

IDENTIFICATION OF MOTIVES UNDERLYING THE DECISION- MAKING PROCESSES LEADING TO OVERWEIGHT AND/OR OBESITY AMONG STUDENTS IN ASSUMPTION UNIVERSITY

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Abstract: The present study was conducted to investigate the psychological motives that promote overweight and obesity. More specifically, the study sought to develop a valid and reliable scale that could tap people's perceptions about the motives for overweight and obesity. The findings from the study identified the three factors of 'eating and snacking frequently', 'lack of motivation to exercise', and 'living an unhealthy lifestyle' as three major motives for overweight and obesity among Thai young adults. The implications of the findings with regard to the development of effective intervention strategies to predict at-risk young adults as well as to evaluate and guide responses to them are discussed.

Keywords: Overweight/Obesity, Motives, Scale Development

Introduction

Overweight and obesity are defined as abnormal or excessive fat accumulation that may impair health (WHO, 2012b). Health statistics have shown that overweight and obesity have progressively become serious health problems worldwide. The WHO reported that 1.5 billion adults (older than 20 years) were overweight and 500 million adults were obese in 2008 (WHO, 2011a). Many researchers have indicated that being overweight and obese are the leading causes of many negative physical and psychological consequences, such as cardiovascular disease, hypertension, body image dissatisfaction, and higher medical costs (Manson & Bassuk, 2003; Simon et al., 2006; CDC, 2011).

Overweight and obesity has dramatically increased during the past three decades in many countries (WHO, 2011b, and 2012a). According to the WHO Global Infobase (2010) showed that for Thai people older than 15 years, the prevalence of overweight were 22.7% among males and 32.5% among females in 2002, rising to 28.3% and 39.9% respectively for males and females in 2010. The prevalence of obesity was also found to have increased significantly across the same time period from 2.5% for males and 7% for females to 2.6% and 11.1% respectively for males and females.

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Literature Review

Overweight and obesity are caused by an imbalance between energy intake and energy expenditure, such as receiving more energy from high-fat foods and expending less energy from an inactive lifestyle (Bray, 2008). Another perspective points to external factors such as diet and exercise, and internal factors such as genetic factors and previous illness as causal factors for overweight and obesity (Gronbaek, 2008). In addition, the National Institute of Health (2010) reported that overweight and obesity may be caused by an inactive lifestyle, the environment, family history, health conditions and medication, emotional factors, smoking, age, pregnancy, and lack of sleep.

Dietary patterns have been a driver of the obesity crisis (DeAngelis, 2004). The WHO (2011a) posited that an increased intake of food high in fat, salt, and sugar but low in vitamins, minerals, and other micronutrients, as well as decrease in physical activity could lead to energy imbalance – a fundamental cause of obesity. Past research also reports that vegetarian and vegan groups have lower BMI than meat-eaters or omnivorous people. High protein intake and low fiber intake are strongly associated with increased BMI which suggests that eating more plant foods and less animal products may help people control their weight (Newby, Tucker, & Wolk, 2005). Some studies have demonstrated that although overweight and obese individuals find most foods rewarding, they selectively attend to high-fat foods because they consider such high fat foods as more rewarding (Giesen et al., 2010).

Lack of regular exercise is known to lead to overweight and obesity. The U.S. Department of Health and Human Services (1996) reported that only 22% of American adults engage in the recommended regular physical activity (5 times a week for at least 30 minutes), and only 15% meet the recommended amount of vigorous activity (3 times a week for at least 20 minutes). Oaten and Cheng (2006) conducted a study on longitudinal gains in self-regulation from regular physical exercise and found that two months of regular exercise is associated with enhanced self-regulation, leading to improved emotional control, healthy eating, and other self-regulatory behaviors. A related study demonstrated that self-determination and autonomous exercise motivation improve eating self-regulation over 12 months among obese women, and that exercise self-determination fully mediates the relationship between physical activity and eating self-determination (Mata et al., 2011).

With nearly 3.2 million deaths each year attributable to insufficient physical activity (WHO, 2012a), a number of studies have pointed to the antecedents and consequences of living a sedentary lifestyle. Chief among the consequences is the increased risk of being overweight or obese (Gronbaek, 2008). Jans, Proper, and Hildebrandt (2007) investigated the Dutch population and found that people sit nearly seven hours each day, one third of which was at work. The authors noted that work-related physical activities such as farming, fishing, mining, and forestry have given way to the more sedentary work of sitting in front of a computer terminal at the office.

Excessive computer usage, both at work and in the home, marks the modern lifestyle as inactive. In collecting family narratives about causes of their child's obesity, Gronbaek (2008) observed a number of interview responses mentioning that computers make children spend more time sitting and less time exercising. For

example, one boy admitted, “it had something to do with the computer. And it was when we were all skating and playing hockey, all of a sudden we stopped.”

High-fat foods are overly represented in the visual food environment because most of these foods are heavily advertised, and most people are susceptible to the constant temptations of high-fat food in the environment (Tetley, Brunstrom, & Griffiths, 2009). In their economic analysis of adult obesity in the U.S., Shin-Yi, Grossman, and Saffer (2004) reported that people in lower income households consume more sodas and snack foods and go to fast-food restaurants more often. They argued that both increase in restaurant prevalence and decrease in restaurant prices were associated with higher frequency of eating out and subsequent weight gain. The authors also noted that marketing strategies influence consumption volume and, hence, may promote obesity in a number of ways. For example, due to inflation, the price of butter and soda increased slower than the price of fruits and vegetables leading to greater consumption of the cheaper foods.

While the above review has implicated a number of factors in the overweight/obesity epidemic, the consensus among health researchers and scientists is that overweight and obesity are not simply the results of any single factor such as overindulgence in highly palatable foods, or a lack of physical activity, but the interaction between many complex and diverse factors that contribute to the energy imbalance. Regardless of how these factors may operate though – independently or interactively – in contributing to the high overweight and obesity rates worldwide, what appears to be of greater concern to health researchers are the judgments or decisions that overweight/obese people make when it comes to eating and exercising. For example, the plethora of research evidence suggest that it is the motive to eat more than they should and exercise less than they should that contribute to their condition (DeAngelis, 2004; Gronbaek, 2008; Oaten & Cheng, 2006; Mata et al., 2011). The present study was designed to identify the motives for overweight and/or obese. Specifically, the study aimed to develop a valid and reliable scale that could tap people’s perceptions about the motives/reasons for being overweight and obese.

Research Design

This study employed both qualitative and quantitative approaches to identify reasons/motives for being overweight and/or obese. The initial qualitative stage involved focus groups, entailing interviews conducted among the study’s participants. Responses obtained from the focus group discussions were used to identify the primary reasons/motives for being overweight and/or obese.

The second stage involved a quantitative approach in which items generated from the focus groups were included in a survey questionnaire for item analysis. Participants’ responses to these items were analyzed via exploratory and confirmatory factor analysis, to identify and confirm the factor structure (i.e., the motives for being overweight and/or obese) of the items included in the questionnaire.

Scale Construction and Item Analysis

Step 1. Focus groups

At the initial stage of this study, a total of four focus groups comprising of 36 participants (16 males and 20 females) aged 18 years and older, generated the responses from which the scale items were developed. The participants in each focus group took part in a discussion about the motives/reasons why people become overweight and/or obese. A total of 156 reasons for overweight/obesity were generated and recorded. These reasons were then content-analyzed to identify thematic categories to represent reasons/motives for being overweight and/or obese. From the analysis, nine thematic categories of responses were identified as motives for overweight/obesity. These categories were labeled 'eating and drinking', 'lack of exercise', 'stress', 'lack of sleep', 'careless/lack of control', 'lack of knowledge', 'lifestyle', 'biological', and 'environmental.' Finally, in order to reduce the number of responses to a more manageable unit, a proportionate number of statements were written by the author to reflect the meaning-content of each of the nine thematic categories. A total of 25 statements were written and these were included in a questionnaire for final scale construction and item analysis.

Step 2. Exploratory factor analysis (EFA)

Participants and procedure

A total of 550 students (male: $n=225$, 40.9%; female: $n=325$, 59.1%) from Assumption University, Thailand, volunteered to fill in the study's questionnaire. The majority of the participants were aged between 18 to 21 years.

Materials

Participants responded to a questionnaire consisting of six sections. As the present study is part of a larger research program conducted to investigate the issues of overweight and obesity (and for the purpose of saving space), only the first two sections of the questionnaire which are relevant to the present study will be described. Section 1 consisted of items written to elicit the participants' demographic information relating to their gender, age, weight, height, and educational level. Section 2 consisted of the 25 items written to reflect the meaning-content of each of the thematic categories identified via the focus group stage of the study. Each item was to be rated on a 6-point scale ranging from 1=strongly disagree, 2=moderately disagree, 3=barely disagree, 4=barely agree, 5=moderately agree, and 6=strongly agree, with high scores indicating strong endorsement of the motives for overweight- and obesity-related behaviors.

Results

The participants' responses to the 25 items reflecting the motives for overweight and/or obesity were subjected to a principal components analysis followed by oblique rotation. The analysis yielded six factors with eigen-values greater than 1.00. These six factors accounted for a combined total variance of 58.31%. Inspection of these six factors showed that Factor 1 and Factor 4 contained items that reflected the tendency 'to eat and snack frequently.' Factor 2 contained items that reflected a 'lack of motivation to exercise.' Factor 3, Factor 5, and Factor 6 contained items that reflected the 'tendency to live an unhealthy lifestyle.' Given the meaningfulness of

these three groupings on the basis of the six extracted factors, oblique rotation limited to three factors was then conducted. From the obtained pattern matrix, a total of 21 items were retained, using the criteria of selecting items with factor structure coefficients greater than or equal to 0.40 and no significant cross-correlations. Of the 21 items, 10 correlated with Factor 1, 5 correlated with Factor 2, and 6 correlated with Factor 3. Examination of the items that correlated with these three factors indicated that Factor 1 consisted of items that reflected motives to eat and snack frequently; Factor 2 consisted of items that reflected a lack of motivation to exercise on a regular basis; and Factor 3 consisted of items that reflected a tendency to live an unhealthy lifestyle.

Step 3. Reliability analysis

In order to maximize the internal consistency of the derived factor solution, the items representing each of the three factors were item analyzed. The Cronbach's Alphas for the three factors and their items' I-T correlations showed that two items (*I am not overly concerned about my health; I drink alcohol frequently*) have very low corrected item-total correlation (.010) and were deleted from these factors. Thus, 9 items represent the factor of 'eating and snacking frequently'; the factor of 'lack of motivation to exercise' is represented by 4 items, and 6 items represent the factor of 'unhealthy lifestyle'. The computed Cronbach's alpha coefficients for the three factors were adequate and ranged from .75 to .87.

Step 4. Confirmatory factor analysis (CFA)

Confirmatory factor analysis was carried out to evaluate the adequacy of the factor structure identified via exploratory factor analysis. The purpose of this phase of the study was to evaluate the posited *a priori* measurement model representing the three motives for overweight/obesity. Figure 1 presents the three-factor measurement model representing the latent constructs of eating and snacking frequently, lack of motivation to exercise, and living an unhealthy lifestyle.

(See Figure 1 on the next page)

A χ^2 goodness-of-fit test (via structural equation modeling) was employed to test the null hypothesis that the sample covariance matrix was obtained from a population that has the proposed model structure. Although the overall chi-square value for three factor model is significant, $\chi^2(df = 149, N = 550) = 650.63, p < .001$, the incremental fit indices (Normed Fit Index – NFI, Incremental Fit Index – IFI, Tucker-Lewis Index – TLI, Comparative Fit Index – CFI) are all close to 0.90 (range: 0.84 – 0.87). These fit indices indicated that the model provided an adequate fit relative to a null or independence model (i.e., the posited model represented between 84% to 87% improvement in fit over the null or independence model), and supported the hypothesized structure of the posited MOOS three-factor model. The RMSEA value of 0.07 is also within the range suggested by Browne and Cudeck (1993), and indicates that the model fits the population covariance matrix reasonably well.

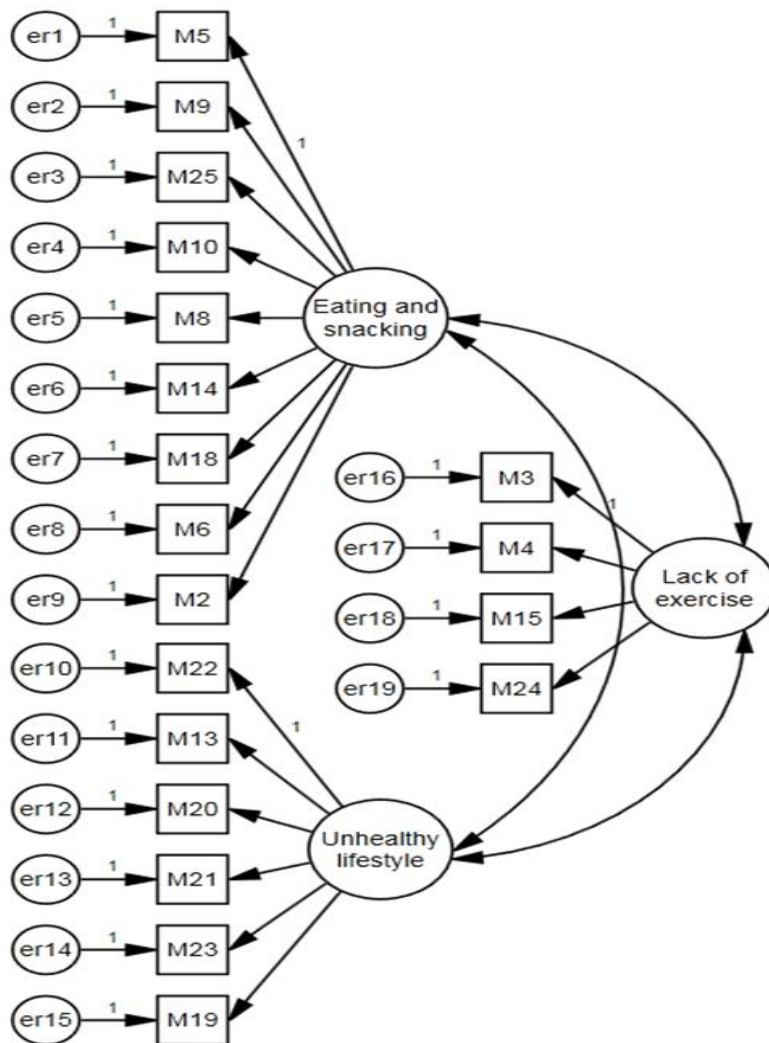


Figure 1: Three-Factor Measurement Model Representing The Latent Constructs of Eating and Snacking Frequently, Lack of Motivation to Exercise, and Living An Unhealthy Lifestyle

Step 5. Test of convergent validity

Convergent validity of the MOOS can be assessed from the confirmatory factor analysis model by determining whether each indicator variable's estimated standardized loading/coefficient with its underlying latent construct is significant (greater than twice its standard error) (Anderson & Gerbing, 1988). In other words, a standardized coefficient is significant ($p < .05$) if its associated critical ratio (C.R.) value is $\geq \pm 1.96$. Examination of the standardized loadings for all 19 indicator variables showed that they are all statistically significant by the C.R. test, indicating convergent validity for the MOOS.

Step 6. Test of discriminant validity

Discriminant validity can be assessed for two estimated latent constructs by constraining the estimated correlation parameter between them to 1.0 and then performing a chi-square difference test on the values obtained for the constrained and unconstrained models (Joreskog, 1971). Following from this suggestion, a series of three chi-square difference tests were conducted. The first difference test was performed between the two factors of 'eating and snacking' and 'unhealthy lifestyle'. For this test, the results showed a significantly lower χ^2 value for the model in which the factor correlation is not constrained to unity, $\chi^2(df = 1) = 55.66, p < .001$. The second difference test was performed between the two factors of 'eating and snacking' and 'lack of motivation to exercise'. For this test, the results also showed a significantly lower χ^2 value for the model in which the factor correlation is not constrained to unity, $\chi^2(df = 1) = 10.69, p < .01$. The third difference test was performed between the two factors of 'lack of motivation to exercise' and 'unhealthy lifestyle'. For this test, the results also showed a significantly lower χ^2 value for the model in which the factor correlation is not constrained to unity, $\chi^2(df = 1) = 39.58, p < .001$. Together, the findings from these three difference tests indicate discriminant validity for the developed scale.

Discussion

The major purpose of this study was to develop a valid and reliable scale that will tap perceptions about the motives/reasons for overweight- and obesity-related behaviors. Exploratory factor analysis and confirmatory factor analysis identified and confirmed a three-factor structure that represented the motives/reasons underlying overweight and obesity. These three factors (eating and snacking frequently, lack of motivation to exercise, and living an unhealthy lifestyle) are in line with past research findings which have shown that the major causes of overweight/obesity are (1) eating too much food, eating unhealthy food, and irregular spacing of meals (Gronbaek, 2008); (2) lack or absence of exercise (Babooram, et al., 2011); and (3) unhealthy lifestyle habits, notably having a sedentary lifestyle (Kelishadi et al., 2007).

The identification of '*eating and snacking frequently*' as a major motive for overweight and obesity among Thai young adults points to the fact that these young adults are eating and snacking more frequently than before, thus contributing to their increased prevalence of overweight and obesity. Traditionally, the Thai populace cultivated and consumed their own food, and high-density fat-saturated foods and sweets were consumed only occasionally during ceremonies (Sagna & Veena, 1996). However, from the 1980s with the introduction of and the convenience of access to Western-style fast foods, there was a dramatic change to the traditional Thai diet of rice, fish, and vegetables. Nowadays, Thai people are confronted with a dizzying number of food choices ranging from such snack foods as hamburgers, French fries, pizzas, to sugar-laden pop soda drinks. There are literally hundreds of hamburgers restaurants (McDonald, Burger King, and Wendy's), pizza restaurants, and ice-cream parlors in Thailand. And given Thailand's hot weather, there is the penchant for Thai people to indulge in ice cream and sweet sugary fizzy drinks.

The identification of '*lack of motivation to exercise*' as a second major motive for overweight and obesity among Thai young adults points to the on-going trend of less engagement in both physical exercise and leisure-time physical activities especially among the young. Prior to the availability of cheap motor transport (motorcycles, cars, subways, BTS, trains and planes), people tended to travel by foot. Nowadays, there are over two million cars registered in Bangkok alone, and the city is served by a network of public transport that has reduced the need for physical activities such as long-distance walking. Other barriers to participation in physical activity include the weather (hot and humid), travel time to fitness facilities that may be out of the way, and inconvenience in navigating Bangkok's notorious traffic jams (Chan & Ryan, 2009; Beaton, et al., 2007).

The identification of '*living an unhealthy lifestyle*' as a third major motive for overweight and obesity among Thai young adults points to an evolution of lifestyle behaviors that is typically sedentary. Traditionally, Thailand, being an agrarian society, is typified by a labor-intensive lifestyle where the majority of the population worked the land. However, with a resurgent economy and the associated emergence of a thriving middle-class over the past three decades, people have flocked away from a country-based labor-demanding lifestyle to one that is less physically demanding, albeit, a more sedentary city-based lifestyle. For today's youth, exposed to the trappings of the modern digital world, life seems to be very easy and convenient, to the point where there is little motivation to engage in strenuous physical activities (such as, climbing steps instead of taking the lift, walking to a friend's house instead of driving, walking to the shops instead of taking public transport). The end result is a sedentary lifestyle marked by a reduction of physical activity.

The development of a valid and reliable scale to tap the motives/reasons for overweight- and obesity-related behaviors represents an important contribution to the identification, measurement, and ultimately, the understanding of the motives underlying the decision-making processes leading to the increased risk of being overweight and/or obese. More than this, the scale represents a useful tool in the evaluation of intervention programs, such as weight-reduction programs, particularly where at-risk young adults have been admitted for treatment. The effectiveness of such programs can be evaluated by applying this scale prior to and at the completion of these programs and examining any changes in the 'sub-scales' scores. Similarly, the scale may also be utilized in the evaluation of health campaigns such as those that focus on the maintenance of healthy weight via eating sensibly, good diet, and exercising.

The overall findings from the present study are compatible with the notion that psychological motives are among the key predictors of the decision of whether or not to engage in overweight/obesity-related behaviors. More specifically, the evidence from the present study points to the role of intrinsic motivation that involves the three primary motives of 'eating and snacking frequently', 'lack of motivation to exercise', and 'living an unhealthy lifestyle.' More and better studies employing these motives in overweight/obese persons are suggested for future investigation to provide the needed experimental evidence that will further our

understanding of the role of motivation, and especially self-motivation, in the long-term and worldwide battle against overweight and obesity.

References

- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423.
- Babooram, M., Mullan, B. A., & Sharpe, L. (2011). Children's perceptions of obesity as explained by the common sense model of illness representation. *British Food Journal*, 113(2), 234–247.
- Beaton, L. J., Blanchard, C. M., Kocourek, J., Morrin, L. I., Papadakis, S., & Pipe, A. L. (2007). Who will be active? Predicting exercise stage transitions after hospitalization for coronary artery disease. *Canadian Journal of Physiology and Pharmacology*, 85(1), 17 – 23.
- Bray, G. A. (2008). Classification and evaluation of the overweight patient. In G. A. Bray and C. Bouchard (Eds.), *Handbook of overweight: Clinical applications* (3rd ed.), pp. 1–25. NY: Marcel Dekker, Inc.
- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 445–455). Newbury Park, CA: Sage.
- Centers for Disease Control and Prevention (CDC) (2011). *Overweight and obesity*. Retrieved August 23, 2011 from <http://www.cdc.gov/obesity/>
- Chan, C. B., & Ryan, D. A. (2009). Assessing the effects of weather conditions on physical activity participation using objective measures. *International Journal of Environmental Research and Public Health*, 6(10), 2639 – 2654.
- DeAngelis, T. (2004). Who's to blame for the surge in super-size Americans? *Monitor on Psychology*, 35, 46–51.
- Giesen, J. C. A. H., Havermans, R. C., Douven, A., Tekelenburg, M., & Jansen, A. (2010). Will work for snack food: The association of BMI and snack reinforcement. *Obesity*, 18, 966–970.
- Gronbaek, H. N. (2008). We've always eaten healthily: Family narratives about causes of their child's obesity and their motivation for taking action. *Nordic Psychology*, 60(3), 183–208.
- Jans, M. P., Proper, K. I., & Hildebrandt, V. H. (2007). Sedentary behavior in Dutch workers: Difference between occupations and business sectors. *American Journal of Preventive Medicine*, 33(6), 450–454.
- Jöreskog, K. G. (1971). Statistical analysis of sets of congeneric tests. *Psychometrika*, 36, 109–133.
- Kelishadi, R., Alikhani, S., Delavari, A., Alaedini, F., Safaie, A., & Hojatzadeh, E. (2007). Obesity and associated lifestyle behaviours in Iran: Findings from the first national non-communicable disease risk factor surveillance survey. *Public Health Nutrition*, 11(3), 246–251.
- Manson, J. E., & Bassuk, S. S. (2003). Obesity in the United States: A fresh look at its high toll. *Journal of the American Medical Association*, 289(2), 229–230.
- Mata, J., Silva, M. N., Vieira, P. N., Carraca, E. V., Andrade, A. M., Coutinho, S. R., Sardinha, L. B., & Teixeira, P. J. (2011). Motivational “spill-over” during

- weight control: Increased self-determination and exercise intrinsic motivation predict eating self-regulation. *Sport, Exercise, and Performance Psychology*, 1(5), 49–59.
- National Institute of Health. (2010). *what causes overweight and obesity?* Retrieved from <http://www.Nhlbi.nih.gov/health/health-topics/topics/obetreatment.html>
- Newby, P. K., Tucker, K. L., & Wolk, A. (2005). Risk of overweight and obesity among semi-vegetarian, lacto-vegetarian, and vegan women. *American Journal of Clinical Nutrition*, 81, 1267–1274.
- Oaten, M., & Cheng, K. (2006). Longitudinal gains in self-regulation from regular physical exercise. *British Journal of Health Psychology*, 11, 717–733.
- Sagna, D., and V. Veena. 1996. *Thai Behavior on Food and Nutrition in 8th National Economic and Social Development Plan*. Bangkok: the Thai Ministry of Public Health.
- Shin-Yi, C., Grossman, M., & Saffer, H. (2004). An economic analysis of adult obesity: Results from the Behavioral Risk Factor Surveillance System. *Journal of Health Economics*, 23(3), 565–587.
- Simon, G. E., Von Korff, M., Saunders, K., Miglioretti, D. L., Crane, P. K., Van Belle, G., & Kessler, R. C. (2006). Association between obesity and psychiatric disorders in the US adult population. *Archives of General Psychiatry*, 63, 824–830.
- Tetley, A., Brunstrom, J., & Griffiths, P. (2009). Individual differences in food-cue reactivity: The role of BMI and everyday portion-size selections. *Appetite*, 52, 614–620.
- U.S. Department of Health and Human Services. (1996). *Physical activity and health: A report of the surgeon general*. Centers for Disease Control and Prevention. Retrieved May 18, 2012 from <http://www.fitness.gov/execsum/execsum.htm>
- World Health Organization. (2011a). *Obesity and overweight*. Retrieved August 15, 2011 from <http://www.who.int/mediacentre/factsheets/fs311/en/>
- World Health Organization. (2011b). *Obesity*. Retrieved August 26, 2011 from <http://www.who.int/topics/obesity/en/>
- World Health Organization. (2012a). *Physical inactivity: A global public health problem*. Retrieved March 21, 2012 from http://www.who.int/dietphysicalactivity/factsheet_inactivity/en/index.html
- World Health Organization (2012b). *Obesity and overweight*. Retrieved July 21, 2012 from <http://www.who.int/mediacentre/factsheets/fs311/en/>
- World Health Organization. (2010). *WHO Global Info base data for saving lives. Estimated overweight & obesity (BMI $\geq$ 25kg/m²) prevalence*. Trends Data [Data file]. Retrieved from <https://apps.who.int/infobase/Comparisons.aspx>