhealthy food advertisements. While this strategy is more likely to be better received by commercial lobby groups, health authorities need to allocate a bigger advertising budget for such a campaign.

This study has further shed light on other factors that health authorities may wish to take into consideration when implementing campaigns. Results showed that prior attitude is a stronger predictor as compared to the effect of regulatory fit combined with message positioning. As such, it is important to recognize the impact of prior attitudes when designing health messages. One approach is to adopt an integrated campaign that targets parents as well, since parental mediation has also been shown to be a consistent predictor of intentions, along with a televised health campaign. Interventions to change intentions (or attitudes in the longer term) should also aim to address and make parents aware of the impact of their own eating behaviors on the eating habits of their children. By working closely with parents such as educating them or providing support to meet the nutritional needs in the family, health authorities and policy makers may be better assured of higher success rates in their campaigns.

In conclusion, with obesity increasing at an alarming rate across the globe, there is an urgency to arrest this health risk which is responsible for the deaths of three million adults every year. Although the prevalence of obesity worldwide is due to multiple factors, many studies have demonstrated the association between the depiction of food on television and weight gain. Hence, more research is needed to focus on theory-based health interventions that are effective in countering excessive promotion of unhealthy food on television. It is hoped that this study, designed with the use of theory to guide practice in mind, will equip practitioners with

communication strategies in designing campaigns aimed at protecting the health of the public.

Appendices

Appendix A: Pre-study Coding Sheet

Content Analysis of Food Ads on Prime-Time TV in Singapore, US & China

Coder ID _____

Ad No _____

SECTION 1

Country Channels (CtryCh)

Singapore	
Ch 5	0
Ch 8	1
Ch U	2

US	
ABC	3
NBC	4
CBS	5

China	
BTV 1	6
BTV 6	7
CCTV 6	8

Date of Broadcast (DateB)

Singapore	
19 Feb	0
20 Feb	1
21 Feb	2
22 Feb	3
23 Feb	4
24 Feb	5
25 Feb	6
26 Feb	7
27 Feb	8
28 Feb	9
1 Mar	10
2 Mar	11
3 Mar	12
4 Mar	13
5 Mar	14
6 Mar	15
7 Mar	16
8 Mar	17
9 Mar	18
10 Mar	19
11 Mar	20
12 Mar	21
13 Mar	22
14 Mar	23
15 Mar	24
16 Mar	25
17 Mar	26
18 Mar	27
19 Mar	28
20 Mar	29
21 Mar	30

US	
1 Feb	0
2 Feb	1
3 Feb	2
4 Feb	3
5 Feb	4
6 Feb	5
7 Feb	6
8 Feb	7
9 Feb	8
10 Feb	9
11 Feb	10
12 Feb	11
13 Feb	12
14 Feb	13
15 Feb	14
16 Feb	15
17 Feb	16
18 Feb	17
19 Feb	18
20 Feb	19
21 Feb	20
22 Feb	21
23 Feb	22
24 Feb	23
25 Feb	24
26 Feb	25
27 Feb	26
28 Feb	27

China	
1 Mar	0
2 Mar	1
3 Mar	2
4 Mar	3
5 Mar	4
6 Mar	5
7 Mar	6
8 Mar	7
9 Mar	8
10 Mar	9
11 Mar	10
12 Mar	11
13 Mar	12
14 Mar	13
15 Mar	14
16 Mar	15
17 Mar	16
18 Mar	17
19 Mar	18
20 Mar	19
21 Mar	20
22 Mar	21
23 Mar	22
24 Mar	23
25 Mar	24
26 Mar	25
27 Mar	26
28 Mar	27
29 Mar	28

22 Mar	31
23 Mar	32

Major Food & Beverage Groups (Fd&BvGps)

Rice & Alternatives	0	Fats, Oil, Sugar & Salt	4
Meat & Alternatives	1	Medication, Supplements & Vitamins	5
Vegetables	2	Beverages	6
Fruits	3	Others (to describe)	7

Specific Food & Beverage (SpFdBv)

Meat/poultry/eggs/seafood	0	Drugs/pharmaceutical products	11
Grain food	1	Instant noodles	12
Cereals/biscuits	2	Chinese herbal products	13
Breads and dairy	3	Canned food/preserved food	14
Fats and oil	4	Fast food, dine-ins, supermarkets & other clusters (further divided into 15 a, b,c)	15
Desserts/salty snacks/ice-cream/chips/jello	5	Others (food)	16
Candy/chocolate	6	Milk/infant formula	17
Dressings/sauces/gravy/seasonings	7	Health drinks	18
Vegetables and fruits	8	Soft drinks/soda/isotonic drinks/coffee/tea/juices	19
Frozen food	9	Alcoholic drinks	20
Health supplements	10	Other beverages	21

Fast Food & Dine-In Restaurants

McDonald's	0	Wendy's	11
Kentucky Fried Chicken (KFC)	1	Other fast food (to describe)	12
Burger King	2	Pizza joints	13
Subway	3	Steamboat	14
Taco Bell	4	Seafood	15
Popeye Fried Chicken	5	Chinese food	16
A & W	6	Western food	17
Sonic	7	Indian food	18
Jack in the Box	8	Malay food	19
Dairy Queen	9	Fusion food/bar	20
Church's	10	Other dine-in restaurants (to describe)	21

Length of Advertisements (Adlength)

5 secs	0
10 secs	1
15 secs	2
20 secs	3

25-30 secs	4
45-60 secs	5
Others	6

Health Claims (HealthClaims) – Absent (0) Present (1)

Low calorie (0)	0/1
Low fat/fat free/no trans fat (1)	0/1
Low cholesterol/good for heart (2)	0/1
Less sugar/sugar free (3)	0/1
High in fiber (4)	0/1
High in calcium (5)	0/1
Rich in vitamins/contains vitamins (6)	0/1
Rich in minerals (7)	0/1
High protein/DHA (8)	0/1
Sodium/less salt (9)	0/1

No preservatives (10)	0/1
No artificial flavors/coloring (11)	0/1
No MSG (12)	0/1
Fresh/original (13)	0/1
Natural (14)	0/1
Essential for health/nutritious/good for development (15)	0/1
Strengthens immune system (16)	0/1
Cures or relieves pain/body aches/joints/constipation/indigestion (17)	0/1
Healthier choice (including symbol) (18)	0/1
Other health claims (19)	0/1

General Claims and No Claims (GenClaims) – Absent (0) Present (1)

No claims (0)	0/1
Great taste (1)	0/1
Change of mood (2)	0/1
Freshness (3)	0/1
A better life/quality life/great body (4)	0/1
Smart choice/best/no.1 (5)	0/1

Academic improvements (6)	0/1
Self efficacy (7)	0/1
Social status enhancements (8)	0/1
Energetic (9)	0/1
Cultural claims (10)	0/1
Value for money/free gifts & others (11)	0/1

SECTION 2

Health Authority Advertisements / Announcements / Warnings

Frequency	Type of health message
1	
2	
3	
4	
5	

Frequency	Type of health message
6	
7	
8	
9	
10	

SECTION 3

Non-Food Advertisements Record (A Channel Per Day)

Country _____

Date of Broadcast _____

Channel _____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85
86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	101	102
103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119
120	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136

Appendix B: Pre-Study Codebook

Coding Guidelines

Sample Description

The sample consists, for each country, 28 DVDs per channel, 84 DVDs from three channels; and a total of 252 DVDs from three countries. The channels are as follow:

1. Singapore: Channels 5, 8 & U
2. US: Channels ABC, NBC & CBS
3. China: BTV1, CCTV6 & BTV6

Instructions

1. Each DVD consists of four television hours. This is the same for all channels across three countries
 2. Units of analyses are a) food advertisements; b) public service announcements/health authority advisory or warnings; and c) non-food advertisements. The detailed coding process and focus are on food advertisements where you will need to observe for specific elements. As for public service announcements/health authority advisory or warnings, note only the frequency and types of health messages; whereas only the frequency of non-food advertisements are to be noted
 3. Code only for observations that you were briefed during training. The coding sheet with the prescribed categories provides a guide for coding
 4. When coding the food advertisements and public service announcements, be sure to spell out your observations in the original language that is used in the advertisements. For example, if the advertisement claims are in English, you are to provide the description in English where applicable. The same goes for food advertisements broadcast in Mandarin
-

SECTION 1

For Every Food and Beverage Advertisement

Please use only the coding value assigned to the prescribed categories.

Country Channels – Choose 1

Singapore	
Ch 5	0
Ch 8	1
Ch U	2

US	
ABC	3
NBC	4
CBS	5

China	
BTV 1	6
BTV 6	7
CCTV 6	8

Date of Broadcast – Choose 1

For some channels, you will find that the dates to be coded are not continuous. Simply indicate the coding value assigned to the broadcast date written on the recorded DVD.

Singapore
19 Feb – 23 Mar 2010

US
1-28 Feb 2010

China
1-29 Mar 2010

Major Food and Beverage Groups – Choose 1

This segment categorizes different types of food and beverage and groups according to similar make-ups and components.

Rice & Alternatives	0
Meat & Alternatives	1
Vegetables	2
Fruits	3

Fats, Oil, Sugar & Salt	4
Medication, Supplements & Vitamins	5
Beverages	6
Others (to describe)	7

1. Rice and alternatives would include foods high in carbohydrates. They include all types of rice, noodles, pasta, bread, rice, prata, potatoes, cereals and grain biscuits etc. Foods which are made mostly from grains and flour falls into this category
2. Meat and alternatives include all red and white meat, such as beef, pork, mutton, chicken, duck, fish and veal
3. Vegetables include all leafy and non-leafy ones. It also includes roots, stems and bulbs such as onions and ginger. Tomatoes, although scientifically considered a fruit, should be coded in this category
4. Fruits – examples are the likes of apples, oranges, strawberries, pineapples, durians blueberries, bananas, peaches etc.
5. Fats, Oil, Sugar & Salt include a variety of foods. They are foods made mostly of one of these four components such as butter, cheese, candy, chocolates, potato chips, cooking oil, coconut oil, jello, biscuits rich in sugar or cream etc.
6. Medication, supplements and vitamins would include all medicated or pharmaceutical drugs, pills that supposed to contain vitamins and health-enriching content to boost health
7. Beverages refers to all forms of liquid, alcohol and non-alcohol
8. Any others that do not fall into any of the defined categories should go to “Others”. Please provide a description of what these are, such as a cluster of food that comprises a variety of food types and therefore does not fall into a specific food group.

Specific Food and Beverage – Choose 1

Meat/poultry/eggs/seafood	0	Drugs/pharmaceutical products	11
Grain food	1	Instant noodles	12
Cereals/biscuits	2	Chinese herbal products	13
Breads and dairy	3	Canned food/preserved food	14
Fats and oil	4	Fast food, dine-ins, supermarkets & other clusters (further classified into 15 a, b, c)	15
Desserts/salty snacks/ice cream/chips/jello	5	Others (food)	16
Candy/chocolate	6	Milk/infant formula	17
Dressings/sauces/gravy/seasonings	7	Health drinks	18
Vegetables and fruits	8	Soft drinks/soda/isotonic drinks/coffee/tea/juices	19
Frozen food	9	Alcoholic drinks	20
Health supplements	10	Other beverages	21

This segment is an expansion of the above. You are to indicate the specific food and beverage food here. Here are the descriptions of certain food categories which you may wish to pay more attention to:

1. Cereals and biscuits refer to the ones which are “healthier” such as baked biscuits or with yogurt fillings etc. For biscuits which are less healthy, such as oreo, they would fall into “Desserts/salty snacks/ice-cream/chips/jello”
2. Frozen food includes any food that is microwavable and ready for consumption without the need to prepare for it
3. Chinese herbal products are body enhancing foods consumed by most Asians and which are supposed to provide specific nutrients to the body. They include “Brands Chicken Essence”, “Bird’s Nest” and “Ginseng” etc.
4. Cluster of foods is divided into three sub-categories. They are classified as mentioned because these foods are usually advertised as a set comprising a variety of different foods such as a MacDonald’s value meal that shows a burger, a drink and fries. The same concept applies to dine-in restaurants and supermarkets. Also, to allow the analysis of the amount of fast food advertising, all fast food advertisements, regardless the advertised food is a set meal or a singular food type, are to be captured under this category
5. Any other foods that do not fall into the defined categories are to fall into “Others (food)” category. Please provide a description of the type of food here
6. Health drinks refers to drinks such as Yakult or Vitagen or contains Collagen etc.
7. Any other types of drinks that are not considered as any of the defined drink categories are to be indicated as “Other beverages.” Please provide a description of the drink.

Fast Food and Dine-In Restaurants – Choose 1

McDonald's	0
Kentucky Fried Chicken (KFC)	1
Burger King	2
Subway	3
Taco Bell	4
Popeye Fried Chicken	5
A & W	6
Sonic	7
Jack in the Box	8
Dairy Queen	9
Church's	10

Wendy's	11
Other fast food (to describe)	12
Pizza joints	13
Steamboat	14
Seafood	15
Chinese food	16
Western food	17
Indian food	18
Malay food	19
Fusion food/bar	20
Other dine-in restaurants (to describe)	21

This segment splits the “Fast food” and “Dine-in restaurants” categories further from the previous segment. Any other fast food joints or dine-in restaurants that do not fall into any of the defined category such as “Whataburger” or “Long John’s Silver” are to be captured under “Other fast food” or “Other dine-in restaurants.”

Length of Advertisements – Choose 1

Please round up to the closest category

5 secs	0
10 secs	1
15 secs	2
20 secs	3

25-30 secs	4
45-60 secs	5
Others	6

Health Claims – Code: No 0 and Yes 1 (NOT mutually exclusive)

Code according to the number of claims present in the advertisement

Low calorie (0)	0/1
Low fat/fat free/no trans fat (1)	0/1
Low cholesterol/good for heart (2)	0/1
Less sugar/sugar free (3)	0/1
High in fiber (4)	0/1
High in calcium (5)	0/1
Rich in vitamins/contains vitamins (6)	0/1
Rich in minerals (7)	0/1
High protein/DHA (8)	0/1
Sodium/less salt (9)	0/1

No preservatives (10)	0/1
No artificial flavors/coloring (11)	0/1
No MSG (12)	0/1
Fresh/original (13)	0/1
Natural (14)	0/1
Essential for health/nutritious/good for development (15)	0/1
Strengthens immune system (16)	0/1
Cures or relieves pain/body aches/joints/constipation/indigestion (17)	0/1
Healthier choice (including symbol) (18)	0/1
Other health claims (19)	0/1

No Claims and General Claims (NOT mutually exclusive)

Code according to the number of claims present in the advertisement

No claims (0)	0/1	Academic improvements (6)	0/1
Great taste (1)	0/1	Self efficacy (7)	0/1
Change of mood (2)	0/1	Social status enhancements (8)	0/1
Freshness (3)	0/1	Energetic (9)	0/1
A better life/quality life/great body (4)	0/1	Cultural claims (10)	0/1
Smart choice/best/no.1 (5)	0/1	Value for money/free gifts & others (11)	0/1

Please note that the meaning of “Freshness” here differs from “Fresh/Original” category in the segment just before, such as “feeling of freshness” or “fried chicken wings that comes right out from the frying pan” etc. Please indicate 0 for “No Claims” when an advertisement does not have any health nor general claims.

SECTION 2

For Public Service Announcements / Health Authority Advisory or Warnings

Please note the frequency of such advertisements and provide a description of the type of health message.

Frequency	Type of health message	Frequency	Type of health message
1		9	
2		10	
3		11	
4		12	
5		13	
6		14	
7		15	
8		16	

SECTION 3

For Non-Food Advertisement Record

Please note and count frequency of non-food and beverage advertisements in this section

Appendix C: Pre-Study Inter-Coder Reliability Indices (*Ir*)

Variables / Categories	US n=356	China n=344	Singapore n=352
Country Channel	1.00	1.00	1.00
Date of Broadcast	1.00	1.00	1.00
Types of Food Promotion	0.97	1.00	0.93
Food & Beverage Groups	0.92	1.00	0.95
Specific Food & Beverage	0.91	0.94	0.94
Food & Beverage Promotional Avenues	0.98	1.00	0.93
Fast Food & Dine-In Restaurants	0.99	0.99	1.00
<u>Health Claims</u>			
Low calorie	0.96	1.00	0.99
Low fat/fat-free/no trans fat	0.98	1.00	0.97
Low cholesterol/good for heart	1.00	1.00	1.00
Less sugar/sugar-free	0.99	0.99	0.98
High in fibre	0.99	1.00	0.99
High in calcium	0.99	1.00	1.00
Rich in vitamins/contains vitamins	0.98	0.95	0.96
Rich in minerals	0.99	0.96	0.99
High proteins/DHA	0.99	1.00	0.99
Sodium/less salt	0.99	1.00	1.00
No preservatives	1.00	1.00	0.99
No artificial flavors/coloring	0.99	1.00	1.00
No MSG	1.00	1.00	1.00
Fresh/original	0.99	0.92	0.99
Natural	0.95	0.95	0.97
Essential for health/overall development	0.98	0.87	0.97
Strengthens immune system	0.99	1.00	0.96
Cures or relieves pain/constipation/indigestion/body aches/joints	0.96	0.98	0.98
Healthier choice symbol	0.96	0.90	0.99
Other health claims	0.87	0.74	0.85
<u>No Claims / General Claims</u>			
No claims	0.84	0.80	0.85
Great taste	0.81	0.76	0.84
Change of mood	0.94	0.96	0.92
Refreshing	0.94	0.92	0.93
Better life/quality of life	0.89	0.83	0.92
Smart or right choice/number 1 choice	0.92	1.00	0.95
Academic improvement/claims	1.00	1.00	1.00
Self efficacy enhancements	0.99	0.99	0.97
Social status enhancements	1.00	1.00	0.99
Energetic	0.97	0.90	0.99
Cultural claims, e.g. filial piety	1.00	0.99	1.00
Value for money/free gifts & others	0.75	0.91	0.78
Length of commercial	0.95	0.91	0.87

Ir is the inter-coder reliability index found in Perreault and Leigh (1989, p. 141 formula (7))

Appendix D: Screenshots of Study 1, Condition 1

Condition 1 - Prevention-Focused Health Message

Screen 1

Screen 2

Screen 3

Appendix E: Screenshots of Study 1, Condition 2

Condition 2 - Promotion-Focused Health Message

Screen 1

Screen 2

Screen 3

Appendix F: Screenshots of Study 2, Condition 1

Condition 1 - Prevention-Focused Health Message Presented **BEFORE** KFC Commercial

Screen 1

Screen 2

Screen 3

Screen 2

Screen 4

Screen 4

Appendix G: Screenshots of Study 2, Condition 2

Condition 2 - Prevention-Focused Health Message Presented **AFTER** KFC Commercial

Screen 1

Screen 2

Screen 3

Screen 4

Appendix H: Screenshots of Study 2, Condition 3

Condition 3 - Promotion-Focused Health Message Presented **BEFORE** KFC commercial

Screen 1

Screen 2

Screen 3

Screen 4

Screen 4

Appendix I: Screenshots of Study 2, Condition 4

Condition 4 - Promotion-Focused Health Message Presented **AFTER** KFC commercial

Screen 1

Screen 2

Screen 3

Screen 4

Appendix J: Setup of Computer Laboratory

Appendix K: Part 1 Questionnaire

PARTICIPANT CONSENT FORM

Dear Participant,

STUDY ON MEDIA AND YOUTH IN SINGAPORE

This study is being conducted to better understand youth in Singapore.

There are two (2) parts to this study. The first part requires you to fill up a 15-20 minute questionnaire and the second part requires you to return on another day to watch a short video followed by another 15 minute questionnaire.

All information obtained in this study will be kept strictly confidential. When reporting the findings, we will make every effort to keep all identifying information confidential, including your name. All procedures involved have been approved by the Institutional Review Board at Nanyang Technological University. Any queries regarding this study can be addressed to Ms Yeo Su Lin, Doctoral Candidate, Wee Kim Wee School of Communication and Information at email yeos0040@ntu.edu.sg or mobile number 98455457.

As an appreciation for your participation, you will receive an incentive of S\$12 cash. This is on condition that you have participated in the full 2-part study held over two days. Kindly complete the Participation Agreement Slip below and return it to Ms Yeo Su Lin. If you do not wish to participate, please indicate it on the sheet as well. We look forward to your participation in this study.

Participant Agreement Slip

I, _____

(Name) _____ (NRIC/FIN), hereby indicate that I have fully understood the above information and **AGREE / DISAGREE*** to participate in the study on Media and Youth in Singapore.

**Please delete if not applicable*

Signature / Date

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Mobile phone number

Please note: There are no anticipated risks, beyond those encountered in daily life, by participating in this study. Your participation in this study is completely voluntary, and you may withdraw from this study at any time without penalty. Just inform the researcher that you no longer wish to participate. However, you will not receive monetary compensation for premature withdrawal. Your participation will remain confidential, and your identity will not be linked to your name or other identifying information. Results of this study may be presented at conferences and/or published in books, journals and/or in the popular media.

This questionnaire comprises several sections. For each statement or question, you are to use a pencil and **SHADE** the answer (only one) that best describes you. Please respond to **ALL** the questions and do not leave any blank. There are no right or wrong answers. We just want to know your thoughts. Your honesty is appreciated.

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For Official Use

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①	①	①
①	①	①
②	②	②
③	③	③
④	④	④
⑤	⑤	⑤
⑥	⑥	⑥
⑦	⑦	⑦
⑧	⑧	⑧
⑨	⑨	⑨

SECTION 1 For every question or statement below, please shade ONE answer that best describes you.

1	Compared to most people, are you typically unable to get what you want out of life?	Never or seldom ①	②	Sometimes ③	④	Very often ⑤
2	Growing up, would you ever “cross the line” by doing things that your parents would not tolerate?	Never or seldom ①	②	Sometimes ③	④	Very often ⑤
3	How often have you accomplished things that got you “psyched” to work even harder?	Never or seldom ①	②	A few times ③	④	Many times ⑤
4	Did you get on your parents’ nerves often when you were growing up?	Never or seldom ①	②	Sometimes ③	④	Very often ⑤
5	How often did you obey rules and regulations that were established by your parents?	Never or seldom ①	②	Sometimes ③	④	Always ⑤
6	Growing up, did you ever act in ways that your parents thought were objectionable?	Never or seldom ①	②	Sometimes ③	④	Very often ⑤
7	Do you often do well at different things that you try?	Never or seldom ①	②	Sometimes ③	④	Very often ⑤
8	Not being careful enough has gotten me into trouble at times?	Never or seldom ①	②	Sometimes ③	④	Very often ⑤
9	When it comes to achieving things that are important to me, I find that I don’t perform as well as I ideally would like to do.	Never true ①	②	Sometimes true ③	④	Very often true ⑤
10	I feel like I have made progress toward being successful in my life.	Certainly false ①	②	③	④	Certainly true ⑤
11	I have found very few hobbies or activities in my life that capture my interest or motivate me to put effort into them.	Certainly false ①	②	③	④	Certainly true ⑤

SECTION 2 For every statement below, please shade ONE answer that best describes you.

		Not at all true of me									Very true of me
1	In general, I am focused on preventing negative events in my life.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
2	I am anxious that I will fall short of my responsibilities and obligations.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
3	I frequently imagine how I will achieve my hopes and aspirations.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
4	I often think about the person I am afraid I might become in the future.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
5	I often think about the person I would ideally like to be in the future.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
6	I typically focus on the success I hope to achieve in the future.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
7	I often worry that I will fail to accomplish my academic goals.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
8	I often think about how I will achieve academic success.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
9	I often imagine myself experiencing bad things that I fear might happen to me.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
10	I frequently think about how I can prevent failures in my life.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
11	I am more oriented toward preventing losses than I am toward achieving gains.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
12	My major goal in school right now is to achieve my academic ambitions.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
13	My major goal in school right now is to avoid becoming an academic failure.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
14	I see myself as someone who is primarily striving to reach my “ideal self” – to fulfil my hopes, wishes, and aspirations.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
15	I see myself as someone who is primarily striving to become the self I “ought” to be – to fulfil my duties, responsibilities, and obligations.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
16	In general, I am focused on achieving positive outcomes in my life.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
17	I often imagine myself experiencing good things that I hope will happen to me.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	
18	Overall, I am more oriented toward achieving success than preventing failures.	①	②	③	④	⑤	⑥	⑦	⑧	⑨	

SECTION 3 For every statement below, please shade **ONE** answer that best describes you.

		Very FALSE for me	Somewhat FALSE for me	Somewhat TRUE for me	Very TRUE for me
1	A person's family is the most important thing in life.	①	②	③	④
2	Even if something bad is about to happen to me, I rarely experience fear or nervousness.	①	②	③	④
3	I go out of my way to get things I want.	①	②	③	④
4	When I'm doing well at something I love to keep at it.	①	②	③	④
5	I'm always willing to try something new if I think it will be fun.	①	②	③	④
6	How I dress is important to me.	①	②	③	④
7	When I get something I want, I feel excited and energized.	①	②	③	④
8	Criticism or scolding hurts me quite a bit.	①	②	③	④
9	When I want something I usually go all-out to get it.	①	②	③	④
10	I will often do things for no other reason than that they might be fun.	①	②	③	④
11	It's hard for me to find the time to do things such as get a haircut.	①	②	③	④
12	If I see a chance to get something I want I move on it right away.	①	②	③	④
13	I feel pretty worried or upset when I think or know somebody is angry at me.	①	②	③	④
14	When I see an opportunity for something I like I get excited right away.	①	②	③	④
15	I often act on the spur of the moment.	①	②	③	④
16	If I think something unpleasant is going to happen I usually get pretty "worked up."	①	②	③	④
17	I often wonder why people act the way they do.	①	②	③	④
18	When good things happen to me, it affects me strongly.	①	②	③	④
19	I feel worried when I think I have done poorly at something important.	①	②	③	④
20	I crave excitement and new sensations.	①	②	③	④
21	When I go after something I use a "no holds barred" approach.	①	②	③	④
22	I have very few fears compared to my friends.	①	②	③	④
23	It would excite me to win a contest.	①	②	③	④
24	I worry about making mistakes.	①	②	③	④

SECTION 4 Please **WRITE** your answers in the blank space provided below (e.g. 0 hours, 0.5 hours, 4 hours etc.).

1. Usually, from Mondays to Fridays,

- a. I watch television _____ hours a day.
- b. I play computer or video games _____ hours a day.
- c. I chat online (e.g. Messenger) or social networking online (e.g. Facebook) _____ hours a day.
- d. I watch online music videos, movies or other online contents (e.g. Youtube) _____ hours a day.
- e. I read magazines _____ hours a day.
- f. I read books/newspapers _____ hours a day.
- g. In general, I spend _____ hours a day **sitting down** doing all my activities, i.e., studying, reading, internet surfing, watching TV, eating, chatting etc.

2. Usually, on Saturdays and Sundays,

- a. I watch television _____ hours a day.
- b. I play computer or video games _____ hours a day.
- c. I chat online (e.g. Messenger) or social networking online (e.g. Facebook) _____ hours a day.
- d. I watch online music videos, movies or other online contents (e.g. online games or Youtube) _____ hours a day.
- e. I read magazines _____ hours a day.
- f. I read books/newspapers _____ hours a day.
- g. In general, I spend _____ hours a day **sitting down** doing all my activities, i.e., studying, reading, internet surfing, watching TV, eating, chatting etc.

SECTION 5 With reference to the pictures below, please shade ONE answer that reflects your thoughts and feelings.

1. What do you think of when you eat the above food?

Bad							Good
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Unpleasant							Pleasant
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Unfavourable							Favourable
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Unenjoyable							Enjoyable
①	②	③	④	⑤	⑥	⑦	
<hr/>							

2. How would you feel after eating the above food?

Not at all happy							Very happy
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Not at all fun							Very fun
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Very negative							Very positive
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Not at all satisfied							Very satisfied
①	②	③	④	⑤	⑥	⑦	
<hr/>							

Section 6 Please shade ONE answer to each of the question below.

When you were a child ...		Not at all		All the time	
1.	How frequently do your parents explain to you why it's important to eat healthily?	①	②	③	④
2.	How frequently do your parents explain why you should eat more or less of a particular food?	①	②	③	④
3.	How frequently do your parents discuss with you about the health benefits of a food?	①	②	③	④
4.	How frequently do your parents discuss with you the importance of eating a variety of foods?	①	②	③	④
5.	How frequently do your parents explain to you the effects of different nutrients (e.g. Vitamin C, calcium)?	①	②	③	④
6.	How frequently do your parents let you eat what you want during meals?	①	②	③	④
7.	How frequently do your parents tell you what food you must eat without explaining why?	①	②	③	④
8.	How frequently do your parents tell you what food you cannot eat without explaining why?	①	②	③	④
9.	How frequently do your parents limit the amount that you eat during meal times?	①	②	③	④
10.	How frequently do your parents limit the amount of snacks that you eat?	①	②	③	④

SECTION 7 Please shade ONE answer to each of the question below.

	Never	Seldom	Sometimes	Often	Very often
1. When you put on weight, do you eat less than you usually do?	①	②	③	④	⑤
2. How often do you refuse food or drinks offered to you because you were concerned about your weight?	①	②	③	④	⑤
3. Do you watch exactly what you eat?	①	②	③	④	⑤
4. Do you consciously eat foods that are slimming (low in calories and fat)?	①	②	③	④	⑤
5. When you have eaten too much, do you eat less than usual the following day?	①	②	③	④	⑤
6. Do you take your weight into consideration when deciding what to eat?	①	②	③	④	⑤

Appendix L: Part 2 Questionnaire

Dear student,

Please take some time to complete this questionnaire. There are no right or wrong answers. Just share your thoughts and feelings with us.

Answer **ALL** the questions by writing or shading with a pencil by following the instructions given in each section.

When you are done, put the questionnaire back into the envelope.
All information that you provide will be kept strictly confidential.

For official use

Serial No.			Computer No			AB	XY
			①	②	③	①	②
①	①	①					
①	①	①					
②	②	②					
③	③	③					
④	④	④					
⑤	⑤	⑤					
⑥	⑥	⑥					
⑦	⑦	⑦					
⑧	⑧	⑧					
⑨	⑨	⑨					

SECTION 1 Please shade ONE answer to each statement below.

	Strongly disagree						Strongly agree
I am more likely to eat less processed and fatty food and eat more fresh and nutritious food now than before I watched the video.	①	②	③	④	⑤	⑥	⑦
I think eating less processed and fatty food and eating more fresh and nutritious food is important.	①	②	③	④	⑤	⑥	⑦
Eating less processed and fatty food and eating more fresh and nutritious food is important to health.	①	②	③	④	⑤	⑥	⑦
I am more interested to learn about eating healthily now than I was before.	①	②	③	④	⑤	⑥	⑦

SECTION 2 For each statement, please fill in the blank by shading ONE answer only.

1 I am _____ to eat fast food in the next 1 week.

unlikely ① ② ③ ④ ⑤ ⑥ ⑦ likely

2 I am _____ to eat fast food in the next 1 month.

unlikely ① ② ③ ④ ⑤ ⑥ ⑦ likely

3 I plan to eat healthier food in the next 1 week.

probably not ① ② ③ ④ ⑤ ⑥ ⑦ probably

4 I plan to eat healthier food in the next 1 month.

probably not ① ② ③ ④ ⑤ ⑥ ⑦ probably

5 It is _____ for me to adopt a healthy diet from now on.

impossible ① ② ③ ④ ⑤ ⑥ ⑦ possible

SECTION 3 With reference to the pictures below, please shade ONE answer that reflects your thoughts and feelings.

1. What do you think of when you eat the above food?

Bad							Good
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Unpleasant							Pleasant
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Unfavourable							Favourable
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Unenjoyable							Enjoyable
①	②	③	④	⑤	⑥	⑦	
<hr/>							

2. How would you feel after eating the above food?

Not at all happy							Very happy
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Not at all fun							Very fun
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Very negative							Very positive
①	②	③	④	⑤	⑥	⑦	
<hr/>							
Not at all satisfied							Very satisfied
①	②	③	④	⑤	⑥	⑦	
<hr/>							

Section 4 Please recall the Eat Healthy Message you saw in the video.

	Not at all						Strongly
1 To what extent do you feel that the message is about avoiding negative outcomes (e.g., poor health)?	①	②	③	④	⑤	⑥	⑦
2 To what extent do you feel that the message is about attaining positive outcomes (e.g., good health)?	①	②	③	④	⑤	⑥	⑦
3 To what extent do you feel that the message makes you feel vigilant and cautious when it comes to taking care of your health?	①	②	③	④	⑤	⑥	⑦
4 To what extent do you feel that the message makes you feel eager and aspire when it comes to taking care of your health?	①	②	③	④	⑤	⑥	⑦

SECTION 5 Please furnish us with your particulars by marking a cross (☒) in the box and where appropriate, write the answer in the blank space provided.

- Your gender: Male ☐ Female ☐
- Your age: 18 ☐ 19 ☐ 20 ☐ 21 ☐ 22 ☐ 23 and above ☐
- Your race: Chinese ☐ Malay ☐ Indian ☐ Others ☐ Please specify _____
- What housing type do you live in?

HDB 2-3 room apartment	☐
HDB 4 room apartment	☐
HDB 5 room apartment	☐
HDB Executive Apartment	☐
Condominium	☐
Private house	☐
- Are you currently on a diet? No ☐ Yes ☐
- What is your height now? _____ metres (estimated)
- What is your weight now? _____ kilograms (estimated)

Appendix M: Items and Results of Exploratory Factor Analysis for Study 1

GRFM by Lockwood et al. (2002)		Factor 1	Factor 2
Prevention Orientation Sub-Scale			
1	In general, I am focused on preventing negative events in my life.	.29	.29
2	I am anxious that I will fall short of my responsibilities and obligations.	.19	.55
4	I often think about the person I am afraid I might become in the future.	.03	.58
7	I often worry that I will fail to accomplish my academic goals.	.08	.69
9	I often imagine experiencing bad things that I fear might happen to me.	-.09	.76
10	I frequently think about how I can prevent failures in my life.	.28	.57
11	I am more oriented toward preventing losses than I am toward achieving gains.	-.17	.70
13	My major goal in school right now is to avoid becoming an academic failure.	.10	.57
15	I see myself as someone who is primarily striving to become the self I “ought” to be – to fulfil my duties, responsibilities, and obligations.	.48	.27
Promotion Orientation Sub-Scale			
3	I frequently imagine how I will achieve my hopes and aspirations.	.65	.08
5	I often think about the person I would ideally like to be in the future.	.64	.19
6	I typically focus on the success I hope to achieve in the future.	.75	.04
8	I often think about how I will achieve academic success.	.60	.25
12	My major goal in school right now is to achieve my academic ambitions.	.44	.36
14	I see myself as someone who is primarily striving to reach my “ideal self” – to fulfil my hopes, wishes, and aspirations.	.73	.09
16	In general, I am focused on achieving positive outcomes in my life.	.76	-.06
17	I often imagine experiencing good things that I hope will happen to me.	.62	-.01
18	Overall, I am more oriented toward achieving success than preventing failures	.73	-.26

Appendix N: Items and Results of Exploratory Factor Analysis for Study 1

BIS/BAS by Carver and White (1994)		Factor 1	Factor 2
Prevention Orientation Sub-Scale			
2	Even if something bad is about to happen to me, I rarely experience fear or nervousness.	.60	-.12
8	Criticism or scolding hurts me quite a bit.	.64	.04
13	I feel pretty worried or upset when I think or know somebody is angry at me.	.70	.09
16	If I think something unpleasant is going to happen I usually get pretty “worked up”.	.54	.13
19	I feel worried when I think I have done poorly at something important.	.72	.05
22	I have very few fears compared to my friends.	.46	-.29
24	I worry about making mistakes.	.66	-.03
Promotion Orientation Sub-Scale			
3	I go out of my way to get things I want.	-.29	.60
9	When I want something I usually go all-out to get it.	-.08	.74
12	If I see a chance to get something I want I move on it right away.	-.11	.64
21	When I go after something I use a “no holds barred” approach.	-.14	.70
4	When I’m doing well at something I love to keep at it.	.22	.34
7	When I get something I want, I feel excited and energized.	.39	.43
14	When I see an opportunity for something I like I get excited right away.	.29	.58
18	When good things happen to me, it affects me strongly.	.43	.37
23	It would excite me to win a contest	.23	.38

Appendix O: Items and Results of Exploratory Factor Analysis for Study 2

GRFM by Lockwood et al. (2002)		Factor 1	Factor 2
Prevention Orientation Sub-Scale			
1	In general, I am focused on preventing negative events in my life.	.36	.31
2	I am anxious that I will fall short of my responsibilities and obligations.	.13	.53
4	I often think about the person I am afraid I might become in the future.	-.01	.67
7	I often worry that I will fail to accomplish my academic goals.	.13	.70
9	I often imagine experiencing bad things that I fear might happen to me.	.02	.78
10	I frequently think about how I can prevent failures in my life.	.38	.53
11	I am more oriented toward preventing losses than I am toward achieving gains.	-.03	.67
13	My major goal in school right now is to avoid becoming an academic failure.	.13	.53
15	I see myself as someone who is primarily striving to become the self I “ought” to be – to fulfil my duties, responsibilities, and obligations.	.45	.24
Promotion Orientation Sub-Scale			
3	I frequently imagine how I will achieve my hopes and aspirations.	.66	.18
5	I often think about the person I would ideally like to be in the future.	.61	.16
6	I typically focus on the success I hope to achieve in the future.	.77	-.04
8	I often think about how I will achieve academic success.	.55	.36
12	My major goal in school right now is to achieve my academic ambitions.	.45	.30
14	I see myself as someone who is primarily striving to reach my “ideal self” – to fulfil my hopes, wishes, and aspirations.	.74	.05
16	In general, I am focused on achieving positive outcomes in my life.	.77	.08
17	I often imagine experiencing good things that I hope will happen to me.	.62	.05
18	Overall, I am more oriented toward achieving success than preventing failures	.67	-.14

Appendix P: Items and Results of Exploratory Factor Analysis for Study 2

BIS/BAS by Carver and White (1994)		Factor 1	Factor 2
Prevention Orientation Sub-Scale			
2	Even if something bad is about to happen to me, I rarely experience fear or nervousness.	.54	-.32
8	Criticism or scolding hurts me quite a bit.	.60	.02
13	I feel pretty worried or upset when I think or know somebody is angry at me.	.52	.01
16	If I think something unpleasant is going to happen I usually get pretty “worked up”.	.64	.17
19	I feel worried when I think I have done poorly at something important.	.64	.05
22	I have very few fears compared to my friends.	.44	-.38
24	I worry about making mistakes.	.68	-.10
Promotion Orientation Sub-Scale			
3	I go out of my way to get things I want.	-.12	.65
9	When I want something I usually go all-out to get it.	-.03	.70
12	If I see a chance to get something I want I move on it right away.	.00	.66
21	When I go after something I use a “no holds barred” approach.	-.09	.63
4	When I’m doing well at something I love to keep at it.	.26	.38
7	When I get something I want, I feel excited and energized.	.42	.38
14	When I see an opportunity for something I like I get excited right away.	.41	.50
18	When good things happen to me, it affects me strongly.	.49	.43
23	It would excite me to win a contest	.33	.34

Appendix Q: Comparison of Findings Computed Based on GRFM Scale by Lockwood et al. (2002) and BIS/BAS Scale by Carver and White (1994)

	Attitudes toward unhealthy food consumption β		Intentions to eat healthily β	
	GRFM by Lockwood et al. (2002)	BIS/BAS by Carver and White (1994)	GRFM by Lockwood et al. (2002)	BIS/BAS by Carver and White (1994)
	Used for analyses in Study 1	Used for analyses in Study 2	Used for analyses in Study 1	Used for analyses in Study 2
Study 1				
Main effects				
- Prevention orientation scores	-.01	-.02	.09*	.04
- Promotion orientation scores	-.03	-.05*	.13**	.09*
Two-way interaction effects				
- Prevention orientation scores X health message focus	-.04	-.02	.08	.05
- Promotion orientation scores X health message focus	-.00	-.03	.10*	.03
Study 2				
Main effects				
- Prevention orientation scores	.01	.00	.03	-.01
- Promotion orientation scores	.06	.06*	.11*	.05
Two-way interaction effects				
- Prevention orientation scores X health message focus	.06	.03	-.08	-.11**
- Promotion orientation scores X health message focus	-.04	-.05	.02	.08
Three-way interaction effects				
- Prevention orientation scores X health message focus X message positioning	-.01	-.05	.02	.12
- Promotion orientation scores X health message focus X message positioning	-.12*	.04	.02	-.15

Note: In study 1, the correlation for prevention orientation scores measured by the GRFM scale by Lockwood et al. (2002) and BIS/BAS scale by Carver and White (1994) was .52, $p < .001$. As for the correlation for promotion orientation scores, the correlation is .45, $p < .001$. In study 2, the correlation for prevention orientation scores measured by the GRFM scale by Lockwood et.al. (2002) and BIS/BAS scale by Carver and White (1994) was .48, $p < .001$. As for the correlation for promotion orientation scores, the correlation was .39, $p < .001$.

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