

Hong Kong Baptist University

## HKBU Institutional Repository

---

Department of Communication Studies Journal  
Articles

Department of Communication Studies

---

10-2014

### Should different marketing communication strategies be used to promote healthy eating among male and female adolescents?

Kara Chan

*Hong Kong Baptist University*, karachan@hkbu.edu.hk

Yu-Leung Ng

*Hong Kong Baptist University*, ny1724@hkbu.edu.hk

Gerard Prendergast

*Hong Kong Baptist University*, gerard@hkbu.edu.hk

Follow this and additional works at: [https://repository.hkbu.edu.hk/coms\\_ja](https://repository.hkbu.edu.hk/coms_ja)



Part of the [Communication Commons](#), and the [Marketing Commons](#)

This document is the authors' final version of the published article.

Link to published article: <https://dx.doi.org/10.1080/07359683.2014.966005>

---

#### APA Citation

Chan, K., Ng, Y., & Prendergast, G. (2014). Should different marketing communication strategies be used to promote healthy eating among male and female adolescents?. *Health Marketing Quarterly*, 31 (4), 339-352. <https://doi.org/10.1080/07359683.2014.966005>

This Journal Article is brought to you for free and open access by the Department of Communication Studies at HKBU Institutional Repository. It has been accepted for inclusion in Department of Communication Studies Journal Articles by an authorized administrator of HKBU Institutional Repository. For more information, please contact [repository@hkbu.edu.hk](mailto:repository@hkbu.edu.hk).

**Should different marketing communication strategies be used to promote healthy eating among male and female adolescents?**

Kara Chan  
(Corresponding author)  
Professor  
Department of Communication Studies  
Hong Kong Baptist University  
Tel: (852) 3411 7836 Fax: (852) 3411 7890  
Email: [karachan@hkbu.edu.hk](mailto:karachan@hkbu.edu.hk)

Yu-Leung Ng  
Research Assistant  
Department of Communication Studies  
Hong Kong Baptist University  
Tel: (852) 3411 8159 Fax: (852) 3411 7890  
Email: [ny1724@hkbu.edu.hk](mailto:ny1724@hkbu.edu.hk)

Gerard Prendergast  
Professor  
Department of Marketing  
Hong Kong Baptist University  
Tel: (852) 3411 7570 Fax: (852) 3411 5586  
Email: [gerard@hkbu.edu.hk](mailto:gerard@hkbu.edu.hk)

Citation: Chan, K., Ng, Y.L., and Prendergast, G. (2014) Should different marketing communication strategies be used to promote healthy eating among male and female adolescents?, *Health Marketing Quarterly*, 31(4), 339-352.

Acknowledgement: This study was fully supported by a Faculty Research Grant from the Hong Kong Baptist University (Project No. FRG2/11-12/011).

HMQ healthy eating final with cover.doc

Should different marketing communication strategies be used to promote healthy eating among male and female adolescents?

#### Abstract

A study was conducted to examine how interpersonal norm, media norm, attitude, perceived behavioral control, perceived barriers, and self-efficacy had an influence on healthy eating intention among adolescents. A probability sample of 544 adolescents aged 12 to 18 was conducted. Results indicated that girls had a more favorable attitude and intention toward healthy eating than boys. Healthy eating intention among boys was predicted by attitude, perceived behavioral control, perceived barriers, and self-efficacy, and among girls was predicted by perceived behavioral control and self-efficacy. Different marketing strategies to promote healthy eating among adolescent boys and girls should be adopted.

Keywords: Theory of planned behavior; Survey; Chinese; Behavioral change

## INTRODUCTION

According to the World Health Organization (2012a), obesity worldwide has doubled since 1980. It has become the fifth leading risk for deaths globally, causing more than 2.8 million adult deaths every year. The risk of obesity and morbidity in adulthood are predicted by childhood and adolescent obesity (World Health Organization, 2012b). The increase in overweight and obese children and adolescents therefore should be of particular concern. Fortunately, obesity and being overweight are preventable (World Health Organization, 2012a).

In Hong Kong, about 17% of children and adolescents were overweight or obese in 2005 to 2006 (So et al., 2008). The overweight and obesity epidemic among children and adolescents, as with other developed countries, has increased to an alarming level nowadays. A previous study revealed that adolescents in Hong Kong ate out with peers frequently and very often consumed unhealthy food (Chan et al., 2009). They found healthy eating desirable and beneficial, but unenjoyable and boring (Chan & Tsang, 2011). Adolescents perceived that parents and government publicity encourage them to eat healthily (Chan et al., 2009; Chan & Tsang, 2011). It was also found that public service advertisements using news and fears to promote healthy eating appears were effective (Chan et al., 2009).

Previous studies have showed gender difference in healthy eating among adolescents (Baker, Little, & Brownell, 2003; Fila & Smith, 2006). The research objective of this study is to understand factors that affect adolescent boys' and girls' healthy eating intention. Findings of the study will provide information for health educators to design an appropriate health marketing strategy for promoting healthy eating among adolescent boys and girls.

## LITERATURE REVIEWS

The theory of planned behavior (TPB; Ajzen, 1988, 1991) was used as a framework in the

current study. The TPB was adopted because it has been applied to a wide range of intention and behavior successfully applied to a wide range of intention and behaviors (Ajzen, 1991) including condom use (Carmack & Lewis-Moss, 2009), gambling (Martin et al., 2010), drinking (Glassman et al., 2010), smoking (Macy et al., 2012), and exercising (de Bruijn, 2011). A meta-analysis showed that the TPB explained 39% and 27% of the variance in intention and behavior, respectively (Armitage & Conner, 2001).

The TPB proposes that attitude, subjective norm, and perceived behavioral control predict behavioral intention, and behavioral intention predicts particular behavior (Ajzen, 1988, 1991). Attitude toward the behavior refers to the behavioral beliefs and evaluations about the possible outcomes of the behavior. Subjective norm refers to the normative beliefs of perceived social pressure, expectations of others, and motivation to fulfill their expectations. Perceived behavioral control refers to the control beliefs about the factors that encourage or discourage performance of the behavior (Ajzen, 1988, 1991). The theory proposes that attitude, subjective norm, and perceived behavioral control are positively associated with intention (Armitage & Conner, 2001).

The TPB has been used to study healthy eating intention and behavior among adolescents (e.g., Baker, Little, & Brownell, 2003; Chan & Tsang, 2011; Fila & Smith, 2006). Attitude toward healthy eating, subjective norm, and perceived behavioral control were positively correlated with healthy eating intention among Americans aged 13 to 17 (Baker, Little, & Brownell, 2003), Native American youth (Fila & Smith, 2006), and Hong Kong Chinese adolescents (Chan & Tsang, 2011). Scholars proposed that psychological factors such as self-efficacy and perceived barriers would also play a significant role in the prediction of healthy eating (e.g., Fila & Smith, 2006).

Compared with attitude toward healthy eating and perceived behavioral control, subjective norm was found to be a weak predictor of healthy eating intention (Baker, Little, & Brownell, 2003; Chan & Tsang, 2011). Meta-analysis has revealed that subjective norm is not

an important predictor of health behavior (Armitage & Conner, 2001). Baker, Little, and Brownell (2003) argued that subjective norm is important to predict healthy eating intention and behavior among adolescents. Intrapersonal factors (i.e., attitude toward healthy eating) were mediated by the relation between subjective norm and intention. It means that subjective norm affects attitude, which in turn affects intention (Baker, Little, & Brownell, 2003). It is hypothesized in the current study that after introducing intrapersonal factors including attitude toward healthy eating, perceived behavioral control, self-efficacy, and perceived barriers, subjective norm would not become a predictor of healthy eating intention among adolescents.

Another reason why subjective norm is a weak predictor of intention is that there are multiple groups with different degrees of influence that affect healthy eating intention among adolescents (Baker, Little, & Brownell, 2003). Story, Neumark-Sztainer, and French (2002) argued that there are four levels of factors that influence adolescent food choices and eating behavior, including physical environmental (e.g., shopping malls), intrapersonal (e.g., attitude), interpersonal (e.g., peers), and societal (e.g., mass media) factors. Interpersonal and media factors should be considered as separate normative beliefs of perceived social pressure. Numerous studies have examined the unique impact of interpersonal (mainly parents and peers) and media influences on underweight and body image dissatisfaction (e.g., Chen & Jackson, 2012; Cheng & Mallinckrodt, 2009; Ferguson, Winegard, & Winegard, 2011). No study has been conducted to examine interpersonal and mass media influences on healthy eating separately. Adolescents, their family members, and their friends have the potential to be largely affected by the macro-system influences (Story, Neumark-Sztainer, & French, 2002). Media and advertising influence, on the other hand, are more distal than interpersonal influences. Differentiating interpersonal and media as separate norms provides a better test of the influence of subjective norm as a predictor of healthy eating intention.

Two intrapersonal factors, self-efficacy and perceived barriers to healthy eating, were added to the TPB model to predict healthy eating intention in the present study. According to the social cognitive theory (Bandura, 1986), self-efficacy is defined as the perceived ability and internal motivation to perform a behavior. It is different from the concept of perceived behavioral control, which is defined as the perceived control over external factors related to the behavior (Armitage & Conner, 1999). Previous studies have revealed that self-efficacy is a significant and an important predictor of healthy eating (Fila & Smith, 2006; Shannon et al., 1990).

Previous research has also showed that adolescents seldom eat healthily because of the perceived barriers to healthy eating (e.g., Eikenberry & Smith, 2004; Fila & Smith, 2006; Goh et al., 2009; Shepherd et al., 2006). Lack of time and money concerns (Eikenberry & Smith, 2004), lack of accessible healthy food and nutrition knowledge (Goh et al., 2009), poor school food supply, and relative lower cost and good taste of fast food (Shepherd et al., 2006) were identified as the barriers to healthy eating.

Research on examining healthy eating by using TPB has typically focused on Western samples (e.g., Baker, Little, & Brownell, 2003; Conner, Norman, & Bell, 2002; Fila & Smith, 2006). Relatively few studies have been conducted on Asian adolescents (e.g., Chan & Tsang, 2011). Previous research using TPB revealed gender difference in healthy eating among adolescents (Baker, Little, & Brownell, 2003; Fila & Smith, 2006). Subjective norm was the most significant predictor of healthy eating behavior among Native American boys while perceived barriers was the most significant predictor of healthy eating behavior among Native American girls (Fila & Smith, 2006). Another study showed that American boys' healthy eating intention was most likely predicted by healthy eating attitude and girls' intention was most likely predicted by perceived behavioral control (Baker, Little, & Brownell, 2003).

The research objective of this study was to investigate how attitude, interpersonal norm,

media norm, perceived behavioral control, perceived barriers, and self-efficacy affect healthy eating intention among adolescent boys and girls in Hong Kong. Different health marketing strategies should be adopted if gender differences in interpersonal and intrapersonal factors are profound.

## METHOD

### Respondents and Procedure

A multi-stage cluster sampling design based on geographic districts, then schools, then classes was conducted. A probability sample of nine secondary schools was drawn from a sampling frame of registered secondary schools arranged by district obtained from the website of the Education Bureau of the Hong Kong government (2012). A letter was sent to the schools to invite them for participation in the study. Schools that refused to participate after two telephone contacts were replaced by other schools in neighboring districts that were also randomly selected. The final sample consisted of eight schools. Two classes in different forms were randomly selected for each of the sampled schools.

A total of 640 questionnaires were distributed to students in secondary forms 1 to 5 (equivalent to grades 7 to 11 in U.S. education system). In total, 563 (88%) student questionnaires were returned. Two students aged 19 and 22 were excluded from the data analysis. With these exclusions, all respondents were aged between 12 and 18. In addition, univariate outliers were identified. Thirteen cases with z-scores three or more standard deviations below the mean for at least one measure of subjective norm, attitude toward healthy eating, perceived behavioral control, perceived barriers, and self-efficacy were excluded. Multivariate outliers ( $p < .001$ ) were also identified (Tabachnick & Fidell, 2001). The above five measures were used as the independent variables. Healthy eating intention was used as the dependent variable. Cumulative distribution function (CDF) for the chi-square distribution was used to identify the probability

for the Mahalanobis distance less than .001 that had an unusual combination of values on the five variables. Four cases were identified as multivariate outliers ( $p < .001$ ) and were excluded.

The remaining sample size was 544. There were 274 males and 267 females. The mean age of the respondents was 14.87 and the standard deviation was 1.57. Fifty percent of the respondents reported living in public housing and another 10% lived in rental private housing. Thirty percent lived in family-owned housing while the remaining 10% lived in other types of housing. The body mass index (BMI) of respondents was calculated by using the formula  $BMI = (\text{weight in kg}) / (\text{height in meters})^2$ . It ranged from 8.2 to 37.9, with a mean of 19.17 and standard deviation of 3.01. An age-sex specific BMI percentile profile for Hong Kong adolescents classified those in the top 15% of a specific age-sex population as overweight and those in the top 5% as obese (So et al., 2008). Based on the cut-off BMI indexes, 6% of the sample was classified as overweight and 3% of the sample was classified obese.

Questionnaire packets were distributed to all participating schools. Students were informed that their participation was voluntary and all responses would be confidential. Respondents filled out the questionnaires during a normal class session. Data collection was conducted in March and April 2012.

## Measures

In the questionnaire, healthy eating was defined as consuming three moderately balanced meals daily that consisted of sufficient fruits as well as vegetables, and consuming fast foods, chips, candies, and desserts sparingly (Baker, Little, & Brownell, 2003; Chan & Tsang, 2011). Based on the procedures with Ajzen and Fishbein's (1980) recommendations, the three main constructs of the theory of planned behavior, including attitude, subjective norm, and perceived behavioral control, as well as two additional constructs, self-efficacy and perceived

barriers, were developed. All items were measured on 5-point scales. The mean scores were formed and high values indicated high levels of each variable. The scales were translated into Chinese, and back-translated into English before fieldwork. The study was conducted in Chinese.

*Subjective norm.* Subjective norm was measured by asking respondents the following four statements for interpersonal norm: “My friends/My family members/My classmates/My teachers ... think I should engage in healthy eating”; and three statements for media norm: “TV programs I watch/Newspapers and magazines I read/The government publicity ... think I should engage in healthy eating”. Respondents were asked to answer using a 5-point scale (1=strongly disagree; 5=strongly agree). Principal component factor analysis with varimax rotation of the above seven statements showed that classmates, friends, teachers, and family loaded on the first component, explaining 38.74% and 35.34% of the scale variance for boys and girls respectively. TV, newspapers and magazines, and government publicity loaded on the second component, explaining 30.57% and 31.03% of the scale variance for boys (KMO = .77,  $p < .001$ ) and girls (KMO = .76,  $p < .001$ ) respectively. These two factors were named as interpersonal norm and media norm. Results of the factor analysis showed that these two factors are unique. The Cronbach alpha coefficients of interpersonal norm were .82 for boys and .80 for girls. Alpha coefficients of media norm were .75 for boys and .76 for girls.

*Attitude.* Attitude toward healthy eating was measured by asking respondents to rate on a 5-point semantic differential scale between strongly disagree and strongly agree for six evaluative adjectives that describe healthy eating, including boring-interesting, useful-useless, enjoyable-unenjoyable, worthy-unworthy, good-bad, beneficial-harmful. The Cronbach alpha coefficients were .82 for boys and .80 for girls.

*Perceived behavioral control.* Three questions about whether they perceive that they have control on healthy eating were asked to measure perceived behavioral control: “Will you try hard to eat healthily?”; “Do you have enough discipline to eat healthily?”; and “Do you have enough time to eat healthily?”. Respondents were asked to rate their answers on a 5-point scale (1 = definitely no, 5 = definitely yes). Alpha coefficients were .69 for boys and .73 for girls.

*Perceived barriers.* Perceived barriers were measured by asking respondents to rate their responses on a 5-point scale between strongly disagree and strongly agree for six statements: “I don’t always eat healthily because ... I like to treat myself/healthy food doesn’t taste as good/not enough healthy options available/confused about what’s healthy and what’s not/haven’t got time/healthy foods are expensive”. The barriers to healthy eating scale is reliable and valid (Fowles & Feucht, 2004). The Cronbach alpha coefficients were .80 and .76 for boys and girls respectively.

*Self-efficacy.* Self-efficacy was measured by asking respondents to rate four statements on a five-point scale: “How certain/confident are you that you could engage in healthy eating over the next two weeks?”; “For me, engaging in healthy eating over the next two weeks would be difficult”; “If I wanted to, I could easily engage in healthy eating over the next two weeks”, and “For me, engaging in healthy eating is really difficulty (reversely coded)”. Alpha coefficients were .82 for boys and .80 for girls.

*Intention.* Healthy eating intention was measured by asking respondents to rate one question on a 5-point scale: “Will you engage in healthy eating in the coming two weeks?” (1 = definitely no, 5 = definitely yes).

## RESULTS

Table 1 shows the age, BMI, and obesity classification by gender. Independent *t*-test results

showed that there are no significant differences between boys and girls in age and BMI. The Pearson chi-square test revealed that boys and girls were not different in terms of obesity classification ( $\chi^2 = 2.55, p = \text{n.s.}$ ).

Mean, standard deviation and Pearson correlations among various measures for boys and girls are displayed separately in Table 2. Independent *t*-test results showed that girls ( $M = 3.75$ ) scored significantly higher for attitude toward healthy eating than boys ( $M = 3.59$ ),  $t(521) = -3.72, p < .001$ . Girls ( $M = 3.70$ ) also scored significantly higher for healthy eating intention than boys ( $M = 3.57$ ),  $t(536) = -2.10, p < .05$ . For all other variables there were no significant differences between boys and girls (Table 2).

As expected, healthy eating intention was positively correlated with interpersonal norm, media norm, attitude, perceived behavioral control, and self-efficacy, and negatively correlated with perceived barriers for both boys and girls. The measures of the above six predictive variables were correlated with one another significantly, with the exceptions of interpersonal and media norm and perceived barriers for both boys and girls. Age and BMI were not associated with the other variables, with the exception that BMI was positively correlated with interpersonal norm for boys.

A series of hierarchical multiple regression analyses were conducted to predict healthy eating intention for boys and girls separately from age, BMI, interpersonal and media norm, attitude, perceived behavioral control, perceived barriers, and self-efficacy (Table 3). Age and BMI were added in the first step, interpersonal and media norm in the second step, and attitude, perceived behavioral control, perceived barriers, and self-efficacy in the third step. In step 1, age and BMI were not correlated with intention for boys and girls. One percent of the total variations of the dependent variable of healthy eating intention for boys and one percent for girls were explained by age and BMI respectively. After controlling for age and BMI in the second step, interpersonal norm was positively correlated with intention

for boys,  $\Delta F (2, 230) = 9.36, p < .001$ , accounting for 9% of the variance in healthy eating intention; and girls,  $\Delta F (2, 235) = 6.92, p = .001$ , explaining 6% of the total variance of healthy eating intention. Media norm was not associated with intention for both boys and girls. In step 3, attitude, perceived behavioral control, and self-efficacy were positively correlated with intention and perceived barriers was negatively correlated with intention, accounting for 51% of the variance in intention for boys,  $\Delta F (4, 226) = 47.60, p < .001$ . For girls, perceived behavioral control and self-efficacy were positively associated with intention, accounting for 45% of the variance in healthy eating intention,  $\Delta F (4, 231) = 40.62, p < .001$ .

## DISCUSSION AND MARKETING IMPLICATIONS

A study was conducted to investigate if different health marketing strategies should be used to promote healthy eating among adolescent boys and girls. Among boys, healthy eating intention was predicted by attitudes, perceived behavioral control, perceived barriers, and self-efficacy, accounting for 51% of the variance for intention. Girls' healthy eating intention was predicted by perceived behavioral control and self-efficacy, explaining 45% of the variance of intention. As perceived behavioral control was the most significant predictor of healthy eating intention, health marketers who wish to promote healthy eating among boys and girls should aim at empowering them with the self-determination and sufficient time to practice healthy eating. Marketers who have the resources to communicate with boys and girls using different messages should establish more favorable attitudes and attempt to reduce the perceived barriers to healthy eating among boys, while encouraging girls to gain confidence in practicing healthy eating.

Interpersonal norm and media norm are two unique factors that affect an adolescent's healthy eating intention. As expected, interpersonal norm was a stronger predictor of intention than media norm. For both boys and girls, after controlling for age and BMI,

healthy eating intention was predicted by interpersonal norm but not media norm. This is probably because interpersonal influences are closer than media influences (Story, Neumark-Sztainer, & French, 2002). It is consistent with a previous study that showed parents were perceived as being the most effective norms in encouraging adolescents in healthy eating (Chan et al., 2009).

After adding psychological factors, including attitude toward healthy eating, perceived behavioral control, self-efficacy, and perceived barriers, the interpersonal norm became non-significant for both adolescent boys and girls. Psychological factors are therefore more important than interpersonal factors in predicting healthy eating intention. The results suggest that interpersonal norm does not have a direct and independent influence on healthy eating intention. Interpersonal norm instead works through other psychological variables. As a result, marketers should not rely on interpersonal norm purely to establish healthy eating intention.

Adolescent girls have a more favorable attitude toward healthy eating and higher healthy eating intention than adolescent boys. This may be because girls are more concerned about body size and body image (e.g., Thompson et al., 1999). A previous study found that Chinese girls experienced higher appearance pressure from friends and mass media than boys. They also more often engaged in appearance comparisons and conversations about body satisfaction with peers than boys (Chen & Jackson, 2012). Another study showed that Swiss girls reported higher body surveillance and body shame than boys (Knauss et al., 2008). Higher intention to eat healthily among girls may also be explained by their higher body dissatisfaction compared to boys. As boys have a less favorable attitude toward healthy eating and lower healthy eating intention than girls, health promoters should expect a more challenging task to promote health messages among adolescent boys.

Attitudes, perceived behavioral control, perceived barriers, and self-efficacy accounted for 51% of the variance for healthy eating intention in boys, while perceived behavioral

control and self-efficacy accounted for 45% of the variance of intention in girls. Results provide empirical evidence that a small set of psychological variables is able to predict healthy eating intention among adolescent boys and girls. The identification of a significant predictor of behavioral control also enables health marketers to concentrate their efforts in message design. Adolescent boys' healthy eating intention is affected more by psychological variables than girls. The result is contradictory to the previous study that healthy eating behavior of Native American girls was affected by more factors than boys (Fila & Smith, 2006).

#### LIMITATIONS AND FURTHER STUDIES

Certain limitations should be recognized. A social desirability bias may exist in that participants reply with favorable answers in the classroom setting to meet the expectations of society and the researchers. Second, self-report measures were used. The measures assessed participants' perception of the concepts rather than measuring them directly. Inaccurate responses may be received because of respondents' self-knowledge, poor memory, or cognitive bias.

Future research should build on these results by examining whether marketing strategies that target these predictors induce actual behavioral change. Past behavior was a predicting role and moderating role in the prediction of binge drinking (Norman, & Conner, 2006). Future work should also examine past eating behavior in predicting healthy eating. The study can be repeated among other Chinese societies for comparison and theory building.

## REFERENCES

- Ajzen, I. (1988). *Attitudes, personality, and behavior*. Milton Keynes, England: Open University Press.
- Ajzen, I. (1991). The theory of planned behavior. *Organization Behavior and Human Processes*, 50(2), 179–211. doi:10.1016/0749-5978(91)90020-T
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood-Cliff, NJ: Prentice–Hall.
- Armitage, C. J., & Conner, M. (1999). Distinguishing perceptions of control from self-efficacy: Predicting consumption of a low-fat diet using the theory of planned behavior. *Journal of Applied Social Psychology*, 29(1), 72–90. doi:10.1111/j.1559-1816.1999.tb01375.x
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology*, 40(4), 471–499. doi:10.1348/014466601164939
- Baker, C. W., Little, T. D., & Brownell, K. D. (2003). Predicting adolescent eating and activity behaviors: The role of social norms and personal agency. *Health Psychology*, 22(2), 189–198. doi:10.1037/0278-6133.22.2.189
- Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall.
- Carmack, C. C., & Lewis-Moss, R. K. (2009). Examining the theory of planned behavior applied to condom use: The effect-indicator vs. causal-indicator models. *Journal of Primary Prevention*, 30(6), 659–676. doi:10.1007/s10935-009-0199-3
- Chan, K., Prendergast, G., Grønhøj, A., & Bech-Larsen, T. (2009). Communicating healthy eating to adolescents. *Journal of Consumer Marketing*, 26(1), 6–14. doi:10.1108/07363760910927000

- Chan, K., & Tsang, L. (2011). Promote healthy eating among adolescents: A Hong Kong study. *Journal of Consumer Marketing*, 28(5), 354–362.  
doi:10.1108/07363761111150008
- Chen, H., & Jackson, T. (2012). Gender and age group differences in mass media and interpersonal influences on body dissatisfaction among Chinese adolescents. *Sex Roles*, 66(1/2), 3–20. doi:10.1007/s11199-011-0056-8
- Cheng, H. L., & Mallinckrodt, B. (2009). Parental bonds, anxious attachment, media internalization, and body image dissatisfaction: Exploring a median model. *Journal of Counseling Psychology*, 56(3), 365–375. doi:10.1037/a0015067
- Conner, M., Norman, P., & Bell, R. (2002). The theory of planned behavior and healthy eating. *Health Psychology*, 21(2), 194–201. doi:10.1037/0278-6133.21.2.194
- de Bruijn, G. (2011). Exercise habit strength, planning and the theory of planned behavior: An action control approach. *Psychology of Sport and Exercise*, 12(2), 106–114.  
doi:10.1016/j.psychsport.2010.10.002
- Education Bureau. (2012). *Kindergarten, primary, and secondary education: School lists*. Retrieved from <http://www.edb.gov.hk/index.aspx?nodeid=480&langno=1>
- Eikenberry, N., & Smith, C. (2004). Healthful eating: Perceptions, motivations, barriers, and promoters in low-income Minnesota communities. *Journal of the American Dietetic Association*, 104(7), 1158–1161. doi:10.1016/j.jada.2004.04.023
- Ferguson, C. J., Winegard, B., & Winegard, B. M. (2011). Who is the fairest one of all? How evolution guides peers and media influences on female body dissatisfaction. *Review of General Psychology*, 15(1), 11–28. doi:10.1037/a0022607
- Fila, S. A., & Smith, C. (2006). Applying the theory of planned behavior to healthy eating behaviors in urban Native American youth. *International Journal of Behavioral Nutrition and Physical Activity*, 3, 11–20. doi:10.1186/1479-5868-3-11

- Fowles, E. R., & Feucht, J. (2004). Testing the barriers to healthy eating scale. *Western Journal of Nursing Research*, 26(4), 429–443. doi:10.1177/0193945904263281
- Glassman, T., Braun, R. E., Dodd, V., Miller, J. M., & Miller, E. M. (2010). Using the theory of planned behavior to explain the drinking motivations of social, high-risk, and extreme drinkers on game day. *Journal of Community Health*, 35(2), 172–181.  
doi:10.1007/s10900-009-9205-1
- Goh, Y. Y., Bogart, L. M., Sipple-Asher, B. K., Uyeda, K., Hawes-Dawson, J., Olarita-Dhungana, J., . . . Schuster, M. A. (2009). Using community-based participatory research to identify potential interventions to overcome barriers to adolescents' healthy eating and physical activity. *Journal of Behavioral Medicine*, 32(5), 491–502.  
doi:10.1007/s10865-009-9220-9
- Knauss, C., Paxton, S. J., & Alsaker, F. D. (2008). Body dissatisfaction in adolescent boys and girls: Objectified body consciousness, internalization of the media body ideal and perceived pressure from media. *Sex Roles*, 59(9/10), 633–643. doi:10.1007/s11199-008-9474-7
- Macy, J. T., Middlestadt, S. E., Seo, D. C., Kolbe, L. J., & Jay, S. J. (2012). Applying the theory of planned behavior to explore the relation between smoke-free air laws and quitting intentions. *Health Education & Behavior*, 39(1), 27–34.  
doi:10.1177/1090198111404702
- Martin, R. J., Usdan, S., Nelson, S., Umstattd, M. R., LaPlante, D., Perko, M., & Shaffer, H. (2010). Using the theory of planned behavior to predict gambling behavior. *Psychology of Addictive Behaviors*, 24(1), 89–97. doi:10.1037/a0018452
- Norman, P., & Conner, M. (2006). The theory of planned behavior and binge drinking: Assessing the moderating role of past behavior within the theory of planned behavior. *British Journal of Health Psychology*, 11(1), 55–70. doi:10.1016/j.addbeh.2006.12.009

- Shannon, B., Bagby, R., Wang, M. Q., & Trenker, L. (1990). Self-efficacy: A contributor to the explanation of eating behavior. *Health Education Research*, 5(4), 395–407.  
doi:10.1093/her/5.4.395
- Shepherd, J., Harden, A., Rees, R., Brunton, G., Garcia, J., Oliver, S., & Oakley, A. (2006). Young people and healthy eating: A systematic review of research on barriers and facilitators. *Health Education Research*, 21(2), 239–257. doi:10.1093/her/cyh060
- So, H. K., Nelson, E. A. S., Li, A. M., Wong, M. C., Lau, T. F., Guldan, G. S., . . . Sung, R. Y. T. (2008). Secular changes in height, weight and body mass index in Hong Kong children. *BMC Public Health*, 8, 320–329. doi:10.1186/1471-2458-8-320
- Story, M., Neumark-Sztainer, D., & French, S. (2002). Individual and environmental influences on adolescent eating behaviors. *Journal of the American Dietetic Association*, 102(3), 40–51. doi:10.1016/S0002-8223(02)90421-9
- Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4<sup>th</sup> ed.). Boston, MA: Allyn & Bacon.
- Thompson, J. K., Heinberg, L. J., Altabe, M., & Tantleff-Dunn, S. (1999). *Exacting beauty: Theory, assessment, and treatment of body image disturbance*. Washington, DC: American Psychological Association.
- World Health Organization. (2012a). *Obesity and overweight: Fact sheet N°311*. Retrieved from <http://www.who.int/mediacentre/factsheets/fs311/en/>
- World Health Organization. (2012b). *Obesity*. Retrieved from <http://www.emro.who.int/health-topics/obesity/>

**TABLE 1** Age, BMI, and Obesity Classification for Boys and Girls

Variable	Boys	Girls	
Age (Years)			<i>t</i>
M	14.8	15.0	-1.30
SD	1.5	1.6	
BMI (kg/m <sup>2</sup> )			<i>t</i>
M	19.1	19.2	-.57
SD	3.1	2.9	
Obesity classification (%) †			$\chi^2$
Not overweight/obese	89.8	92.3	2.55
Overweight	7.8	4.5	
Obese	2.5	3.3	

Note. † Based on age-sex specific body mass index percentile for Hong Kong 2005/06 (So et al., 2008).

**TABLE 2** Mean, Standard Deviation, and Pearson Correlations among Various Measures for Boys and Girls

	1	2	3	4	5	6	7	8	9
<b>Boys</b>									
1. Age		.11	.00	-.05	.05	-.05	.03	.04	-.02
2. BMI			.14*	.08	.10	.08	-.02	.02	.09
3. Interpersonal norm				.56***	.38***	.33***	-.06	.20**	.27***
4. Media norm					.36***	.33***	-.08	.12*	.25***
5. Attitude						.41***	-.36***	.39***	.44***
6. Perceived behavioral control							-.36***	.45***	.66***
7. Perceived barriers								-.41***	-.42***
8. Self-efficacy									.45***
9. Healthy eating intention									
<i>M</i>	14.78	19.10	3.35	3.35	3.59***	3.53	2.75	3.30	3.57*
<i>SD</i>	1.52	3.15	0.58	0.66	0.52	0.66	0.70	0.72	0.78
<b>Girls</b>									
1. Age		.06	.03	-.03	.10	.00	.04	-.00	.05
2. BMI			.06	-.01	-.01	-.00	.08	-.09	-.02
3. Interpersonal norm				.50***	.39***	.22***	-.10	.16**	.23***
4. Media norm					.27***	.18**	-.08	.19**	.20**
5. Attitude						.31***	-.30***	.41***	.34***
6. Perceived behavioral control							-.37***	.58***	.61***
7. Perceived barriers								-.38***	-.31***
8. Self-efficacy									.55***
9. Healthy eating intention									
<i>M</i>	14.96	19.25	3.39	3.37	3.75***	3.59	2.80	3.37	3.70*
<i>SD</i>	1.63	2.87	0.56	0.62	0.46	0.61	0.66	0.66	0.71

Notes. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ . Means of boys and girls differ at \*  $p < .05$  and \*\*\*  $p < .001$ .

**TABLE 3** Multiple Regression Analyses: Predicting Healthy Eating Intention from Age, BMI, Interpersonal Norm, Media Norm, Attitude, Perceived Behavioral Control, Perceived Barriers, and Self-efficacy for Boys and Girls

Predictor	<u>Step 1</u>		<u>Step 2</u>		<u>Step 3</u>	
	$\beta$	t	$\beta$	t	$\beta$	t
<b>Boys</b>						
Age	-.01	-.21	.00	.01	-.00	-.02
BMI	.12	1.78	.07	1.08	.03	.57
Interpersonal norm			.19	2.45*	.01	.16
Media norm			.12	1.58	-.01	-.08
Attitude					.15	2.56*
Perceived behavioral control					.49	8.53***
Perceived barriers					-.13	-2.43*
Self-efficacy					.13	2.27*
$R^2$	.01		.09		.51	
$R^2\Delta$	.01		.07		.42	
<b>Girls</b>						
Age	.07	1.06	.06	.97	.05	.97
BMI	-.03	-.39	-.03	-.49	.00	.02
Interpersonal norm			.16	2.28*	.04	.67
Media norm			.11	1.60	.02	.39
Attitude					.06	1.07
Perceived behavioral control					.39	6.17***
Perceived barriers					-.03	-.52
Self-efficacy					.29	4.54***
$R^2$	.01		.06		.45	
$R^2\Delta$	.01		.06		.39	

Notes. \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .