DETERMINANTS OF HEALTHY EATING BEHAVIOURS AMONG MIDDLE SCHOOL STUDENTS: THE THEORY OF PLANNED BEHAVIOUR APPROACH

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ABSTRACT

DETERMINANTS OF HEALTHY EATING BEHAVIOURS AMONG MIDDLE SCHOOL STUDENTS: THE THEORY OF PLANNED BEHAVIOUR APPROACH

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This study was conducted in attempt to integrate a number of cognitive and motivational factors in healthy eating domain and to develop a structural model that might explain young students' healthy eating intentions and behaviors. Founded on the theory of planned behavior framework, the current study explored the interrelationships among students' behavioral beliefs, control beliefs, normative beliefs, and attitudes toward behavior, subjective norms, perceived behavioral control (PBC), intentions, personal norms, self-identity, food consumption habits and sustainability perceptions, and healthy eating behavior. The data were collected from 1780 middle school students through administration of a survey designed to assess constructs regarding healthy eating behavior in a 5-point Likert scale and analyzed utilizing Structural equation modeling (SEM). Goodness of fit statistics revealed that the structural model exhibited an acceptable fit to the data. The proposed model was

able to explain 51% of the variance in healthy eating intentions, and 33% of the variance in healthy eating behaviors. Analyses also revealed that healthy eating related behavioral beliefs, normative beliefs, and control beliefs were directly related to students' attitudes toward healthy eating behavior, subjective norms, and PBC respectively. Students' attitudes toward healthy eating behavior, PBC, personal norms, self-identity, and healthy eating habits and sustainability perceptions, but not subjective norms, associated with students' healthy eating intentions, which, in turn, led to healthy eating behaviors. Along with intentions, PBC and self-identity were found to be linked to healthy eating behaviors. These results emphasized the need to consider issues of self-identity and personal norm in the TPB.

Keywords: Healthy Eating Intentions and Behaviors, Personal Norms, Self-Identity, Food consumption and Sustainability, the Theory of Planned Behavior

ÖZ

ORTAOKUL ÖĞRENCİLERİNİN SAĞLIKLI BESLENME DAVRANIŞLARININ BELİRLEYİCİ FAKTÖRLERİ: PLANLANMIŞ DAVRANIŞ TEORİSİ YAKLAŞIMI

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Bu çalışma, ortaokul öğrencilerinin sağlıklı beslenme niyetlerini ve davranışlarını açıklayan bilişsel ve motivasyonla ilgili faktörlerini içeren bir model geliştirmeyi amaçlamaktadır. Planlanmış Davranış Teorisine dayanan bu çalışma, öğrencilerin davranış inançları, normatif inançları, kontrol inançları, davranışa yönelik olan tutum, öznel normlar, algılanan davranış kontrolü, niyet, kişisel normlar, öz-kimlik, beslenme alışkanlığı ve sürdürülebilirlik algıları ve sağlıklı beslenme davranışları arasındaki ilişkileri incelmeyi amaçlamaktadır. Çalışmada kullanılan veri 1780 ortaokul öğrencisinden sağlıklı beslenme davranışını ilgilendiren yapıları 5'li Likert ölçeğine göre toplanmış olup Yapısal Eşitlik Modeli (YEM) kullanılarak analiz edilmiştir. Uyum İyiliği Test verileri önerilen modelin toplanan veriye uyumlu olduğunu göstermiştir. Önerilen model, öğrencilerin sağlıklı beslenme niyetinin

%51'ini ve sağlıklı beslenme davranışlarının %33'ünü açıklamayı başarmıştır. Yapısal Eşitlik Modeli (YEM) analizinin sonuçları öğrencilerin sağlıklı beslenmeye yönelik olan davranışsal inançların, normatif inançların ve kontrol inançlarının sırası ile doğrudan sağlıklı beslenmeye yönelik olan tutumları, öznel normları ve algılanan davranış kontrolü ile ilgili olduğunu saptamıştır. Bununla birlikte, öğrencilerin sağlıklı beslenmeye yönelik olan tutumlarının, algılanan davranış kontrolünün, kişisel normların, öz-kimliklerinin ve beslenme alışkanlığı ve sürdürülebilirlik algılarının öğrencilerin sağlıklı beslenme niyetleri ile ilgili olduğu ve bu niyetlerin öğrencilerin sağlıklı beslenme davranışları ile bağlantılı olduğu görülmüştür. Bununla birlikte, öğrencilerin niyetlerinin, algılanan davranış kontrolünün ve öz-kimliklerin sağlıklı beslenme davranışları ile bağlantılı olduğu bulunmuştur. Bu sonuçlar, öz-kimlik ve kişisel norm boyutlarının planlanmış davranış teorisi kapsamında düşünmemiz gerektiğini vurgulamaktadır.

Anahtar Kelimeler: Sağlıklı Beslenme Niyetleri ve Davranışları, Kişisel Normlar, Öz-Kimlik, Beslenme alışkanlıkları ve sürdürülebilirlik, Planlanmış Davranış Teorisi

To My Daughter, AZRA

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LIST OF ABBREVIATIONS

ATT: Attitude toward behavior

SN: Subjective Norm

PBC: Perceived Behavioral Control

INT: Behavioral Intention

Beh: Behavior

bb: Behavioral beliefs

nb: Normative beliefs

cb: Control beliefs

PN: Personal Norms

SI: Self-Identity

SUS: Food Consumption Habit and Sustainability

TPB: Theory of Planned Behavior

WHO: World Health Organization

IFR: Institute of Food research

NDNS: National Diet and Nutritional Survey

GHGE: Greenhouse Gas Emissions

ACS: American Cancer Society

USDA: U.S. Department of Agriculture

USDHHS: U.S. Department of Health and Human Services

WCRF: World Cancer Research Fund

TDHS: Turkey Demographic and Health Survey

TNHS: Turkey Nutrition and Health Survey

STEM: Science Technology Engineering and Mathematics

CFA: Confirmatory Factor Analysis

RMSEA: Root Mean Square Error of Approximation

SRMR: Root Mean Square Residuals

CFI: Comparative Fit Index

NFI : Normed Fit Index

SPSS: Statistical Package for Social Science

SEM: Structural Equation Modeling

LISREL: Linear Structural Relationships

St. D: Standard Deviation

CHAPTER 1

INTRODUCTION

This chapter describes the context in which the current research has unfolded. Firstly, introducing the main aim of the present study, the chapter provides the theoretical framework of the current study and outlines the significance of the current study together with explaining how dietary patterns are associated with health benefits and continues with explaining how healthy diet contributes to sustainability. Next, the chapter outlines healthy eating problem in Turkey and describes the action that Turkey has taken to tackle healthy eating problem. Then, based on theoretical and empirical evidences a model is proposed in order to investigate middle school students' healthy eating intentions and behaviors. Finally, the chapter explains why the present study is significant and provides definition of important terms.

Overweight and obesity give rise to significant health problems for all ages of people but overweight and obesity in earlier ages (e.g., Childhood, adolescent) arise higher risk of subsequent health problems (World Health Organization [WHO], 2012). It is, therefore, essential to understand psychological factors that influence eating behaviors. A number of theoretical frameworks have been proposed to explain human behavior. One of the models frequently used to examine such influences on behavior is the Theory of Planned Behavior (TPB; Ajzen, 1991). The Theory of Planned Behavior attracted the attention of several researchers through generating considerable empirical interest since its formulation (Notani, 1998). The Theory has been noted to provide strong empirical support for different kinds of behaviors such as waste management and composting (Taylor and Todd, 1995a; 1995b), recycling (Cheung, Chan, & Wong, 1999; Gamba, & Oskamp 1994; Hopper & Nielsen 1991), water conserve (Lam, 2006), renewable energy (Bang, Ellinger, Hadjimarcou & Traichal, 2000), pro-environmental behaviors (Cheung, Chan & Wong, 1999; Stern, Dietz, Kalof & Guagnano, 1995; Taylor & Todd, 1995, 1997), hunting (Hrubes,

Ajzen & Daigle, 2001), leisure choice (Ajzen & Driver, 1992), travel mode (Bamberg, Ajzen & Schmidt, 2003) and health behaviors (Armitage, & Conner, 1999; Conner, Norman, & Bell, 2002; Hagger et al., 2002; McEachan et al., 2011), weight lost (Schifter ve Ajzen, 1985). The current study, thus, utilizes the Theory of Planned Behavior (Ajzen, 1991) as a theoretical framework to investigate the antecedents of healthy eating intentions and behaviors among middle school students.

1.1. A Theoretical Framework: The Theory of Planned Behavior

As an extension of the theory of reasoned action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975) the Theory of Planned Behavior (Ajzen, 1988, 1991) has emerged as one of the most influential and popular conceptual frameworks for the study of human action (Ajzen, 2001). The Theory states that human action is guided by three kinds of considerations:

> *beliefs about the likely outcomes of the behavior and the evaluations of these outcomes (behavioral beliefs), beliefs about the normative expectations of others and motivation to comply with these expectations (normative beliefs), and beliefs about the presence of factors that may facilitate or impede performance of the behavior and the perceived power of these factors (control beliefs)* (Ajzen, 2006).

Beliefs, in this manner, serve as the fundamental building blocks for the Theory of Planned Behavior. Although the importance of beliefs has frequently been acknowledged, not so many researches have focused on acquisition and formation of beliefs (Ajzen, 1975). As a result of direct observation or information received from outside sources a person may start to form or learn number of beliefs about an object (Ajzen, 1975). In the process of belief formation, a person associates attributes to an object through personal evaluations (Ajzen, 1975). So, the person starts to obtain beliefs about institutions, peoples, and about himself. The belief aggregation serves as the informational base that eventually determines the person's attitudes, intentions and behaviors. The theory postulates that behavior is a function of salient information, or beliefs, relevant to the behavior. People can hold many beliefs about any given behavior, but they can attend to only a relatively small number at any given moment (Miller, 1956).

Ajzen (2006) asserts that behavioral beliefs comprise either a favorable or unfavorable *attitude toward the behavior*, normative beliefs constitute *the subjective norm*, or perceived social pressure, and control beliefs result in the level of *perceived behavioral control*. Altogether, attitude toward the behavior, subjective norms, and perceived behavioral control contribute to the formation of a behavioral intention.

Behavioral intention is assumed to be the most powerful predictor of a specific behavior. Intention involves a strong natural tendency to act, and has been defined as the degree of willingness one has to engage in a specific behavior (Ajzen, 1998). As a general consensus, the more positive the attitude and the subjective norm, and the higher the perceived control, the stronger will be an individual's intention to perform the target behavior, and presumably the individual will involve in that behavior (Ajzen, 2005). Hence intention is considered to be immediate antecedent of behavior. That is, the stronger the people's intentions to engage in a behavior or to achieve their behavioral goals, the more successful they are predicted to be. Intention is, in turn, determined by three independent constructs: attitude toward behavior, subjective norm, and perceived behavioral control. These constructs mediate performing a specific behavior via individual's intention.

The theory assumes that the contribution of these constructs on intention depends, in part, on the intention under investigation (Ajzen, 2005). In some instances normative considerations could be more important than attitudinal considerations while for other intentions attitudinal considerations are central. Similarly, for some behaviors perceived behavioral control could be more significant than others (Ajzen, 2005). Thus, in some situations only attitudes, subjective norms, perceived behavioral control or combination of these constructs are important determinants needed to explain the behavior in question through intention. Furthermore, the relative importance of these three factors may vary across individuals and across populations (Ajzen, 2005). The following figure (Figure 1.1) depicts schematic representation of the TPB.

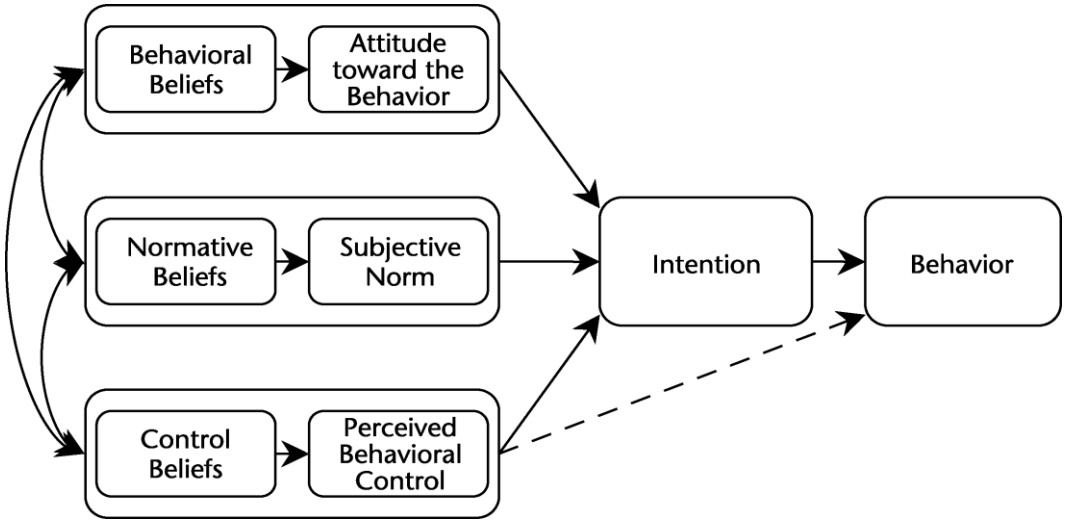


Figure 1.1 The Theory of Planned Behavior (Ajzen, 2005)

Figure 1.1 point outs two important features of the TPB. In the first place, according to the theory, perceived behavioral control has motivational implications for intentions. People who possess positive attitudes toward a behavior and believe that important others would approve of their behavior are unlikely to form strong behavioral intentions to involve in it if they believe that they have neither the resources nor the opportunities to perform that behavior. The theory, thus, expects a link between perceived behavioral control and intention that is not mediated by attitude and subjective norm.

Secondly, in many cases performing a behavior depends not only on encouragement but also on sufficient control over the target behavior. Perceived behavioral control can help us predict engaging in behavior independent of behavioral intention to the extent that it reflects actual control with some degree of accuracy. In other words, perceived behavioral control can influence behavior either indirectly, through intentions, or directly. If an individual, for example, has a sufficient degree of actual control over the behavior Ajzen (2005) posits that perceived behavioral control could serve as a proxy for actual control and contribute directly to the prediction of the behavior (see dotted line in Figure 1.1) to the extent that perceived behavioral control is veridical.

According to the theory of planned behavior, these constructs originate from the salient beliefs people hold. The theory proposes that these salient beliefs can be distinguished into three different categories; behavioral beliefs, normative beliefs, and control beliefs, which are assumed to provide cognitive and affective foundations for attitudes, subjective norms and perceptions of behavioral control respectively. The theory states that attitude toward a behavior is determined by accessible beliefs related to the consequences of the behavior, termed as *behavioral beliefs*. Each behavioral belief links the behavior to a specific outcome associated with the behavior. The individual's evaluation of the outcomes associated with the behavior and the strength of these associations establish the attitude toward the behavior. Specifically, attitude toward a behavior is determined by multiplying belief strengths and corresponding outcome evaluations. The resulting products are summed to obtain an estimate of the attitude toward the behavior, and this estimation is based on the person's accessible (salient) beliefs about the behavior. This expectancy-value model has been described by Ajzen (2005) symbolically in the following Equation1:

$$A_B \propto \sum b_i e_i \tag{1}$$

where A_B stands for attitude toward behavior *B*; b_i is the behavioral belief (subjective probability) that performing behavior B will lead to specific outcome *i*; e_i is the individual's evaluation of outcome *i*. These are summed over the number of accessible behavioral beliefs an individual holds about performing behavior B at the time (Ajzen, 2005, p124).

Normative component, however, is assumed to be a function of beliefs of a different kind (Ajzen, 2005, p.125). Subjective norms are the person's beliefs about specific individuals' or groups' approval or disapproval of performing a specific behavior. The beliefs that form the basis for subjective norms are termed as *normative beliefs* and considered to be influential when the perceptions of important others (also called a referent) are valued and considered to be important by the person. The theory asserts that the more the individual perceives that referents approve or favor

performance of a specific behavior the more likely that individual will intend to perform the behavior. Normative beliefs and subjective norm relation is represented symbolically in the following Equation 2;

$$SN \propto \sum n_i m_i \tag{2}$$

here, *SN* is the subjective norm; n_i is the individual's normative belief concerning referent *i*; m_i is the person's motivation to comply or not to comply with referent *i*; and the sum is over the number of the salient (accessible) normative beliefs.

The final predictor in the model, perceived behavioral control, is also assumed to be a function of beliefs (Ajzen, 2005, p.125). Beliefs associated with the absence or presence of factors, such as resources or opportunities that facilitate or impede engaging in the behavior termed as *control beliefs*. These beliefs help to create the perception that one has or does not have the capability to accomplish the behavior. Perceived behavioral control refers to "the ease or difficulty in performing the behavior based one one's past experience and anticipated impediments and obstacles" (Ajzen, 1988, p. 132). The theory states that individuals, who have high-perceived behavioral control, will more likely intend to involve in the behavior in question than those possess low perceived behavioral control. The relation between control beliefs and perceived behavioral control is depicted symbolically in the following Equation3.

$$PBC \propto \sum c_i p_i \tag{3}$$

where *PBC* is perceived behavioral control; c_i is the control belief associated with a given factor (facilitator or inhibitor of the behavior) *i* will be present; p_i is the perceived power of factor *i* to promote or impede the performance of target behavior. These are summed over control beliefs that hold by individual to engage in the behavior (Ajzen, 2005, p125).

To sum up, the theory of planned behavior nominates attitudes toward behavior (derived from beliefs about the consequences of a behavior, and the evaluation of

these outcomes), subjective norms (beliefs about important others' expectations and the motivation to comply with these expectations), and perceived behavioral control (originated from beliefs associated with the existence of factors that facilitate or impede performance of a behavior and the perceived power of these factors) as determinants of behavioral intention that is posited to be the most proximal and powerful predictor of the behavior in question. The more positive these components toward a focal behavior, the more likely the behavior will occur.

Even though the TPB has been accepted as a model with strong empirical support (Godin & Kok, 1996), and existence of meta-analytic support for its intention and behavior predictive ability for different behavior types (Ajzen, 1991; Notani, 1998; Armitage & Conner, 2001) especially including health behaviors (Hagger et al., 2002; McEachan et al., 2011) some researchers strongly argued the extendibility of the TPB and suggested different constructs to increase the theory's effectiveness to predict intention and behavior (Conner & Armitage 1998 ; Rivis & Sheeran, 2003). Indeed, Ajzen (1991) points out the model to be open to additional constructs if they found to be important predictors in intention or behavior:

> *… the theory of planned behavior is, in principle, open to the inclusion of additional predictors if it can be shown that they capture a significant proportion of the variance in intention or behavior after the theory's current variables have been taken into account (p.199).*

This suggestion has provided flexibility and encouragement to researches in various contexts to study TPB with different variables. The review conducted by Armitage and Conner (1998) documented empirical and theoretical evidence about the addition of 6 variables to the TPB; belief salience measures, past behavior/habit, perceived behavioral control (PBC) vs. Self-efficacy, moral norms, self-identity, and affective beliefs. Thus, as the evidences provided above suggest, it can be argued that in addition to the original model of the TPB, in order to understand the nature of healthy eating behavior in depth it is useful to examine different variables to explain healthy eating intentions and behaviors. In this study, personal norms, self-identity, and Food consumption habit and sustainability used as additional variables in attempt to increase predictive power of the TPB.

A number of researchers suggested personal norms as an alternative component to the norm variable in the TPB (Beck & Ajzen, 1991; Raats et at., 1995). In his Norm Activation Theory, Schwartz (1977) conceptualizes personal norms and predicts that a behavior is more likely when it reflects personal goals and values. Personal norms have been defined as self-expectations that are based on internalized values (Schwartz, 1968b) and are experienced as feelings of personal obligation to engage in a certain behavior (Schwartz, 1977). Personal norms differ from social norms in a way that while the obligations and expectations related to personal norms are derived from the self, the obligations and expectations that are linked to social norms are derived from social group (Schwartz, 1977; Schwartz & Howard, 1984). In addition to the TPB constructs several studies evidenced that personal norm to have influence on behavioral intentions such as committing driving violations (Parker, Manstead & Stradling, 1995), skipping church attendance (Gorsuch & Ortberg, 1983), and drinking in university halls and pubs (Budd & Spencer, 1985). Harland, Staats and Wilke (1999) using TPB framework examined the effect of personal norms on pro-environmental intention and behavior of 302 Dutch citizens in the environmental relevant behavioral change program. Pro-environmental behaviors in this study were using unbleached paper, reduce meat consumption, use other transport than car, use energy saving bulbs, and turn off faucet while brushing teeth. While the proportion of variance explained by the TPB constructs varied from 37% to 51% addition of personal norm component significantly increased intention predictability of each behavior between 1% (use other forms of transport than car) and 10% (reduce meat consumption), improving the explained variance in the five intentions between 45% (use unbleached paper) to 58% (reduce meat consumption). Besides, the study also found personal norms to increase the variance explained in all pro-environmental behaviors between 3% and 7%, except reduce meat consumption behavior. The study regressed attitude, subjective norms and perceived behavioral control on past behavior. According to the TPB, however, the only construct among the TPB constructs that might be added to explanation of behavior beside intention is PBC. So, the results regarding behavior prediction of this study needs caution before making inferences about the predictive power of personal norms on behavior. Nevertheless, personal norms in this study were found to be significant independent

predictor of different pro-environmental behaviors including using unbleached paper, reducing meat consumption, using other transport than car, using energy saving bulbs, and turning off faucet while brushing teeth. Besides Nordlund and Garvill (2003) studied reducing personal car intentions of 1534 participants from general public in five Swedish cities. The path analysis of the study results revealed personal norms as a significant effect on willingness to reduce using their own car in order to reduce environmental problems. Although not in the context of the TPB, Norlund and Garvill (2003) found that personal norms are significant predictor of behavioral intentions in this case reducing personal car use in order to solve environmental problems.

A meta-analysis of Bamberg and Moser (2007) conducted specifically to address psychosocial determinants of pro-environmental behavior, with 57 environmental behavior studies, clearly revealed personal norm to be significantly independent predictor of behavioral intention. Specifically, according to this meta-analysis, personal norms together with perceived behavioral control and attitude component accounted for 52 % of the variance in environmental behavioral intentions, on average. Unlike to Bamberg and Moser (2007), Rivis et al., (2009) included a wide range of behaviors in their analysis such as physical activity, pro-environmental behaviors, health protection, smoking, blood donation, and ethical decision making. Rivis et al., (2009), in their meta-analysis, examined 47 studies to expand the normative component of the Theory of Planned Behavior. Across 47 studies, the meta-analysis found all TPB constructs to be significantly accounted for 44% of the variance in behavioral intentions, on average. Besides, the results of the analysis revealed that the addition of personal norm construct to the original TPB model led to a significant increment in the variance explained in intentions, explaining 3% variance additionally, on average. Besides, they found personal norms to influence behavior via behavioral intention. More recent TPB studies conducted in the domain of recycling (Nigbur et al., 2010), and sun-safe behavior (White et al., 2014) also revealed a significant relationship between personal norms and behavioral intentions to suggest personal norms having important influences on behavioral intentions. Although personal norms has never been studied in the domain of healthy eating with

the TPB framework, in general, the studies have shown that personal norms component qualifies as significant additional predictor of behavioral intention in the TPB (Parker et al., 1995; Rivis et al., 2009; Nigbur et al., 2010; White et al., 2014). Thus, it was expected that the personal norm would emerge as an independent predictor of behavioral intention to eat healthy and the relationship between personal norms and healthy eating behavior would be mediated by healthy eating intentions.

Self-identity is another component that has been proposed as an important additional predictor of behavioral intention since the late 1980s (Biddle, Bank, & Slavings, 1987; Sparks & Shepherd, 1992). Self-identity can be defined as 'a person's perception of himself' (Sherwood, 1965, p. 66). According to the Identity Theory (e.g., Thoits & Virshup, 1997), individuals describe themselves in terms of socially meaningful categories such as socio-demographic characteristics (e.g., ethnicity), social roles (e.g., wife), social types (e.g., drinker, smoker) and personality traits (e.g., caring, trustworthy, funny). Self-identity in healthy eating context is synonymous with the terms 'self-concept' and 'self-perception', as they all refer to the self-directed question, 'Who am I?' (Sparks & Guthrie, 1998). A review of Rise et al. (2010), with 40 TPB studies, suggesting that self-identity to be an independent predictor of intentions to perform a variety of health behaviors, such as alcohol consumption, donate blood, speeding behaviors, physical activity, buy ecological products, recycling, quit smoking, dietary patterns, and healthy eating. Their review found that self-identity had a medium-sized average correlation with behavioral intention (r = .47) explaining an additional 6% of the variance in intention in studies assessing the core TPB constructs, and an additional 9% of the variance in studies also controlling for past behavior. Bruijn and Putte (2012), however, explored the role of self-identity within the framework of the theory of planned behavior and showed that self-identity was the second strongest predictor of exercise behavior and interacted with exercise intention. In their structural equation model of theory of planned behavior, Ries, Hein, Pihu and Armenta (2012) found that self-identity had a direct effect on physical activity intention and physical activity behavior explaining additional 4% of the behavior. These empirical evidences clearly suggest that self-identity exert its effect on behavioral intentions and behavior. Hence, it would seem

clear that adding measures of self-identity to the TPB would be useful to explain behavioral intentions and behaviors. As a result, in the current study, self-identity was expected to provide additional predictions of young students' intentions to eat healthy and their behaviors. Using the theory of planned behavior framework, Terry, Hogg and White (1999), examined the role of self-identity in recycle behavior with a sample of 143, age range 17 to 59 years, community residents of Brisbane, Australia. Terry et al., (1999) found self-identity as a significant predictor of recycling intention after controlling for past behavior, attitude, subjective norms, and perceived behavioral control. Specifically, according to the results of the study self-identity component accounted for 2% of the variance in intentions even after controlling of the effects of TPB constructs and past behavior. Besides, self-identity in this study did not account for a significant proportion of variance in reported recycling behavior indicated that self-identity has an indirect relationship with behavior through behavioral intentions. A concurrent study by Armitage and Conner (1999) examined self-identity as a potential addition to the TPB and found self-identity to predict consumption of low fat diet intentions independently. Another study conducted by Fedaku and Kraft (2001) found self-identity as a significant predictor of contraceptive intentions in TPB model even after controlling for past behavior. In addition, Smith et al., (2007) found self-identity as a strong predictor of intention to purchase one's preferred beer in the TPB model explaining additional 15% of the variance in intentions after controlling for attitude, subjective norms and perceived behavioral control. Despite arguments suggesting self-identity as a reflection of other constructs such as attitude, past behavior (Fishbein, 1997; Sparks, 2000) the findings of (Terry et al., 1999; Armitage & Conner, 1999; Smith et al., 2007) show that self-identity contribute to intention independently even after controlling for attitudes, subjective norms, perceived behavioral control and past behavior.

Lastly, available research provided us with some clues regarding the possible link between healthy eating and sustainability in general, sustainable food consumption in particular (Foresight, 2011; IFR, 2012). For example, the relationship between environmental sustainability and healthy diet addressed by the recent *Foresight* report (The Future of Food and Farming: Challenges and choices for Global

sustainability) strongly highlighting the benefits of consuming moderate amount of livestock products for sustainable future (Foresight, 2011). Sustainability, in general, considered including environmental (such as biodiversity, water use, land use), economic (employment, trade etc.), and social (health and welfare of population, ethics etc.) dimensions (Foresight, 2011). A sustainable diet, in this manner, should have attributes from these dimensions as well as the balance between these dimensions. Emphasizing this balance, Food and Agriculture Organization of the United Nations (2010, p.33) formulated sustainable diet concept as:

> *those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources.*

In line with the definition of sustainable diet it can be said that sustainable diet is not only environmental friendly and economic but also require being healthy for the life of the present and future generations. Consequently, it can be argued that healthy diet contributes to sustainable environment, which in turn leads to sustainable future. Considering these assets of sustainable diet, there is growing interest in promoting more plant foods and less livestock products, a healthy diet, as a recommendation not only for individual health but also a solution for environmental problems (Garnett 2011; Scarborough, Allender, Clarke, Wickramasinghe & Rayner. 2012; Trichopoulou, 2012). A report released by Institute of Food Research (IFR, 2012), conducting comprehensive review using scientific literature and general sources, also evidenced the role of healthy diet in environmental sustainability in terms of its impact on health and welfare, economic dimension, as well as energy use, biodiversity, waste, and water use. Thus, in order to establish more sustainable environment a diet with lower GHG emissions emerges as a global need. Harland et al., (2012), using the data from the National Diet and Nutrition Survey (NDNS) rolling programme of UK, recommend adoption of more plant based diet to capture health and environmental objectives. By using Nutrition data bank (NDNS) and greenhouse gas emissions (GHGE) data of British Standards Institute in mathematical modeling, Macdiarmid et al., (2012) showed that people could

contribute to reducing GHGEs by eating a healthy diet. A more recent study conducted by Westhoek et al., (2014) explored the consequences of replacing 25-50 % of livestock products with plant-based foods and found that reducing livestock products by 50 % will lead to considerable amount (25-40%) of reduction in GHG emissions, and reduction in reactive nitrogen (around 40%) within EU borders. As a result, these studies indicate that it is possible to achieve more sustainable environment with engaging in more healthy foods. In conclusion, eating healthy is important not only due to in its value in improving the quality of human health but also sustaining health of environment. Considering the suggestions highlighting the relationship between healthy diet and sustainable future (Foresight, 2011; IFR, 2012; Macdiarmid et al., 2012; Westhoek et al., 2014), it seemed logical to include Food consumption habit and sustainability as another potential predictor for healthy eating intentions and that assumed that sustainability concerns that young students hold explain additional variance in their healthy eating intentions and exert its effect indirectly on healthy eating behavior through intentions.

Taking insights from the literature, the current study utilizes Theory of Planned Behavior (Ajzen, 1991) as a theoretical framework to uncover young students' healthy eating intentions and behaviors through examining their attitudes toward healthy eating, subjective norms, and perceived behavioral control. In addition to the original TPB constructs, the contributions of self-identity, personal norms, and Food consumption habit and sustainability were considered. This study, hence, intended to extent the existing research on the Theory of Planned Behavior in the context of healthy eating by developing a structural model (see Figure 1.2) that might explain the relationships among such concepts in different socio- cultural contexts. As the TPB suggests, it was expected that i) behavioral beliefs, normative beliefs, and control beliefs would be linked to attitude toward behavior, subjective norms, and perceived behavioral control respectively. ii) attitude toward behavior, subjective norm, and perceived behavioral control were expected to be associated with behavioral intentions, which in turn, predict behavior. iii) that perceived behavioral control would both directly and indirectly, through intentions, contributes to the behavior prediction. Apart from the relationships between the original TPB

components, it was expected also that i) personal norms would predict behavioral intention independently and intentions would mediate the relationship between personal norms and behavior. ii) self-identity would contribute to the predictions of behavioral intentions and behaviors. iii) Food consumption habit and sustainability would directly contribute to the prediction of intentions and exert its effect on healthy eating behavior via intentions.

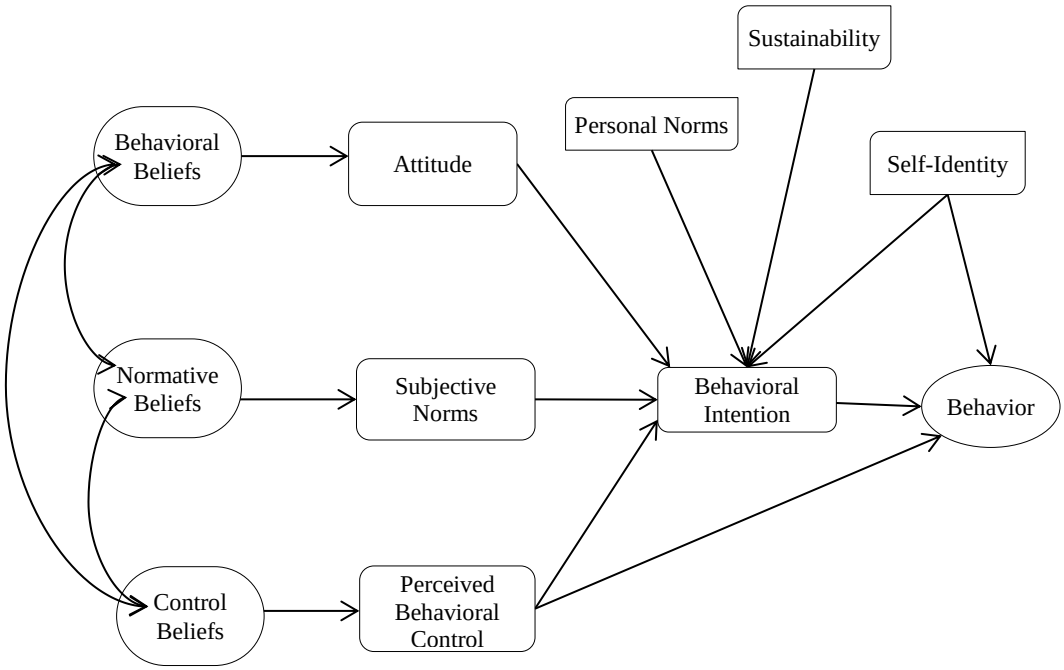


Figure 1.2 Proposed Structural Model

Accordingly, the current study seeks for the answer of the following research question.

1.2 Research Questions

1. What are the 5th, 6th, 7th and 8th grade students' attitudes toward healthy eating, subjective norms, perceived behavioral, healthy eating intentions, self-healthy eating identities, personal-healthy eating norms, Food consumption habit and sustainability, and healthy eating behaviors?
2. In what ways are behavioral beliefs, normative beliefs, and control beliefs are related to attitudes, subjective norms, and perceived behavioral control?
3. In what ways are attitudes toward healthy eating, subjective norms, perceived behavioral control, personal norms, self-identity, and Food consumption habit

and sustainability are related to healthy eating intentions?

4. In what ways are healthy eating intentions, perceived behavioral control, and self-identities are related to healthy eating behavior?

1.3 Background and Significance of the Problem

In recent years, increasing evidence has suggested that about 1.7 billion people around the world are overweight or obese, creating one of the biggest health problem that threats the world's population (Rosado, del R Arellano, Montemayor, Garcia & Caamano Mdel, 2008). This problem mainly stems from the shift in nutritional and lifestyle habits as a result of the popularity of fast foods, soft drinks and lack of exercise (Unnithan & Syamakumari, 2008). Contemporary studies have suggested enough evidence between various aspects of diet and life threatening diseases such as cardiovascular disease (Van Horn & Kavey, 1997) and cancer (Wong & Lam, 1999). Despite significant medical advancements, cardiovascular disease has become a leading cause of death during last 50 years. According to the World Health Organization estimation (2009), 17.5 million people had died due to cardiovascular disease in 2005, representing 30% of total worldwide deaths. Developing countries occupy 80% of these deaths coming from the fact that more than 115 million people dealing with obesity-related problems in these countries (De-Onis, & Blossner, 2000). If this problem continues, cardiovascular disease related death rate might reach to 20 million people worldwide by the end of 2015 (Boutayep, 2006; Yusuf, Reddy, Ounpu, & Anand, 2001). Adulthood overweight and related diseases including heart disease, hypertension, diabetes, and cancer have roots in adolescence overweight and obesity (Al-Sendi, Shetty & Musaigar, 2003). Although the relationship between such diseases and various aspects of diet is complex, Kumanyika et al. (2000) have implicated total fat and saturated fat in the diet, dietary fiber, and fruit and vegetable consumption as healthy eating diet aspects. Dietary fat aspect of diet has also been strongly advised in United States (e.g., American Cancer Society Advisory Committee on Diet, Nutrition, and Cancer Prevention [ACS], 2012; U.S. Department of Agriculture/U.S. Department of Health and Human Services [USDA/USDHHS], 1995) not to consume more than 30% of daily energy from fat and less than 10% of calories from saturated fat in order to reduce the risk of

these diseases. United Kingdom has reached similar consensus (see Committee on Medical Aspects of Diet, 1991). The health benefits of fiber consumption over lipid and glucose intake to prevent colon cancer also documented in other studies (Anderson, Smith & Gustafson, 1994; Ness & Powles, 1997; Brown, Rosner, Willett, & Sacks, 1999; Deckelbaum et al., 1999). As a result, the importance of consuming more plant-based foods and less animal sourced products have been suggested for health benefits by worldwide organizations (see Table1.1)

Table 1.1
Dietary recommendations that highlight plant-based eating

Organization	**Recommendations**
WHO, 2004	Increase the consumption of fruits and vegetables, and legumes, wholegrains and nuts.
World Cancer Research Fund (WCRF, 2007)	To reduce your cancer risk, base your diets on plant foods (like vegetables, fruits, wholegrains, and pulses such as beans), which contain fiber and other nutrients. Eat no more than 500 g (cooked weight) per week of red meats, like beef, pork and lamb, and avoid processed meats such as ham, bacon, salami, hot dogs and some sausages in order to lower cancer risk.
Report of the Dietary Guidelines Advisory Committee on the Dietary Guidelines for Americans (2010, p. 16)	'several distinct dietary patterns are associated with health benefits, including lower blood pressure and a reduced risk of cardiovascular disease (CVD) and total mortality. A common feature of these diets is an emphasis on plant foods'; 'the totality of evidence documenting a beneficial impact of plant-based dietary patterns on CVD risk is remarkable and worthy of recommendation.'

In fact, the suggestions to consume more plant foods and less animal products go beyond an individual's health benefits as mentioned above (see sustainability). Recalled that 10-12 % of total Greenhouse Gas (GHG) emissions globally, originated from agricultural sector (Friel et al., 2009; Harland et al., 2012) and every stage of food production releases GHGs but meat and dairy cause the greatest contribution to GHG emissions in the diet (Carlsson-Kanyama & Gonzales, 2009; Wallen, Brandt & Wennersten, 2004; Millward, Garnett & Plenary, 2010).

Considering the role of healthy diet not only on health benefits but also on sustainability, several European countries recommended more plant foods and less amount of meat intakes (Friel et al., 2009; see Swedish National Food Administration; Swedish Environmental Protection Agency; 2009; see also the New Nordic Diet; Mithril et al., 2012). The UK government Food 2030 strategy committed to acknowledge consumers to follow healthy and sustainable choices (Defra, 2010). In line with this commitment, *The Eatwell* plate is proposed by The UK Department of Health in association with Welsh Government, the Scottish Government and the Food Standards Agency in Northern Ireland (Harland, Buttriss & Gibson, 2012). Sustainable healthy eating, as a result, has become a core policy objective both in national and international levels.

In national level, Turkey, as a developing country, has been experiencing a rapid social and economic transition since 1980s (Ayranci et al., 2010). This major change, unfortunately, had a negative impact on eating behaviors of Turkish people (Akbay, Tiryaki & Gul, 2007). A document released by Turkey Demographic and Health Survey (TDHS, 2008), overweight prevalence in 15-49 age group of females (BMI= 25-29.9 kg/m^2) in 1998, 2003 and 2008 was found as 33.4%, 34.2% and 34.4% respectively and the obesity prevalence (BMI 30 kg/ m^2) in 1998, 2003 and 2008 was found as 18.8%, 22.7% and 23.9% respectively. The picture for younger people, unfortunately, does not differ much. According to the results of Turkey Nutrition and Health Survey (TNHS, 2010), 8.2% of 2248 children, between ages of 6 to 18, have been diagnosed as obese. One of the main reasons of these results can be attributed to the increasing fast food consumption among Turkish people. In recent years, fast food has been observed as the most preferred nutrition style especially among children and adolescents in urban areas of Turkey (Health Ministry of Turkey, 2011). Overall, these results clearly evidence that overweight and obesity prevalence among Turkish people has been increasing. These evidences indicate that obesity is becoming a serious problem in Turkey too.

Despite plenty of research in domain of healthy diet (WCRF, 2007; WHO, 2004; TDHS, 2008) and acceptance of their recommendations by Health Ministry of Turkey (2010), a recent document released by TDHS (2012) shows that overweight

and obesity prevalence has been dramatically increasing between male and female adolescents and adults since 2008 (see Table 1.2). According to the results of TDHS (2012), in 2008 the overweight and obesity percentage among 15 years and older individuals in Turkey was found to be 32.4 and 15.2 respectively. In 2012, the overweight and obesity percentage incremented to 34.8 and 17.2 respectively, indicates that over a third of the people in Turkey diagnosed as overweight.

Table 1.2
Overweight and obese percentage distribution of individuals 15 years and older in Turkey TDHS, (2012)

Years	**Gender**	**Overweight (%)**	**Obese (%)**
2012	Male	39.0	13.7
	Female	30.4	20.9
	Total	34.8	17.2
2010	Male	37.3	13.2
	Female	28.4	21.0
	Total	33.0	16.9
2008	Male	36.9	12.3
	Female	27.4	18.5
	Total	32.4	15.2

To tackle increasing overweight and obesity problem, a 5 yearlong Healthy Nutrition and Active Life Program have been initiated by Health Ministry of Turkey since 2010. The program designed to supply effective fight against obesity by making the obesity prevention action plan operational with the coordination of related institutions and organizations for the prevention and decrease of obesity prevalence which is an important health problem (Turkish Ministry of Health, 2011). Concerning educational institutions, the program aimed to make the pre-school and school children, adolescents, young people gain adequate and balanced diet and regular physical activity habit by including the subject of prevention from obesity in the formal and extensive education programs and to provide contribution to the raising of healthy and productive generations. Ensuring improvement of the education program related with the adequate and balanced nutrition and physical activity in pre-schools, primary education, secondary education and universities has

been chosen as an effective strategy to promote healthy eating behaviors (Health Ministry of Turkey, 2011).

The Turkish School Curriculum contributes to Healthy Nutrition and Active Life Program aims by establishing healthy eating theme that should be introduced in science courses. Consequently, healthy eating issue as a part of food and nutrition education has gained an important focus in National Science Curriculum. For example, according to the life sciences curriculum, by the end of the grade 5 students are expected to learn the effects of the hygiene and the freshness of the food and additives on health as well as to prepare healthy eating diet (see Table 1.3). By grade 7, as a part of the unit on digestion system, students are expected to give examples of foods affecting health either positively or negatively and students are expected to learn that foods containing fiber (fruits and vegetables) are necessary to keep digestive system healthy. These pedagogical interventions in life sciences curriculum are aimed to make young students aware of the adverse effects of unhealthy eating and help them to understand healthy eating concept.

Table 1.3
Turkish Science Curriculum objectives related to healthy eating

Grade Level	**Objectives**	**Unit**
Grade 5	Students will be able to investigate and discuss the effects of fresh foods and additives on health	Healthy eating
	Students will be able to prepare a sample meal for balanced diet	
Grade 7	Students will be able to discuss and summarize factors that affect digestive system health	Digestive system

Source: Ministry of Education (2013)

To this end, utilizing Theory of Planned Behavior (Ajzen, 1991) as a theoretical framework this study is intended to uncover factors underlying middle school students' healthy eating intentions and behaviors.

1.4 Significance of the Study

In *Handbook of Research on Science Education* (Abell & Lederman, 2007) Douglas Roberts identifies continuing political and intellectual tensions surrounding science

education. Roberts (2007) addresses the role of curriculum as emphasizing science subject matter itself and science in life situations that science plays a crucial role and refers the former role as Vision I and the latter as Vision II. Although, Vision I embodies the products and processes of science establishing accepted canonical natural science many, however, have placed the emphasis on Vision II that is the science- related situations in which considerations other than science have an important place for humanity (Roberts, 2007; Osborne, 2007; Bybee, McCrae & Laurie, 2009). Health and Environment are the science-related life situations and global issues significantly emphasized among the challenges face humanity now and in the future that require social, political and economic solutions (European Environment Agency, 2005; National Research Council, 2012; United Nation, 2002). An educational approach that emphasizes life situations and global issues as a primary concern emerged as a need in order to understand and address these challenges (Bybee, 2010). So, curriculum should cover not only science subject matter itself but also its application pertaining to personal, social and global contexts. Educational importance of addressing these challenges has also been emphasized by international educational organizations through assessing students' scientific competencies, understanding, and attitudes related to health and environment that students acquire at the end of compulsory schooling (PISA, 2006; OECD, 2013). Main applications of science in health and environment that are involved in personal, social, and global settings constitute a major part in a framework of context for science assessment (PISA, 2006). Specifically, maintenance of personal health through food choices, environmentally friendly behavior and its reflection on sustainability are specifically chosen contexts for the PISA (2006) science assessment. This study, therefore, is significant because it may contribute to the educational approach of addressing science-related health context through investigating factors affecting healthy eating.

Next Generation Science Framework specifically aimed to help students be aware of negative consequences of human activity for the health of both human generation and the natural environment (National Research Council, 2012). In addition, Science Technology Engineering and Mathematics (STEM) education also strongly

emphasizes the need to minimize human impacts on Earth systems by integrating science and engineering based lessons aimed to solve environmental problems (National Academy of Sciences, 2014). Given the significance of healthy eating for sustainable environment (Food and Agriculture Organization of the United Nations, 2010; Garnett 2011; Foresight, 2011), the current study utilized Food consumption habit and sustainability component as an additional predictor of middle school students' healthy eating intentions.

Even though there exists studies investigating factors affecting sustainable food consumption such as the effect of ecological citizenship on sustainable consumption (Seyfang, 2006) and the effect of involvement with sustainability, certainty, perceived consumer effectiveness, perceived availability and attitude toward buying sustainable dairy products on intention to buy sustainable foods (Wermair & Verbeke, 2007), the literature lacks studies examine the relationship between healthy eating and sustainability concerns. To our best knowledge, no study has investigated the impact of sustainable healthy eating on healthy eating behavior in Turkey, a developing country. The study can be seen as a first attempt to identify the relationship between sustainability concerns of the students and their healthy eating intentions. If the relationship reaches to significant level than further research could be conducted to examine this relationship deeply. This relationship could help us to find a solution to make more sustainable future. In this perspective, this study is important because it may contribute to the existing literature by investigating the contribution of students' healthy eating intentions to sustainability.

Moreover, the theory of planned behavior conceptualizes subjective norms as the person's beliefs about specific individuals' or groups' approval or disapproval of performing a specific behavior. Subjective norms operationalized as social pressure either to comply with the wishes of others or not (Ajzen, 1991). Specifically, if an individual is motivated to comply specific others' approval or disapproval of performing a behavior than the individual will perceive a social pressure to engage or not to engage in a specific behavior. Social pressure, however, is rarely directly or explicitly effect behavioral intentions leading a number of researchers to argue that subjective norms component is inadequate and rarely predicts behavioral intention

(Sparks et al., 1995; Trafimow & Finly, 1996). This argument supported empirically in meta-analyses conducted by Godin and Kok (1996) with 56 studies, and Armitage and Conner (2001) with 185 studies found subjective norm component to be the weakest predictor of intentions across TPB studies. These findings arose questions about the theory's subjective norm variable suggesting the need for reconsideration of the normative component. To address the questions about the theory's subjective norm component, the current study proposes personal norms as an alternative predictor in order to better explain healthy eating intentions of middle school students. If personal norms contribute to intentions better than subjective norms do then the roots of students' healthy eating intentions could be more wisely investigated by future research. The current study, therefore, is significant because it may find significant additional explanations to middle school students' healthy eating intentions, consequently healthy eating behaviors with personal norms.

Furthermore, based on the Theory of Planned Behavior framework, the current study aimed to propose and test the model (see Figure 1.2), which includes the TPB constructs as well as personal healthy eating norms, self-healthy eating identities, and Food consumption habit and sustainability. Recalled that the theory of planned behavior is accepted as one of the most influential and well-supported social psychological theories for predicting any kind of human behavior as well as allow addition of extra variables.

Finally, incorporating a broad array of explanatory variables of theoretical importance, this study designed an instrument for researchers and educators to uncover potential determinants of healthy eating intentions and behaviors as well. This comprehensive instrument designed specifically for young students and measured the wide array of factors, including attitudes toward behavior, subjective norms, perceived behavioral controls, intentions, behavior, personal norms, self-identity and Food consumption habit and sustainability. In summary, while previous research examined only a few constructs (e.g. attitudes, subjective norms, and perceived behavioral control) the present study, on the other hand, considered various constructs in order to better explain young students healthy eating intentions and behaviors. We hope that the present survey will provide a valuable tool for

educators to understand the factors that underlie middle school students' healthy eating intentions and behaviors. Besides, we believed that uncovering the determinants of young people's healthy eating intentions and behaviors could provide science educators in Turkey with information about the existing situation, and also strengthen the efforts to promote healthy eating behaviors among middle school students.

1.5 Definition of the important terms

Attitude: Despite the vast amount of research and publication regarding attitude, unfortunately, there has been little agreement what an attitude is. As Keisler, Collins, and Miller have pointed out, "… all too often, social psychologists have tried to make their definition of attitude, both a [conceptual] definition and a theory of the concept" (p.4). The Theory of Planned Theory utilizes the definition that most researchers would probably agree on it that is "*a learned predisposition to respond in a consistently favorable or unfavorable manner with respect to a given object*" (Ajzen, 1988)

Subjective norm: The total pressure of beliefs that certain referents think the person should or should not perform the behavior in question has been termed as "subjective norm" by Ajzen and Fishbein (1975). Subjective norm is referred to the perception of person's judgement and opinion that encouraged them to perform or not to perform the behavior.

Perceived Behavioral Control: Perceived Behavioral Control (PBC) is similar to Bandura's (1986) self-efficacy concept refers to "the ease or difficulty in performing the behavior based one one's past experience and anticipated impediments and obstacles" (Ajzen, 1988, p. 132).

Intention: According to the TPB, intention is defined as the person's location on a subjective probability dimension involving a relation between himself and some action. A behavioral intention, therefore, refers to a person's subjective probability that he will perform some behavior and has been defined as the degree of willingness one has to engage in a specific behavior (Ajzen, 1998).

Belief: Beliefs represent the information person has about the object specifically a belief links an object to some attribute. The terms "object" and "attribute" refer to any discriminable aspect of individual's world. Thus, object maybe a person, a group of people, an institution, a behavior, a policy, an event, etc. and the associated attribute may be any object, trait, property, quality, characteristic, outcome, or event (Ajzen & Fishbein, 1975).

Healthy eating: Healthy eating refers to a diet low in fat, high fiber, and high fruit and vegetable consumption.

Personal Norms: Personal norms refer to person's own standards acquired through the awareness of personal needs toward behavior and awareness of consequences related to the behavior. Personal norms defined as self-expectations that are based on internalized values and are experienced as feelings of personal obligation to engage in a certain behavior (Schwartz, 1977).

Self-identity: Self-identity in this context is synonymous with the terms 'self-concept' and 'self-perception', as they all refer to the self-directed question, 'Who am I?' (Sparks & Guthrie, 1998).

Sustainable Healthy Eating: Food and Agriculture Organization of the United Nations (2010) defined sustainable diet as follow;

> "those diets with low environmental impacts which contribute to food and nutrition security and to healthy life for present and future generations. Sustainable diets are protective and respectful of biodiversity and ecosystems, culturally acceptable, accessible, economically fair and affordable; nutritionally adequate, safe and healthy; while optimizing natural and human resources"

CHAPTER 2

REVIEW OF LITERATURE

This chapter puts forward a detailed review of the related literature to elaborate the ideas presented in the introduction chapter. The literature review part, in general, covers models that explain health behaviors, explains the Theory of Planned Behavior in detail, and provides TPB studies in various behaviors. Specifically, section 2.1 provides an overview of models used in the context of health behaviors. Next, section 2.2 presents the effectiveness of the TPB. Section 2.3 includes an in-depth description of the theory of planned behavior. Section 2.4 starts with exemplifying behaviors predicted by the TPB followed by healthy behaviors context and finalizes by discussing previous TPB studies done specifically in healthy eating behavior context.

2.1 Models that Explain Health Behaviors

To date a number of theoretical models have been proposed to trace the factors that affect health behavior and identify proximal determinants of this behavior. Among them are multi-stage models, behavioral-enaction models, and motivational models (Armitage & Conner, 2000). Table 2.1 presents predominantly used theories for each model together with their constructs, aims and weaknesses.

Multi-stage models assume behavior change as a multi-stage process and conceptualize factors influencing behavior change in different stages (Koraly, 1993). Stage theorists assert two aspects: (a) people at different stages show different behavior in quality, (b) information and interventions types change from state to stage that is required to adopt a new behavior (Weinstein, 1988). These models propose that there might a close link between the stages and the most effective intervention. However the case is far from proven (although see Dijkstra *et al.,* 1998; Weinstein *et* al., 1998a, for promising future directions).

Unlike multi-stage models, behavioral enaction models are single stage process and mainly focused on improving intention behavior relations suggest the utility of implementation intentions with striking effects on behavior Sheeran and Orbell (1999). To date, however, few studies have applied them in health contexts suggesting that further empirical supports for applications of the models in the health field are required (Armitage & Conner, 2000).

Table 2.1

Social Cognition Models to Explain Behavior

Model Name	Developer	Constructs of the Model	Aim of the Model	Weaknesses of the Model
Health Action Process Approach	Schwarzer (1992)	Adoption, initiation and maintenance of health behavior motivational phase, volitional phase, Self- efficacy, outcome expectancies, risk perceptions.	To examine motivational influences of health action.	A concern about multi-stage models is the type and the number of different stages. As the behavior in question changes the number of distinguishable stages also change. So, what actually happens in each stage remains unclear. In line with Sutton (1998)'s comments concerning pseudo stages, clearly distinguishable stages for these models is debatable and needs future research for clarity (Armitage & Conner, 2000).
Rubicon Model	Heckhausen (1991)	Intention formation, post-decision, action, evaluation, motivational and volitional process.	To examine motivational influences of health action.	
Action Control Theory	Kuhl (1985)	Action and implementation control processes. Emotion control, motivation control, coping with failure.	To describe the factors that influence behavior change in different stages namely action and implementation control stages.	
Transtheoretical Model of Change	Prochaska and DiClemente (1992)	Precontemplation, Contemplation, Preparation, Action and Maintenance stages.	To examine the stages that people go through behavior change phase.	
Precaution Adoption Process	Weinstein and Sandman (1992)	Seven stages; Unaware of issue, Unengaged by issue, Undecided about acting, Decided not to act, Decided to act, Acting and Maintenance.	To explain how a person comes to decisions to take action and the person translates that decision into action.	

Table 2.1
Social Cognition Models to Explain Behavior (Continued)

Behavioral Enaction Models	...Implementato Intentions	Gollwitzer (1993)	Goal intentions and implementation intentions	To improve intention-behavior relations	Although the formation of these models has been supported by a range of experimental evidence Gollwitzer's (1993) model have not been widely applied to health behavior. Further research needed for its' effectiveness in prediction of health-related behavior (Armitage & Conner, 2000).
	Goal Theory	Bagozzi (1993)	Self-confidence, likelihood of goal attainment and the perception of pleasantness/ unpleasantness	To examine motivational influences on goal intentions and trying.	Not enough studies have applied these theories in health contexts to assess their effectiveness thus they don't provide clear direction for future research (Armitage & Conner, 2000).
Motivational Models	Social Cognitive Theory (SCT)	Bandura (1986)	Self-efficacy and outcome expectancies	To examine determinants of the behavior in question.	Although the theory has been applied to variety of health behaviors and behavioral intentions, the model explained only small to medium variance in behavior (e.g., Resnicow, Davis-Hearn, Smith *et al.*, 1997).
	Protection Motivation Theory (PMT)	Rogers (1983)	Adaptive coping and maladaptive coping.	To identify variables underlie health behaviors.	Although Hodgkins ***et al.***, (1998) assert variables in PMT to be sensitive to health interventions, given the lack of predictive power, it seems likely that the theory would exert minimal impact on behavior (Sutton, 1998).

Table 2.1
Social Cognition Models to Explain Behavior (Continued)

The health belief model (HBM)	Janz and Becker (1984)	Perceived susceptibility, perceived severity, perceived benefits, perceived barriers, health motivation (one's motivation to engage in health behaviors) and cues to action.	To identify variables underlie health behaviors	Although these constructs presented as separate predictors of behavior, the model grasped criticisms about the components that they have been formulated without definition and without rules of combination. A review done by Sheeran and Abraham (1996) reveals that all HBM variables correlated only weakly with behavior. This result could be attributed to poor definition of constructs and lack of combinatorial rules between the constructs (Sheeran and Abraham, 1996).
Theory of Planned Behavior	Ajzen (1988)	Attitude toward behavior, Subjective norms, Perceived Behavioral Control, Intention, Behavioral beliefs, Normative Beliefs, Control Beliefs and Behavior.	To examine determinants of the behavior in question.	Criticized for not providing specific guidance for behavioral change (Armitage & Conner, 2000)

Source: Armitage and Conner (2000)

Similar to behavioral enaction models, motivational models propose a single stage process to predict a behavior at a single point in time and some of them designed specifically to identify factors underlie health behaviors. Meta-analyses of motivational models suggest that they provide parsimonious accounts of health behavior (Armitage & Conner, 2000). Although prediction of a behavior is useful, models that explain the behavior in question are considered being effective. However, as Sutton (1998) argues that ‘‘models that do not enable us to predict behavior are unlikely to be useful as explanatory models’’ (p. 1319) assessment of predictive power provides a useful basis for judgments of efficacy. In terms of behavioral prediction, the TPB provides advancement on Health Belief Model, Social Cognitive Theory, and Prediction Motivation Theory. The studies that have compared the models clearly demonstrate the TPB to be better predictor of intentions and behavior over these models (e.g., Quine, Rutter and Arnold, 1998; Weinstein, 1993, but see Dzewaltowski *et al.,* 1990).

Among others, the theory of planned behavior emerged as one of the most influential frameworks in order to explain the nature of human behavior (Ajzen, 2001). Briefly, the theory proposes behavioral intention to be the most powerful predictor of a specific behavior. According to the theory, behavioral intention is, in turn, determined by three independent constructs namely attitude toward behavior, subjective norms, and perceived behavioral control. As a general consensus, the more positive the attitude and the subjective norm, and the higher the perceived control, the stronger will be an individual’s intention to perform the target behavior, and presumably the individual will involve in that behavior (Ajzen, 2005). Hence, intention is considered to be immediate antecedent of behavior. That is, the stronger the people's intentions to engage in a behavior or to achieve their behavioral goals, the more successful they are predicted to be. The Theory also posits that perceived behavioral control could serve as a proxy for actual control and contribute directly to the prediction of the behavior independent of behavioral intentions. So, the theory assumes that perceived behavioral control could influence behavior either indirectly, through intentions, or directly. According to the theory of planned behavior, these constructs derived from the salient beliefs people hold. The theory proposes that

these salient beliefs can be distinguished into three different categories; behavioral beliefs, normative beliefs, and control beliefs, which are assumed to provide cognitive and affective foundations for attitudes, subjective norms and perceptions of behavioral control respectively (Ajzen, 2005). Specifically, beliefs about the outcomes of a behavior and the evaluation of these outcomes constitute behavioral beliefs. Likewise, beliefs about important others' expectations and the motivation to comply these expectations form normative beliefs. In similar fashion, control beliefs originated from beliefs associated with the existence of factors that facilitate or impede performance of a behavior and the perceived power of these factors.

2.2 Meta-analytic support for the TPB

In addition to the studies cited above, several meta-analytic reviews, published up to the present, constitute a strong evidence for the theory's predictive power in general. Ajzen (1991) published the first TPB review with 19 studies. His study revealed that a considerable amount of variance in intentions could be accounted for by attitude, subjective norm, and perceived behavioral control. The study showed that the multiple correlations of these predictors ranged from .43 to .94, with an average correlation of .71 accounting for 50 % of the variance in intention. He also found that his theory accounted for 26 % of the variance in behavior. For the second review, Godin and Kok (1996) analyzed 56 TPB studies implemented in health domain to explain and predict health-related behaviors. In this analysis, attitude toward behavior and perceived behavioral control were found to be mostly significant predictor of intention and intention remained the most important predictor of the behavior. The results of the review demonstrated that the theory explained 41% of the variance in intentions and 34% of the variance in health related behaviors on average. The third meta-analysis conducted by Notani (1998), with 36 TPB studies from different domains, examined pair-wise correlations among the model's components (attitude, subjective norms, perceived behavioral control, intention, and behavior). Notani found that pairwise correlations were modest, with Attitude-Behavioral intention being the strongest (r = .51) and Subjective norm-Perceived behavioral control the weakest (r = .13). The results of the study, however, suggest that TPB performed well, with perceived behavioral control serving as a predictor of

intention and behavior (Notani, 1998). The fourth meta-analytic review targeted 185 independent TPB studies published up to the end of 1997 have been analyzed by Armitage and Conner (2001) with respect to self-report behavior measures and objective or observed behavior measures. It can be argued that these results may not show the real picture since TPB, as a behavioral decision-making model, relies on self-reported data. Despite evidence suggests the vulnerability of such self-report data to self-presentational biases (Gaes, Kalle, & Tedeschi, 1978), this has been ignored in the literature pertaining to TPB studies (Armitage & Conner, 2001). Even though self-reported data predicts better than observed behavior, the TPB is still capable of explaining 20% of the variance in prospective measures of actual behavior; i.e. a medium to large effect size (Armitage & Conner, 2001). They found that the model accounted for highly significant proportions of the variance both in self-reported behavior (R^2 = .31) and observed behavior (R^2 = .20). Although the study found the difference to be significant, it is notable that the theory can explain substantial proportions of the variance in actual behavior and present supplemental evidence for the efficacy of the theory. Overall, the study results indicated that the TPB accounted for 27% and 39% of the variance in behavior and intention respectively. Finally, considering a lack of hierarchical analysis in previous meta-analyses McEachan, Conner, Taylor and Lawton (2011) identified 206 usable studies to investigate the efficacy of the model with regard to behavior and methodological moderators. The results showed that, when compared to other behaviors, dietary and safer sex intentions are relatively better predicted (50.3 % and 51.3 % variation explained, respectively). Although risk, detection, safer sex and abstinence from drugs behaviors weakly predicted, physical activity (23.9% variance explained) and diet behaviors (21.2% variance explained) were better predicted. Overall, the authors of the study explored that TPB explained 44.3 % of the variance in intentions and 19.3% of the variance in behavior across health-related studies.

To sum up, these meta-analyses clearly demonstrate that the Theory of Planned Behavior is an efficacious model designed to explain and predict different kind of behaviors. Its effectiveness and popularity could be attributed to clear operational definitions of the concepts with guidelines concerning how to assess (Ajzen, 2006),

analyze (Hankins, French, & Horne, 2000), and develop theory-based interventions (Sutton, 2002). In conclusion, considering the meta-analyses conducted up to now, this study utilized the Theory of Planned Behavior as a theoretical framework to investigate middle school students' healthy eating behavior due to its effectiveness for explaining behavior in question, specifically healthy behavior.

Even though there exists plenty of evidence (as discussed in Meta –analytic support section) for strong relations between beliefs, attitudes, intentions, perceived behavioral control, subjective norms and behavior in the original model, as pointed out, the nature of exact relationship is still uncertain (Ajzen, 1991). From a general perspective, however, the theory accounted for significant predictor of behaviors including, proenvironmental behaviors such as wastepaper recycling behavior (Cheung & Chan, 1999), ecological behavior (Kaiser & Gutscher, 2003), household waste recycling (Knussen, Yule, MacKenzie & Wells, 2004), water conservation (Trumbo & O'keeffe, 2001). The Theory of Planned Behavior has also been utilized to examine other types of behaviors among them are choice of travel mode (Bamberg, Ajzen & Schmidt, 2003), leisure activities (Ajzen & Driver, 1991) condom use (Reinecke, Schmidt, & Ajzen, 1996), class attendance (Ajzen & Madden, 1986; Prislin & Kovrlija, 1992), decision to complete high school (Davis, Ajzen, Saunders & Williams, 2002), hunting intentions and behavior (Hrubes, Ajzen, & Daigle, 2001), decision to donate blood (Armitage & Conner, 2001b), premarital sex (Chan & Cheung, 1998), violating driving regulations (Parker, Manstead, & Stradling, 1995), dishonest behaviors such as cheating on an examination and shoplifting (Beck &Ajzen, 1991), and investment decisions (East, 1993). Overall, previous research indicated that the theory of planned behavior has been applied successfully to a number of areas and corroborate predictive power of the three constructs (i.e., attitude, perceived norm, and perceived behavioral control) in predicting intention and actual behavior (Cheung & Chan, 1999).

The predictive power of the theory has also been replicated in various health related issues including substance use such as drinking and smoking, physical activity and weight loss. In recent meta-analysis of applications of the TPB to health behavior, McEachan et al. (2011) identified 18 studies investigating alcohol use (n=3),

smoking (n=7) and drug use (n= 8). According to this meta-analysis, attitudes, subjective norms, and PBC were able to explain an average of 53% of variance in behavioral intentions across a range of substance use behaviors. Behavioral intention and PBC, in turn, accounted for 39 % of the variance in behavior on average.

Most of the TPB studies conducted in health domain focus on substance use. In one of the earlier study, Armitage, Conner, Loach and Willets (1999) designed a prospective study, utilizing structural equation modeling approach, to address the ability of extended TPB to explain alcohol usage, and cannabis usage among 176 undergraduate students between ages of 18 to 49 from a university in northern England. Attitude toward behavior, subjective norms, self-efficacy, perceived behavioral control, and intention, in their study, assessed at Time 1 and behavior measures were assessed one week later (Time 2). The results of the study revealed that 66 % of the variance in intentions to consume alcohol explained by perceived control over behavior, self-efficacy and subjective norms. Specifically, perceived control over behavior had a negative relation (r= -0.52) with intentions, and self-efficacy having a positive relation (r= 0.82) with intentions predominantly explained the variance in alcohol consumption intentions. Subjective norms, on the other hand, were positively related (r= 0.22) to intentions and were the second strongest predictor after PBC. Unlike to cannabis usage, alcohol usage intentions predicted by subjective norms but not by attitudes. Such finding shows that people perceive more social pressure when consuming alcohol than using cannabis which is not legal. In the United Kingdom, alcohol consumption possesses a main role in the culture of young people and young people in UK have their first alcohol consumption experience generally at their homes (Armitage et al., 1999). In line with this cultural context, the findings of this study shows that the students' perceived pressure from their families mainly determines their subjective norms. Attitude component, however, did not predict the intentions significantly at all. Concerning behavior, only intentions contributed significantly to the subsequent alcohol consumption, explaining 17% of the variance in the behavior, prediction indicating that alcohol consumption was under volitional control for young people in UK. Perceived behavioral control, however, had a strong relation with intentions implying that

although alcohol consumption under volitional control, perceived control over behavior and self-efficacy possess a significant role in the formation of alcohol consumption intentions, which in turn, predicts alcohol consumption behavior significantly. Besides, the results of the study of Armitage et al., (1999) related to cannabis usage revealed that attitude toward behavior, self-efficacy and perceived control over behavior explained 88% of the variance in intentions to consume cannabis. Unlike to alcohol usage, in cannabis usage, attitudes toward behavior were the predominant predictor of behavioral intention fallowed by self-efficacy indicating that undergraduate students are more likely to intend to use cannabis if they have positive disposition toward cannabis and if they perceive self-efficacy. Similar to alcohol usage, perceived control over behavior was negatively (r= -0.23) related to intentions. The negative relationship between perceived behavioral control and intention indicates that students who have high behavioral control over cannabis usage are less likely to hold intentions to use cannabis. Subjective norm was the only component that did not contribute to the prediction of cannabis usage intentions significantly indicating that social pressure does not play an important role in the cannabis usage intentions. Concerning behavior, both intentions and self-efficacy contributed to the cannabis usage behavior significantly and positively explaining 60% of the variance in the behavior. Perceived control over behavior, however, had non-significant contribution to the prediction of cannabis usage. The findings of Armitage et al., (1999) provide support for the TPB to be predictor of alcohol consumption and cannabis usage intentions and behaviors. The results of this study also distinguish self-efficacy from perceived behavioral control and provide support for the inclusion of extra variable, which is self-efficacy in TPB model.

A concurrent study conducted by Conner, Warren, Close and Sparks (1999) with a sample of 159 students in Leeds University also provided support for the predictive power of the TPB in the context of alcohol consumption utilizing additional construct, which are self-identity and past behavior. Conner et al., (1999), in their study, recruited 159 Leeds university students (42 males, 117 females) to investigate their alcohol consumption and found attitude toward alcohol consumption and subjective norms but not perceived behavioral control to be significant predictors of

alcohol consumption intentions accounting for 40% of the variability in intentions. While attitudes and subjective norms were positively related to intentions, perceived behavioral control was negatively related to intentions. So the results suggest that more positive attitudes and higher perceived social pressure and lower behavioral control related to higher intentions. These findings imply that university students who possess more positive dispositions toward alcohol consumption and high social norms are more likely intended to use alcohol than those who have low attitudes toward alcohol and low social pressure. When self-identity component was added to the model the results of the study revealed that self-identity explained significant amount of variance in intentions indicating that university students who perceive themselves as drinkers are likely to possess intention to use alcohol. After the addition of self-identity, past behavior was added to the model and the results revealed that past behavior significantly increased the amount of variance in intentions. The authors of this study suggest that the effect of past behavior was not mediated by the TPB components and self-identity, which indicates that past behavior component captures different aspect of intentions than attitudes toward behavior, subjective norms, PBC, and self-identity. Alcohol consumption behavior, on the other hand, was predicted significantly only by intentions suggesting that this type of behavior is mostly under volitional control. In line with the previous findings (Armitage et al., 1999), the results of Conner et al., (1999) also suggest that the TPB can be used to predict alcohol consumption intentions and behaviors of students. Specifically, Conner et al., (1999) showed the evidence that self-identity component might be added to the TPB model in order to better explain alcohol consumption intentions. Besides, Conner et al., (1999) also provided some evidence to include past behavior in order to better explain alcohol consumption intentions.

Another line of research in substance use concentrated on smoking domain of health behavior. A study by Godin et al., (1992) shows the predictive power of TPB, with additional construct that is habit, in intentions and behaviors not to smoke cigarette among 346 adults (129 males, 217 Females) of Canadian population. According to the study results, attitudes toward smoking, subjective norms, and perceived behavioral control together accounted for 39 % of the variance in intentions not to

smoke cigarette with perceived behavioral control being the strongest predictor of the behavioral intention followed by attitudes and subjective norms. The smoking habit, on the other hand, did not explain significantly intention not to smoke. The results of this study indicate that attitudes toward not to smoke, subjective norms, and perceived behavioral control influences the strength of intentions not to smoke cigarette, but not the smoking habit. So these findings imply that individuals holding more positive attitudes toward not to smoke and higher perceived social pressure together with higher behavioral control are more likely intended to cease smoking cigarette. Non-smoking behavior, on the other hand, was significantly predicted by perceived behavioral control and habit explaining 27 % of the variance in behavior, but not by intentions. The results suggest that this type of behavior is mostly under the influence of actual control over non-smoking than being volitional. This finding suggests that individual find quitting smoking as a difficult and smoking habit takes priority on any rational decision. Overall, Godin et al., (1992) present support for the usefulness of the TPB in understanding smoking behavior and advocate the inclusion of past behavior in the TPB model in order to better understand smoking behavior.

Norman, Conner and Bell (1999) investigated the same behavior with a sample of 84 smokers attending health promotion clinics in a primary care setting. Similar to Godin et al, (1992), the TPB in this study was also found to be predictor of smokers' intention to quit explaining %49 of the variance in behavioral intentions. In line with the findings of Godin et al, (1992), the PBC component was the strongest predictor of behavioral intention. Unlike to Godin et al., (1992), Norman, Conner and Bell (1999) found intention not to smoke to be significant predictor of non-smoking behavior but not perceived behavioral control. The difference between these two studies could be attributed to the characteristics of sample they studied. While Godin et al., (1992) studied with general population Norman et al., (1999) conducted their study with participants who attends health promotion clinics. Since the TPB measures in the latter study were not administered prior to the health promotion clinics it was not possible to determine what changes smokers' intentions (Norman et al, 1999). It is possible that those who attend health promotion clinics might develop will power that has a significant effect in developing smoking cessation behavior.

Nevertheless, Norman et al., (1999) found the TPB to be a useful theoretical framework to understand the intentions and behaviors of smokers that attend to health promotion clinics in a primary care setting.

Physical activity is another domain that the TPB could effectively explain behavioral intentions and behaviors. Godin, Valois and Lepage (1993), investigated exercising intentions and behavior of 1177 adults from general population selected randomly from metropolitan telephone directory provided by a company specialized in Canadian national surveys. Trained interviewers visited the subjects at home and the data were collected with the use of paper and pencil questionnaires. The self-report behavior data was collected after 6 months by mail from respondents. Structural equation modeling analysis revealed the TPB components that are attitudes, subjective norms, and perceived behavioral control together with an additional variable which is habit accounted for 74 % of the variation in intentions to engage in exercising. While attitudes toward exercising and perceived behavioral control significantly explained exercising intentions, subjective norms did not contribute significantly to the formation of adults' exercising intentions. These findings point out those attitudes toward exercising and perceived ease or difficulty as a result of existing barriers or facilitators related to exercising behavior play key factors in explaining adults' intentions such that individuals who hold more positive attitudes and higher behavioral control are more likely to develop intention to involve in exercising behavior. The findings of this study also points out the non-significance influence of perceived social pressure on exercising intentions. Concerning behavior, 48 % of variance in exercising was explained by intention and habit but not by perceived behavioral control. Specifically, habit component in this study predominantly contributed to the prediction of behavior followed by intentions suggesting that those who have exercise history are more likely to involve in exercising behavior if they also possess high intentions. Non-significant effect of PBC on behavior together with significant contribution of PBC on intentions shows that opportunities, resources or skills that facilitate or inhibit exercise behavior seem to have no direct effect on exercising behavior but rather indirect effect through intentions. From theoretical point of view, the findings of this study highlight the

volitional aspect of this type of behavior. In general, Godin et al., (1993) provided support for the usefulness of the TPB to understand exercising intention and behaviors of general population and also evidenced the inclusion of habit component in the TPB model in order to better explain individuals' exercising intentions and behaviors.

Theodorakis (1994) examined exercise behavior of 395 females between ages of 18 to 45 with a random stratified sampling method from 4 fitness clubs in Salonika city of Greece. Theodorakis found attitude and perceived behavioral control to be significant predictors of exercising intentions explaining 58 % of the variance in intentions. Besides, intention and perceived behavioral control contributed significantly to the prediction of exercising behavior accounting for 57 % of the variance in the behavior. In line with the findings of Godin et al., (1993) this study suggest that attitudes toward exercising and behavioral control play significant role in the formation indicating that those females holding positive attitudes and having high behavioral control are likely to develop exercise intentions. Similar to Godin et al. (1993), Theodorakis found that subjective norm variable did not contribute to the prediction of exercise behavior significantly indicating that perceived social pressure does not influence adults' exercise intentions. When additional components that are role-identity and attitude strength were added to the TPB model this study found that both role-identity and attitude strength significantly contributed to the prediction of exercise intention explaining 64% of the variance in intentions together with the original TPB components. Concerning behavior, the findings of this study revealed that intentions together with perceived behavioral control accounted for significant amount of variance in behavior explaining 32 % of the variance in exercising behavior. This finding proposes that stronger intention and high behavioral control related to increased participation in the behavior implying that individuals holding higher volitional control together with higher behavioral control are more likely to engage in exercise behavior than those holding less volitional control and low behavioral control (Theodorakis, 1994). When attitude strength and role-identity added to the model the results showed that both components explained significant amount of variance in exercising intentions. The findings of this study provide some

evidence of the significant contribution of attitude strength component to the prediction of exercise intentions and behaviors. Attitude strength in this study included importance, confidence, certainty, centrality, skill, and knowledge dimensions. So, the level of confidence, certainty, and the skills and knowledge possessed determines the frequency of participation in an activity (Theodorakis, 1994). To conclude, the findings of this study support the predictive utility of the TPB model in health behavior especially exercising behavior and evidenced the significant contribution of additional variables that are attitude strength and role-identity in the TPB model.

Other than substance use and physical activity, a more recent study conducted by Zemore and Ajzen (2014) also suggests a promise for application of the TPB to predict substance abuse treatment completion. Zemore and Ajzen (2014) examined a convenience sample of 200, age range of 18 to 60, participants' intentions to complete substance abuse program, selected from a large public, outpatient alcohol and drug treatment program in California. Their path model testing application of the TPB model explained 56 % of the variance in intentions that is to say attitudes toward completing substance abuse program, subjective norms and perceived behavioral control accounted for more than half of the variation in intentions to complete the program. Zemore and Ajzen (2014) found only attitudes and perceived behavioral control contributed to the prediction of intention to complete the treatment. According to the findings of the study subjective norms were unrelated to intentions. Intention to complete treatment and perceived behavioral control, in turn, explained a moderate amount of variance, 24 %, in treatment completion. Overall, the results of this study suggest the TPB model to understand substance abuse treatment completion intentions and behaviors.

Intentions to lose weight among 83 American college women were predicted on the basis of the TPB where perceived control and intentions were together moderately successful in predicting the amount of weight that participants actually lost over 6 – week period (Schifter & Ajzen, 1985). In this study, attitudes toward weight loss (β= 0.79) made the strongest independent contribution to the prediction of weight loss intentions followed by perceived behavioral control (β = 0.30) and subjective norms

(β = 0.17), with a multiple correlation of 0.74. The findings of this study point out that intention to lose weight is largely based on attitudes and moderately linked to perceived behavioral control. Although significant, subjective norms had relatively low effect on the formation of weight loss intentions. Altogether, these findings imply that collage women holding more positive attitudes toward weight loss and more behavioral control together with high social pressure are more likely to intent lose weight. Concerning behavior, the findings of this study revealed a low correlation between intentions and actual weight lost. Perceived behavioral control, however, better predicted behavior than intentions suggesting that weight lose seems little to do with volitional control but largely effected by individuals' perceived behavioral control. So, those women who believe that they have the resources or opportunities to promote weight loss and have volitional control are more likely to succeed losing weight than those who have low behavioral control and low volitional control. Schifter and Ajzen (1985) showed that, in consistent with the TPB, intention to lose weight is a function of attitude toward weight loss, subjective norms related to this behavior, and perceived controls over weight lose behavior.

Considering different health behaviors together, McEachan et al., (2011) applied meta-analytic procedures of Hunter and Schmidt (2004) to 237 health related TPB studies. The meta-analysis covered 29 studies related health risk behavior (included studies such as speeding, drinking alcohol, smoking, and using drugs), 17 studies related to detection (included studies such as attending health checks and self-breast examination), 13 studies related to abstinence (included studies such as quitting drugs such as smoking and reducing binge drinking), 103 studies related to physical activity, 15 studies related to safer sex, and 30 studies related to dietary behaviors. There were also 37 studies (such as breast feeding, general health) that were not categorized. The results of the meta-analysis showed that attitude and subjective norms together with perceived behavioral control accounted for 44.3% of the variance, on average, in intentions across a wide range of health related behaviors. While attitude component was the strongest predictor (B = 0.34) across different health related contexts followed by perceived behavioral control (B = 0.34), subjective norms remained as the weakest predictor (B = 0.15). In relations to

prediction of behavior, behavioral intention being the main predictor of behavior together with perceived behavioral control explained 19.3% of the variance in behavior.

To summarize, the studies discussed so far indicate that the TPB has been able to explain behavioral intentions and behaviors in different health related contexts in considerable amount. In conclusion, the results of these studies suggest that applying the TPB to health related contexts is useful to understand the behavior in question.

Apart from general health behaviors, the theory of planned behavior has also been applied to healthy eating domain. Following part presents and discusses research specifically on healthy eating domain.

2.3 Research on Healthy Eating

To begin with, Armitage and Conner (1999) studied low fat diet behaviors of participants form a general public of UK with an age range of 17 to 55 utilizing original TPB constructs and additional constructs that are self-efficacy and self-identity. The data for the study is collected through 73 undergraduate students from Leeds University that were instructed to collect data from 4 individuals resulting in a sample of 221 participants. The results revealed that attitude, subjective norms, perceived control over behavior, and self-efficacy accounted for 60 % of the variance in intention to eat low fat diet. Among them attitude being the strongest predictor together with self-efficacy were the dominant predictors of intentions suggesting that individuals' attitudes toward low fat diet and their self-efficacy might be the most effective targets in developing a low fat diet interventions. These findings imply that individuals with more positive attitudes toward low fat diet and holding the belief that they are capable of keeping with low fat diet are more likely intended to involve in low-fat diet behavior. When self-identity added to the model the findings of the study revealed that self-identity increased the percentage of explained variance in intentions significantly, putting extra 5% to the variance in intentions. Considering behavior, the study found a considerably strong correlation (r=0.60) between healthy eating intentions and healthy eating behavior. Intentions together with perceived control over behavior accounted for 39 % of the variance in self-reported low fat diet

behaviors. The study also measured actual behavior with Food Frequency Questionnaire (Cade & Margetts, 1988). Using the Food Frequency Questionnaire it was possible only to account for 18% of the variance in low fat diet behaviors. Self-reported behavior measure, however, accounted for additional 21 % of the variance in behavior. In this study, intention was the only significant predictor of both self-perceived and actual behavior suggesting that eating low fat behavior is relatively volitional. Overall, findings from their study indicated that the TPB usefully predicts both low fat eating intentions and behavior among general population. Besides, supporting the findings of Armitage et al., (1999) this study provided empirical evidence that shows the distinction between perceived control over behavior and self- efficacy and the inclusion of self-efficacy construct in the TPB model. Furthermore, Armitage and Conner (1999) showed that in addition to the original TPB components self- identity explains low fat intentions significantly.

Another study, conducted by Povey et al., (2000), examined healthy eating intentions and behaviors of 235 members of the general public in UK with a median age of 38 years. Using the TPB, this study explained 42 % of variance in intentions to eat healthy and 15 % of variance in healthy eating behaviors. Specifically, in this study, attitudes were found to be the strongest predictors of intentions confirming the findings of Armitage and Conner (1999) followed by PBC and subjective norms. These findings imply that individuals with more positive attitudes toward healthy eating, higher perceived pressure from important others together with higher behavioral control are more likely to develop healthy eating intentions than others. Regarding behavior, the study revealed that healthy eating intentions together with perceived behavioral control accounted for 15 % of the variance in behavior. Unlike to Armitage and Conner (1999), this study found that in addition to intentions, PBC was also found to be a significant predictor of behavior. Although Armitage and Conner (1999) and Povey et al., (2000) studied with the same culture they found different results concerning the contribution of PBC component on the prediction of intentions. This difference could be attributed to the characteristics of the sample. It is possible that different sample could report different level of volitional control and external control over their healthy eating behavior. Besides, as Armitage and Conner

(1999) points out, this difference could also be explained by the possibility that inaccurate measurement of perceptions of controls, especially external factors, in the first study. The contribution of PBC to behavior prediction in the study of Povey et al., (2000) was found to be higher than intentions suggesting that healthy eating behavior seems to be related to behavioral control rather than being volitional. The findings related to behavior imply that healthy eating behavior engagement is largely influenced by external factors has little to do with personal motivation. In general, Povey et al., (2000) found the TPB as a useful theoretical framework to better explain healthy eating intentions and behaviors of general public.

Astrom and Rise (2001), utilizing the TPB, predicted young adults' healthy eating intentions. A total of 735, 25 years old participants contributed the study. According to the study results the theory explained 53 % of the variance in young adults' healthy eating intentions. Specifically, the results of this study revealed that perceived behavioral control exhibited as the strongest predictor while subjective norms being the weakest predictor. Another concurrent study conducted by Povey, Wellens and Conner (2001) investigated predictors of following meat, vegetarian and vegan diets with 111 university students (25 meat eaters, 26 meat avoiders, 34 vegetarians, and 26 vegans). Regression analysis of the study revealed that attitudes, subjective norms, and perceived behavioral control were significant predictors of intentions to follow each diet except for the vegetarian diet where subjective norms were non-significant predictor of intentions. Specifically, while attitude was the strongest predictor of following meat diet intentions, in line with the results of Astrom and Rise (2001) perceived behavioral control was the strongest predictor following vegetarian and vegan diet intentions. Povey et al., (2001) also found subjective norms to be the least significant predictor of intentions confirming the results of Astrom and Rise (2001).

Conner, Norman & Bell (2002), in their longitudinal study, investigated healthy eating intentions and behaviors of 144 participants attending health promotion clinics in a primary care setting age ranged between 20 and 68. In this study, intentions found to be 43% of the variance in behavioral intentions cross-sectional and 20 % prospectively, over a 6-year interval suggesting that the theory can predict also long-

term intentions. It is interesting to note that the study showed the TPB to explain prospective intentions over considerable time intervals. Specifically, perceived behavioral control and attitudes were found to be significant predictor of healthy eating intentions while subjective norms remained non-significant in the model implying that individuals holding high perceived behavioral control together with more positive attitudes toward healthy eating are more likely intended to involve in healthy eating behavior. Intentions, in turn, explaining 9 % of the variance in the behavior were significant prospective predictors of healthy eating behavior. In line with the findings of Armitage and Conner (1999) PBC component, in this study, did not contributed to the prediction of health behavior. The findings related to behavior indicate that healthy eating is mostly under volitional control for this sample. The TPB in this study, in addition to explaining prospective intentions, was also found to explain prospective healthy eating behavior 6 years later. The capability of the TPB to explain healthy eating behaviors over considerable time periods is important because it suggest not only the prediction of intentions but also the prediction of maintenance of health behavior (Norman & Conner 1996; Conner, Norman & Bell 2002). Besides, explaining prospective health behavior also highlights the temporal stability of health cognition (Conner, Norman & Bell 2002). Conner, Norman and Bell (2002) found that as intentions become more stable they become stronger predictor of health behavior. As Ajzen (1996, p.389) points out, the temporal stability of cognitions has significant role in the "strength" of health cognitions in relation to its power to predict to predict prospective health behavior maintenance (Conner, Norman & Bell 2002). So, the findings of this study suggest that individuals holding more stable healthy eating intentions are more likely to develop strong health cognitions which leads them to keep with healthy eating behavior in long term.

The studies discussed so far targeted the participants from general public with an age range between 17 to 68 years. In order to narrow the picture to adolescents' level, the remaining of the chapter will continue with the studies conducted with high school and lower grades. So, the following part of this chapter will focus on healthy eating research on young people.

Using the Theory of Planned Behavior, Backman et al., (2002) identified predictors of healthful dietary practices in on a sample of 780 high school students aged 14 to 19 years in San Bernardino, California. They explored that attitudes toward healthful dietary practices, subjective norms, and perceived behavioral control were all significant predictors of intention to eat healthful diet explaining 42 % of the variance in behavioral intention. The study, specifically, found attitudes (r= 0.54) to be the strongest predictor of healthful diet intentions followed by subjective norms (r=0.51) and perceived behavioral control (r= 0.46) suggesting that high school students having more positive attitudes toward healthy eating, high social pressure together with high perceived behavioral control are more likely intended to engage in healthy eating behavior. In this study, the belief analysis indicated that taste of healthful foods, feel good about self, tolerance of giving up liked foods and lose weight or maintain healthful weight were found to be significant contributors in the formation of high school students' attitudes toward healthy eating. Similarly, mother, siblings and friends referents were found to establish the students' normative beliefs, which in turn contributed to the formation of their subjective norms. In similar fashion, knowledge about how to eat a healthful diet, availability of healthful foods, and motivation factors were found to determine their perceived behavioral control. These findings indicate that it is important for nutrition education programs to provide accessible tasty and healthy foods, help them to gain skills to make more wise food choice, and include mothers, siblings and friends in intervention approach (Backman et al., 2002). Intention, in turn, accounted for 17 % of the variance in healthful dietary behaviors suggesting a modest prediction. Baranowski, Cullen and Baranowski, (1999), in their review of psychological variables of dietary intake, suggested that the productiveness of specific behaviors would be higher than behavioral categories. In this manner, the modest prediction of healthy dietary behaviors could be attributed to the use of a 67-item Food frequency Questionnaire (FFQ) to assess the usual dietary intake and healthy eating behavior of adolescents' in broad behavioral category. Besides, the results of the study indicate that perceived behavioral control did not contribute to the healthful dietary practices directly suggesting that adolescents' healthy eating behaviors are influenced by personal motivation rather than external control factors to eat healthy. Apart from original

TPB model components, Backman et al., (2002) also investigated the effects of gender and ethnicity on model variables. The findings related to gender revealed that females hold more positive dispositions toward healthy eating behavior, had stronger subjective norms and greater healthy eating intentions than males in significant amount. In this manner, when developing effective intervention programs for adolescents it is important to consider gender specific strategies to develop males attitudes toward healthy eating behavior, subjective norms, and intentions because attitudes and subjective norms made the strongest contributor to the formation of intentions which in turn was the only significant component predicted behavior (Backman et al., 2002). The findings related to ethnicity revealed that both male and female black participants reported greater caloric intake and percent calories from fat than their Hispanic and white counterparts significantly. It could be argued that eating habits of adolescents have roots in the culture they live and when designing intervention programs for adolescents cultural differences need to be taken into account.

Studying with similar age group, Fila and Smith (2006) investigated the efficacy of the Theory of Planned Behavior (TPB) to predict healthy eating behavior of 139 urban Native American between age range of 9 -18 in Minnesota. The results of this study revealed that attitudes, subjective norms, perceived behavioral control, and barriers independently correlated with adolescents' healthy eating intentions explaining with barriers having the strongest relationship followed by attitudes, perceived behavioral control and subjective norms. Specifically, adolescents reported the availability of healthy food around, their family not to buy healthy foods, the irresistible taste of junk foods, and the satisfaction they get from healthy foods as barriers to healthy eating. These findings indicate that adolescents' holding higher perceptions that barriers do not inhibit their involvement in healthy eating behavior together with higher attitudes toward healthy eating behavior and higher subjective norms are more likely to form intentions to eat healthy. The study, however, found no direct association between intention and healthy eating behavior. As the authors of the study indicate, the lack of association between intention and behavior could be attributed to intention stability. Conner et al. (2002), in their longitudinal study of

healthy eating intentions and behaviors within the TPB framework, found that intentions were stronger predictors of behavior when intentions were stable in adults eating a low-fat diet. In this study adolescents' healthy eating intentions could be changed constantly by external factors suggesting that forming strong intentions to eat healthy may not be a priority in adolescents hence not affecting their healthy eating behavior. In fact this explanation is supported by empirical results of the study of Fila and Smith (2006). Healthy eating behavior, in the study of Fila and Smith (2006), predicted by barriers being the strongest contributor to the prediction of behavior followed by attitudes toward healthy eating behavior, self-efficacy, and subjective norm altogether explaining 36% of the variance in healthy eating behaviors of adolescents. These findings suggest that adolescents' healthy eating behavior depends largely on external factors that facilitate of inhibit their involvement in healthy eating behavior. The findings related to behavior prediction imply that adolescents holding higher perceptions of barriers as healthy eating facilitator, higher attitudes toward healthy eating behaviors, and higher perception of capability to engage in healthy eating behavior together with higher subjective norms are more likely exhibited healthy eating behavior. These findings need to be considered when developing intervention programs to promote healthy eating behavior among adolescents. In Native American culture extended family and community are valuable and the youth in this culture are more willing to accept and follow their community member advices (Fila and Smith 2006). As the authors of this study suggest, health promotion campaigns need to consider this cultural advantage to highlight the healthy eating behavior among adolescents. Given the study sample (n=139) it can be argued that care should be taken to generalize the results of this study unless the study is replicated in different settings. From a general perspective, however, the findings of Fila and Smith (2006) support the view that the TPB could be applied to adolescents'' healthy eating intentions and behaviors and provided evidence for integrating barriers and self-efficacy components in order to better explain adolescents' healthy eating behaviors.

Considering younger participants, Hewitt and Stephens (2007) examined the role of the TPB in predicting eating intentions and behavior among 10 – 13-year-old 261

New Zealand children. Attitudes, subjective norms and perceived behavioral control together with behavioral beliefs explained 51% of the variance in intentions. Subjective norms, among them, were the most significant predictor followed by attitudes toward healthy eating, perceived behavioral control, and behavioral beliefs. Contradictory to previous studies (Backman et al, 2002; Fila & Smith, 2006) subjective norms were the strongest predictor of behavioral intention in this study. This difference could be attributed to the participants' age range in each study as well as cultural differences the participants' live in. Hewitt and Stephens studied with younger participants compared to Backman et al, (2002) and Fila and Smith (2006). Such difference appears to be rational since important others' perceptions will have more effect on children's beliefs resulting in formation of their subjective norms (Hewitt and Stephens, 2007). The findings pertaining to intentions indicate that adolescents' healthy eating intentions predominantly effected by the normative referents, especially parents and caregivers, which contribute to the formation of their perceived level of social pressure. In general, in New Zealand, adolescents holding more social pressure, more positive attitudes toward healthy eating, more behavioral control together with more positive perceptions toward outcomes related to healthy eating behavior are more likely intended to engage in healthy eating behavior. Besides, intentions were a direct determinant of healthy eating behaviors explaining 39% of the variance in children's healthy eating behavior. Intentions, being the most significant behavior predictor, together with perceived behavioral control predicted 44% of the variance in healthy eating behaviors. Healthy eating behavior in New Zealand children, rather than being influenced by external factors, seems to be largely under their volitional control that is to say they follow healthy eating if they wanted to. So the findings indicate that children holding more personal motivation and higher behavioral control are more likely to exhibit healthy eating behavior than those children holding less intentions and lower behavioral control. The findings of this study also found PBC to effect behavior indirectly through intentions which provide support for the TPB model. Regarding gender differences, Hewitt and Stephens (2007) revealed that girls hold higher positive attitudes toward healthy eating, stronger subjective norms, higher healthy eating intentions and reported higher healthy eating behaviors significantly than boys corroborating the

findings of Backman et al., (2002). These findings, altogether, points out the importance of subjective norms, attitudes toward behavior, perceived behavioral control, intentions as well as gender differences in promoting healthy eating practices among children and provide support for the effectiveness of the TPB model to better understand adolescents' healthy eating intentions and behaviors.

Chan and Tsang (2011) using TPB investigated healthy eating among 570 secondary school students aged 11 to 19 from grade 7 to grade 11 in Hong Kong. The participants of the study were reached through university students enrolled in the integrated communication program at a university in Hong Kong. These university students were recruited as interviewers and asked to reach secondary school students in their social network. Their study found that the theory constructs together accounted for 45 % of the variance in students' healthy eating intentions. In accordance with Fila and Smith, (2006), Chan and Tsang (2011) found perceived behavioral control being the most important factor in predicting behavioral intentions followed by attitude and subjective norms. Importantly, the study revealed that although adolescents perceived healthy eating beneficial and desirable they also found health eating boring and not enjoyable. Additionally, according to the study, family members and the government were the normative referents that represent major sources of adolescents' subjective norms. While perceived behavioral control and attitudes toward healthy eating significantly contributed to the prediction of intentions, the contribution of subjective norms was non-significant indicating that perceived social pressure has little to do with the promotion of Honk Kong adolescents' healthy eating intentions. These findings suggest that adolescents' holding more behavioral control and more positive attitudes toward healthy eating are more likely intended to engage in healthy eating. Apart from the original TPB components Chan and Tsang (2011) also attempted to explain adolescent healthy eating intentions by attitudes toward healthy eating advertisements. They found no significant contribution of attitude toward healthy eating advertisements on prediction of adolescents' healthy eating intentions. Chan and Tsang (2011), however, revealed a significant and positive correlation between such advertisements and attitudes toward healthy eating (r= 0.29), subjective norms (r= 0.19), and

perceived behavioral control (r= 0.24). These findings suggest that advertisements might be beneficial in order to promote positive attitudes toward healthy eating, subjective norms, and perceived behavioral control. So, the claim is that attitude toward healthy eating advertisements might affect healthy eating intentions indirectly via attitude, subjective norms and perceived behavioral control components (Chan and Tsang, 2011). Although future research is needed to test this assertion, the results of this study provide evidence that the TPB model significantly predicts adolescents' healthy eating intentions in Honk Kong.

Gronhoj et al., (2013), in order to analyze adolescents' behavioral intention for healthy eating, applied the TPB to a cluster sample survey of 410 Danish students aged 11 to 16 years studying in Grade 6 to Grade 10. The study results revealed that perceived behavioral control was the most important factor to predict behavioral intentions followed by attitudes explaining 33% of the variance in intentions corroborating the previous studies conducted with adolescents (Chan & Tsang, 2011) and with adults (Conner, Norman & Bell, 2002; Astrom & Rise, 2001). Subjective norms, on the other hand, were found to be non-significant predictor of adolescents' behavioral intentions confirming the findings of studies conducted with adolescents (Chan and Tsang, 2011; Conner, Norman & Bell, 2002). These findings suggest that for adolescents higher behavioral control and higher attitudes toward healthy eating behavior contributes to the formation of higher intentions to follow healthy eating. So, it can be said that adolescents who possess high behavioral control and more favorable attitudes toward healthy eating are more likely to develop related intentions than those adolescents holding less behavioral control and less positive attitudes toward healthy eating. Gronhoj et al., (2013) also investigated the effect of gender and Body mass Index (BMI) on healthy eating intentions. The study revealed that female participants and the adolescents with higher body mass index reported stronger intentions. This finding suggest that besides gender, the positive correlation between BMI and intentions shows that urgent needs trigger individuals intention to practice healthy eating behavior (Gronhoj et al., 2013). This study propose that when promoting healthy eating practices among adolescents PBC, and positive perceptions toward healthy eating together with gender issue need to be considered.

Contemplating healthy eating studies together, McEachen et al., (2011) conducted a comprehensive meta-analysis of prospective prediction of health related behaviors with the Theory of Planned behavior considering behavior and methodological considerations. As discussed in Meta-analytic support for TPB (Section 2.2) the authors of this review found that dietary behaviors (21.2% variance explained) were better predicted compared to risk, detection, safer sex and abstinence from drugs behaviors (between 13.8% and 15.3% variance explained. When the age of participants considered the meta-analysis found that adults' behaviors (26.7%) appeared to be better predicted compared to adolescents' (9.6 % variance), on average. The low prediction in adolescents' healthy eating behavior could be the result of not assessing specific behavior as discussed in Backman et al., (2002) context. Another consideration is the number of adolescent dietary behavior studies included in the review of McEachen et al., (2011). The review covered only 3 dietary related behaviors of adolescents while the number of adults' dietary behaviors was 14. Although the authors of the meta-analysis convinced that the number of studies was sufficient to compare adolescents and adults, more studies are needed to be conducted in adolescent level to understand their healthy eating behaviors.

McEachen et al., (2011) found similar percentage variance accounted for adolescents' and adults' intentions to engage in healthy behaviors. While subjective norms are found to be the strongest predictor of behavioral intention for adolescents, attitudes toward healthy eating behavior were the most important predictor of adults' dietary intentions. In this chapter only Hewitt and Stephens (2007) confirmed the subjective norms to be the strongest predictor of adolescents' behavioral intentions. The subjective norm component in other studies (Backman et al., 2002; Fila & Smith, 2006; Chan & Tsang, 2011; Gronhoj et al., 2013) was either not the strongest or non-significant predictor of behavioral intention. These results raise concerns about effectiveness of the normative component to explain adolescents' behavioral intention suggesting further examination of the component.

2.4 Conclusions from Literature Review

All in all, the studies described in this chapter strongly provide theoretical and empirical evidence of predictive power of the TPB in different behaviors especially in healthy eating behaviors. Nevertheless, the literature review covered up to here indicate that a very limited number of TPB studies conducted to analyze adolescents' healthy eating behavior especially for middle school students. Considering this gap in the literature, the current study focuses on investigating middle school students' healthy eating intentions and behaviors.

Besides, the literature provide evidence for the inclusion of extra variables such as self-efficacy (Armitage et al., 1999; Armitage & Conner, 1999), self-identity (Conner et al., 1999; Armitage & Conner, 1999), past behavior (Conner et al., 1999; Godin et al., 1992), habit (Godin et al., 1992), role-identity and attitude strength (Theodorakis, 1994) in the TPB model to better explain the behavior in question. It is therefore reasonable and useful to integrate different variables to understand the target behavior if needed.

Furthermore, the literature review revealed that the relative contribution of the attitudes, subjective norms, and perceived behavioral control on intentions is under investigation such that while attitudes were the most significant contributor of healthy eating intentions in the study of Backman et al., (2002) with high school students in California, subjective norms emerged as the strongest contributor of healthy eating intentions in the study of Hewitt and Stephens (2006) with 10-13 years-old New Zealand children. Likewise, the relative contribution of intentions and PBC in predicting behavior is also varying across studies. For example, Backman et al., (2002) and Conner et al., (2002), studying with health care attendees in UK, found intentions to be the only component predicts healthy eating behavior whereas Povey et al., (2000), studying with general public in UK, found intentions together with PBC component to explain healthy eating behavior. Thus, the literature review provides evidence that the importance of TPB constructs on explaining healthy eating intentions and behaviors vary across populations. This finding, in fact, support the view that in some populations only attitudes, subjective norms, PBC or

combination of these components become significant determinants that explain the target behavior through intentions (Ajzen, 2005).

Finally, the relative weights of attitudes, subjective norms, and perceived behavioral control on the formation of intentions and behaviors could be explained by cultural contexts. Specifically, Backman et al., (2002) found attitudes to be the strongest contributor in healthy eating intention prediction followed by subjective norms and perceived behavioral control among US adolescents. Fila and Smith (2006), however, found PBC to be the strongest contributor in healthy eating intentions followed by attitudes and subjective norms among Native American adolescents. In their study, Fila and Smith (2006) explored subjective norms to be the least significant predictor of their healthy eating intentions among Native American adolescents although in this culture youth are more willing to accept and follow their family and community member advices. Concerning healthy eating behavior, while Backman et al, (2002) found intentions as the only contributor, Fila and Smith (2006) found PBC as the most significant contributor with no association between intentions and behavior. When studies concern European culture considered similar findings emerged. Specifically, while Hewitt and Stephen (2007) explored subjective norms as the strongest contributor of healthy eating intentions followed by attitudes and PBC among New Zealand adolescents, Gronhoj et al., (2013) revealed PBC to be the strongest predictor of healthy eating intentions followed by attitudes and non-significant contribution of subjective norms in healthy eating intentions' of Danish adolescents. It seems that subjective norms become less significant and PBC becomes more significant in the formation healthy eating intentions and PBC becomes more significant predictor of healthy eating behavior among adolescents both in US and European culture. These findings, actually, imply the significance of cultural context in healthy eating domain. The shift in the healthy eating determinants could be attributed to the changing cultures of US and European population as a result of wide spreading of fast food culture in these cultures. So, this implies that as the culture changes eating habits also change.

CHAPTER 3

METHODOLOGY

This chapter specifies design of the current study, participants, measures, procedure and analysis of data along with the rationale behind them. Specifically, the chapter addresses research model applied for the study, details about the characteristics of the participants, the processes employed for the instrument development, and the procedures applied for the data collection and analysis. The chapter finalizes by assumptions and limitations of the study.

3.1 Design of the Study

Since the purpose of the study is to identify the determinants of healthy eating behaviors of middle school students the study designed in accordance with survey research model reflecting a cross-sectional quantitative survey type. Surveys are conducted in order to describe the characteristics of a population through collecting information from a selected sample of population by asking questions. In descriptive surveys, the concern is to find out how the members of a population distribute themselves on one or more variables and to locate what the distribution is (Fraenkel, 2012). In the present study, the relationship between healthy eating related beliefs (namely behavioral beliefs, normative beliefs and control beliefs), attitudes toward healthy eating, subjective norms, perceived behavioral control, healthy eating intentions, personal healthy eating norms, self-healthy eating identities, Food consumption habit and sustainability, and healthy eating behaviors were investigated. Based on the theory of planned behavior and previous research a model specifying the relationship among variables of interest was developed.

3.2 Participants of the study

Participants of the study are 1780 middle school students attending 5, 6, 7 and 8 grades in public schools of Keçiören district of Ankara. The study conducted in 5 different public schools of Keçiören. The schools were selected conveniently from both rural and urban areas, regarding their means of accessibility. The researcher

administered the questionnaire that has been developed by the researcher to the participants during regular class hours in classroom setting. Before application of the questionnaire, the participants were verbally informed that their course grades will not be affected by the result of the questionnaire and complete confidentiality and anonymity is guaranteed. The questionnaire implementation took between 30 to 35 minutes. Table 3.1 depicts general characteristics of the study sample.

3.2.1 Demographic information

A total of 1780 5, 6, 7 and 8 grade middle school students participated in the study. Among them 353 middle school students were 5th graders, 409 middle school students were 6th graders, 538 middle school students were 7th graders and 480 middle school students were 8th graders (see Table 3.1). There were totally 929 (52.2%) females and 851 (47.8%) males attending to in public schools of Keçiören district of Ankara.

Table 3.1
General Characteristics of the sample

	Frequency (f)	**Percentages (%)**
Gender		
Female	929	52.2
Male	851	47.8
Total	1780	100
Grade level		
Fifth Grade	353	19.8
Sixth Grade	409	23.0
Seventh Grade	538	30.2
Eight Grade	480	27.0
Total	1780	100

3.2.2 Socio-economic Status of the Sample

Table 3.2 presents information concerning participants' socio-economic status (SES). Educational level of the parents and job status of the parents were considered as indicators of SES level. As shown in the table, 2.4 % of mothers are reported as illiterate, 23.3% of mothers graduated from primary school, while 23.4% graduated

from secondary school. About 35% had attained high school education. In addition only 12.1% of mothers reported to have graduated from university.

Table 3.2
Socio-Economic Status of the Sample

Education level	**Mother**		**Father**	
	f	**%**	***f***	**%**
Illiterate	43	2.4	10	.6
Primary School	414	23.3	256	14.4
Middle School	416	23.4	352	19.8
High School	633	35.6	670	37.6
Undergraduate	215	12.1	426	23.9
Missing	59	3.3	66	3.8
Occupation				
Housewife	1325	74.4	-	-
White collar	141	7.9	398	22.4
Blue collar	133	7.5	702	39.4
Retired	22	1.2	109	6.1
Self-employed	144	8.1	525	29.5
Unemployed	-	-	24	1.3
Missing	15	.9	22	1.3

While 14.4% of fathers graduated from primary school, 19.8% graduated from middle school. Nearly 37.6% graduated from high school (see Table 3.2). Of the fathers, 23.4% had university degree. There were 43 illiterate mothers and 10 illiterate fathers in the sample. In brief, fathers' educational level was higher than mothers' educational level. As far as parents' work status is concerned, majority of students reported their mothers (74.4%) as housewife, about 7.9% was indicated as officer, and 7.5% was worker while 8.1 % were self-employment. On the other hand, only 1.4% of fathers were reported to be unemployed. Of the working fathers, 22.4% were officer, 39.4% were worker while 29.5% were self-employed and 6.1% were retired. As the statistics show, majority of the mothers were unemployed in contrast to fathers.

3.3 Instrumentation

Instrumentation part details about and discusses thoroughly the process undertaken to develop the questionnaire used in the current study.

3.3.1 Questionnaire Development

Ajzen (2002a) suggests that in order to reach out behavioral beliefs of the subjects an elicitation study is required to identify accessible behavioral, normative, and control beliefs. Although Ajzen (2002a) indicates the necessity of elicitation study, he does not mention about the sample size to use in the study. Convenient sample of 20 middle school students were planned to be interviewed for this study. Since the answers from respondents were repeating the elicitation study terminated with 15 middle school students.

A direct interview approach is used, as before starting the interviews, the purpose of the interview is explained to each interviewee. Before starting each interview, all interviewees are assured about the anonymity of the information they will give. Based on the consent of the interviewee, 7 of the conversations were audio recorded, for the others note taking strategies were applied. Completing one interview took about 12-17 minutes. Central interview questions in the elicitation study were designed according to the format specified by Aizen (2002a) and aimed to capture underlying beliefs relevant to healthy eating. The responses to the questions are used to identify personal salient beliefs, i.e., the unique beliefs of each research participant, or to construct a list of modal salient beliefs, i.e., a list of the most commonly held beliefs in the research population.

The responses to the interview questions are categorized and their frequencies are determined. Due to small sample size and short answers given in the elicitation study the results are summed up in traditional tally method instead of using an analysis program. These modal salient beliefs gathered from interview provided the basis for constructing a standard questionnaire (Appendix E) that is used to assess the constructs of the current study. The questionnaire is designed according to the frequencies of the answers given in the elicitation study and the standard wording recommended for measuring the constructs of TPB (Ajzen, 2002a).

3.3.2 Content of the Questionnaire

The self-report questionnaire included socio-demographic variables as well as statements assessing each component of the theory of planned behavior, namely healthy eating intentions, attitudes toward healthy eating, subjective norms, perceived behavioral control, healthy eating behaviors, and beliefs on the mentioned domains. Along with these components the questionnaire included items, also, assessing personal healthy eating norms, self-healthy eating identity, and Food consumption habit and sustainability of middle school students. Each item of these constructs was assessed in 5-point unipolar scale with 1 denoting negative answer and 5 denoting positive answer. Table 3.3 represents assessed constructs, related item number and scale example.

Table 3.3
The Constructs Measured with the Questionnaire in the Main Study

Constructs	**Number of items**	**5-point unipolar scale example**
Attitude Toward Behavior	11	Pleasant-Unpleasant
Behavioral Outcomes	16	*Strongly agree-Strongly disagree*
Outcome Evaluation	16	*Very important – definitely unimportant*
Subjective Norms	4	Strongly agree-Strongly disagree
Normative Referents	7	*Strongly agree-Strongly disagree*
Motivation to Comply	7	*Very important – definitely unimportant*
Perceived Behavioral Control	5	Strongly agree-Strongly disagree
Control Belief Factors	8	*Strongly agree-Strongly disagree*
Control Belief Power	8	*Strongly agree-Strongly disagree*
Behavioral Intention	9	Strongly agree-Strongly disagree
Personal Norms	4	Strongly agree-Strongly disagree
Self-identity	3	Strongly agree-Strongly disagree
Food consumption habit and sustainability	9	Strongly agree-Strongly disagree
Behavior	1	Every day - Never

The theoretical constructs illustrated in Table 3.3 are hypothetical that is they cannot be observed directly. Instead these constructs must be inferred from observable responses. There are two ways of assessing the TPB constructs, directly and

indirectly (Ajzen, 2002a). Attitude toward behavior, subjective norms, perceived behavioral control and intention are standard direct measures that are usually measured directly. Behavioral outcomes, outcome evaluation, normative referents, motivation to comply, control beliefs and control belief power on the other hand are belief composites intended to measure attitude toward behavior, subjective norms and perceived behavioral control indirectly.

To assess attitude toward behavior directly the questionnaire included 11 items, and 16 items for each *behavioral outcomes* and *outcome evaluation* that constitutes belief component of attitude toward behavior for indirect measurement. Subjective norms are assessed directly through 4 items. Belief component of subjective norms are measured by *normative referents* (7 items) and *motivation to comply* (7 items) that constitute normative beliefs. For direct measurement of perceived behavioral control construct, the questionnaire contained 5 items. Belief domain of perceived behavioral control is assessed by *control beliefs* (8 items) and *control belief power* (8 items) that comprise indirect measure of the perceived behavioral control. Behavioral intention is assessed directly by 9 items. Finally, self-reported behavior was assessed by 1 item.

In addition to the TPB constructs, the survey included personal norms, self-identity and Food consumption habit and sustainability components (see Table 3.3). Self-identity dimension was assessed reflecting 'self-concept' and 'self-perception' (Sparks and Guthrie, 1998) with respect to healthy eating with 3 items. Following Schwartz's (1977) conceptualization of personal norm, this study used 4 items assessing students' personal norms reflecting personal values and feelings of personal obligation to engage in healthy eating. Food consumption habit and sustainability dimension was assessed with 9 items capturing both sustainability and health dimension of eating. Sustainability dimension included ecocentric (concern for living things) while health dimension covered anthropocentric (concern for humans) perceptions.

Table 3.4
Assessment and item example of the constructs

Constructs	**Coding**	**Item example**	**Item-value**
Attitude toward behavior	ATT	"For me, eating a healthy diet is important (5) unimportant (1)"	1 to 5
Subjective Norm	SN	"People who are important to me think that I should eat a healthy diet."	1 to 5
Perceived Behavioral Control	PBC	"I have enough personal control to eat healthy regularly"	1 to 5
Behavioral Intention	INT	"I plan to eat healthy constantly for the next two weeks"	1 to 5
Behavior	Beh	How frequent do you eat healthy?	1 to 5
Behavioral beliefs	bb	Determined by "behavioral outcomes (bo) **X** corresponding outcome evaluation (oe)". Ex: If I eat healthy diet I would feel better (bo1) (1 to 5) **X** feeling better is important to me (oe1) (1 to 5)	1 to 25
Normative beliefs	nb	Determined by "normative referents (nr) **X** motivation to comply these referents (mc)" Ex: My family expects me to eat healthy (nr) (1 to 5) **X** My family's expectation about my healthy eating is important to me (mc) (1 to 5)	1 to 25
Control beliefs	cb	Determined by "control belief associated with given factor (cbf) **X** corresponding control belief power (cbp)" Ex: I do not like taste of healthy foods (cbf) **X** Tasty healthy foods make it easier to eat healthy (cbp)	1 to 25
Personal Norms	PN	"I feel guilty if I do not eat healthy"	1 to 5
Self-Identity	SI	"I think of myself as someone who eat healthy "	1 to 5
Food consumption habit and sustainability	SUS	"If I eat healthy I would contribute to the health of next generations "	1 to 5

As discussed in literature part (Section 2.2) these belief composites constitute antecedents of attitudes toward behavior, subjective norms, and perceived behavioral

control and based on Expectancy-Value Theory (Frey et al., 1993). Utilizing this approach, behavioral belief (bb) items determined by multiplying behavioral outcome (bo) items and corresponding outcome evaluation (oe) items; normative belief (nb) items obtained by multiplying normative referents (nr) items and corresponding motivation to comply (mc) items; control belief (cb) items determined by multiplying control belief associated with given factor (cbf) items and corresponding control belief power (cbp) items. This assessment procedure is not applied to attitude, subjective norm, PBC, behavioral intention, behavior and personal norm, self-identity, Food consumption habit and sustainability constructs. They are assessed directly. Table 3.4 represents item examples from each construct and explains how each construct is assessed.

3.3.3 Pilot Study

Prior to main data collection, a pilot study was carried out with 475 middle school students from three different schools located in three different districts of Ankara, Yenimahalle, Etimesgut, and Mamak. Data were gathered from students' regular class hours. In the pilot study, 6^{th} grades (N=203) quietly dominated 8^{th} grades (N=71). In each grade level, although, the number of female participants dominates males they were quite similar in 6^{th} (M=95, F=108) and 8^{th} grades (M=35, F=35). Overall, the data were gathered from female participants (N= 267) and male participants was not so discrepant. Table 3.5 summarizes general characteristics of the pilot study sample

Table 3.5
General Characteristics of pilot study sample

	Grade				
Gender	**5th**	**6th**	**7th**	**8th**	**Total**
Female	63	108	60	36	267
Male	39	95	39	35	208
Total	102	203	99	71	475

The data obtained in the pilot study were transformed into SPSS22 software program through following procedures; preparing a codebook, creating data file and entering data. Using this software, the data then were screened and cleaned, and negative

questionnaire items were transformed. Next, several descriptive statistics explored to explain the sample reached in the pilot study. Finally, reliability analysis and factor analysis conducted for each construct assessed in the questionnaire.

Internal consistency refers to "the degree to which the items that make up scale hang together" (Pallant, 2007, p.95). It is suggested that Cronbach alpha (α) to have a value greater than .7. For the scales less than 10 items, however, it is recommended to report mean inter-item correlations with an optimal range of 0.2 to 0.4 (Briggs & Cheek, 1986). These are the minimum criteria to be sure that all the items in a scale assess the same underlying construct. So, it is expected that the direct measures of the TPB, attitude toward behavior, subjective norms, and intention to exhibit high internal consistency. This requirement, on the other hand, is not applied to the belief composites that are assumed to determine attitude toward behavior, subjective norms, and PBC (Ajzen, 2002a).

Each constructs' internal consistency analysis regarding the pilot study is depicted in Table 3.6. Cronbach's alpha values were calculated as 0.85, 0.89, 0.84, and 0.83, for attitude toward behavior, behavioral beliefs, behavioral outcomes, and outcome evaluations; 0.80, 0.77, 0.68, and 0.75, for subjective norms, normative beliefs, normative referents, and motivation to comply; 0.72, 0.70, 0.61, and 0.75, for perceived behavioral control, control beliefs, control belief factors, and control belief power; 0.92, 0.82, 0.90, and 0.82 for behavioral intention, personal norms, self-identity, and Food consumption habit and sustainability respectively. The inspection of reliability analyses indicated that only "control belief factor" and "normative referents" had (α) value less than 0.7 indicating unsatisfactory internal consistency. Although internal consistency is not necessary for belief composites the results indicate quietly high value of Cronbach's alpha for belief composites expect control belief factor and normative referents. Since both control belief factors are belief dimensions and for theoretical reasons (Ajzen 2002a) reliability requirement does not apply it can be concluded that all the constructs meet the reliability criteria exhibiting satisfactory internal consistency.

Table 3.6.
Reliability Analyses of the Constructs measured in the Pilot Study

Constructs	**Number of items**	**Cronbach's Alpha**	**Mean Inter-Item Correlations**
Attitude Toward Behavior	12	0.85	0.35
Behavioral Beliefs	20	0.89	0.31
Behavioral Outcomes	20	0.84	0.24
Outcome Evaluation	20	0.83	0.23
Subjective Norms	4	0.80	0.45
Normative Beliefs	8	0.77	0.35
Normative Referents	8	0.68	0.25
Motivation to Comply	8	0.75	0.33
Perceived Behavioral Control	8	0.72	0.26
Control Beliefs	11	0.70	0.17
Control Belief Factors	11	0.61	0.12
Control Belief Power	11	0.75	0.22
Behavioral Intention	9	0.92	0.57
Personal Norms	4	0.82	0.39
Self-identity	3	0.90	0.75
Food consumption habit and sustainability	10	0.82	0.33
Behavior	1	-	-

In addition to internal consistency analysis, item analysis completed through checking inter-item correlations were checked for values less than 0.2, corrected item-total correlation values for less than 0.3, and finally "alpha if item deleted" values were checked for values higher than the subscale's alpha coefficient (Pallant, 2007). The result of item analysis suggested 5 items to be deleted from the questionnaire to have more valid and reliable scores. These items were ATT12, PBC1, PBC3_rec, PBC8_rec, and, SUS5_rec items. Reliability analysis, however, were not deemed conclusive and Confirmatory Factor Analyses (CFA) undertaken to test the construct validity of the instrument for further investigation.

For the next step, Confirmatory Factor Analysis (CFA) was applied to all 85 items, to examine how well they fit to ten latent factors; attitude toward behavior, subjective norms, perceived behavioral control, intention, behavioral beliefs,

normative beliefs, control beliefs, personal norms, self-identity, and Food consumption habit and sustainability. Linear Structural Relations Statistics Package Program (LISREL 8.80) was applied to estimate and test the specified CFA model. Root Mean Square Error of Approximation (RMSEA), Root Mean Square Residuals (SRMR), Normed Fit Index (NFI), and Comparative Fit Index (CFI) were presented as fit statistics. The Root Mean Squared Error of Approximation (RMSEA) values below 0.06 and the Root Mean Square Residuals (SRMR) values below .08 are accepted as good fit values. Moreover, Normed Fit Index (NFI) greater than .90 and Comparative Fit Index (CFI) higher than .90 indicate a good fit to the data (Tabachnick & Fidell, 2013).

Table 3.7
CFA Results of the Pilot Study before Item Deletion

Fit Indices	RMSEA	SRMR	NFI	CFI
Values	0.06	0.07	0.90	.94

Table 3.7 illustrates the fit indices of the CFA without item deletion. The results of the Confirmatory factor analysis indicated that there was a good fit between the CFA model and the data suggesting that the specified CFA model is acceptable (Jöreskog & Sörbom, 1993).

Besides fit indices, each item's Lambda ksi estimate in the CFA is analyzed for further investigation (Appendix A). Lambda ksi estimates are the factor loadings that indicate the correlations between each observed variable and the latent factor. The higher the values, the more relevant they are to define the factor's dimensionality such that values of 0.8 or higher demonstrate well-defined constructs (Pintrich et al., 1991). In general, as suggested by applied researchers (Cliff and Hamburger, 1967; Stevens, 2009; Hair et al, 2009), loadings that are about 0.40 or greater in absolute value were used for interpretation purposes.

When the Lambda ksi estimates of CFA items were examined most of the items were found to have high estimate values which indicates high correlation with corresponding latent variable (see Appendix A). The CFA results, however, reveal that several items to have low loadings. These items were ATT12 from attitude

dimension, PBC8_rec, PBC3_rec, and PBC1 from perceived behavioral control dimension, bb5, bb4, bb19 and bb20 from behavioral belief dimension, nb5 from normative belief dimension, cb3, cb6, cb1 and cb4 from control belief dimension and SUS5_ rec from Food consumption habit and sustainability dimension (see Appendix A). Due to low loadings, these items were concluded to have low correlation with their corresponding dimensions. Considering both reliability analyses and confirmatory factor analyses results a total of 14 items from mentioned domains were omitted due to very low factor loading and not contributing to the total variability. The main study was conducted without these problematic items.

A second CFA, after item deletion, was conducted on the remaining items and fit indices were presented in Table 3.8.Compared to the second CFA fit indices in the Table 3.8 indicates better fit to the data compared to the CFA without item deletion as presented in Table 3.7.

Table 3.8
CFA Results of the Pilot Study after Item Deletion

Fit indices	RMSEA	SRMR	NFI	CFI
Values	0.06	0.06	0.92	.95

When the Labda ksi estimates of the second CFA items were analyzed most of the items had high factor loadings indicating high correlations with corresponding latent variables (see Appendix A). The item analysis indicated that only cb2 item from control beliefs latent variable had relatively low value compared to the rest of the items (see Appendix A). It was found that if this item was deleted from the control belief dimension it would result in lower reliability so it was not omitted from the subsequent analyses.

In conclusion, the main study was conducted with 71 items and corresponding 10 constructs illustrated in the second CFA of pilot study (see Appendix A). Reliability results of the main study constructs along with pilot study were presented in table 3.9.

Each constructs' internal consistency analysis regarding the main study is depicted in Table 3.9. Cronbach's alpha values were calculated as 0.85, 0.90, 0.80, and 0.78, for

attitude toward behavior, behavioral beliefs, subjective norms, and normative beliefs; 0.75, 0.67, 0.92, and 0.76, for perceived behavioral control, control beliefs, behavioral intention, and personal norms; 0.90, and 0.84, for self-identity and Food consumption habit and sustainability respectively. The inspection of reliability analyses indicated that only "control beliefs" had (alpha) value less than 0.7 indicating unsatisfactory internal consistency (see Table 3.9).

Table 3.9
Reliability results of The Constructs Measured with the Questionnaire in the Main Study and Pilot Study

	Pilot Study		**Main Study**	
Constructs	**Number of items**	**Cronbach's alpha**	**Number of items**	**Cronbach's alpha**
Attitude Toward Behavior	11	0.87	11	0.85
Behavioral Beliefs	16	0.89	16	0.90
Subjective Norms	4	0.80	4	0.80
Normative Beliefs	7	0.78	7	0.78
Perceived Behavioral Control	5	0.79	5	0.75
Control Beliefs	7	0.69	7	0.67
Behavioral Intention	9	0.92	9	0.92
Personal Norms	4	0.71	4	0.76
Self-identity	3	0.90	3	0.90
Food consumption habit and sustainability	9	0.86	9	0.84
Behavior	1	-	1	-

3.4 Data collection Procedure

The data were collected during the spring semester of 2013-2014 and fall semester of 2014-2015 academic years in three stages.

In the first stage, the researcher conducted an elicitation study (interview) with a convenient sample of 15 middle school students. After participants accepted to be interviewed, a semi-structured interview including open and close-ended questions about healthy eating made face to face with each interviewee. A direct interview

approach was applied, as before starting the interviews, the purpose of the interview was explained to them. Before starting each interview, the researcher assured the interviewees about the anonymity of the information they will give. Based on the consent of the interviewees 7 conversations audio recorded, and for the other 8 conversations note taking strategies were applied. Completing one interview took about 12-17 minutes.

The interview results were then used to develop the instrument implemented in the pilot and main studies. Then, the researcher submitted the details of the study to the Applied Ethics Research Center at the Middle East Technical University. After obtaining Ethics Committee Approval (see Appendix C) from the University, the researcher also took permission from Ministry of National Education (see Appendix D) to collect data during the spring semester of 2013-2014 and fall semester of 2014-2015 academic years from different number of elementary schools located in Ankara.

The second phase of the data collection, included pilot study, was conducted during the spring semester of 2013-2014 academic years. The researcher visited all the schools selected for pilot study, and administered the developed questionnaire to 5^{th}grade, 6^{th}, 7^{th} and 8^{th} grade students. The researcher entered the data gathered in this study to the SPSS program by hand.

The third stage of the data collection, covered the main study, was carried out during the fall semester of 2014-2015 academic years. The researcher visited all the schools selected for the main study, and administered the revised questionnaire (according to the pilot study results) to 5^{th}grade, 6^{th}, 7^{th} and 8^{th} grade students. Because of the large sample size, to ease data collection and data entry the instrument was designed into optical form.

Regarding the second and third phase of the study, the researcher introduced himself to the students before administering the instrument. He explained the purpose of the study and asked for their participation and assured the anonymity and confidentiality the responses they will give. Next, the researcher declared that their participation in the study would not affect their grades or relation with their teacher in any way. Then he distributed the instruments to the students.

Before the administration of the instrument the researcher gave instructions to the students about how to fill out the questionnaire, and what was requested in the instrument. Although the classroom teachers were present in the class during administration of the instrument, they were remained seated and silent. Besides, the teachers were not allowed to see any of the student response. The instrument took about 35 minutes to be completed by the students.

3.5 Data Analysis

Regarding the three stages of data collection mentioned above, the following data analysis procedures were applied.

Traditional tally method implemented to analyze the qualitative data obtained from the interview in elicitation study. Confirmatory Factor Analysis (CFA) and reliability analysis were applied in the pilot study in order to address the questions concerning psychometric properties of the data collection in questionnaire development stage.

Structural Equation Modeling (SEM) approach was used in the main study to test the hypotheses about the relationships among variables. SEM, integrating complex statistical procedure, is a statistical methodology that implements a confirmatory approach on a theory that represents "causal" processes pertaining to some phenomenon. SEM "combines measurement model or confirmatory factor analysis (CFA) and structural model into a simultaneous statistical test" (Hoe, 2008, p.76). Structural Equation Modeling possesses two important aspect of statistical procedure. Firstly, the causal processes under study are represented by a series of structural equations and these structural equations are modeled with illustrations for clearer understanding of theory under study (Byrne, 1998). Secondly, the statistical test of the model is conducted simultaneously using the entire system of variables to inspect the model's consistency with the data. In this manner, SEM is a powerful technique that provides models for multivariate relations and estimation for direct and indirect effects of variables under study (Byrne, 1998).

Several advantages of SEM made it chosen widely over older generation of multivariate procedures. Firstly, in data analysis procedure, structural equation modeling utilizes confirmatory approach rather than exploratory. Since most other multivariate procedures utilize exploratory factor analysis approach it is difficult to test a hypothesis. Second of all, while SEM assess and corrects for measurement error, older generation of multivariate techniques are incapable of processing these parameters. Lastly, while older multivariate techniques deal with observed variables, SEM based techniques provide the option of integrating both observed and unobserved variables. Conclusively, given these highly desirable characteristics, SEM has become a popular methodology for non-experimental research. In this study, considering the TPB literature (Ajzen, 1985; 1991; 2002a; 2005) the proposed model based on this literature was tested via Structural Equation Modeling (SEM) technique.

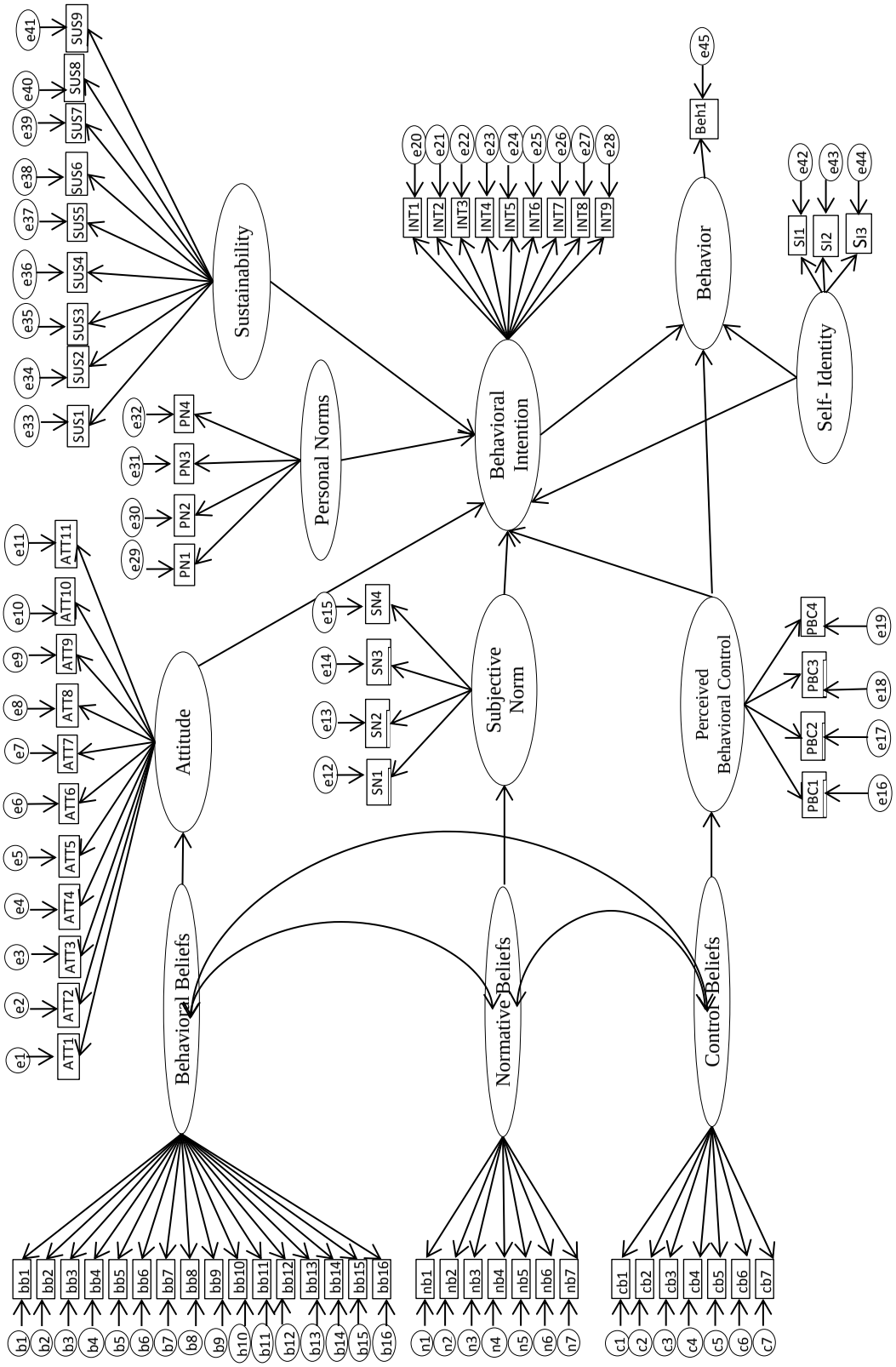


Figure3.1 Measurement Model for Middle School Students' Healthy Eating Intentions

Figure 3.1 represents a draft model to explain healthy eating intentions' and behaviors of middle school students within the Theory of planned Behavior framework. Codes used to illustrate the model and their meanings are described in the following Table 3.10.

Table 3.10
Abbreviations used in the Measurement Model and their meanings

Abbreviations	**Corresponding Domain**	**Domain items coded as**
INT	Behavioral Intention	INT1, INT2 … INT9
ATT	Attitude Toward Behavior	ATT1, ATT2 … ATT11
SN	Subjective Norm	SN1…. SN4
PBC	Perceived Behavioral Control	PBC1, PBC2 … PBC7
PN	Personal Norms	PN1…..PN4
SI	Self-Identity	SI1……SI4
SUS	Food consumption habit and sustainability	SUS1…….SUS9
Beh	Behavior	Beh1
Bb	Behavioral Beliefs	bb1, bb2 … bb20
Nb	Normative Beliefs	nb1, nb2 …. nb7
Cb	Control Beliefs	cb1…cb6
B	Measurement error associated with behavioral beliefs	b1, b2 … b3
N	Measurement error associated with normative beliefs	n1, n2 … n7
C	Measurement error associated with control beliefs	c1 …. c6
E	Measurement error in prediction of ATT, SN, PBC, INT, SI, PN, SUS, and Beh construct items	e1, e2…. e45

A consensus among SEM practitioners and theorists indicates that SEM models are tested through five steps including model specification, identification, estimation, evaluation and modification (Hair et al., 2006; Kline, 2005; Schumacker & Lomax, 2004). In model specification stage, the hypothesized relationships among observed and latent variables in the model are specified. These relationships are depicted by path diagrams. In particular, one-way arrows denote structural regression coefficients

and thus show the impact of one variable on another (Byrne, 1998). The curved two-way arrows stand for covariances or correlations between the two variables the arrows pointing to (Byrne, 1998). It is the phase to declare which relationships are vary, which are fixed to a constant, and which are null.

Identification stage is about whether a unique value for each parameter can be obtained from observed data that depends on the choice of model and the specification of fixed, constrained and free parameters (Teo, Tsai & Yang, 2013). The model is called 'just identified' if all the parameters are determined with just enough information and said to be 'over identified' if number of information exceeds the parameters that is to say with more than one way of estimating a parameter (Schumacker & Lomax, 2004). The model, otherwise, defined as 'under identified' if one or more parameters could not be determined due to lack of information (Schumacker & Lomax, 2004).

Estimation process aims to produce estimated model-implied covariance matrix that resembles estimated sample covariance matrix of the observed indicators with the residual matrix being as smallest as possible (Teo, Tsai & Yang, 2013). This process involves determining the value of the unknown parameters and the error associated with the estimated value. In this process, a fitting function or estimation procedure is applied in order to obtain parameter estimates to minimize the residual through different procedures such as Maximum Likelihood Estimation (MLE), unweighted least squares (ULS), weighted least squares (WLS), generalized least squares (GLS), and asymptotic distribution free (ADF) methods matrix (Teo, Tsai & Yang, 2013).

In evaluation process, the goal is to determine how well the data fit the model. SEM literature (Bolllen and Long, 1993; Hayduk, 1987; Loehlin; 1992) provides abundance of fit statistics. The most commonly used fit index by researchers is Chi-square statistic that indicates the discrepancy between hypothesized model and data by testing "the null hypothesis that the estimated covariance–variance matrix deviates from the sample variance–covariance matrix only because of sampling error" (Baumgartner and Homburg 1996, p. 149). Significant values of the chi-square test denote a strong difference between the model and the data and that the former

should be refused. As the sample size increases, however, chi-square test loses its practical usefulness because of leading to the rejection of models with only slight deviation from the data (Baumgartner and Homburg 1996). It is recommended, in this manner, to report additional fit indexes (Baumgartner and Homburg, 1996) (see Table 3.11).

Root Mean Squared Error of Approximation (RMSEA) demonstrates how satisfactory the model fits the population covariance matrix, and suggests that values of .05 or less indicates a close approximation and that values of up to .08 suggest a reasonable fit of the model in the population (Brown and Cudeck, 1993).

Table 3.11
Descriptions and thresholds of goodness-of-fit indices used in the assessment of both measurement and structural models

Fit Index	Description	Cut offs	References
X^2	Chi-square goodness-of-fit test	P >0.05	Hair et al. (2006)
X^2/df	Ratio of Chi-square to Degrees of Freedom	2–1 or 3–1	Hair et al. (2006)
RMSEA	Root Mean Squared Error of Approximation	<0.05: good fit <0.08: reasonable fit	Brown and Cudeck (1993)
GFI	Goodness of-Fit Index	> 0.90	Kline (2005)
AGFI	Adjusted Goodness of-Fit Index	> 0.90	Hu and Bentler (1995)
NNFI	Non-Normed fit Index	> 0.90	Hu and Bentler (1995)
CFI	Comparative Fit Index	> 0.90	Hu and Bentler (1995)

Goodness of Fit Index uses the actual data to compare the squared residuals from prediction, not adjusted for the degrees of freedom. GFI values of .09 or higher indicates well fit of the model in the population (Kline, 2005). A limitation of the GFI, however, is that its expected values vary with sample size (Kline, 2005). Although the GFI was proposed to produce a fit statistics that is less sensitive to sample size computer simulation studies of Marsh, Balla, and McDonald (1988)

revealed that the mean values of the GFI models tend to increase along with the number of cases. Besides, GFI has a downward bias when there are large numbers of degrees of freedom in comparison to sample size (Sharma et al., 2005) and upward bias with large samples (Bollen, 1990; Miles and Shevlin, 1998). Furthermore, McCallum and Hong (1997) found an increase in the GFI values as the number of parameters increase. Adjusted Goodness of Fit Index differs from GFI only in using adjusted degrees of freedom in the specified model and, similar to GFI, values of .09 or higher indicates well fit. Similar to GFI, AGFI tends to increase with sample size (Hooper, Coughlan & Mullen, 2008). Because of these limitations of GFI and AGFI, in the current study these fit indices were not chosen as reference to judge the adequacy of the SEM model.

Non-Normed Fit Index (NNFI) shows how much better the model fits, compared to a baseline model, normally the null model, adjusted for the degrees of freedom, with being non-normed can take values greater than 1.00 (Hu and Bentler, 1995). Like NNFI, Comparative Fit Index (CFI) shows how well the model fits compared to baseline model. NNFI and CFI values greater than .90 indicate well fit of the model in the population (Hu and Bentler, 1995).

Finally, as reflected by the goodness-of-fit indices the extent the hypothesized model fits the sample data modification phase is undertaken to modify the model if needed and justified.

Two statistical software programs utilized in this study are: (1) SPSS22 and (2) LISREL 8.8. SPSS refers to Statistical Package for Social Science and is used for reliability analysis as well as for missing data, outliers, correlations analyses, and assumptions. Pilot study CFA and main study SEM were carried out by LISREL, standing for *Linear Structural Relationships*, is the title of a computer program that is utilized in structural equation modeling (SEM). Although there are other software programs AMOS (Arbuckle, 1995), EQS (Bentler, 1995), SEPATH (Steiger, 1994), CALIS-SAS (Institute, 1992) that perform structural equation modeling, LISREL (Jöreskog & Sörbom, 1989) is the most longstanding and the most preferred statistical program by investigators (Bryne, 1998). LISREL, serving as a framework

for all following statistical programs (Bryne, 1998), made the impact that SEM models are often referred to as LISREL models.

3.6 Assumptions and Limitations of the study

The Theory of Planned Behavior assumes that the constructs, attitude toward behavior, perceived norms, and perceived behavioral control originate from beliefs. As in the TPB, the study assumes that the constructs, attitude toward behavior, social norms, and perceived behavioral control originate from salient beliefs and the questionnaire items developed within the framework of the TPB is assumed to assess behavioral intention sufficiently.

Besides these assumptions, the study included also several limitations. Firstly, since self-report questionnaire is applied in the study, it can be argued that the data collected for the study was limited to some level. It was assumed, therefore, that the questionnaire administered in this study reveals participants' attitudes, subjective norms, perceived behavioral control, intention and the beliefs behind these constructs as well as personal norms, self-identity, and Food consumption habit and sustainability.

Sampling procedure could be cited as another limitation. The participants selected in this study were 5, 6, 7 and 8 grade elementary school students in Ankara. There exist 24 different rural and urban districts in Ankara. Due to time and economic considerations the sample was selected conveniently from Keçiören district by means of access. Generalizations, in this manner, was limited to the population reflected this convenience and it can be argued that the sample is limited to represent middle school students in Turkey in some degree.

Finally, interview conducted to reveal participants' salient beliefs regarding healthy eating in the elicitation study is also regarded as a limitation. It cannot be assured by interview that all beliefs about target behavior will be elicited. Due to this reason, interview process will always have a limitation in itself.

CHAPTER 4

RESULTS

This chapter presents the results obtained from the data gathered in the current study. Mainly, the data analyses consist of preliminary data analyses, descriptive statistics, and structural equation model analysis. Specifically, preliminary data analyses address details about the data screening procedures including accuracy of the data, missing data, and outliers. In the descriptive statistics part, mean scores, standard deviation, minimum and maximum values, and frequency analyses of the constructs used in the study are presented followed by students' self-assessment of healthy eating background and sources of information. Lastly, structural equation model analysis includes the assumptions underlying SEM analyses and development and testing procedures of the structural model.

4.1. Preliminary Data Analysis

This analysis conducted to inspect whether the data set is appropriate to perform statistical analyses.

4.1.1. Data Screening Procedures

Data screening procedures involved accuracy of data, checking data set for missing values, and analyzing cases with values well above or below the majority of other cases.

4.1.1.1. Accuracy of Data

In the accuracy of data step, both categorical and continuous variables in the data set for values out of range were checked. First, the frequency distribution of each categorical variable was examined (see Table 3.1 and Table 3.2 in Method section). Then, the maximum and minimum values of each continuous variable were examined (see Table 4.2). The results revealed that all data were reasonable. That is, there was no categorical or continuous variable out of range.

4.1.1.2. Missing Data

Missing data step involved inspecting missing values of the data set. Based on the amount of missing values there exists different statistical techniques including list wise deletion of cases, pair wise deletion of cases, mean substitution, regression imputation, maximum likelihood parameter estimation, and matching response pattern to deal with missing data (Schumacker & Lomax, 2004). In this study, missing data analysis was performed for all of the items in the questionnaire. Each item was analyzed to identify the missing data percentages. If the percent of missing cases is 5% or less of the sample, the method used for handling missing data does not make a serious effect on the data set (Tabachnick & Fidell, 2013). Descriptive analyses of each item revealed that percent of missing cases ranged from 0.1% to 3.7% indicating small amount of missing data in the sample. For SEM analysis, however, neither list wise deletion nor pair wise deletion techniques are not recommended, due to the reduction in the sample sizes. Instead, it is recommended to use mean substitution technique for data sets with small amount of missing values; regression imputation technique for data sets with moderate amount of missing values; and maximum likelihood technique for data sets with large amount of missing values (Schumacker & Lomax, 2004). So, missing values were replaced by multiple imputation with expected maximization (EM). Multiple imputation uses matching response patterns in the data and replaces missing values for several variables simultaneously (Schumacker & Lomax, 2004).

4.1.1.3. Outliers

Outlier section involved examining the data set for values well above or below the majority of other cases. Outlier analysis was performed by examining histograms, box plots, 5% trimmed mean values of each subscale to identify univariate outliers, and standardized residual values of each subscale to identify multivariate outliers in the data set. In the histograms potential outliers are the data points sitting on their own at the tails of the distributions (Pallant, 2007). When histograms of each subscale are examined there exist no distinguishable data points sitting on their own and each histogram presents reasonably even slope suggesting no extreme data points in the data (see Appendix B). Regarding box plots, extreme outliers are the data

points (indicated by asterisk *) that extend more than three box lengths from the edge of the boxes (Pallant, 2007). The analyses of boxplots reveal no extreme data points in the current study (see Appendix B). Also, if 5 % trimmed mean value and original mean value are very different from each other than it is recommended to investigate these data points further (Pallant, 2007). The analyses of original mean value and corresponding 5% trimmed mean values of each subscale were very similar indicating no problem with outliers (see Appendix B).

In order to check univariate outliers, z-score values above 3.29 were checked for each variable in the data set regardless of their status as DVs or IVs (Tabachnick & Fidell, 2013). The analysis of each variable in the data set revealed that several variables related to attitudes, subjective norms, and behavioral beliefs resulted in several z-scores larger than 3.29 values (Appendix B) suggesting that these large scores were related to with naturally skewed distributions that are most students possess positive attitudes toward healthy eating and believe that healthy eating produces positive outcomes. In addition, given the study sample (N=1780) it can be argued that obtaining larger z-scores is reasonable because of the large sample sizes (Tabachnick & Fidell, 2013).

Regarding multivariate outlier analysis, using IBM SPSS REGRESSION, four cases were detected as multivariate outlier candidates, that have z-scores larger than 3.29. Table 4.1 represents case number of each outlier. In order to check whether these outliers were influential or not, Cook's distances were examined for values greater than 1 (Stevens, 2002). Further analysis indicated that these outliers were not influential on the subsequent analysis. The results revealed that these outliers were not influential, given that all measures of Cook distances were less than 1. So, it was concluded that these outliers could be retained in the subsequent analysis.

Table 4.1
Multivariate outliers

Case number	Standardized value (z-score)	Cook's distance
140	4.14	0.00
108	3.32	0.00

Following section reports the Descriptive Statistics regarding the constructs of the current study.

4.2. Descriptive Statistics

In descriptive statistics part, a number of descriptive analyses were conducted in order to provide preliminary insights into the nature of responses obtained from the sample. Minimum and maximum, mean, standard deviation, skewness and kurtosis values, and frequency analyses relating to each predictor and belief composites are presented in Table 4.2. The results illustrated in Table 4.2 revealed that all of the scales had negative skewness values, indicating clustering of scores at the high end (right hand side of the graph), ranging between -0.24 and -2.23. In addition, all the kurtosis values, except two values, were positive, ranging between -0.26 and 7.19, indicating rather peaked distributions.

RQ1: What are the 5^{th}, 6^{th}, 7^{th} and 8^{th} grade students' attitudes toward healthy eating, subjective norms, perceived behavioral, healthy eating intentions, self-healthy eating identities, personal-healthy eating norms, Food consumption habit and sustainability, and healthy eating behaviors?

Table 4.2 summarizes the descriptive analyses of each construct assessed in the questionnaire. The mean score for these variables ranged from 3.27 for control belief factors to 4.66 for behavioral outcomes indicating that the participants scored well above of the mid-point of 3 in the all scales except control belief factor scale. The participants obtained the highest score from Outcomes Evaluation (*M*= 4.66) followed by Subjective Norms (*M*= 4.42) and Normative Referents (*M*= 4.35). The participants, on the other hand, scored lowest on the Control Belief Factors (*M*= 3.27) scale. The inspection of the results revealed that outcomes evaluation are given the top priority which indicates that possible outcomes are highly important for the participants and that they distinctly value the possible outcomes associated with healthy eating behavior. Besides, the participants reported quite high Subjective Norms with a mean 4.42 and standard deviation of 0.73 indicating that middle school students perceived high amount of social pressure from normative referents, represented by specific groups or individuals, in which they scored a mean of 4.35

with a standard deviation of 0.65. Middle school students, on the other hand, did not perceive factors as a control mechanism to facilitate or impede their healthy eating behavior.

Table 4.2
Minimum, Maximum, Mean, Standard Deviation, Skewness and Kurtosis Values for Scales

Construct	*Minimum*	*Maximum*	*Mean*	*St.D*	*Skewness*	*Kurtosis*
Attitude Toward Healthy Eating	1.00	5.00	4.29	0.60	-1.06	1.30
Behavioral Outcomes	1.40	5.00	4.24	0.55	-1.09	2.01
Outcomes Evaluation	1.00	5.00	4.66	0.44	-2.23	7.19
Subjective Norms	1.00	5.00	4.42	0.73	-1.58	2.75
Normative referents	1.00	5.00	4.35	0.65	-1.76	4.37
Motivation To Comply	1.00	5.00	4.35	0.68	-1.58	3.20
Perceived Behavioral Control	1.00	5.00	4.08	0.77	-0.90	0.57
Control Belief Factors	1.00	5.00	3.27	0.77	-0.24	-0.26
Control Belief Power	1.36	5.00	3.79	0.76	-0.52	0.07
Intention to eat Healthy	1.00	5.00	4.04	0.93	-1.16	1.09
Healthy Eating Behavior	1.00	5.00	3.90	1.04	-0.66	-0.39
Self-healthy eating Identities	1.00	5.00	4.01	1.00	-0.95	0.36
Personal healthy eating Norms	1.00	5.00	3.79	0.95	-0.70	0.08
Sustainable Healthy Eating Perceptions	1.00	5.00	3.98	0.80	-0.93	0.81

With respect to gender, girls obtained relatively lower scores than boys only in control belief factors, self-identity, personal norm, and Food consumption habit and sustainability constructs (see Table 4.3). These findings implied that girls were more likely than boys to hold positive attitudes toward healthy eating behavior, subjective norms, perceived behavioral control, intention to eat healthy, and exhibit healthy eating behaviors. Girls and boys scored highest and lowest on the same constructs that are outcome evaluation and control belief factors respectively. Girls (M=4.68), regarding outcomes evaluation dimension, seem more aware of the importance of possible healthy eating outcomes than boys (M=4.62). In terms of control belief factors dimension, however, boys (M=3.30) judged factors more effective healthy eating facilitator or impediment than girls' (M=3.24) judgment of the same factors

that is also one of the highest mean difference. Another highest mean difference (M_d= 0.12) appear in normative referents dimension suggesting that girls perceived higher social pressure from specific individuals and groups than boys in considerable amount.

Table 4.3
Means and Standard Deviations of Scales with respect to Gender

	Female		*Male*	
Construct	*Mean*	*SD*	*Mean*	*St. D*
Attitude Toward Healthy Eating	4.34	0.59	4.24	0.62
Behavioral Outcomes	4.26	0.55	4.22	0.55
Outcomes Evaluation	4.68	0.42	4.65	0.45
Subjective Norms	4.45	0.74	4.38	0.73
Normative referents	4.41	0.58	4.29	0.71
Motivation To Comply	4.36	0.64	4.33	0.71
Perceived Behavioral Control	4.10	0.76	4.06	0.78
Control Belief Factors	3.24	0.77	3.30	0.76
Control Belief Power	3.82	0.78	3.76	0.74
Intention to eat Healthy	4.11	0.92	3.98	0.95
Healthy Eating Behavior	3.95	1.02	3.85	1.06
Self-healthy eating Identities	3.97	1.01	4.05	0.99
Personal healthy eating Norms	3.78	0.94	3.80	0.95
Food consumption habit and sustainability	3.94	0.81	4.02	0.79

4.2.1. Attitudes toward Healthy Eating

An attitude can be defined as a disposition to respond favorably or unfavorably to an object, person, institution, or event (Ajzen, 2005). In this context, attitudes refer to favorably or unfavorably dispositions to healthy eating behavior. In the study, there were 11 items which measuring individuals' attitudes towards healthy eating behavior on a 5-point Likert scale where high points denote favorable disposition and low points denote unfavorable dispositions. Table 4.4 demonstrates the participants' level of disposition, in percentages, to the healthy eating attitude items with corresponding mean and standard deviation.

As reported in Table 4.4, the overall mean score of attitude (M=4. 29) scale is considerably higher than the mid-point of 2.5, indicating that participants of this study hold favorable attitudes toward healthy eating behavior with a standard

deviation of .60. Healthy eating was perceived by most of the respondents as "beneficial" (97.3 %) "wise" (96.5 %), and "necessary" (94.9 %). On the other hand, of the participants, 14 % perceived healthy eating as "boring" 12.4 % perceived healthy eating as "unenjoyable", and 11.7 % considered healthy eating as "time consuming". Besides, for several items, the participants reported themselves in the middle of two adjectives that is to say they expressed a fair amount of uncertain dispositions regarding healthy eating behavior. For instance, the students were not sure whether healthy eating is "Enjoyable or Boring" (25.2%), "Desirable or Undesirable" (22.2 %), and "Practical or Time consuming" (21.8%). These findings indicated that the participants were mainly consistent in their responses favoring favorable dispositions despite the existence of moderate amount of uncertainty in several items.

Table 4.4
Frequency Distributions of Participant Agreement with Attitude toward Behavior Statements and Corresponding Item Means and Standard Deviations

Items							**Mean**	**St.D**
For me, healthy eating is	→							
Important	78.1	16.0	4.9	0.6	0.3	Unimportant	4.71	0.62
Necessary	79.0	15.9	4.1	0.6	0.5	Unnecessary	4.72	0.62
Beneficial	87.6	9.7	2.3	0.2	0.2	Harmful	4.84	0.47
Desirable	34.4	30.8	22.2	0.4	6.1	Undesirable	3.81	1.16
Enjoyable	32.3	28.5	25.2	7.5	6.5	Boring	3.72	1.18
Pleasant	39.9	26.6	21.2	7.1	5.3	Unpleasant	3.89	1.17
Good	76.8	16.2	5.5	1.0	0.5	Bad	4.68	0.67
Delicious	46.6	26.9	15.3	5.3	5.8	Undelicious	4.03	1.16
Practical	39.8	26.7	21.8	6.7	5.0	Time consuming	3.90	1.15
Wise	89.4	7.1	2.4	0.6	0.5	Foolish	4.84	0.52
Easy	46.3	27.2	15.7	5.4	5.4	Hard	4.03	1.15
Total							4.29	0.60

4.2.2. Behavioral Outcomes

Behavioral outcomes are the beliefs related to the consequences of the behavior in case it is performed. In the context of the current study, these outcomes related to the possible outcomes of healthy eating behavior. In the study, there were 16 items assessing possible outcomes associated with healthy eating behavior on a 5-point Likert scale. Table 4.5 depicts participants' level of agreements, in percentages, to behavioral outcomes with corresponding mean and standard deviation.

Table 4.5
Frequency Distributions of Participant Agreement with Behavioral Outcomes Statements and Corresponding Item Means and Standard Deviations

Items	**SD**	**D**	**U**	**A**	**SA**	**M**	**St.D**
If I eat healthy……							
I would be resistant to diseases	0.5	1.0	5.7	19.3	73.5	4.64	0.68
I would be energetic	0.8	1.0	6.2	22.6	69.4	4.59	0.72
I would be healthy	0.8	0.8	3.0	14.4	81.0	4.74	0.63
I would protect natural resources	5.4	5.3	27.0	22.4	39.8	3.86	1.16
I would feel better	1.0	1.6	9.2	22.0	66.2	4.51	0.81
I would keep away from infections (such as flue, influenza)	1.9	2.6	11.1	25.8	58.6	4.37	0.92
I would contribute to the environmental problem solutions	8.7	9.2	30.3	22.8	29.0	3.54	1.24
My body would be more stronger	0.7	1.6	6.2	17.5	74.0	4.63	0.73
I would live longer	9.6	6.7	27.3	19.4	37.0	3.68	1.29
I would feel healthy	.8	1.7	6.6	21.6	69.3	4.57	0.76
I would enjoy eating	4.7	7.4	20.0	28.1	39.8	3.91	1.14
I would be protected from diseases	0.9	2.1	8.3	24.3	64.3	4.49	0.81
I would have balanced body	0.6	1.2	5.8	21.5	70.8	4.61	0.71
I would contribute to environmental health	6.0	6.6	25.5	25.9	36.0	3.79	1.17
I would get less sick	2.1	3.7	12.1	24.9	57.1	4.31	0.97
I would lessen environmental waste	10.1	8.8	22.8	22.6	35.7	3.65	1.31
Total Scale						4.24	0.55

(Note: SA strongly agree. A agree. U undecided. D disagree. SD strongly disagree. M mean. St. D Standard deviation)

The mean score obtained from behavioral outcomes dimension was 4.24 with a standard deviation of 0.55 indicating that the participants, commonly, associate the listed 16 outcomes with healthy eating behavior (see Table 4.5). Most of the students agreed to the health related items stated that "I would be healthy"(95 %), "I would be resistant to diseases" (92.8%)," I would have balanced body"(92.3), and "I would be

energetic" (92 %). Disagreement and undecided responds, on the other hand, appears at most in the environment related items stated that "I would protect natural resources" with 10.7% and 27%, "I would contribute to the environmental problem solutions" with 17.9% and 30.3%, "I would contribute to environmental health" with12.6% and 25.5%, "I would lessen environmental waste" with 18.9% and 22.8, and the item stated that "I would live longer" with16.3% and 27.3% respectively.

The results indicate that more than 90% of the participants agree with the items emphasizing self-related behavioral outcomes of healthy eating whereas their agreement for the items emphasizing environment related behavioral outcomes of healthy eating is much more less. It appears that most of the participants put an emphasis on self-related outcomes by associating healthy eating behavior with health related outcomes. Participants, however, seemed either "disagreed" or "undecided" for most of the cases related to environment related behavioral outcomes. Respondents' answers to the environmental related behavioral outcomes items reveal that, on average, the middle school students have low 'eco-centric' perspectives of possible outcomes related to healthy eating behavior.

4.2.3. Outcome Evaluation

The questionnaire asked participants to rate the importance of 16 items corresponding behavioral outcomes associated with healthy eating behavior on a 5-point Liker scale. Table 4.6 illustrates participants' ratings, in percentages, related outcome evaluation with corresponding mean and standard deviation.

As indicated in Table 4.6 the overall mean score of outcome evaluation was calculated as 4.66 with a standard deviation of .44 indicating that the participants put a great emphasis on the importance of each possible healthy eating outcome. Majority of the participants, in general, strongly agreed with all the 16 outcomes specifically, self- related outcomes such as "Being resistant to diseases"(97.8 %)," Being energetic"(97 .7%), and "Being healthy"(97 %), are given top priority when compared to eco-centric outcomes stated that "Lessen environmental waste"(85.5 %), "Contributing to the environmental problem solutions"(85 %). Interestingly, "Living longer" (81.4 %) was not rated as of ultimate importance as frequently as

other self-related outcomes. Not surprisingly, undecided responses appear at most in the environment related items stated that "Contributing to the environmental problem solutions" (10.8%), and "Lessen environmental waste" (10.6%). Compared to health related outcomes, healthy eating related eco-centric outcomes are given low priority.

Table 4.6
Frequency Distributions of Participant Agreement with Outcome Evaluation Statements and their Corresponding Item Means and Standard Deviations

Items	**CU**	**UI**	**U**	**I**	**CI**	**M**	**St.D**
Being resistant to diseases	0.5	0.3	1.3	9.7	88.1	4.85	0.49
Being energetic	0.2	0.2	1.8	13.0	84.7	4.82	0.47
Being healthy	0.5	0.6	2.0	7.1	89.9	4.85	0.51
Protecting environmental resources	1.7	1.0	8.7	18.1	70.6	4.55	0.83
Feeling better	0.3	1.0	3.0	12.5	83.1	4.77	0.58
Protection from infections (such as flue, influenza)	0.7	1.0	3.9	13.3	81.1	4.73	0.64
Contributing to the environmental problem solutions	2.2	1.9	10.8	19.2	65.8	4.45	0.92
Having a stronger body	0.4	0.8	3.0	12.2	83.5	4.77	0.58
Living longer	3.9	2.5	12.2	16.8	64.6	4.36	1.05
Feeling healthy	0.6	0.6	3.4	13.3	82.2	4.76	0.60
Enjoying eating	1.4	2.0	7.6	19.6	69.4	4.54	0.83
Protection from diseases	0.4	0.7	2.9	11.2	84.7	4.79	0.57
Having a balanced body	0.6	0.6	3.3	11.7	83.8	4.78	0.58
Contributing to the environmental health	2.0	1.7	8.5	20.3	67.5	4.50	0.87
Being less sick	1.0	1.2	4.2	15.0	78.6	4.69	0.70
Lessen environmental waste	2.5	1.4	10.6	19.8	65.7	4.45	0.92
Total Scale						4.66	.44

(Note: CI= completely important. I important. U undecided. UI unimportant. CU completely unimportant. M mean. St. D Standard deviation)

4.2.4. Subjective Norms

Subjective norms are the person's beliefs about specific individuals' or groups' approval or disapproval of performing a specific behavior. The current study included 4 items evaluating the participants' perceived social pressure regarding healthy eating on a 5-point Likert scale. Table 4.7 presents the participants' level of

agreements, in percentages, to the subjective norm statements with corresponding mean and standard deviation.

Table 4.7
Frequency Distributions of Participant Agreement with Subjective Norms Statements and Corresponding Item Means and Standard Deviations

Items	SD	D	U	A	SA	M	St.D
People I value their opinions want me to eat healthy	1.8	1.9	8.8	19.5	67.9	4.50	0.87
People who are important to me expect healthy eating from me	2.9	3.2	12.2	24.0	57.8	4.31	1.00
People who are important to me think I should eat healthy	2.9	2.0	10.9	22.0	62.3	4.39	0.96
People who are important to me want me to eat healthy	2.5	2.5	8.3	18.5	68.1	4.47	0.93
Total Scale						4.42	.73

(Note: SA strongly agree, A agree, U undecided, D disagree, SD strongly disagree, M mean, St.D standard deviation)

Concerning middle school students' subjective norms, it can be inferred that students' perceived high amount of social pressure with a mean score of 4.42 and standard deviation of .73. Majority of the participants contributed following items such as "People who are important to me want me to eat healthy" (86.6 %) and "People I value their opinions want me to eat healthy" (87.4%).

4.2.5 Normative Referents

Normative referents are the specific individuals or groups that approve or favor performance of a specific behavior. In this context, the study included 7 specific individuals or groups that approve the participants' healthy eating behaviors. In the questionnaire, there were 7 items evaluating the participants' agreement to the specific individuals and groups' expectations of performing healthy eating behavior on a 5-point Likert scale. Table 4.8 illustrates the participants' level of agreements, in percentages, to the healthy eating related normative referents items with corresponding mean and standard deviation.

Table 4.8
Frequency Distributions of Participant Agreement with Normative Referents Statements and Corresponding Item Means and Standard Deviations

Items	SD	D	U	A	SA	M	St.D
Family	0.7	0.1	1.3	5.1	92.8	4.89	0.46
Friends	8.4	6.1	24.6	29.7	31.2	3.69	1.21
Teachers	3.9	3.5	13.0	21.9	57.6	4.26	1.06
Relatives	3.3	2.7	10.8	23.5	59.7	4.34	1.00
Health personnel (Doctors, Health specialists, Dieticians)	3.6	2.6	6.1	16.1	71.6	4.49	0.98
Family elders (Grandfather, grandmother)	2.4	1.0	5.0	12.2	79.4	4.65	0.82
Healthy Ministry	6.1	4.2	14.8	18.5	56.3	4.15	1.19
Total Scale						4.35	0.65

(Note: SA strongly agree, A agree, U undecided, D disagree, SD strongly disagree, M mean, St.D standard deviation)

As reported in Table 4.8, the participants' overall mean score of the normative referents scale is 4.35 with a standard deviation of 0.65 indicating that the listed specific individuals and groups contribute highly to the perceived social pressure of the participants. The results presented in the Table 4.8 showed that the participants' perceived highest expectations relating to healthy eating behavior from their family members, family (97.9 %), family elders (91.6 %) and relatives (83.2), followed by health specialists (87.7 %) and their teachers (%79.5). These results indicate that, compared to family members, teachers are less likely to exert a positive influence on the students' healthy eating behaviors. Friends, with an 60.9 % of agreement, were also perceived to have a positive influence with regard to eating healthily, although of the influence agents investigated, friends scored the lowest mean score (M= 3.69) and therefore generally would be the least likely to exert this type of influence with an 24.6 undecided percentage. The students' expectations from their teachers, however, remained considerably lower compared to their family members.

4.2.6. Motivation to Comply Referents

In the questionnaire, there were 7 items evaluating the participants' motivation to comply the specific individuals and groups' expectations of performing healthy eating behavior on 5-point Likert scale. Table 4.9 illustrates the participants' ratings, in percentages, to the motivation to comply items and corresponding means and standard deviations.

Table 4.9
Frequency Distributions of Participant Agreement with Motivation to Comply Referents Statements and Corresponding Item Means and Standard Deviations

Items	CU	UI	U	I	CI	M	St.D
Family	0.4	0.2	1.4	5.1	92.9	4.90	0.42
Friends	7.9	4.4	17.9	29.4	40.4	3.90	1.21
Teachers	4.8	3.5	12.9	23.7	55.1	4.21	1.10
Relatives	3.3	2.8	8.7	23.0	62.1	4.38	0.99
Health personnel (Doctors, Health specialists, Dieticians)	4.6	3.6	10.1	19.3	62.4	4.31	1.09
Family elders (Grandfather, grandmother)	1.9	1.1	4.9	15.3	76.8	4.64	0.79
Health Ministry	8.7	3.8	13.7	18.8	54.9	4.08	1.27
Total Scale						4.35	0.68

(Note: CI completely important, I important, U undecided, UI unimportant, CU completely unimportant, M mean, St.D standard deviation)

The overall mean score of participants' motivations to comply referents was calculated as 4.17 with a standard deviation of 0.69 indicating that the participants, on the whole, possessed high motivation to comply the listed referents in Table 4.9. According to the participants' scores it can be said that students possessed high motivation to adhere their family members. As indicated in Table 4.9, the participants possessed the highest motivation to comply their family members (98% for family, 92.1% for family elders, and 85.1 % for relatives) fallowed by health specialists (81.7%) and their teachers (78.8 %). Health Ministry, as a national institution, grasped only 73.7 % of the participants' emphasis regarding healthy eating behavior. The participants put the lowest emphasis on the importance of their friends (69.8 %). Considering normative referents together with motivation to comply these referents it can be concluded that family members fallowed by health specialists are the strongest referents to establish the participants' subjective norms.

4.2.7. Perceived Behavioral Controls

Perceived behavioral control refers to "the ease or difficulty in performing the behavior based one one's past experience and anticipated impediments and obstacles" (Ajzen, 1988, p. 132). In the current study context, perceived behavioral control refers to participants' perceived ease or difficulty to perform healthy eating behavior. In the questionnaire, there were 5 items evaluating the participants'

perceived behavioral control related to healthy eating based on 5-point Likert scale. Table 4.10 depicts participants' mean scores, standard deviations and level of agreements, in percentages, to the each behavioral control statements.

Table 4.10
Frequency Distributions of Participant Agreement with Perceived Behavioral Control Statements and Corresponding Item Means and Standard Deviations

Items	**SD**	**D**	**U**	**A**	**SA**	**M**	**St.D**
It is easy for me to eat healthy constantly if I wanted to	2.9	3.7	12.8	30.8	49.9	4.21	0.99
I believe that if I start eating healthy I could keep to it constantly	3.9	4.2	15.7	22.7	53.5	4.18	1.09
I have enough discipline to eat healthy constantly	3.0	4.3	18.4	24.8	49.4	4.13	1.05
I try hard to eat healthy	7.2	10.2	19.8	27.5	35.4	3.74	1.24
I have enough personal control over eating healthy constantly	2.8	4.4	18.5	25.2	49.1	4.13	1.04
Total Scale						4.08	0.77

(Note: SA strongly agree, A agree, U undecided, D disagree, SD strongly disagree, M mean, St.D standard deviation)

The participants of the study reported moderately high behavioral control over their healthy eating behaviors with an overall mean score of 4.08 and a standard deviation of 0.77 on the perceived behavioral scale (see Table 4.10). Majority of the participants contributed following items such as "It is easy for me to eat healthy constantly if I wanted to" (80.7%) and "I believe that if I start eating healthy I could keep to it constantly" (76.2%). On the other hand, disagreement (17.4 %) and undecided (19.8 %) responds appear at most in the following statement "I try hard to eat healthy" indicating that the participants were significantly uncertain whether to try hard to eat healthy or not. The results, in general, suggest that the participants perceive healthy eating behavior as an easy activity to perform.

4.2.8. Control Belief Factors

Control belief factors are the beliefs associated with the absence or presence of factors, such as resources or opportunities that facilitate or impede engaging in the behavior. In the context of the current study, control belief factors denoted resources

and opportunities that promote or restrain healthy eating behavior. In the questionnaire, there were 7 items assessing participants' perceptions of factors that facilitate or impede healthy eating behavior based on a 5-point Likert scale. Table 4.11 shows participants' level of agreements, in percentages, to control belief factor statements with corresponding mean and standard deviation.

Table 4.11
Frequency Distributions of Participant Agreement with Control Belief Factor Statements and Corresponding Item Means and Standard Deviations

Items	**SD**	**D**	**U**	**A**	**SA**	**M**	**St.D**
My school canteen sells healthy foods	35.6	20.7	26.1	9.8	7.8	2.33	1.26
Fast foods and snacks are addictive	7.3	7.8	16.2	21.7	47.1	3.94	1.26
I can get fast foods and snacks easier than healthy foods	16.8	11.8	24.8	17.5	29.2	3.31	1.43
I find it hard to eat healthy when I am outside (Such as Cafes, Restaurants, and Malls)	10.8	7.5	16.3	22.6	42.8	3.79	1.35
Friends make it hard to eat healthy	25.8	15.9	23.7	16.2	18.4	2.85	1.44
Eating fast food does not take time	17.7	10.5	24.4	17.6	29.8	3.31	1.44
Spending too much time in malls makes it hard to eat healthy	17.4	10.8	22.1	18.5	31.1	3.35	1.45
Total Scale						3.27	0.77

(Note: SA strongly agree. A agree. U undecided. D disagree. SD strongly disagree. M mean. St.D standard deviation)

Middle school students were asked to reveal factors that control their healthy eating behavior. The overall mean score on control belief factor scale was calculated as 3.27 with a standard deviation of 0.77 indicating that the participants expressed a dispersion in their responds regarding these items. Majority of the participants contributed the following items stated "Fast foods and snacks are addictive" (68.8 %) and "I find it hard to eat healthy when I am outside (Such as Cafes, Restaurants, and Malls)" (65.4%). It can be inferred, from these results, that middle school students perceive unhealthy foods as being addictive and perceive outdoor as not being healthy eating facilitator establishing the strongest factors that impede students' engagement in healthy eating behavior. Interestingly, majority of the students did not perceive school environment as an opportunity to facilitate their healthy eating

behavior with a disagreement to the following item stated, "My school canteen sells healthy foods" (56.3%). Besides, for many items, the participants expressed a significant amount of uncertainty. For instance, students were not sure whether their school canteen sells healthy food (26.1 %), or accessibility of fast foods is easier than healthy food accessibility (24.8 %).

4.2.9. Control Belief Power

The questionnaire included 7 items assessing corresponding power of control belief factors associated with healthy eating based on 5-point Likert scale. Table 4.12 depicts participants' level of agreements, in percentages, to related control belief power statements with corresponding mean and standard deviation.

Table 4.12
Frequency Distributions of Participant Agreement with Healthy Eating Control Belief Power Statements and Corresponding Item Means and Standard Deviations

Items	**SD**	**D**	**U**	**A**	**SA**	**M**	**St.D**
Availability of healthy foods in school canteen	14.2	6.1	15.6	15.4	48.7	3.78	1.46
Fast foods and snacks to be unreachable	10.6	5.2	18.4	16.9	48.8	3.88	1.35
Easily accessible healthy foods	3.0	3.9	14.1	19.9	59.1	4.28	1.04
Availability of healthy foods in places such as Cafes, Restaurants and Malls	10.4	8.2	17.8	17.4	46.1	3.81	1.37
Friends that prefer healthy foods	7.3	7.0	15.3	18.1	52.3	4.01	1.27
No waste of time for nutrition	7.8	5.5	24.8	18.8	43.1	3.84	1.26
Spending too much time in Malls	23.7	13.8	27.2	13.5	21.8	2.96	1.45
Total Scale						3.79	0.76

(Note: SA strongly agree. A agree. U undecided. D disagree. SD strongly disagree. M mean. St.D standard deviation)

As reported in Table 4.12, the participants of the study, in general, perceived the listed first 6 factors as powerful factors that facilitate and the last factor that impede engaging in healthy eating behavior, with an and overall mean score of 3.79 and a standard deviation of 0.76. Most of the participants perceived accessibility and friend environment as the most powerful factors contributing healthy eating behavior with agreeing the following items stated that "Easily accessible healthy foods"(79 %) and "Friends that prefer healthy foods" (70.4%). Disagreement and undecided

responses, on the other hand, appear at most in the item stated that "Spending too much time in Malls" with 37.4 % and 27.2 % respectively which means that the participants does not perceive malls as healthy eating facilitators at all.

4.2.10. Healthy Eating Intentions

Intention involves a strong natural tendency to act, and has been defined as the degree of willingness one has to engage in a specific behavior (Ajzen, 1998). In this study context, intention regarded as the degree of willingness to engage in healthy eating behavior. Specifically, there were 9 items in the questionnaire assessing participants' healthy eating intentions on 5-point Likert scale. Table 4.13 illustrates participants' level of agreements, in percentages, to the intention statements with corresponding mean and standard deviation.

Table 4.13
Frequency Distributions of Participant Agreement with Intention to Eat Healthy Statements and Corresponding Item Means and Standard Deviations

Items	**SD**	**D**	**U**	**A**	**SA**	**M**	**St.D**
I will try to eat healthy constantly during the next two weeks	6.3	5.1	18.4	23.8	46.5	3.99	1.19
I plan to eat healthy constantly during the next two weeks	5.7	6.1	18.3	25.8	44.1	3.96	1.17
I will expand effort to eat healthy constantly during the next two weeks	4.7	5.2	15.9	24.6	49.6	4.09	1.13
I am determined to eat healthy constantly during the next two weeks	6.0	6.2	20.5	21.7	45.6	3.95	1.20
I will try to consume less fast foods during the next two weeks	5.7	5.8	14.4	24.8	49.3	4.06	1.18
I plan to consume less snack during the next two weeks	7.7	6.8	15.3	22.8	47.4	3.96	1.26
I will try to consume less fuzzy drinks during the next two weeks	7.7	6.4	15.3	22.1	48.5	3.97	1.26
I am determined to consume more vegetables during the next two weeks	7.4	4.9	15.6	21.2	50.8	4.03	1.24
I intend to consume more fruits during the next two weeks	5.5	2.0	8.7	16.9	66.9	4.38	1.09
Total Scale						4.04	0.93

(Note: SA strongly agree, A agree, U undecided, D disagree, SD strongly disagree, M mean, St.D standard deviation)

According to the results in the Table 4.13, it can be said that the participants of the study reported themselves, in general, as high intenders to eat healthy with an overall

mean score of 4.04 and a standard deviation of 0.93. Compared to other items in the intention scale, majority of the intenders contributed the following items stated that "I intend to consume more fruits during the next two weeks" (83.8 %) and "I will expand effort to eat healthy constantly during the next two weeks" (74.2 %). On the other hand, non-intenders exhibited themselves in the following items "I plan to consume less snack during the next two weeks" and "I will try to consume less fuzzy drinks during the next two weeks" "I am determined to eat healthy constantly during the next two weeks" with 14.5%, 14.3%, and 12.2% disagreement level and with 15.3 %, 15.3%, and 20.5% undecided level respectively. Although middle school students describe themselves as high intenders to eat healthy, when it comes to snacks and fuzzy drinks consumption their intention decrease significantly.

4.2.11. Behavior Scale

In the questionnaire, there was only one item evaluating the participants' healthy eating behaviors with a rating scale (never, 1-2 days a week, 3-4 days a week, 5-6 days a week). Table 4.14 presents frequency and mean score of self-reported healthy eating behaviors based on one item.

Table 4.14
Frequency Distributions of Participant Agreement with Behavior Statement and Corresponding Item Means and Standard Deviations

Items	**Never**	**1-2 days a week**	**3-4 days a week**	**5-6 days a week**	**Everyday**	**M**	**St.D**
How frequent do you eat healthy	1.8	9.0	22.0	31.8	35.4	3.90	1.04
Total Scale						3.90	1.04

(Note: M mean, St.D standard deviation)

The mean score on self-reported healthy eating behavior scale was calculated as 3.90 with a standard deviation of 1.04. Concerning healthy eating behaviors of middle school students it can be inferred that they exhibit healthy eating behavior, in general. 22 % of the students reported that they eat healthy 3-4 days a week, 31.8 % of them reported 5-6 days a week, and 35.4 % of them reported that they eat healthy

every day. 1.8 % of the participants, on the other hand, reported that they never eat healthy.

Apart from original TPB constructs the current study also investigated three additional constructs namely Self-identities and Personal Norms related to healthy eating and Food consumption habit and sustainability in order to reveal the predictors of middle school students' healthy eating intentions and behaviors.

4.2.12. Self-identities related to Healthy Eating

Self-identity is the awareness of one's unique identity and also refers to salient and enduring aspects of one's self-perception (Sparks, 2000). So self-identity can be defined as 'a person's perception of himself' (Sherwood, 1965, p. 66). Contextually, in this study, self-identity denoted an individual's perception of himself regarding healthy eating behavior. The questionnaire included 3 items assessing students' self-identities related to healthy eating on a 5-point Likert scale. Table 4.15 illustrates participants' level of agreements, in percentages, to the self-identity statements with corresponding mean and standard deviation.

Table 4.15
Frequency Distributions of Participant Agreement with Self-Healthy Eating Identity Statements and Corresponding Item Means and Standard Deviations

Items	**SD**	**D**	**U**	**A**	**SA**	**M**	**St.D**
I consider myself as a healthy eater	3.2	5.3	18.9	28.9	43.6	4.04	1.06
I think of myself as someone who pays attention to healthy eating	3.3	5.9	20.3	26.9	43.5	4.01	1.08
I think that I eat healthy	4.1	7.0	19.4	27.0	42.6	3.97	1.13
Total Scale						4.01	1.00

(Note: SA strongly agree, A agree, U undecided, D disagree, SD strongly disagree, M mean, St.D standard deviation)

The participants overall mean score on self-identity scale was calculated as 4.01 with a standard deviation of 1.00 indicating that middle school students, mostly, perceived themselves as healthy eaters . Majority of the participants agreed the following item "I consider myself as a healthy eater" (72.5%). On the other hand, disagreement appears at most in the item stated that "I think that I eat healthy" (11.1%). It appears

that middle school students developed high self-identities regarding healthy eating despite existence of about 20 % level of uncertainty in each item.

4.2.13. Personal Norms related to Healthy Eating

Personal norms are self-expectations that are based on internalized values that reflect commitment with internalized values and are experienced as feelings of personal obligation to engage in a certain behavior (Schwartz, 1977). Regarding the context of the current study, personal norms referred to feelings of personal obligation to involve in healthy eating behavior. In the questionnaire, there were 4 items assessing participants' personal healthy eating norms based on 5-point Likert scale. Table 4.16 demonstrates the participants' level of agreements, in percentages, to the personal norm statements with corresponding mean and standard deviation.

Table 4.16
Frequency Distributions of Participant Agreement with Personal Healthy Eating Norm Statements and Corresponding Item Means and Standard Deviations

Items	**SD**	**D**	**U**	**A**	**SA**	**M**	**St.D**
I feel obligated to eat healthy	10.0	7.9	18.6	23.3	40.1	3.76	1.32
I would feel guilty if I do not eat healthy	17.6	13.2	24.1	19.1	26.0	3.23	1.42
Healthy eating is an important part of my life	4.1	4.4	15.6	24.0	51.9	4.15	1.10
I feel a personal responsibility in healthy eating issue	5.4	5.9	16.6	23.4	48.7	4.04	1.17
Total Scale						3.79	.95

(Note: SA strongly agree, A agree, U undecided, D disagree, SD strongly disagree, M mean, St.D standard deviation)

As reported in Table 4.16, the overall mean score of the participants on personal norm scale was 3.79 with a standard deviation of 0.95. As the results indicate, the participants own feelings of personal obligation to engage in healthy eating behavior above moderate level. Most of the participants agreed on the following items "Healthy eating is an important part of my life" (75.9%) and "I feel a personal responsibility in healthy eating issue" (72.1 %). On the other hand, disagreement and undecided responds appear at most in the item stated that "I would feel guilty if I do

not eat healthy" with 30.8% and 24.1 % respectively suggesting that middle school students do not hold guilty feelings at all while eating unhealthy.

4.2.14. Food consumption habit and sustainability

In this study, middle school students were asked to reveal their level of agreements to a series of statements about Food consumption habit and sustainability. There were 10 items assessing participants' perceptions on Food consumption habit and sustainability dimension on a 5-point Likert scale. Table 4.17 depicts participants' level of agreements, in percentages, to the sustainability dimension of healthy eating statements with corresponding mean and standard deviations.

Table 4.17
Frequency Distributions of Participant Agreement with Sustainability concerning Healthy Eating Statements and Corresponding Item Means and Standard Deviations

Items	**SD**	**D**	**U**	**A**	**SA**	**M**	**St.D**
Fast food (Hamburger etc.) consumption is dangerous for our health	5.1	3.6	8.8	19.7	62.8	4.31	1.11
Fast food (Hamburger etc.) consumption is dangerous for environmental health	7.0	5.3	15.0	21.3	51.4	4.05	1.23
Solution to environmental problems requires a radical change in our eating patterns.	4.9	4.0	21.3	23.1	46.7	4.03	1.13
A change in eating habits will play an important role in solution to environmental problems.	4.8	5.3	20.7	22.0	47.2	4.01	1.15
I buy local foods instead of imported commodity	5.3	5.7	33.0	23.6	32.4	3.72	1.13
Spending too much time in malls affects consumption and natural resources negatively	7.7	7.3	25.5	19.8	39.7	3.76	1.26
I contribute to local economy by eating healthy	7.2	5.9	23.8	21.7	41.4	3.84	1.23
I would improve the life of next generation if I eat healthy	4.7	4.1	17.9	20.8	52.4	4.12	1.13
I would protect plant and animal species I eat healthy	6.7	5.7	21.1	20.1	46.5	3.94	1.22
Total Scale						3.98	0.80

(Note: SA strongly agree, A agree, U undecided, D disagree, SD strongly disagree, M mean, St.D standard deviation)

The mean score on Food consumption habit and sustainability scale was calculated as 3.98 with a standard deviation of 0.80. The percentages of participant responses to the environmental related items indicate that elementary school students have high eco-centric perceptions. This could be inferred from the participants' agreement with such statements as "Fast food (Hamburger etc.) consumption is dangerous for our health" (84.5%) and "I would improve the life of next generation if I eat healthy" (73.2 %) and "Fast food (Hamburger etc.) consumption is dangerous for environmental health" (72.3%). On the other hand, disagreement appears at most in the item stated that "Spending too much time in malls affects consumption and natural resources negatively" (15%). Majority of the participants were undecided on the item stated that "A change in eating habits will play an important role in solution to environmental problems" (33%). Although remained "undecided" for several cases, students are aware of the relation between sustainability and food consumption habits, and tended to eat healthy not only for themselves but also for contributing to solve environmental problems. It is possible to infer that students hold positive perceptions toward the relation between sustainability and food consumption habits.

4.2.15 Self-Assessment of Healthy Eating Background

In this part, Participants were asked for a self-evaluation of their level of knowledge and interest in healthy eating. Based on a self-report, although majority of participants claimed to know "a lot" about healthy eating (75.1%), 17 % of the participants remained undecided whether they know about healthy eating. Less than 10 % thought that they did not know much about. It can be inferred that majority of the participants possess strong confidence in the extent of their healthy eating knowledge (M= 4.13, SD=1.05)

Participants' self-assessment of level of interest in healthy eating revealed their moderate level of interest in healthy eating (M= 3.36, SD =1.04). While 20.4 % and 34% of the respondents were "very interested" and "quite interested", respectively, 33 % described themselves as "somewhat interested" in healthy eating (see Figure 4.1). Minority perceived themselves as "slightly interested" (8.7%) and "Not interested" (3.1%) about healthy eating.

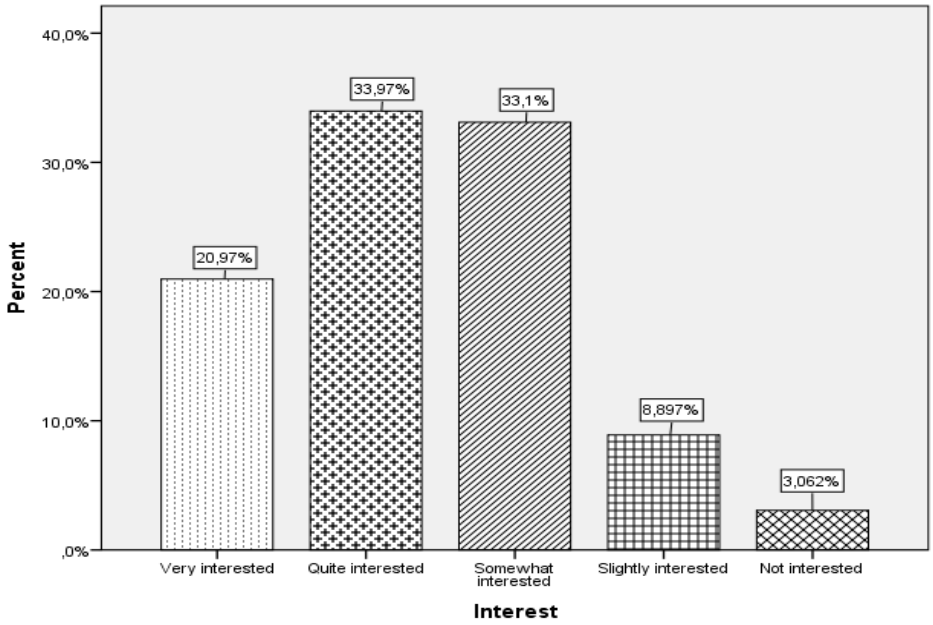


Figure 4.1 How much interested are you in healthy eating?

When asked about their school canteen, 26.5 % of the participants reported "seldom" using canteen, 40.9% reported that they "sometimes" buy food from canteen, 16% reported "frequent", and 10 % percent reported that they "always" buy food from school canteen at school times(see Figure 4.2). 6.4 % of the participants, on the other hand, reported "never" using school canteen when they are at school.

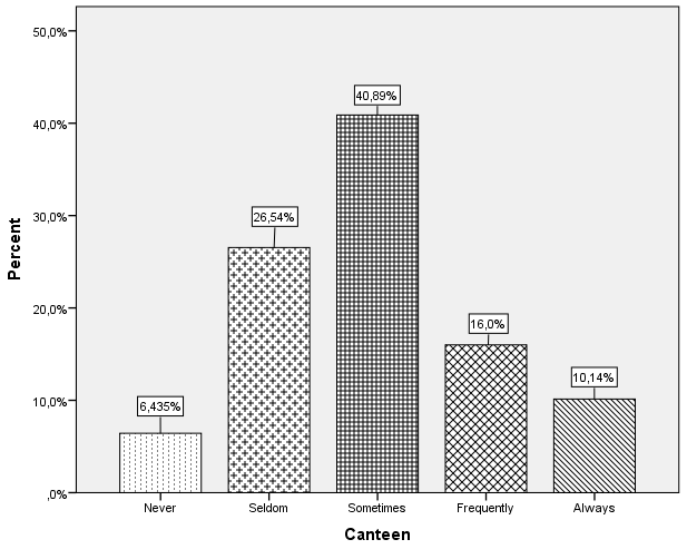


Figure 4.2 How frequent do you from canteen at school times?

The middle school students, when responding to the question about the how often does healthy eating topic mentioned in your science courses frequency of healthy eating related courses, 64% of the students agreed or strongly agreed that healthy eating topic is mentioned 39% indicated that healthy eating topic is sometimes mentioned in their courses, 19.9 % reported “frequently” mentioning of the topic in their courses, and 10.6 % reported as “always” (see Figure 4.3). On the other hand, 21.6 % and 8.9 % of the respondents indicated that they “rarely” and “never” see, respectively, healthy eating among the topics covered in their courses. Regarding how to eat healthy issue, as indicated in figure 4.3, majority of the participants declared that how to eat healthy issue is covered in their courses (63.7%). Around 18% of the participants, however, either remained undecided or disagreed whether how to eat healthy issue is covered in the class.

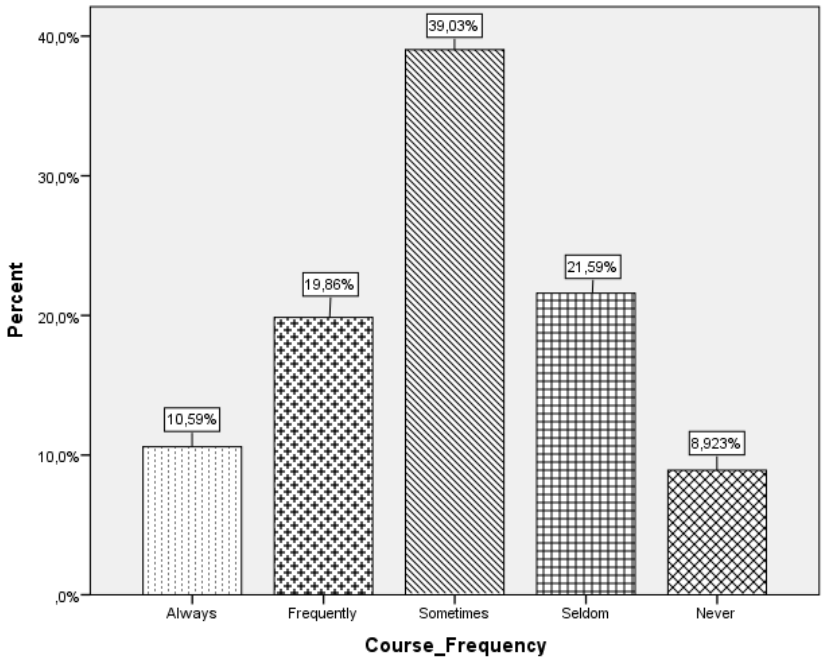


Figure 4.3 How frequent healthy eating topic is covered in your courses?

In this category, sources of information were listed and the participants were asked to indicate the sources they obtain regarding healthy eating. As presented in Table 4.18, majority of participants declared that they obtain information about healthy eating from their families (95.6 %), followed by health specialists (89.0 %) and school (74.9 %). social media is the next. Although almost half of the participants agreed on

social media (i.e.,Television Internet) to be a source of healthy eating information, the other half remained either undecided or disagreed on the same issue (see Table 4.18). It appears that middle school students depend on family enviroment as to be the first source of information regarding healthy eating.

Table 4.18
Sources of information about healthy eating

Items	SD	D	U	A	SA	M	St.D
Family	.9	.5	3.1	10.1	85.5	4.79	0.6
School	7.3	4.3	13.6	20.3	54.6	4.11	1.22
Health specialists	5.2	2.1	8.7	19.8	64.2	4.36	1.07
Television	18.8	8.5	22.1	20.8	29.9	3.34	1.46
Internet	16.3	10.5	21.1	20.5	31.6	3.41	1.43
Magazines	13.7	10.5	20.8	22.9	32.1	3.49	1.39
Friends	15.0	11.0	24.2	22.1	27.6	3.36	1.38

(Note: SA strongly agree. A agree. U undecided. D disagree. SD strongly disagree. M mean. St.D standard deviation)

Descriptive statistics, so far, provided a detailed insight on the participants' responds to each presented construct items. In the next phase, Structural Equation Modelling (SEM) analysis was conducted in order to see how these constructs related and their effect on healthy eating intention and behavior. In order to proceed, assumptions related to SEM analyses are discussed beforehand.

4.3. Structural Equation Modeling Analysis

4.3.1. Assumptions

The assumptions underlying SEM analyses include independence of observations, random sampling of respondents, and a reasonable sample size and missing data, multivariate normality and outliers, linearity, absence of multicollinearity and singularity.(Reisinger & Turner, 2003; Tabachnick & Fidell, 2013).

4.3.1.1. Independence of observations

To begin with, independence of observations is a main requirement for nearly all kind of hypothesis testing. It means that each observation or measurement was independent of any other observation or measurement (Gravetter & Wallnau, 2007). In this study, the data were collected during regular class hour periods of

participants, and it was assumed that each participant responded to the questionnaire independent of one another participants.

4.3.1.2. Random Sampling

Random sampling assumption suggests that the participants were selected randomly, without any certain criteria of selection. This assumption helps to ensure that "the sample is representative of the population and that the results can be generalized to the population" (Gravetter & Wallnau, 2007, p.248). In this study, the data were collected from four different middle schools in one district of Ankara, which were selected conveniently from both rural and urban areas, regarding their means of accessibility.

4.3.1.3. Linearity

In this study, linearity was checked by generating a matrix of scatterplots among each pair of variable. In the case of the situation where it is not feasible to examine all pairwise scatterplots randomly selected pair of scatterplots could be examined to assess linearity (Tabachnick & Fidell, 2013). In this study it was also not possible to examine all pairwise scatterplots. Therefore, randomly selected scatterplots form a matrix of scatterplots generated by IBM SPSS GRAPHS (see Appendix B) was examined and most of the plots did not show any obvious of non-linearity and it was assumed that linearity assumption was satisfied.

4.3.1.4. Multivariate Normality and Outliers

In SEM analysis, normality assumptions are highly important for determining the estimation method that will be used during hypothesis testing. LISREL uses Maximum Likelihood (ML) estimation by default (Jöreskog & Sörbom, 1993). However, when the variables are not normally distributed, it is not recommended to use ML (Byrne, 1998; Kline, 2011; Schumacker & Lomax, 2004). In the absence of normality, it is recommended to use alternative methods such as Weighted Least Squares (WLS) or Robust Maximum Likelihood (RML), which are asymptotically distribution free methods and do not require normal scores (Du Toit & Du Toit, 2001).

Table 4.19
Test of Univariate Normality for Continuous Variables

	Skewness		Kurtosis		Skewness and Kurtosis	
	Z-Score	P-Value	Z-Score	P-Value	Chi-Square	P- Value
ATT	-14.972	**0.000**	10.785	**0.000**	340.463	**0.000**
SN	-19.983	**0.000**	24.086	**0.000**	979.457	**0.000**
PBC	-13.274	**0.000**	4.775	**0.000**	198.993	**0.000**
INT	-15.969	**0.000**	8.991	**0.000**	335.851	**0.000**
SI	-13.864	**0.000**	2.999	**0.003**	201.206	**0.000**
PN	-10.843	**0.000**	0.566	0.571	117.884	**0.000**
SUS	-13.684	**0.000**	6.896	**0.000**	234.808	**0.000**
Bb	-14.469	**0.000**	10.278	**0.000**	314.994	**0.000**
Nb	-14.620	**0.000**	7.637	**0.000**	272.064	**0.000**
Cb	5.128	**0.000**	-2.215	**0.027**	31.198	**0.000**
Beh	-10.351	**0.000**	-3.127	**0.002**	116.913	**0.000**

Specifically, univariate normality is about the skewness and kurtosis values of the variables in the model. It is violated if the skewness and kurtosis values exceed the range of -2 and +2 (George & Mallery, 2003). Table 4.19 illustrates the skewness and kurtosis values of the variables in this study. The results indicated that most of the variables had statistically significant z-score values for skewness and kurtosis ($p<0.05$), and all the variables had statistically significant chi-square values ($p<0.05$), indicating non-normality.

In addition, the assumption of multivariate normality implies that (1) "all the individual univariate distributions are normal", (2) "each variable is normally distributed for each value of every other variable", and (3) "all bivariate scatterplots are linear, and the distribution of residuals is homoscedastic" (Kline, 2011, p.60). LISREL provides a chi-square test of multivariate normality, which indicates the skewness and kurtosis values for all the measured variables in the model. The result of the multivariate normality test is illustrated in Table 4.20. The multivariate normality test revealed a significant chi-square value of 3578.78 ($p<0.05$), with significant multivariate skewness of 13.79 (z-score= 50.75), and significant multivariate kurtosis of 194.64 (z-score= 31.66), indicating violation of multivariate normality assumption. Outliers discussed in the preliminary analysis section.

Table 4.20
Test of Multivariate Normality for Continuous Variables

Skewness			Kurtosis			Skewness and Kurtosis	
Value	z-Score	p-value	Value	z-Score	p-Value	Chi-Square	p- Value
13.79	50.75	**0.000**	194.43	31.66	**0.000**	3578.78	**0.000**

4.3.1.5. Multicollinearity and Singularity

In SEM analyses matrices need to be inverted. "If variables are perfect linear combinations of one another or are extremely highly correlated the necessary matrices cannot be inverted" (Tabachnick & Fidell, 2013, p.689). An extremely small determinant of the covariance matrix may indicate a problem with multicollinearity or singularity. SEM programs, in general, provide warning messages in the existence of multicollinearity or singularity. LISREL does not provide the determinant of the covariance matrix in the output but the program in this study converged so the covariance matrix was assumed to be nonsingular.

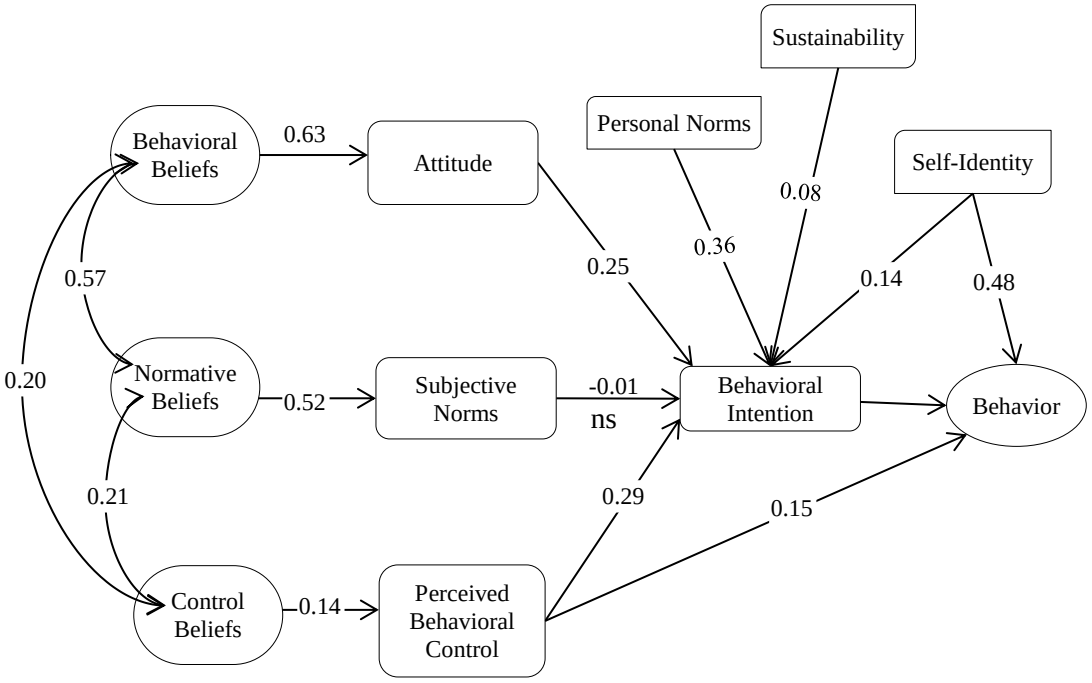
4.3.1.6. Sample Size and Missing Data

Regarding the assumption of sample size, SEM analysis is based on large samples (Kelloway, 1998). It is mostly because small samples influence the violation of non-normality, decrease the accuracy and stability of parameter estimates (Schumacker & Lomax, 2004), affect the power of significance tests, and produce biased goodness of fit indices (Curran, West, & Finch, 1996). In the literature, there are a number of different recommendations for sample size depending upon the complexity of the specified model. In general, recommendations range from 10 to 20 cases per estimated parameter (Stevens, 2002) with overall sample size preferred to exceed 200 cases (Garver & Mentzer, 1999). In this study, the sample size was 1780, which was a highly satisfactory number for ensuring the sample size issues stated.

Finally, missing data issue was discussed in Preliminary analysis section of this chapter.

4.3.2. Structural Equation Model

Developing the structural model began with hypothesizing an initial model (presented in Chapter 1) on the basis of substantive theory. The data file containing the raw variables was imported into LISREL 8.80. Then the SIMPLIS command language was used for formulating the structural model which was tested on the basis of correlation matrix using Robust Maximum Likelihood as the estimation technique. While developing the model a number of structural equations were tested considering the theory as well as the chi square values, standard errors, t-values, standardized residuals, and modification indices.



Chi-Square = 10835.49, df = 2727, P-value = 0.00000, RMSEA = 0.041

Figure 4.4 Structural Model with Standardized Solution

Figure 4.4 represents the structural model with standardized solution. The model consisted of six latent independent variables (exogenous) and five latent dependent variables (endogenous). The independent latent variables were Behavioral Beliefs (bb), Normative Beliefs (nb), Control Belief (cb), Self-Identity (SI), Personal Norms (PN), and Food consumption habit and sustainability (SUS). Besides, the latent dependent variables were Attitude toward healthy eating behavior (ATT), Subjective

Norms (SN), Perceived Behavioral Control (PBC), Intention to Eat Healthy (INT) and Healthy Eating Behavior (Beh).

In SEM analysis, there is a modification index for each fixed parameter in the model which estimates the decrease in chi square that will be obtained if that particular parameter is added to the model (Jöreskog & Sörbom. 1993). In LISREL, the default value for alpha is taken as 0.05 and "modification indices larger than 7.882 are considered to be large" (Jöreskog & Sörbom. 1993. p.108). In this study, regarding the modification indices among the observed variables a number of error covariances were added in the model syntax.

Table 4.21
Model Fit Indices of SEM for Proposed Model

Fit Index	Description	Criterion	Current Study
X^2	Chi-square goodness-of-fit test	P >0.05	10835.49 (**p=0.00**)
X^2/df	Ratio of Chi-square to Degrees of Freedom	<5	3.97
RMSEA	Root Mean Squared Error of Approximation	<0.05: very good fit <0.08: reasonable fit	0.041
RMR	Root Mean Square Residual	<0.05	**0.10**
PNFI	Parsimony Normed Fit Index	Higher values	0.93
NFI	Normed fit Index	> 0.90	0.97
NNFI	Non-Normed fit Index	> 0.90	0.98
CFI	Comparative Fit Index	> 0.90	0.98
IFI	Incrimental Fit Index	> 0.90	0.98
RFI	Relative Fit Index	> 0.90	0.97

Table 4.21 summarizes the model fit indices belonging to the final structural model. The model demonstrated a chi-square value of x^2= 10835.49, with degrees of freedom df= 2727. As the chi square is sensitive to sample size, such as above 200 (Kelloway, 1998; Schumacker & Lomax, 2004) it was typical to obtain a significant

probability level (p= 0.00). In SEM analysis, a x^2/df ratio less than 5 is an indicative of a good fit between observed and reproduced correlation matrices, and a NFI, NNFI and CFI of 0.9 or greater suggest that the model fits the data well. For this model, it was found that x^2/df= 3.97, NFI= 0.97, NNFI= 0.98 and CFI= 0.98, indicating a very good fit to the data. Specially, the RMSEA value of 0.041 can be regarded as an evidence for a very good fit for the indicated variables. Moreover considering the other fit indices and their criteria. It was possible to conclude that the fit of the model was very good and the proposed model was highly supported by the sample data.

The structure coefficients (γ and β) represent the relationships among latent variables in the model. Specifically, γ (lowercase gamma) indicates the strength and direction of the relationship among latent dependent variables and latent independent variables (Schumacker & Lomax, 2004). Table 4.22 illustrates the lowercase gamma values.

Table 4.22
Relationships among Latent Dependent and Independent Variables of SEM (γ)

Dependent Variables	Independent Variables					
	SI	PN	SUS	bb	nb	cb
ATT	-	-	-	0.63	-	-
SN	-	-	-	-	0.52	-
PBC	-	-	-	-	-	0.14
INT	0.14	0.36	0.08	-	-	-
Beh	0.48	-	-	-	-	-

RQ2: In what ways are behavioral beliefs, normative beliefs, and control beliefs are related to attitudes, subjective norms, and perceived behavioral control?

As reported in Table 4.22, there exists positive relationship between latent dependent and independent variables of the model. Specifically, when belief constructs analyzed, the results suggest that each belief component is directly related to corresponding construct such that there is positive and strong direct relationship between behavioral beliefs and attitudes toward healthy eating. Similarly, there exists strong direct positive relationship between normative beliefs and subjective norms indicating that the students' beliefs about specific individuals' or groups' approval or disapproval of performing healthy eating behavior give rise to students' subjective

norms. The positive relationship between control beliefs and perceived behavioral control suggest that the students' beliefs associated with the availability of resources or opportunities that facilitate or impede healthy eating behavior determine their healthy eating intentions.

RQ3: In what ways are attitudes toward healthy eating, subjective norms, perceived behavioral control, personal norms, self-identity, and Food consumption habit and sustainability are related to healthy eating intentions?

When additional constructs analyzed, self-healthy eating identities, personal healthy eating norms, and Food consumption habit and sustainability are directly related to healthy eating intentions (see Table 4.22). Specifically, the current study revealed high relationship between personal healthy eating norms and healthy eating intentions, medium relationship between self-healthy eating identities and healthy eating intentions, and small relationship between Food consumption habit and sustainability and healthy eating intentions. These relationships suggest that students' personal obligation to eat healthy, healthy eating perceptions of themselves and their concerns about sustainability contribute healthy eating intentions of middle school students.

Next, Lowercase beta (β) indicates the strength and direction of the relationship among latent dependent variables (Schumacker & Lomax, 2004). Table 4.23 summarizes the lowercase beta (β) values among the model's latent dependent variables.

Table 4.23
Relationships among Latent Dependent Variables (β)

	ATT	SN	PBC	INT	Beh
ATT	-	-	-	-	-
SN	-	-	-	-	-
PBC	-	-	-	-	-
INT	0.25	-0.01	0.29	-	-
Beh	-	-	0.15	0.12	-

The results reported in Table 4.23 revealed that attitude toward healthy eating, subjective norms and perceived behavioral control directly related to healthy eating intentions. Specifically, when the direction of relationships investigated, the results

show that subjective norms are negatively related to healthy eating intentions implying that the higher the subjective norms students hold the lower healthy eating intentions they possess. Attitudes toward healthy eating and perceived behavioral control, on the other hand, are positively related to healthy eating intentions suggesting that the more favorable the attitudes toward healthy eating and the higher the perceived behavioral control the stronger will be the students' healthy eating intentions.

RQ4: In what ways are healthy eating intentions, perceived behavioral control, and self-identities are related to healthy eating behavior?

Intentions together with perceived behavioral controls, in turn, are directly related to healthy eating behaviors advocating that the students, who have a strong tendency to engage in healthy eating behavior and have a high control over healthy eating behavior, are more likely perform healthy eating behavior (see Table 4.25). Besides, self-identity is directly related to healthy eating intentions suggesting that students who perceived themselves as healthy eaters are more likely to follow healthy eating (see Table 4.24).

Apart from the relationships among latent variables, SEM analysis provides the structural equation of the model. The structure coefficients, standard errors, and t-values of each structural equation in the model were illustrated in the Table 4.24. In particular, t-values are the ratios between each estimate and its standard error, and a significant t-value indicates that the variable considerably influence the corresponding dependent variable (Jöreskog & Sörbom, 1993). In LISREL, the default value for alpha (α) is taken as 0.05, and t values "smaller than 1.96 in magnitude" are considered to non-significant (Jöreskog & Sörbom, 1993, p.107). In the specified model, only one path indicated non-significant t value that is the path from Subjective Norms (SN) to Intention to Eat Healthy (INT), (t= -0.46).

Table 4.24 also illustrates the squared multiple correlation (R^2) values for each structural equation. In SEM analysis, R^2 is used as a measure of strength of each relationship in the model (Jöreskog & Sörbom, 1993), which indicates the amount of variance explained by the set of independent variables for the corresponding

dependent variable. R^2 values in SEM are interpreted in the same way as R^2 values in regression analysis (Kelloway, 1998). According to the results, the presented model was able to explain 40% of the variance in Attitude toward Healthy Eating Behavior (ATT); 27% of the variance in Subjective Norms (SN); 2 % of the variance in Perceived Behavioral Control (PBC); 51 % of the variance in Intention to Eat Healthy (INT); 33 % of the variance in Healthy Eating Behavior (Beh).

Regarding both the squared multiple correlations and structure coefficients, results related with predictor variables revealed that students' Behavioral Beliefs associated with healthy eating accounted for 40% of the variability in their Attitudes toward Healthy Eating Behavior. Next, students' perceived social pressure, which is Normative Beliefs, accounted for 27 % the variability in their healthy eating related Subjective Norms. In a similar vein, students' Control Beliefs, explained only 2% of the variability in their Perceived Behavioral Control.

Table 4.24
Structural Equations of the Model

Paths To	From	Structure Coefficients	Std. Error	t-Value	R^2
ATT	bb	0.63(γ)	0.04	15.50	0.40
SN	nb	0.52(γ)	0.03	14.92	0.27
PBC	cb	0.14(γ)	0.05	4.22	0.02
INT	ATT	0.25(β)	0.04	9.69	0.51
	SN	–0.01(β)	0.03	-0.46*	
	PBC	0.29(β)	0.03	12.06	
	SI	0.14(γ)	0.03	4.35	
	PN	0.36(γ)	0.08	7.63	
	SUS	0.08(γ)	0.04	2.27	
Beh	INT	0.12(β)	0.03	4.38	0.33
	PBC	0.15(β)	0.04	6.04	
	SI	0.48(γ)	0.02	18.75	

* Non-significant paths

Results related with healthy eating intentions revealed that students' Attitude toward Healthy Eating Behavior, Subjective Norms, Perceived Behavioral Control, Self-healthy eating Identities, Personal healthy eating Norms, and Food consumption habit and sustainability accounted for 51 % of the variability in their Intentions to Eat Healthy. Among these variables, Personal healthy eating Norms (γ = 0.36, t= 7.63) hold the highest association with Intentions to Eat Healthy followed by Perceived Behavioral Control (β = 0.29, t= 12.06).

Besides, results related with healthy eating behavior revealed that students' Intentions to eat Healthy together with Perceived Behavioral Control and Self-healthy eating Identities accounted for 33% of the variability in their Healthy Eating Behavior. Specifically, Self-healthy eating Identities (γ = 0.48, t= 18.75) hold the highest association with Healthy Eating Behavior followed by Perceived Behavioral Control (β=0.15, t= 6.04).

Cohen (1988) suggested using a standardized measure of effect size, called f^2, which is equal to $R^2/(1 - R^2)$, where R^2 is the squared multiple correlation (p.410-414). According to Cohen (1988), an f^2 value of 0.02 is considered as a small effect size, 0.15 is considered as a medium effect size, and f^2 values of 0.35 or greater are regarded as large effect sizes. If these values are converted into R^2 values, an R^2 value of 0.02 will be regarded as small effect size, 0.13 as medium effect size, and 0.26 as large effect size. The Effect size results suggest that all the structural equations had large effect sizes (f^2 larger than 0.35), except for the structural equation belonging to Perceived Behavioral Control (R^2= 0.02, f^2= 0.02), which had a small effect size.

In addition to the direct effect results presented up to now, indirect and total effects are also provided by LISREL. Indirect effect takes place when there is no single straight line or arrow directly connects two latent variables, but one latent variable is reached from another latent variable through one or more mediating variables (Raykov & Marcoulides, 2006). Total effect, in this fashion, is determined as the sum of direct and indirect effects between two latent variables. Hence, total effects are equal to the indirect effects, when there is no direct effect among the latent variables

(Jöreskog & Sörbom, 1993). Indirect effects of latent independent variables of the current study on the latent dependent variables are presented in Table 4.25

Table 4.25
Indirect effects of Independent variables on Dependent Variables

Dependent Variables	Independent Variables					
	SI	PN	SUS	bb	nb	cb
ATT	-	-	-	-	-	-
SN	-	-	-	-	-	-
PBC	-	-	-	-	-	-
INT	-	-	-	0.16	-0.01	0.04
Beh	0.02	0.04	0.01	0.02	0.00	0.03

The total effects of these independent variables on the latent dependent variables are provided in the following Table 4.26.

Table 4.26
Total effects of Independent variables on Dependent Variables

Dependent Variables	Independent Variables					
	SI	PN	SUS	bb	nb	cb
ATT	-	-	-	0.63	-	-
SN	-	-	-	-	0.52	-
PBC	-	-	-	-	-	0.14
INT	0.14	0.36	0.08	0.16	-0.01	0.04
Beh	0.50	0.04	0.01	0.02	0.00	0.03

Additionally, the indirect effects among the latent dependent variables are illustrated in the Table 4.27.

Table 4.27
Indirect effects among Latent Dependent Variables

	ATT	SN	PBC	INT	Beh
ATT	-	-	-	-	-
SN	-	-	-	-	-
PBC	-	-	-	-	-
INT	-	-	-	-	-
Beh	0.03	0.00	0.03	-	-

Similarly, total affects among the latent dependent variables are illustrated in the Table 4.28.

Table 4.28
Total effects among Latent Dependent Variables

	ATT	SN	PBC	INT	Beh
ATT	-	-	-	-	-
SN	-	-	-	-	-
PBC	-	-	-	-	-
INT	0.25	-0.01	0.29	-	-
Beh	0.03	0.00	0.18	0.12	-

When the direct and indirect effects were taken into consideration together, regarding students' healthy eating intentions, the results revealed that students' attitudes toward healthy eating behavior, subjective norms, perceived behavioral control, self-healthy eating identities, personal healthy eating norms and their Food consumption habit and sustainability were directly linked to their healthy eating intentions. Specifically, when students possessed high attitudes toward healthy eating, and believed that they have a control over their behavior together with high perceptions of themselves as healthy eaters and high personal obligations to involve in healthy eating behavior and high Food consumption habit and sustainability they established high intentions to eat healthy. The contribution of subjective norms, however, remained non-significant among the other constructs indicating that middle school students' beliefs about important others approve of their healthy eating behavior are not significant enough to promote their healthy eating intentions (see Table 4.28).

Besides, among belief components, behavioral beliefs and control beliefs were indirectly related to healthy eating intentions indicating that the higher the students' beliefs regarding possible outcomes of healthy eating outcomes and higher beliefs about the capability to accomplish healthy eating behavior associated with the absence of presence of factors that facilitate or impede engaging in healthy eating behavior the higher healthy eating intentions to form (see Table 4.25). It appears that behavioral beliefs and control beliefs, together with personal healthy eating norms, self-healthy eating identities and perceptions of sustainable healthy eating, lay the foundations of middle school students' healthy eating intentions.

Concerning healthy eating behaviors, the results revealed that healthy eating intentions were directly, perceived behavioral control and self-healthy eating identities were directly and indirectly related to healthy eating behaviors. In

particular, when the direct and indirect effect was considered, healthy eating intentions, perceived behavioral control and self-healthy eating identities were significantly related to healthy eating behaviors. These results suggest that students' perceived degree of actual control over healthy eating behavior and their self-healthy eating identities can influence their healthy eating behaviors considerably either indirectly, through intentions, or directly. In addition, belief components contributed to healthy eating behavior indirectly.

CHAPTER 5

DISCUSSIONS

This chapter first presents the major findings of the current study then discusses the results in detail along with providing conclusions. The chapter continues with implications of the study then finalizes by limitations of the study and recommendations for future research.

5.1 Discussions and Conclusion

Employing a revised theory of planned behavior, which integrated personal norm, self-identity and Food consumption habit and sustainability, this study proposed and tested a structured model to clarify the nature of healthy eating intention and behavior among middle school students in Turkey. Firstly, this study supported that TPB is a promising framework for uncovering Turkish middle school students' healthy eating intention and behavior as well.

Overall, the results of the path analysis revealed that while self-identity was the main predictor explaining 23% of the variance in students' healthy eating behaviors, intentions, made the lowest contribution to the prediction of behavior. however, personal norms (perceived moral obligation to personal consumption of healthy diet) was the main predictor explaining 13% of the variance in students' healthy eating intentions followed by perceived behavioral control, attitudes toward behavior, and self-identity. Sustainable healthy eating, on the other hand, emerged as the weakest predictor of students' healthy eating intentions, explaining only 1% variance. In this context, subjective norms was the only construct that did not contribute (direct or indirect) to Turkish students' intentions to eating healthy.

In particular, healthy eating behavior, while directly and positively predicted by healthy eating intentions ($\beta = .12$), perceived behavioral control ($\beta = .15$), and self-identity ($\gamma = .48$), indirectly related to personal norms, sustainable healthy eating, and self-identity through their effect on behavioral intention. Self-identity found to be the

main predictor of Turkish middle school students' healthy eating behaviors, while intentions remained to be the lowest contributor. Besides, behavioral beliefs (i.e. possible results of a healthy eating behavior that is important for the students), and control beliefs (i.e., situations that makes it easy/difficult for the students to behave in a certain way) had indirect effects on students' healthy eating behaviors through their effect on attitudes toward eating healthy, (i.e., behavior) and perceived behavioral control respectively. Behavioral intentions to eating healthy, on the other hand, predicted directly and positively by attitudes toward eating healthy (β = .25), perceived behavioral control over eating healthy (β = .29), personal norms related to eating healthy (γ=.36), self-identity (γ = .14), and sustainable healthy eating (γ = .08). Apart from, behavioral beliefs and control beliefs had indirect influence on students' healthy eating intentions. Contrary to perceived behavior, personal norms contributed most to middle school students' healthy eating intentions which was followed by perceived behavioral control, attitudes toward behavior, and self-identity. There appeared to be weakest but still significant relationships between students' healthy eating intentions and their Food consumption habit and sustainability. Data somewhat supported the hypothesized model.

As hypothesized, in this study, self-identity emerged as a significant predictor of behaviors such that students who identified themselves as healthy eaters were more likely to engage in healthy eating behavior than those who did not have self-healthy eating identity. In fact, descriptive statistics also supported these findings showing that students held relatively strong self-identity (*M*=4.01). For example great majority of middle school students identified themselves as "healthy eaters" (72.5%) and "as someone who pays attention to healthy eating" (70.6%) So, it can be said that middle school students with a strong self-identity were more strongly perceive themselves as healthy eaters and were more likely to behave consistent with this identity (i.e., eat healthy). Since self-identity considered as the awareness of one's unique identity and also refers to salient and enduring aspects of one's self-perception (Sparks, 2000).

The present study, thus, highlighted the important role that self-identity play in explaining healthy eating behavior. It appears that the predictive power of self-identity (β = .48) is greater than the original constructs of TPB which are perceived behavioral control and intention. Apart from having direct effect on behavior, self-identity, in the present study, exerted its effect on behavior indirectly over intentions. In other words, self-identity mediates the link between intentions and behavior. The results of the current study regarding self-identity imply that middle school students' self-identities contributed their healthy eating not only directly but also indirectly through its effect on healthy eating intentions. These results are congruent with the previous studies which identified self-identity as an important determinant of behavior (Ries, Pihu & Armenta, 2012; Bruijn & Putte, 2012; Whitmarsh & O'Neill, 2010; Werff, Steg and Keizer, 2013). Studying with middle and high schools, Ries, Pihu and Armenta, (2012) found significant relationship between self-identity and physical activity behavior (r= 0.31). Their results showed that self-identity contributed not only directly but also indirectly to the physical activity behavior. Authors attributed the direct relationship to the claim that self-identity captures a distinct psychological aspect than the TPB constructs and the indirect relationship to the claim that self-identity influences behavior in interaction with intention. Based on these findings they suggest that adolescents who identify themselves as physically active persons are more likely to practice physical activity than those who do not have a physical activity self-identity and proposed that self-identity is an important predictor of physical activity behavior and therefore should be integrated in the TPB model. Similarly, Brujin and Putte (2012) found significant relationship between self-identity and exercise behavior (r= 0.33) among undergraduate students. Similar to Ries, Pihu and Armenta (2012), they also explored the contribution of self-identity on behavior not only directly but also indirectly, through intentions. They attributed the indirect relationship to the self-identity-intention interaction such that the contribution of strong exercise identity as an assistant to hold stronger exercise intentions strengthen the likelihood of exercise behavior (Brujin & Putte, 2012). Based on these findings they suggest that those who have high exercise identity are more likely to engage in exercise behavior than those who have low exercise identity

and points out the usefulness of self-identity as an additional component to the TPB model for explaining exercise behaviors.

Whitmarsh and O'Neill, 2010, studying with adults, found self-identity to predict pro-environmental behaviors, significantly, including waste reduction, regular water and domestic energy conservation, eco-shopping and eating implying that self-identity could be an important component in order to explain such behaviors. Based on these findings, it has been suggested to target people's self-identity in order to change their behaviors (Whitmarsh & O'Neill, 2010). Besides, Werff, Steg and Keizer, (2013) proposed a model that explore a) the factors influencing environmental self-identity, and b) the direction of the relationship of environmental self-identity with pro-environmental judgments, intentions, and behavior. Environmental self-identity found to predict the intention to reduce meat consumption ($\beta = 0.44$), $p < .001$, implying that environmental self-identity might be the crucial construct in explaining positive "spillover" between environmental behaviors. They further claimed that environmental self-identity stimulates other future environmental-friendly intentions.

Accordingly, current findings contribute to the growing body of literature by suggesting that self-identity is a valuable addition to the TPB within the healthy eating behavior domain.

As predicted, perceived behavioral control was another construct that significantly predicted students' healthy eating behavior. Students who possessed high control over their behaviors were more likely to perform healthy eating behavior while students had lower behavioral control tended to exhibit less healthy eating behavior. So, the significant relationship between PBC and behavior implies that perceived behavioral control serve as a proxy for actual control and contribute directly to the prediction of the healthy eating behavior. Compared to intentions, perceived behavioral control was better-predicted students' healthy eating behaviors. So, the findings of the current study imply that rather than being volitional, perceived ease or difficulty in performing healthy eating behavior contributes to the middle school students' healthy eating intentions. One possible explanation of this finding might be

that students perceive unhealthy foods irresistible which dominates their volitional control to engage in healthy eating behavior. Another possible explanation is that the presence of factors those facilitate or impede engaging in healthy eating behavior control middle school students' healthy eating behavior that establishes their perceived behavioral control. In fact, descriptive statistics also support these explanations. A clear majority of participants found unhealthy foods irresistible (68.8%), acknowledged the difficulty of eating healthy in outdoors (65.4%), as well as perceived their school environment as not supporting their healthy eating behavior (56.3 %) with holding relatively high control beliefs (*M*=4.08). Besides, the indirect effect of control beliefs (i.e., Fast foods and snacks are irresistible, I find it hard to eat healthy when I am outside, spending too much time in malls makes it hard to eat healthy) on students' healthy eating behaviors also supports these possible explanations. As the TPB suggests beliefs serve as the building blocks of individuals' attitudes, subjective norms, and perceived behavioral control. In line with this perception, control beliefs form individuals' perceived behavioral control, which predicts their behavior. Besides, the results of the current study revealed that control beliefs indirectly related to behavior over perceived behavioral control.

Indeed, previous research on the contribution of perceived behavioral control on healthy eating behavior demonstrated mixed results. For example, Armitage and Conner (1999), Conner, Norman and Bell (2002), and Backman et al., (2002) found no significant relationship between perceived behavioral control and healthy eating behavior. Finding no significant effect of PBC on healthy eating behaviors led the researchers to develop an argument that intentions are the only predictor of healthy eating behavior and suggest that this type of behavior is volitional. Contrary to this argument, other researchers strongly propose the view that behavior is affected to a greater extent by external factors than intentions (Povey et al., 2000; Fila & Smith, 2006). Studying with general public, Povey et al., (2000) found the contribution of perceived behavioral control to behavior prediction to be higher than intentions. This finding led them to suggest that healthy eating behavior seems to be related to behavioral control rather than being volitional. Besides, these findings imply that healthy eating behavior engagement is largely influenced by external factors and has

little to do with personal motivation (Povey et al., 2000). Studying with adolescents, Fila and Smith (2007) also found that perceived behavioral control explained behavior better than intentions. Fila and Smith (2007) attributed this finding to the argument that youths' healthy eating intentions might be empowered by external resources or opportunities that facilitates or inhibits their engagement in healthy eating behavior.

They suggest that adolescents who possess high behavioral control over healthy eating are more likely to engage in healthy eating than those who have low behavioral control.

In line with the findings of Povey et al., (2000) and Fila and Smith (2007), the results of the current study demonstrated that contribution of PBC component on healthy eating behaviors was higher than healthy eating intentions suggesting that healthy eating behavior among adolescents seems to be effected by external factors rather than being volitional.

Moreover, in line with the predictions, the current study revealed that the students' healthy eating intentions were positively and significantly related to their healthy eating behaviors. Finding such relationship was expected because intention involves a strong natural tendency to act (Ajzen, 1998). As a general consensus, the stronger the individual's intention to involve in a behavior, the more likely the individual performs that behavior. Given the significant effect of intentions on behavior in the current study, students' holding higher healthy eating intentions reported higher healthy eating performance. This result implied that students having higher intentions to eat healthy exhibited higher healthy eating behavior while students having lower intentions exhibited lower healthy eating behavior. Actually, descriptive statistics support these findings. Although participants of the current study reported themselves as high intenders to eat healthy (M= 4.04), when it comes to unhealthy food consumption such as fuzzy drink and snacks their level of intention decrease in considerable amount leading us to conclude middle school students possessed low to high levels of healthy eating intentions. For example, non-intenders exhibited themselves in the following items "I plan to consume less snack during the next two

weeks" and "I will try to consume less fuzzy drinks during the next two weeks" "I am determined to eat healthy constantly during the next two weeks" with 14.5%, 14.3%, and 12.2% disagreement level and with 15.3 %, 15.3%, and 20.5% undecided level respectively. Considering the significant and positive effect of intention and PBC on healthy eating behaviors it can be argued that middle school students' healthy eating behavior is not only affected by external factors but personal motivation derived from volitional control is also important.

Previous studies have also reported intentions to predict healthy eating behaviors significantly (Armitage & Conner, 1999; Povey et. al., 2000; Conner, Norman & Bell, 2002; Backman et al., 2002; Hewitt and Stephens, 2007). Similar to Backman et al., (2002) and Hewitt and Stephens (2007) who demonstrated that healthy eating intentions had significantly predicted healthy eating behaviors among adolescent, the current study revealed that middle school students' healthy eating intentions contributed directly to the prediction of their healthy eating behavior. Backman et al., (2002) and Hewitt and Stephens (2007) found that intentions directly predicted adolescents' healthy eating behavior and explained this prediction with an argument that intentions mediates the relationship between TPB components, that are attitudes toward healthy eating, subjective norms, PBC, and children's healthy eating behavior. Their results supported this argument and they suggest that attitudes toward healthy eating, subjective norms and behavioral control related to healthy eating contribute to the formation of adolescents' healthy eating intentions, which in turn predicts their healthy eating intentions.

Overall finding regarding the predictors of middle school students' healthy eating behaviors revealed that self-identity emerged as the most powerful predictor of middle school students' healthy eating behaviors followed by perceived behavioral control and healthy eating intentions.

As far as results about healthy eating intentions are considered, the present study showed a statistically significant and positive association between students' healthy eating intentions and personal healthy eating norms. Theoretically, finding a positive relationship between personal norms and intentions can be anticipated because

students who possess internalized values and personal obligation to engage in an activity are more likely to develop intentions to involve in that activity (Schwartz, 1977). This relationship suggests that students' personal obligation to engage in healthy eating behavior promotes their healthy eating intentions. This result might imply that students personal goals or values are much more effective than important others in shaping and promoting their healthy eating intentions. The positive and significant relationship further implies that those who feel personally obligated to eat healthy will do so if they feel guilty in case of not eating healthy and if they feel personal responsibility in healthy eating issue. The explanatory power of personal norms on intentions is theoretically reasonable because personal norms are distinct from attitudes and subjective norms (Schwartz & Howard, 1984). The findings of the present study support the view of Schwartz and Howard (1984) and suggest that personal norm component captures distinct aspect of intention formation that the TPB constructs cannot. Given the non-significant effect of subjective norms on healthy eating intentions in the current study, the positive relationship between students' personal healthy eating norms and healthy eating intentions apparently implies that students are intended to engage in healthy eating not for the sake of others but for their own sakes. In other word, students having greater personal norms had higher healthy eating intentions while students having lower personal norms had lower intentions to eat healthy. In fact, descriptive statistics supported these findings. In general, students who participated in the current study had fairly strong personal norms about healthy eating behavior (M = 3.79). The results of the present study suggest that in healthy eating domain personal norms are of importance. It appears that the contribution of personal norms to the explanation of intention is greater than the usual TPB constructs. Although personal norms have been shown as a significant additional predictor of behavioral intention in the TPB, to our best knowledge, they have never been studied in the domain of healthy eating with the TPB. In this perspective, the results of the current study extend the previous research findings by suggesting a significant positive relationship between personal healthy eating norms and healthy eating intentions. Nevertheless, previous studies, have also demonstrated that personal norm component significantly contributed to the prediction of

intentions when added to the TPB model (Rivis et al., 2009). For instance, the significant effect of the personal norms on the intentions has shown in various domains including pro-environmental behaviors (Gärling, Fujii, Gärling, & Jakobsson, 2003; Harland, Staats, & Wilke, 1999), needle sharing (Bélanger, Godin, Alary, Noël et al., 2002), recycling (Nigbur et al., 2010, physical activity (Jackson, Smith, & Conner, 2002), blood donation (Lemmens et al., 2005), and smoking reduction (Moan & Rise, 2006).

Although personal norms have been suggested as an additional predictor in the TPB (Abraham & Sheeran, 2004) this construct have been studied in the context of single behavior and small sample sizes which resulted in questionable predictive utility of personal norm construct (Rivis et al., 2009). In their meta-analysis, however, Rivis et al., (2009) studied wide range of behaviors including physical activity, pro-environmental behaviors, health protection, smoking, blood donation, and ethical decision making. Rivis et al., (2009), in their comprehensive meta-analysis of TPB studies, evidenced that personal norm construct explained an additional 3% of the variance in intention even after controlling for the original TPB constructs suggesting that personal norms contribute significantly to the formation of intentions. Rivis et al., (2009) also evidenced the discriminant and convergent validity of personal norm construct which explains its unique predictive power in the TPB model. So, this finding could be attributed to the claim that personal norms capture a distinct psychological aspect than the TPB constructs cannot explain (Schwartz & Howard, 1984). Based on the findings of this meta-analysis, social psychologists should consider personal norms and investigate related normative beliefs in explaining individuals' behaviors in applied settings (Rivis et al., 2009). These findings indicate that the predictive power of personal norms in the TPB model has theoretical value in significant amount (Rivis et al., 2009). Besides, their review found personal norms to influence behavior via behavioral intention confirming the view that intention is considered to be the most immediate and important component that predicts behavior and mediates the effect of other components (Ajzen, 1991). In line with the Ajzen's (1991) view and conforming the results of Rivis et al., (2009), the current study

found that personal norms related to healthy eating had indirect effect on healthy eating behavior, through intentions.

Another expected picture emerged for the hypothesized relationship between perceived behavioral control and healthy eating intentions; middle school students' perceived behavioral control contributed to their healthy eating intentions. This finding implied that students possessing higher control on their healthy eating behavior had higher healthy eating intentions while students possessing lower behavioral control had lower healthy eating intentions. Descriptive statistics support these findings with revealing that middle school students' had fairly high level of perceived behavioral control (*M*= 4.08). In the present study, big majority of the students perceived eating healthy constantly as an easy activity if they wanted to (80.7%) and believed that if they start eating heathy they could keep it constantly (76.2%). on the other hand, considerable amount of the students reported that either they were disagreed (17.4%) or undecided (19.8 %) about trying hard to eat healthy. In general, however, the students perceived healthy eating behavior as an easy activity to perform. Reasonably, "the ease or difficulty in performing the behavior based one one's past experience and anticipated impediments and obstacles" (Ajzen, 1988, p. 132) establishes an individuals perceived behavioral control. Based on this premise, if students believe that healthy eating behavior is an easy activity then they are conceivably to develop strong behavioral intentions to involve in healthy eating. Based on these findings, it can be argued that middle school students' perceived behavioral control play a significant role in the formation of their healthy eating intentions.

These findings confirm the previous studies conducted among adolescents suggesting that PBC is a significant predictor of healthy eating intentions (Backman et al., 2002; Hewitt & Stephens, 2007; Chan & Tsang, 2011; Gronhoj et al., 2013). While some studies (Backman et al., 2002; Hewitt & Stephens, 2007) reported PBC component to be the weakest contributor in predicting adolescents' healthy eating intentions, others (Chan & Tsang, 2011 and Gronhoj et al., 2013) found the PBC to be the strongest predictor of intentions among the TPB components. For example, Chan and Tsang (2011) studying with adolescents found PBC to be the most significant

component that explains their healthy eating intentions. Specifically, their study results indicated that adolescents possessed a low level of having enough disciplines to eat healthy. This result could be attributed to the lack of persistence among adolescents and to the influence of external factors on adolescents healthy eating (Chan & Tsang, 2011). So, a persistent communication effort has been suggested to help them gain enough discipline for eating healthy (Chan & Tsang, 2011). A more recent study of Gronhoj et al., (2013) also explored PBC to be the strongest predictor of adolescents' healthy eating intentions. In particular, adolescents believed that they had the ability and time to eat healthy as well as enough discipline to eat healthy resulting in high perceived control over healthy eating behavior (Gronhoj et al., 2013). As the study results suggest, when encouraging adolescents to eat healthy a significant aspect, therefore, should promote their control over healthy eating behavior (Gronhoj et al., 2013). Based on this suggestion, communication and intervention strategies are recommended to empower their ability and motivation to engage in healthy eating (Gronhoj et al., 2013). Besides, the authors also points out the importance of availability and affordability of healthy foods in social and physical environment in order to enhance adolescents' perceived control over healthy eating behavior.

In line with the findings of Chan and Tsang, (2011) and Gronhoj et al., (2013) the current study also found adolescents' behavioral control contributed to their healthy eating intentions better than their attitudes toward healthy eating and subjective norms.

What is more, the present study revealed students' attitudes toward healthy eating to be positively and significantly related to their healthy eating intentions suggesting that middle school students holding more favorable attitudes toward healthy eating had high healthy eating intentions while students holding less favorable attitudes toward healthy eating had lower healthy eating intentions. In fact, middle school students expressed favorable attitudes toward healthy eating behavior (M= 4.29). Great majority perceived healthy eating as being beneficial (97.3 %), useful (94.5 %), and important (94.1 %). Minority of students found healthy eating as boring (14 %), unenjoyable (12.4 %), time consuming (11.7 %), and not delicious (11.7%), on

the other hand, contributed in establishing their unfavorable dispositions toward healthy eating.

Previous research on healthy eating has also indicated the predictive power of attitudes toward healthy eating on healthy eating intentions (Armitage & Conner, 1999; Povey et. al., 2000; Astrom & Rise 2001; Backman et al., 2002; Fila & Smith, 2006; Hewitt & Stephens, 2007; Chan & Tsang, 2011). In this aspect, the current study provided additional support for the link between attitudes toward healthy eating and healthy eating intentions in different cultural context. Predictive power of attitudes toward any kinds of behaviors was also reported (Boldero, 1995; Cheung et al., 1999; Taylor & Todd, 1995; White & Hyde, 2011). For example, in one of the earlier study by Taylor and Todd (1995) found that both attitudes toward recycling and perceived behavioral control were positively related to individuals' recycling and composting intentions.

Likewise, the present study demonstrated, a significant and positive relationship between self-identity and their healthy eating intentions, suggesting that individuals who identify themselves as healthy eaters are more likely to develop healthy eating intentions and are intended to engage in healthy eating behavior more than those with weaker self- identity. So, it can be argued that middle school students who perceived themselves as healthy eaters are more likely intended to engage in healthy eating behavior. Consequently, the findings of the present study imply that middle school students holding more healthy eating identities possessed high healthy eating intentions while students holding less healthy eating identities had low healthy eating intentions.

Despite arguments surrounding self-identity proposing reflecting of other constructs, such as attitudes (Sparks & Shepard, 1992) and past behavior (Fedaku & Kraft, 2001), Rise et al., (2010), in their comprehensive meta-analysis of self-identity in the TPB studies, shows that self-identity construct explained an additional 6% of the variance in intention even after controlling for the original TPB constructs that are attitudes toward behavior, subjective norms and perceived behavioral control. Besides, they found the identity component to be responsible for additional 9%

increase of the variance in intention when past behavior controlled. They attributed these findings to the claim that self-identity is theoretically and empirically distinct from the original TPB components and past behavior. To begin, although attitude theorists (e.g., Eagly & Chaiken, 1993) claim that self-identity construct overlaps with attitude, quite modest shared variance between self-identity and attitude (R^2 = 0.14) and the significant association between intention and self-identity contradicts this assertion suggesting that attitude and self-identity referred to different concepts that have different motivational origins (Rise et al., 2010). Similarly, quite modest shared variance between self-identity and past behavior (R^2 = 0.11) and significant prediction of intentions by self-identity even after controlling for past behavior shows that these two constructs assess different psychological concepts (Rise et al., 2010). Besides, different from normative influences, categories or personal types that are complied by individuals comprise their self-identities (Thoits & Virshup, 1997). Moreover, the meta-analysis also explored that the influence of self-identity on behavior was mediated by intention suggesting that self-identity effect the target behavior indirectly, through intentions. Taking these findings into consideration, it is quite reasonable to conclude that the self-identity component is an essential predictor of intentions and behavior and therefore should be included in the TPB model in order to explain the behavior in question (Rise et al., 2010)

Studying with 108 university students with an age range of 18 to 30, Smith et al., (2007) found self-identity component to account for additional 12% variance in intentions after controlling for the original TPB constructs that are attitudes toward behavior, subjective norms, and perceived behavioral control and as well as past behavior. As the study results suggest university students who developed an identity that perceive themselves as typical buyers of a specific brand of beer are more likely intended to buy that beer (Smith et al., 2007). Similar to Rivis et al., they attributed this finding to the claim that self-identity construct captures distinct psychological aspect than the original TPB components and past behavior. The correlation between attitudes and self-identity components, in the study Smith et al., (2007), was quite high (r=0.61) suggesting that these two constructs had similar effects on intentions supporting the claim that they are not distinct constructs. In their article, Smith et al.,

(2007) argue that the values self-identity and attitudes hold may conflict and in such cases self-identity might contribute the prediction of intentions better than attitudes do (Sparks, 2000). In fact, Smith et al., (2007) provide empirical evidence for their argument by revealing that self-identity (β=0.40) predicted intentions better than attitudes (β=0.21).

Confirming the empirical findings of Smith et al., (2007) and Rise et al., (2010), in the current study, self-identity contributed to the prediction of intentions significantly in addition to the TPB constructs. The empirical findings of the current study also support the claim that self-identity contributes significantly to the formation of intentions through capturing a distinct psychological process independent of other TPB constructs. To conclude, we agreed with the Smith et al' (2007) and Rise et al' (2010) assertion that self-identity should be considered in the TPB model.

The current study represents one of the preliminary steps in exploring the nature of association between healthy eating intentions and Food consumption habit and sustainability among Turkish middle school students. As hypothesized, students' Food consumption habit and sustainability found to be significantly and positively related to their healthy eating intentions. This result suggests that students who hold positive perceptions toward sustainability issues tended to develop high intentions to eat healthy. Stated differently, students' concerns about sustainability and healthy eating intentions depend on each other. The students might think that food consumption habits have detrimental effect not only on their health but also on environmental sustainability. Holding this perception, they are likely to develop intentions to eat healthy both for them and for contributing to solve environmental problems. In fact, descriptive statistics support these findings (*M*=3.98). Specifically, Food consumption habit and sustainability items revealed that majority of students, participated in this study, perceived fast food consumption as being unhealthy for themselves (84.5%) and harmful for environment (72.3%). Majority of the students also successfully connected environment problems with consumption patterns and believed that solution to environmental problems require a radical change in our consumption patterns (69.2%) and they believed that a change in eating habits will

play an important role in solution to environmental problems (70%). Besides, the students also reported to buy local foods (56%) and believed that eating healthy will contributes to local economy (63.1%). Furthermore, majority of middle school students had the perception that their healthy eating behavior would improve the life of next generation (73.2 %) and would protect plant and animal species (66.6 %). So, these findings imply that middle school students, generally, hold higher perceptions toward the relation between their consumption patterns and sustainability. The results of the current study also revealed an indirect effect of Food consumption habit and sustainability on behavior suggesting that the students' perceptions toward sustainability influence their intentions to eat healthy, which in turn predicts their healthy eating behavior.

Contrary to expectations, societal expectations had no influence (direct or indirect) on Turkish students' intentions to eating healthy. Given the cultural characteristics of Turkey, we expected to find a significant association between these two constructs. Turkish culture has been characterized as collectivist in one of the earlier study (Hofstede, 1980). In fact, Turkish culture reflects a synthesis of the East and the West values (see Tas & Tekkaya, 2010) and represents a combination of collectivism and individualism (Kagitcibasi, 1996). In 'collectivistic' cultures, the emphasis is given on interdependence and the needs of important others are valued (Markus & Kitayama, 1991). In this manner, Turkish students were expected to be family oriented and would take expectations of their families into consideration. However, the students' perceived social pressure does not promote their intentions to eat healthy. In fact, descriptive statistics regarding subjective norms revealed evidence that the participants of the current study are family-oriented. Specifically, majority of the study participants believed that their family (97.9 %), family elders (91.6 %) and relatives (83.2%) thought that they should eat healthy (behavior). Similarly, the students held strong motivation to comply with the wishes of their family (98%), family elders (92 %) and relatives (85 %). As a result, normative referents and motivation to comply sub dimensions of subjective norms revealed that family members predominantly contributed to the formation of middle school students' healthy eating related subjective norms. So, the results of the current study suggest

that these normative referents constituted the students normative beliefs. Besides, the present study also found a significant and positive relationship between students' normative beliefs and their subjective norms suggesting that the students' normative beliefs form their subjective norms. Subjective norms, on the other hand, were not related to students' healthy eating intentions. One possible explanation is that students' perceived social pressure does not have an effect on the activities pertaining to one's self anymore. In other words, if the consequences of an action is not related to the others then individuals do not value the perceptions of important others. In the context of healthy eating, the consequences of eating healthy affect individuals themselves but not the others. So, it is possible that individuals might develop personal values rather than normative values that may affect their willing to engage in healthy eating. The results of the current study also found no indirect effect of students' normative beliefs, neither on their healthy eating intentions nor on their healthy eating behaviors suggesting that normative beliefs do not serve a motivational base for students to develop intentions to engage in healthy eating behavior.

Although a number of previous studies have indicated a significant link between societal concerns and healthy eating intentions of adolescents (Backman et al., 2002; Fila and Smith, 2006; Hewitt and Stephens, 2007) no such a relationship was found in the current study. The result of the current study, on the other hand, is in line with the findings of Chan and Tsang (2011) and Gronhoj et al., (2013) revealing non-significant relationship between the two components among adolescents. Backman et al., (2002), for example, reports subjective norms to be the second significant predictor of high school students' healthy eating intentions and claimed that their mothers, siblings and friends played significant role in the formation of their salient normative beliefs which in turn determined their subjective norms. Based on this finding, they suggested that these referents may play an important role in promoting adolescents' healthy eating behaviors through integrating these referents when developing intervention programs targeted adolescents. Similarly, Fila and Smith (2006) also reported subjective norms to be a significantly related to middle school and high school students' healthy eating intentions and claimed that Native American

culture reflect the respect for elders and strong community sense which may explain youths' subjective norm in this population. In line with this finding, intervention methods need to consider this cultural advantage to promote adolescents' healthy eating behavior (Fila & Smith, 2006). Another study by Hewitt and Stephens (2007) found subjective norms to be the main predictor of middle school students' healthy eating intentions. This finding seemed reasonable because significant others' perceptions would have more impact on children's' perceptions and intentions (Francis et al., 2001; Hewitt & Stephens, 2007).

In his seminal article, Ajzen, (1991) stated that intentions to perform behaviors can be predicted with high accuracy from attitudes toward the behavior and subjective norms as well as perceived behavioral control. Early studies provide some support for the predictive power of social norm especially in pro-environmental behaviors (Hopper & Nielsen 1991; Oom do Valle, Reis, Menezes, & Rebelo, 2004; Oskamp et al. 1991; Schwab, Harton & Cullum, 2012; Vining & Ebreo, 1992). In other studies, however, no significant influence of social norms was found (e.g., Edgerton, McKechnie & Dunleavy 2009). Besides, Gamba and Oskamp (1994) reported that social norms while predicted self-reported behavior, did not predicted observed behavior. Still others have suggested that social norms were not related to whether an individual recycled or not **(**See also Vinning, Linn, & Burdge, 1992).

Taking the predictors of healthy eating intentions all together, the results of the present revealed that personal norms emerged as the main significant predictor of middle school students' healthy eating intentions followed by perceived behavioral control, attitude toward behavior, self-identity and Food consumption habit and sustainability. Albeit the weakest predictor among the others, the current study showed that Food consumption habit and sustainability contributed significantly to the prediction of students' healthy eating intentions.

To summarize, consistent with the TPB model, the present study evidenced that intentions together with PBC contributed directly and significantly to the healthy eating behaviors. As the TPB suggests, it was also found that PBC had affected behaviors indirectly, through intentions (Ajzen, 2005). In addition to the original

TPB components, the present study also demonstrated the predictive power of self-identity in healthy eating behavior. Besides, in line with the TPB model, the current study revealed that attitude toward behavior and perceived behavioral predicted healthy eating intentions. On the contrary, the present study did not find significant relationship between subjective norms and intentions. Furthermore, the present study also evidenced that personal norms, self-identity, and Food consumption habit and sustainability contributed significantly and positively to the prediction of healthy eating intentions. These findings point out that the more positive the attitude toward healthy eating behavior, the higher the perceived control over healthy eating, the higher personal norms and self-identities related to healthy eating together with higher perceptions regarding sustainability the stronger will be an individual's intention to eat healthy.

5.2 Implication, Limitations and Recommendations of the Study

The current study presented a healthy eating behavioral model among young students by assessing their attitudes toward behavior, subjective norms, perceived behavioral control together with their corresponding belief domains that are behavioral beliefs, normative beliefs and control beliefs, intentions, self-identities, personal norms, Food consumption habit and sustainability and healthy eating behavior. Secondly, this investigation conducted with middle school students attending public schools located in three district of Ankara. Data from other school districts and from school types might provide different results. Therefore, the generalization of the results from this study should be viewed with caution. A future research can be conducted with different participants, utilizing either same construct or other constructs assumed to exert an effect on healthy eating intentions and behavior. Besides, future research can be conducted to investigate the relationships between subjective norms and intentions, and between Food consumption habit and sustainability and intentions because the relationship was found to be relatively low between these constructs. So, future research might examine and clarify the relationships between these components.

In this study, we limit our analyses to these constructs. Although gathered, some of the constructs, including perceived interest, perceived knowledge, and demographic information (i.e., gender, grade level, SES, etc.) did not included in the model. Further research should examine the effect of such variables. Future research should focus on conceptualization of health among student also investigated.

Lastly, the study was limited by its reliance on self-reported data and may not reflect their actual behavior. Next study is required to confirm the accuracy and consistency of the current results by using multiple measures and methods. Nonetheless, a nation-wide study can be required to generalize the findings to Turkish population.

Further research is also needed to investigate the patterns of healthy eating habit. This is the first known empirical study conducted using revised TPB in Turkey. As an extension of this study it would be desirable to explore the role of culture on eating habit, healthy eating intention and behavior.

Despite these limitations, the study contributes to the existing literature in many ways. First, self-identity appeared to be the main predictor of the healthy eating while, personal norms appeared to be the predominant predictor of healthy eating intentions. Hence, students with high self-identities are more likely to exhibit healthy eating behavior, while those with high personal norms are more likely intended to engage in healthy eating. It is clear from these findings that SI/PN was crucial for encouraging healthy eating behavior among youngest. Such results have important implications for science teachers who are the implementers of the curriculum. To promote students' personal norms and self-identities, science teachers should design most appropriate interventions by taking contextual, cultural, and personal factors into consideration. In addition to personal norms and self-identities, Food consumption habit and sustainability seemed to be another important construct to consider. Regardless of its low variance, Food consumption habit and sustainability contributed to a portion of the overall healthy eating intentions. Accordingly, when designing their instruction, science teachers need also to take care not to reinforce personal health benefit of healthy eating but also need to expand effort for students' environmental concern. Students need to realize that by eating healthy they also

contribute to the health of the environment. Overall, this means that eating healthy requires students having stronger self-identities, stronger personal norms and higher Food consumption habit and sustainability.

The present study gives educators, policymakers, and academic staff some significant clues, which could be used to enhance healthy eating behavior. The results of study provide educators, teachers, curriculum developers, textbook authors and social politicians with suggestions that contribute to the improvement of the quality of health education in Turkey. The results of the study can be used to develop a strategy to promote healthy eating behaviors among Turkish adolescents.

Second, considering the role of perceived behavioral control in shaping students' healthy eating intentions and behaviors, enhancing their behavioral control over healthy eating should be an important goal when promoting healthy eating behavior among adolescents. Therefore, intervention strategies at schools and promotion campaigns, in general, should focus on to empower adolescents' ability, discipline, personal control and motivation to eat healthy. This could be done by providing education on how to keep away from unhealthy foods and how to keep with healthy diet. Importantly, intervention strategies also should consider the importance of availability and affordability of healthy foods in social and physical environment when enhancing their perceived behavioral control.

Third, the empirical findings of the study suggest that Turkish adolescents' attitudes toward healthy eating had direct relationship with their intention to eat healthy. Thus, school interventions should expand efforts to influence these attitudes. Subjective norms, however, found to be as a non-significant predictor of middle school students' healthy eating intentions. Future research could examine the effect of subjective norms on students' intentions to eat healthy in Turkey context.

Furthermore, considering the role of students' Food consumption habit and sustainability on their healthy eating intentions and behavior, it is reasonable to expand efforts to help them gain more positive perceptions toward sustainability. Although the relationship between Food consumption habit and sustainability and intentions' found to be low the results revealed that the students, generally, are aware

of the relationship between sustainability and their food consumption habits. Therefore, curriculum developers and teachers should pay more attention to the teaching of the eating patterns and sustainability. In order to develop such a curriculum design, a further research is significantly required to investigate the relationship between students' Food consumption habit and sustainability and their eating patterns in detail. Therefore, the results of the present study can be seen as an initiator for the future research.

To conclude, in this study attitudes, perceived behavioral control, self-identity, personal norms and Food consumption habit and sustainability have been found to be enhanced among students in order to promote their healthy eating intentions and behaviors. Findings might be useful for informing classroom practices in the teaching of science concepts and the development of suitable materials promoting students' health literacy. Furthermore, teachers' awareness of issue of healthy eating could itself contribute to the improvement of their teaching.

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APPENDICES

Appendix A: Pilot Study CFA Results (1st Trial)

Latent Variables	Observed variables	LX Estimates
Attitude Toward Behavior	Att4	0.83
	Att5	0.82
	Att6	0.81
	Att8	0.70
	Att9	0.65
	Att11	0.61
	Att7	0.54
	Att1	0.50
	Att2	0.48
	Att10	0.43
	Att3	0.41
	Att12	0.24
Subjective Norms	SN3	0.77
	SN2	0.73
	SN4	0.71
	SN1	0.61
Perceived Behavioral Control	PBC4	0.76
	PBC5	0.75
	PBC6	0.63
	PBC7	0.62
	PBC2	0.56
	PBC8_rec	0.32
	PBC3_rec	0.24
	PBC1	0.18
Behavioral Intention	INT2	0.88
	INT1	0.86
	INT3	0.85

	INT4	0.84
	INT6	0.75
	INT8	0.72
	INT7	0.68
	INT5	0.67
	INT9	0.54
Behavioral Beliefs	BBB15	0.75
	BBB12	0.74
	BBB10	0.73
	BBB14	0.72
	BBB7	0.71
	BBB8	0.68
	BBB17	0.65
	BBB2	0.63
	BBB16	0.60
	BBB1	0.54
	BBB9	0.53
	BBB3	0.52
	BBB13	0.50
	BBB6	0.49
	BBB18	0.46
	BBB11	0.46
	BBB5	0.40
	BBB4	0.37
	BBB19	0.30
	BBB20	0.29
Normative Beliefs	NBB3	0.71
	NBB7	0.62
	NBB4	0.61
	NBB8	0.61
	NBB6	0.60

	NBB1	0.49
	NBB2	0.48
	NBB5	0.25
Control Beliefs	CBB7	0.57
	CBB9	0.57
	CBB8	0.54
	CBB10	0.46
	CBB2	0.45
	CBB5	0.41
	CBB11	0.41
	CBB3	0.38
	CBB6	0.37
	CBB1	0.29
	CBB4	0.24
Self-Identity	SI1	0.89
	SI2	0.89
	SI3	0.84
Personal Norms	PN4	0.77
	PN3	0.76
	PN2	0.62
	PN1	0.41
Food Consumption and Sustainability	SUS9	0.74
	SUS10	0.71
	SUS3	0.71
	SUS8	0.70
	SUS4	0.67
	SUS2	0.63
	SUS7	0.62
	SUS1	0.55
	SUS6	0.45
	SUS5	0.08

Appendix A continued: Pilot study CFA results (2nd Trial)

Latent Variables	Observed variables	LX Estimates
Attitude Toward Behavior	Att4	0.83
	Att5	0.82
	Att6	0.81
	Att8	0.70
	Att9	0.64
	Att11	0.61
	Att7	0.54
	Att1	0.50
	Att2	0.47
	Att10	0.43
	Att3	0.40
Subjective Norms	SN3	0.77
	SN2	0.73
	SN4	0.71
	SN1	0.61
Perceived Behavioral Control	PBC4	0.75
	PBC5	0.75
	PBC6	0.64
	PBC7	0.63
	PBC2	0.56
Behavioral Intention	INT2	0.88
	INT1	0.86
	INT3	0.85
	INT4	0.84
	INT6	0.75
	INT8	0.72
	INT7	0.68
	INT5	0.66

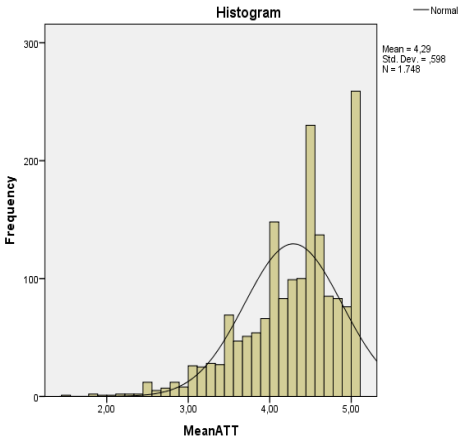
	INT9	0.54
Behavioral Beliefs	BBB15	0.75
	BBB12	0.75
	BBB10	0.74
	BBB14	0.74
	BBB7	0.71
	BBB8	0.69
	BBB17	0.64
	BBB2	0.63
	BBB16	0.59
	BBB1	0.55
	BBB9	0.52
	BBB3	0.52
	BBB13	0.50
	BBB6	0.48
	BBB18	0.46
	BBB11	0.45
Normative Beliefs	NBB3	0.72
	NBB7	0.62
	NBB4	0.62
	NBB8	0.61
	NBB6	0.60
	NBB1	0.49
	NBB2	0.49
Control Beliefs	CBB7	0.61
	CBB9	0.58
	CBB8	0.54
	CBB10	0.52
	CBB2	0.35
	CBB5	0.43
	CBB11	0.43

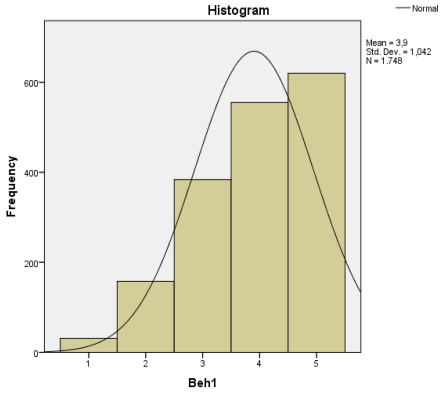
Self-Identity	SI1	0.89
	SI2	0.89
	SI3	0.82
Personal Norms	PN4	0.77
	PN3	0.76
	PN2	0.61
	PN1	0.40
Food Consumption habit and Sustainability	SUS9	0.73
	SUS10	0.70
	SUS3	0.71
	SUS8	0.70
	SUS4	0.67
	SUS2	0.63
	SUS7	0.61
	SUS1	0.55
	SUS6	0.46

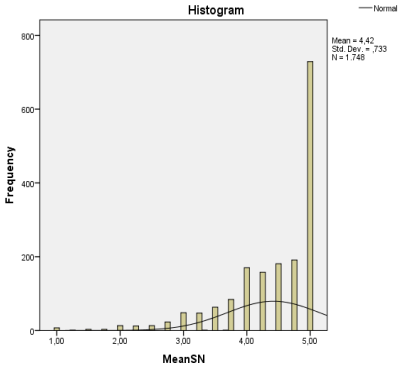
Appendix B: Outlier and Linearity Analysis

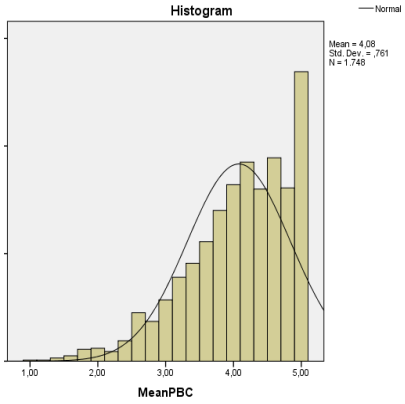
Constructs		Statistic	Std. Error
MeanATT	Mean	4.29	0.01
	5% Trimmed Mean	4.33	
MeanSN	Mean	4.42	0.02
	5% Trimmed Mean	4.50	
MeanPBC	Mean	4.08	0.02
	5% Trimmed Mean	4.13	
MeanINT	Mean	4.04	0.02
	5% Trimmed Mean	4.13	
Beh1	Mean	3.90	0.02
	5% Trimmed Mean	3.97	
MeanSI	Mean	4.01	0.02
	5% Trimmed Mean	4.09	
MeanPN	Mean	3.79	0.02
	5% Trimmed Mean	3.85	
MeanSUS	Mean	3.98	0.02
	5% Trimmed Mean	4.04	
MeanBeBelief	Mean	20.08	0.08
	5% Trimmed Mean	20.31	
MeanNoBelief	Mean	19.52	0.11
	5% Trimmed Mean	19.87	
MeanCoBelief	Mean	12.49	0.10
	5% Trimmed Mean	12.40	

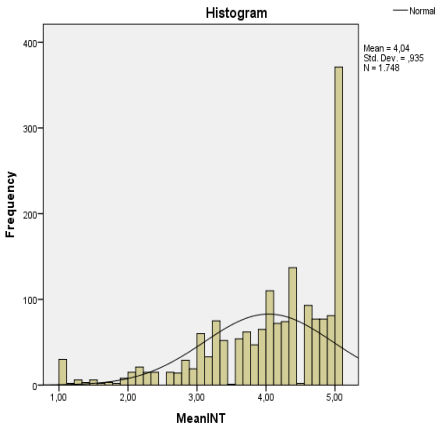
Appendix B: Outlier and Linearity Analysis ---- Histograms

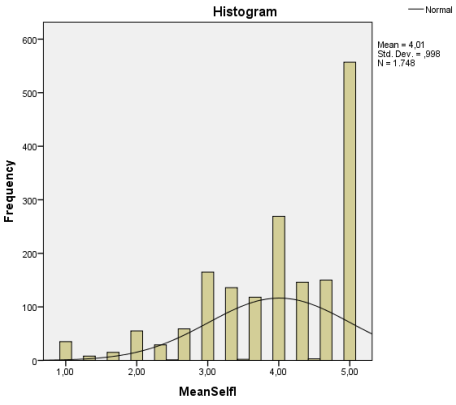




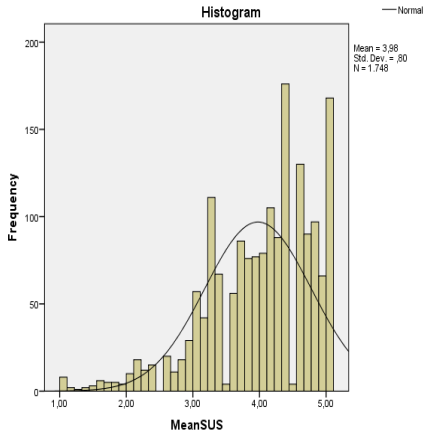


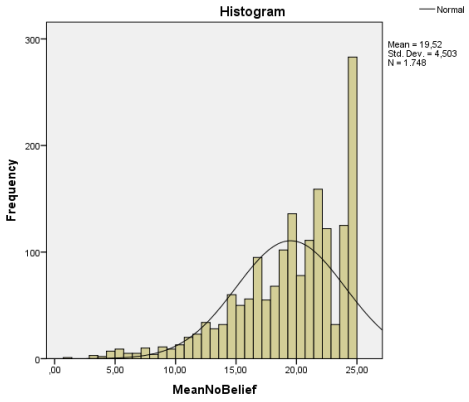


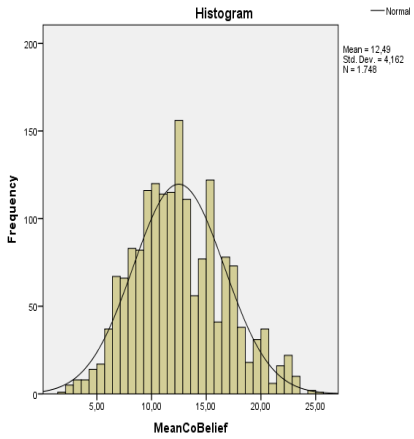


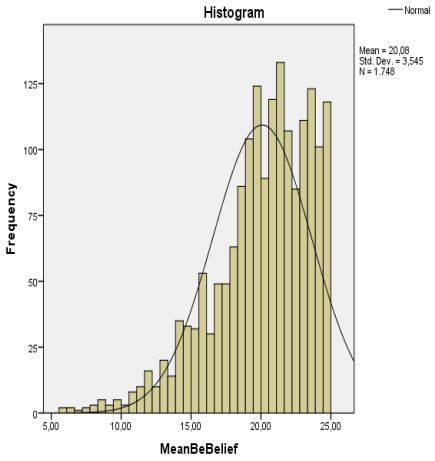


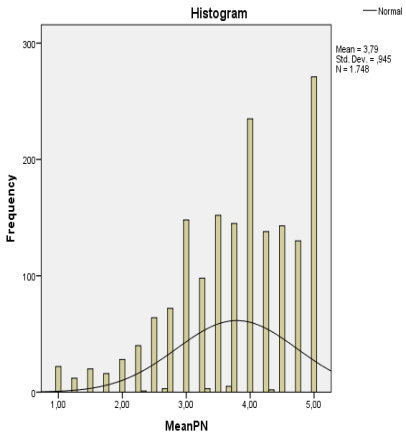
Appendix B: Outlier and Linearity Analysis ------ Histograms



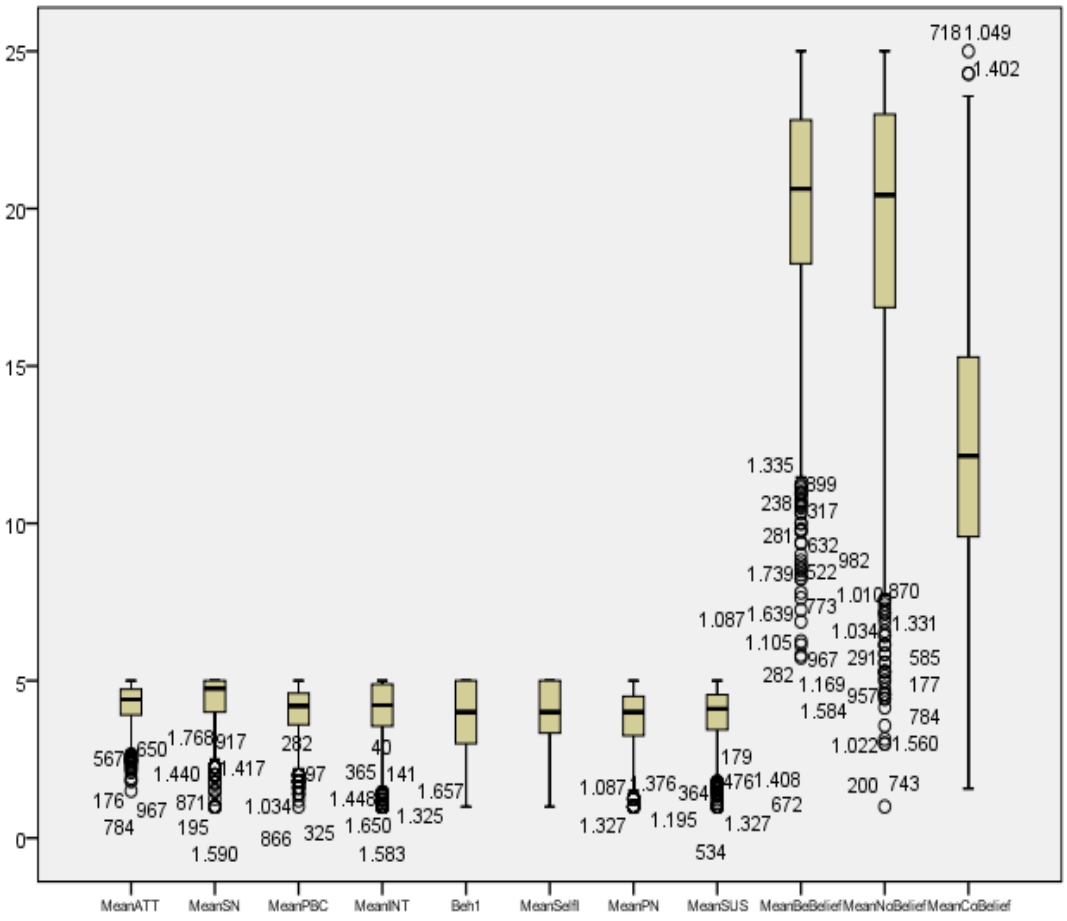








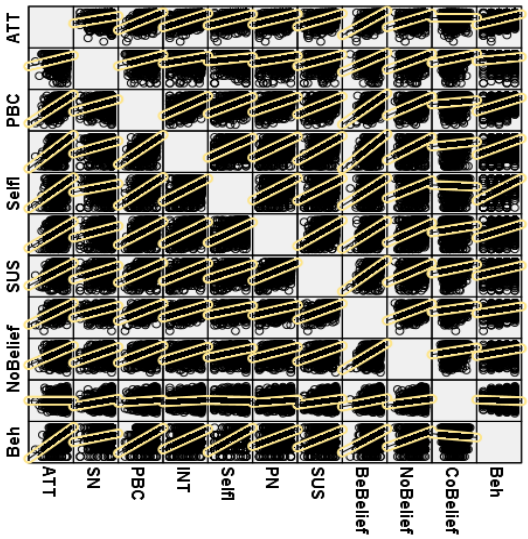
Appendix B: Outlier and Linearity Analysis ---- Boxplots



Appendix B continued: Univariate outliers

Attitudes		Subjective norms		Behavioral beliefs	
Case number	z-score	Case number	z-score	Case number	z-score
870	3.95	912	3.32	1556	-3,58
1653	3.95	1566	3.32	141	-3,58
8	3.95	213	3.32	394	-3,58
1198	3.95	936	3.32	676	-3,58
912	3.82	191	3.32	1378	-3,58
1529	3.82	900	3.32	479	-3,38
1629	3.82	1770	3.32	1013	-3,38
		1088	3.32	1414	-3,38
		1556	3.32	1450	-3,38
		505	3.32	936	-3,38
				1382	-3,38
				282	-3,38

Linearity



Appendix C: Ethics Committee Approval

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

DUMLUPINAR BULVARI 06800
ÇANKAYA ANKARA/TURKEY
T: +90 312 210 22 91
F: +90 312 210 79 59
ueam@metu.edu.tr
www.ueam.metu.edu.tr

Sayı: 28620816/ 230-422

02.05.2014

Gönderilen : Prof. Dr. Ceren Öztekin
İlköğretim

Gönderen : Prof. Dr. Canan Özgen
IAK Başkanı

İlgi : Etik Onayı

Danışmanlığını yapmış olduğunuz İlköğretim Bölümü öğrencisi İbrahim Bilim'in "Sağlıklı Beslenme Davranışlarının Planlanmış Davranış Teorisi ve Kişisel Normlar ile Belirlenmesi" isimli araştırması "İnsan Araştırmaları Komitesi" tarafından uygun görülerek gerekli onay verilmiştir.

Bilgilerinize saygılarımla sunarım.

Etik Komite Onayı

Uygundur

02/05/2014

Prof.Dr. Canan Özgen
Uygulamalı Etik Araştırma Merkezi
(UEAM) Başkanı
ODTÜ 06531 ANKARA

Appendix D: Ministry of National Education Approval

T.C.
ANKARA VALİLİĞİ
Milli Eğitim Müdürlüğü

Sayı : 14588481/605.99/2359210 10/06/2014
Konu: Araştırma İzni
(İbrahim BİLİM)

ORTA DOĞU TEKNİK ÜNİVERSİTESİNE
(Öğrenci İşleri Daire Başkanlığı)

İlgi : a) MEB Yenilik ve Eğitim Teknolojileri Genel Müdürlüğünün 2012/13 nolu genelgesi
b) 29/05/2014 tarih ve 2825 sayılı yazınız.

Enstitünüz yüksek lisans öğrencisi İbrahim BİLİM'in "Sağlıklı Beslenme Davranışlarının Planlanmış Davranış Teorisi ve Kişisel Normlar İle Belirlenmesi" konulu tez önerisi kapsamında uygulama yapma isteği Müdürlüğümüzce uygun görülmüş ve araştırmanın yapılacağı İlçe Milli Eğitim Müdürlüğüne bilgi verilmiştir.

Anketlerin uygulama yapılacak sayıda çoğaltılması ve çalışmanın bitiminde iki örneğinin (CD ortamında) Müdürlüğümüz Strateji Geliştirme-1 Şube Müdürlüğüne gönderilmesini arz ederim.

Zafer YILMAZ
Müdür a.
Şube Müdürü

EK:
Mühürlü Anket Örnekleri (8 sayfa)

Güvenli Elektronik İmzalı
Aslı İle Aynıdır.
11.../6.../2014..

12.06.2014-9413

Yaşar SUBAŞI
Şef

Bu belge, 5070 sayılı Elektronik İmza Kanununun 5 inci maddesi gereğince güvenli elektronik imza ile imzalanmıştır
Evrak teyidi http://evraksorgu.meb.gov.tr adresinden 7667-db57-352a-9ddd-222f kodu ile yapılabilir.

Emniyet Mh. Alparslan Türkeş Cd. No: 4/A Yenimahalle/ANKARA
www.ankara.meb.gov.tr
istatistik06@meb.gov.tr

Ayrıntılı bilgi için: Murat YILMAZER
Tel: (0 312) 212 36 00
Faks: (0 312) 212 02 16

Appendix E

Sağlıklı Beslenme Davranışı Ölçeği

A. Kişisel Bilgiler

1. Cinsiyetiniz : ❑Kız ❑ Erkek

2. Yaşınız : ❑10 ❑11 ❑12 ❑13 ❑14

3. Sınıfınız : ❑5 ❑6 ❑7 ❑8

4. Annenizin eğitim durumu
❑Okuma-yazma bilmiyor ❑İlkokul mezunu
❑Ortaokul mezunu ❑Lise mezunu ❑Üniversite mezunu

5. Babanızın eğitim durumu
❑Okuma-yazma bilmiyor ❑İlkokul mezunu
❑Ortaokul mezunu ❑Lise mezunu ❑Üniversite mezunu

6. Babanızın mesleği?
❑ Çalışmıyor ❑ Memur ❑ İşçi ❑ Emekli ❑ Diğer.....

7. Annenizin mesleği
❑ Ev hanımı ❑ Memur ❑ İşçi ❑ Emekli ❑ Diğer.....

8. Okulda olduğunuz zaman **hangi sıklıkla** kantinden alışveriş yapıyorsunuz?
❑ Hiçbir zaman ❑ Nadiren ❑ Ara sıra ❑ Sık sık ❑ Her zaman

ANKETİ NASIL DOLDURACAĞIM?

Bir ifadeye kesinlikle KATILIYORSANIZ 5 sayısını;

kesinlikle KATILMIYORSANIZ 1 sayısını işaretleyiniz.

Eğer bir ifadeye daha fazla veya daha az katılıyorsanız, 1 ile 5 arasında sizin düşüncenizi en iyi ifade eden sayıyı işaretleyiniz. Doğru ya da yanlış cevap yoktur, sizin düşünce ve hisleriniz önemlidir.

B. Sağlıklı Beslenmeye Yönelik Tutumunuz

Örnek: "Benim için sağlıklı beslenme **Önemlidir**" diye düşünüyorsanız 5 numaralı kutucuğu doldurunuz. "Benim için sağlıklı beslenme **Önemsizdir** " diye düşünüyorsanız 1 numaralı kutucuğu doldurunuz. Her ikisine de katılmıyorsanız 5 ile 1 arasındaki düşüncenizi en iyi yansıtan kutucuğu doldurunuz.

Benim için sağlıklı beslenme

Önemlidir				**Önemsizdir**
⑤	④	③	②	①

Benim için sağlıklı beslenme

Gereklidir				**Gereksizdir**
⑤	④	③	②	①

Benim için sağlıklı beslenme

Faydalıdır				**Zararlıdır**
⑤	④	③	②	①

Benim için sağlıklı beslenme

Zevklidir				**Zevksizdir**
⑤	④	③	②	①

Benim için sağlıklı beslenme

Eğlencelidir				**Sıkıcıdır**
⑤	④	③	②	①

Benim için sağlıklı beslenme

Keyiflidir				**Keyifsizdir**
⑤	④	③	②	①

Benim için sağlıklı beslenme

İyidir				**İyi değildir**
⑤	④	③	②	①

Benim için sağlıklı beslenme

Lezzetlidir				**Lezzetsizdir**
⑤	④	③	②	①

Benim için sağlıklı beslenme

Pratiktir				**Zaman alıcıdır**
⑤	④	③	②	①

Benim için sağlıklı beslenme

Doğrudur				**Yanlıştır**
⑤	④	③	②	①

Benim için sağlıklı beslenme

Kolaydır				**Zordur**
⑤	④	③	②	①

Benim için sağlıklı beslenme

Ucuzdur				**Pahalıdır**
⑤	④	③	②	①

Sağlıklı beslendiğiniz takdirde **size göre** aşağıdakiler **ne derece** olur. **Sağlıklı beslenirsem .....**	**Kesinlikle Katılıyorum 5**	**Katılıyorum 4**	**Kararsızım 3**	**Katılmıyorum 2**	**Kesinlikle Katılmıyorum 1**
1. Hastalıklara yönelik dirençli olurum	☐	☐	☐	☐	☐
2. Enerjik olurum	☐	☐	☐	☐	☐
3. Sağlıklı olurum	☐	☐	☐	☐	☐
4. Fazla kilolu (obez) olmam	☐	☐	☐	☐	☐
5. Kilo almam	☐	☐	☐	☐	☐
6. Doğal kaynaklarımızı korumuş olurum	☐	☐	☐	☐	☐
7. Kendimi zinde (daha iyi) hissederim	☐	☐	☐	☐	☐
8. Enfeksiyonlardan korunurum	☐	☐	☐	☐	☐
9. Çevre sorunlarının çözülmesine katkı sağlamış olurum	☐	☐	☐	☐	☐
10. Vücut direncim artar	☐	☐	☐	☐	☐
11. Uzun yaşarım	☐	☐	☐	☐	☐
12. Kendimi sağlıklı hissederim	☐	☐	☐	☐	☐
13. Yemek yemekten zevk (keyif) alırım	☐	☐	☐	☐	☐
14. Hastalıklardan korunurum	☐	☐	☐	☐	☐
15. Dengeli bir vücuda sahip olurum	☐	☐	☐	☐	☐
16. Çevre sağlığına katkıda bulunmuş olurum	☐	☐	☐	☐	☐
17. Daha az hasta olurum	☐	☐	☐	☐	☐
18. Atık (Çöp) miktarını azaltmış olurum	☐	☐	☐	☐	☐
19**. Lezzetsiz yiyecekler yemek zorunda kalırım**	☐	☐	☐	☐	☐
20**. Sevmediğim yiyecekleri yemek zorunda kalırım**	☐	☐	☐	☐	☐

Aşağıdaki durumlar **sizin için ne derece önemlidir**?	**Çok önemli 5**	**Önemli 4**	**Kararsızım 3**	**Önemsiz 2**	**Hiç önemli değil 1**
1.Hastalıklara yönelik dirençli olmak	☐	☐	☐	☐	☐
2.Enerjik olmak	☐	☐	☐	☐	☐
3.Sağlıklı olmak	☐	☐	☐	☐	☐
4.**Fazla kilolu (obez) olmamak**	☐	☐	☐	☐	☐
5. **Kilo almamak**	☐	☐	☐	☐	☐
6. Doğal kaynaklarımızı korumak	☐	☐	☐	☐	☐
7. Kendini zinde (daha iyi) hissetmek	☐	☐	☐	☐	☐
8.Enfeksiyonlardan korunmak (grip, nezle gibi)	☐	☐	☐	☐	☐
9. Çevre sorunlarının çözülmesine katkı sağlamak	☐	☐	☐	☐	☐
10. Vücut direncinin artması	☐	☐	☐	☐	☐
11. Uzun yaşamak	☐	☐	☐	☐	☐
12.Kendini sağlıklı hissetmek	☐	☐	☐	☐	☐
13. Yemekten zevk (keyif) almak	☐	☐	☐	☐	☐
14. Hastalıklardan korunmak	☐	☐	☐	☐	☐
15. Dengeli bir vücuda sahip olmak	☐	☐	☐	☐	☐
16. Çevre sağlığına katkıda bulunmak	☐	☐	☐	☐	☐
17. Daha az hasta olmak	☐	☐	☐	☐	☐
18. Atık miktarını azaltmak	☐	☐	☐	☐	☐
19. Lezzetli yiyecekler yemek	☐	☐	☐	☐	☐
20. Sevdiğim yiyecekleri yemek	☐	☐	☐	☐	☐

Aşağıdaki ifadelere **ne derecede** katılıyorsunuz?	**Kesinlikle Katılıyorum 5**	**Katılıyorum 4**	**Kararsızım 3**	**Katılmıyorum 2**	**Kesinlikle Katılmıyorum 1**
1.Görüşlerine önem verdiğim insanlar sağlıklı beslenmemi ister	☐	☐	☐	☐	☐
2.Benim için önemli olan insanlar benden sağlıklı beslenmemi bekler	☐	☐	☐	☐	☐
3. Benim için önemli olan insanlar sağlıklı beslenmem gerektiğini düşünür	☐	☐	☐	☐	☐
4.Benim için önemli olan insanlar sağlıklı beslenmemi ister	☐	☐	☐	☐	☐

Aşağıda belirtilen **kişi ya da kurumlar** sağlıklı beslenmemi bekler;	**Kesinlikle Katılıyorum 5**	**Katılıyorum 4**	**Kararsızım 3**	**Katılmıyorum 2**	**Kesinlikle Katılmıyorum 1**
1.Ailem (Annem, Babam)	☐	☐	☐	☐	☐
2.Arkadaşlarım	☐	☐	☐	☐	☐
3.Öğretmenlerim	☐	☐	☐	☐	☐
4.Akrabalarım	☐	☐	☐	☐	☐
5.Televizyon programları	☐	☐	☐	☐	☐
6.Sağlık Personelleri (Doktorlar, Sağlık uzmanları, Diyetisyenler)	☐	☐	☐	☐	☐
7.Aile büyüklerim (Dede, anneanne, babaanne)	☐	☐	☐	☐	☐
8.Sağlık Bakanlığı	☐	☐	☐	☐	☐

Aşağıdaki **kişi ya da kurumların sağlıklı beslenmeniz konusundaki beklentileri** sizin için **ne derece** önemlidir?	**Çok önemli 5**	**Önemli 4**	**Kararsızım 3**	**Önemsiz 2**	**Hiç önemli değil 1**
1.Ailem	☐	☐	☐	☐	☐
2.Arkadaşlarım	☐	☐	☐	☐	☐
3.Öğretmenlerim	☐	☐	☐	☐	☐
4.Akrabalarım	☐	☐	☐	☐	☐
5.Televizyon programları	☐	☐	☐	☐	☐
6.Sağlık Personelleri (Doktorlar, Sağlık uzmanları, Diyetisyenler)	☐	☐	☐	☐	☐
7.Aile büyüklerim (Dede, anneanne, babaanne)	☐	☐	☐	☐	☐
8.Sağlık Bakanlığı	☐	☐	☐	☐	☐

Aşağıdaki ifadelere **ne derecede** katılıyorsunuz?	**Kesinlikle Katılıyorum 5**	**Katılıyorum 4**	**Kararsızım 3**	**Katılmıyorum 2**	**Kesinlikle Katılmıyorum 1**
1.İstediğim takdirde düzenli olarak sağlıklı beslenmek benim elimdedir	☐	☐	☐	☐	☐
2.İstediğim takdirde düzenli olarak sağlıklı beslenmek benim için kolaydır	☐	☐	☐	☐	☐
3.Sağlıklı beslenmek istiyorum fakat **yapabileceğimden emin değilim**	☐	☐	☐	☐	☐
4.Eğer sağlıklı beslenmeye başlarsam bunu düzenli olarak devam ettireceğime inanıyorum	☐	☐	☐	☐	☐
5.Düzenli olarak sağlıklı beslenmek için gereken disipline sahibim	☐	☐	☐	☐	☐
6.Sağlıklı beslenmek için çok çabalıyorum	☐	☐	☐	☐	☐
7.Düzenli olarak sağlıklı beslenmek için yeterince kişisel kontrole sahibim	☐	☐	☐	☐	☐
8.Ne kadar yanlış olduğunu bilsem de **kendimi hazır yiyecek ve içecek tüketmekten alıkoyamıyorum** (Kebap, döner, pizza, hamburger, lahmacun, pide, patates kızartması, kola, gazoz vb.)	☐	☐	☐	☐	☐

Aşağıdaki koşulların/durumların gerçekleşmesi sizce **ne derece mümkündür?**	**Kesinlikle Katılıyorum 5**	**Katılıyorum 4**	**Kararsızım 3**	**Katılmıyorum 2**	**Kesinlikle Katılmıyorum 1**
1.Hangi yiyeceklerin ve içeceklerin sağlıklı olduğunu biliyorum	☐	☐	☐	☐	☐
2.Okulumun kantininde sağlıklı yiyecekler satılıyor	☐	☐	☐	☐	☐
3.Okulumda sağlıklı beslenme konusunda yeterince bilgi veriliyor	☐	☐	☐	☐	☐
4.Evimde sağlıklı yiyecekler pişiyor	☐	☐	☐	☐	☐
5.Hazır yiyeceklerin ve abur cuburların tadları bağımlılık yapıyor	☐	☐	☐	☐	☐
6.Sağlıklı yiyeceklerin **tadı hoşuma gitmiyor**	☐	☐	☐	☐	☐
7.Hazır yiyeceklere ve abur cuburlara, sağlıklı yiyeceklerden daha kolay ulaşabiliyorum	☐	☐	☐	☐	☐
8.Dışarda olduğum zaman sağlıklı beslenmekte zorlanıyorum (Kafe, lokanta, alışveriş merkezleri vb.)	☐	☐	☐	☐	☐
9.Arkadaş ortamı sağlıklı beslenmemi zorlaştırıyor	☐	☐	☐	☐	☐
10.Hazır yiyeceklerle beslenmek **zamanımı almıyor**	☐	☐	☐	☐	☐
11.Alışveriş merkezlerinde uzun zaman geçirmek sağlıklı beslenmemi zorlaştırıyor	☐	☐	☐	☐	☐

Aşağıdaki koşullar/ durumların sağlanması **sağlıklı beslenme yapmamı kolaylaştırır:**	**Kesinlikle Katılıyorum 5**	**Katılıyorum 4**	**Kararsızım 3**	**Katılmıyorum 2**	**Kesinlikle Katılmıyorum 1**
1.Hangi yiyeceklerin ve içeceklerin sağlıklı olduğunu bilmek	☐	☐	☐	☐	☐
2.Okulumun kantininde sağlıklı yiyeceklerin satılması	☐	☐	☐	☐	☐
3.Okulumun sağlıklı beslenme konusunda beni bilgilendirmesi	☐	☐	☐	☐	☐
4.Evimde sağlıklı yiyeceklerin pişmesi	☐	☐	☐	☐	☐
5.Hazır yiyeceklerin ve abur cuburların **göz önünde bulunmaması**	☐	☐	☐	☐	☐
6.Sağlıklı yiyeceklerin tadının lezzetli olması	☐	☐	☐	☐	☐
7.Sağlıklı yiyeceklerin kolay ulaşılabilir olması	☐	☐	☐	☐	☐
8. Kafe, lokanta, alışveriş merkezleri vb. yerlerde sağlıklı yiyeceklerin satılması	☐	☐	☐	☐	☐
9.Arkadaş ortamında iken herkesin sağlıklı yiyecek ve içecek tercih etmesi	☐	☐	☐	☐	☐
10.Beslenmenin zaman almaması	☐	☐	☐	☐	☐
11.Alışveriş merkezlerinde uzun zaman geçirmek	☐	☐	☐	☐	☐

Aşağıdaki ifadelere **ne derecede** katılıyorsunuz?	**Kesinlikle Katılıyorum 5**	**Katılıyorum 4**	**Karasızım 3**	**Katılmıyorum 2**	**Kesinlikle Katılmıyorum 1**
1.**Önümüzdeki 2 hafta boyunca düzenli olarak** sağlıklı beslenmeye **çalışacağım**	☐	☐	☐	☐	☐
2.Önümüzdeki 2 hafta boyunca düzenli olarak sağlıklı beslenmeyi **planlıyorum**	☐	☐	☐	☐	☐
3.Önümüzdeki 2 hafta boyunca düzenli olarak sağlıklı beslenmek için **çaba harcayacağım**	☐	☐	☐	☐	☐
4.Önümüzdeki 2 hafta boyunca düzenli olarak sağlıklı beslenme **kararındayım**	☐	☐	☐	☐	☐
5.Önümüzdeki 2 hafta boyunca **daha az hazır yiyecek** tüketmeyi **deneyeceğim**	☐	☐	☐	☐	☐
6.Önümüzdeki 2 hafta boyunca **daha az abur cubur** yemeyi **planlıyorum**	☐	☐	☐	☐	☐
7.Önümüzdeki 2 hafta boyunca **daha az gazlı içecek** tüketmeyi **deneyeceğim**	☐	☐	☐	☐	☐
8.Önümüzdeki 2 hafta boyunca **daha fazla sebze yemeklerini** tüketme **kararındayım**	☐	☐	☐	☐	☐

9.Önümüzdeki 2 hafta boyunca **daha fazla meyve** tüketme **niyetindeyim**	☐	☐	☐	☐	☐

Aşağıda belirtilenleri **hangi sıklıkla** yapıyorsunuz?	**Her gün**	**Haftada 5-6 gün**	**Haftada 3-4 gün**	**Haftada 1-2 gün**	**Hiç bir zaman**
1.Ne kadar sıklıkla **sağlıklı** besleniyorsunuz	☐	☐	☐	☐	☐

Aşağıdaki ifadelere **ne derecede** katılıyorsunuz?	**Kesinlikle Katılıyorum 5**	**Katılıyorum 4**	**Kararsızım 3**	**Katılmıyorum 2**	**Kesinlikle Katılmıyorum 1**
1.Kendimi **sağlıklı beslenen biri** olarak düşünüyorum	☐	☐	☐	☐	☐
2.Kendimi **sağlıklı beslenmeye dikkat eden birisi** olarak görüyorum	☐	☐	☐	☐	☐
3.Sağlıklı **beslendiğimi düşünüyorum**	☐	☐	☐	☐	☐
4.Sağlıklı beslenmek **zorunda** olduğumu hissediyorum	☐	☐	☐	☐	☐
5.Eğer sağlıklı **beslenmezsem** kendimi **suçlu** hissederim	☐	☐	☐	☐	☐
6.Sağlıklı beslenme **hayatımın önemli bir parçasıdır**	☐	☐	☐	☐	☐
7.Sağlıklı beslenme konusunda **kendimi kişisel olarak sorumlu** olduğumu hissediyorum	☐	☐	☐	☐	☐

Aşağıdaki ifadelere **ne derece** katılıyorsunuz?	**Kesinlikle Katılıyorum 5**	**Katılıyorum 4**	**Kararsızım 3**	**Katılmıyorum 2**	**Kesinlikle Katılmıyorum 1**
1.Hazır yiyecek (hamburger, v.b.) tüketimi sağlığımız açısından zararlıdır.	☐	☐	☐	☐	☐
2. Hazır yiyecek (hamburger, v.b.) tüketimi doğal çevrenin sağlığı açısından zararlıdır.	☐	☐	☐	☐	☐
3.Çevre sorunlarının çözülmesi, beslenme alışkanlıklarımızda önemli değişiklikler yapmamızı gerektirir.	☐	☐	☐	☐	☐
4.Beslenme alışkanlıklarındaki değişimler çevre	☐	☐	☐	☐	☐

problemlerinin çözümlenmesinde önemli rol oynayacaktır.					
5.Çevre sorunlarının beslenme alışkanlıklarımız ile **hiçbir ilgisi yoktur.**	☐	☐	☐	☐	☐
6.İthal ürünler yerine yerel yiyecekleri satın alıyorum	☐	☐	☐	☐	☐
7.Alışveriş merkezlerinde uzun zaman geçirmek, tüketimi ve doğal kaynak kullanımını olumsuz yönde etkileyen bir yaşam tarzıdır.	☐	☐	☐	☐	☐
8.Sağlıklı beslenerek ülke ekonomisine katkı sağlarım	☐	☐	☐	☐	☐
9.Sağlıklı beslenirsem gelecek nesillerin yaşam kalitesini arttırmış olurum	☐	☐	☐	☐	☐
10.Sağlıklı beslenirsem bitki ve hayvan türlerini korumuş olurum	☐	☐	☐	☐	☐

Sağlıklı Beslenme ile ilgili bilgileri **hangi kaynaklardan alıyorsunuz**?	**Kesinlikle Katılıyorum** 5	**Katılıyorum** 4	**Kararsızım** 3	**Katılmıyorum** 2	**Kesinlikle Katılmıyorum** 1
1.Aile	☐	☐	☐	☐	☐
2.Okul (Öğretmenler, ders kitapları vb.)	☐	☐	☐	☐	☐
3.Doktorlar, diyetisyenler	☐	☐	☐	☐	☐
4.Televizyon	☐	☐	☐	☐	☐
5.İnternet	☐	☐	☐	☐	☐
6.Gazete ve dergiler	☐	☐	☐	☐	☐
7.Arkadaşlar	☐	☐	☐	☐	☐

1. Derslerinizde sağlıklı beslenme konusu **ne sıklıkla** işleniyor?

Her zaman	Sık sık	Ara sıra	Nadiren	Hiçbir zaman
⑤	④	③	②	①

2. Derslerimizde **nasıl sağlıklı besleneceğimiz** anlatılıyor.

Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
⑤	④	③	②	①

3. Sağlıklı beslenme konusunda **yeterince bilgi sahibiyim.**

Kesinlikle Katılıyorum	Katılıyorum	Kararsızım	Katılmıyorum	Kesinlikle Katılmıyorum
⑤	④	③	②	①

4. Sağlıklı beslenme ile **ne kadar ilgilisiniz**?

Çok İlgiliyim	Oldukça ilgiliyim	Biraz ilgiliyim	Çok az ilgiliyim	Hiç İlgili değilim
⑤	④	③	②	①

Appendix F: Turkish Summary

GİRİŞ

Obezite'nin bütün yaş gruplarında sağlık sorunlarını tetiklediği özellikle daha düşük yaşlarda nüksetmesi sonradan ortaya çıkabilecek olan sağlık sorunlarını arttırdığı ortaya çıkmıştır(DÜNYA SAĞLIK ÖRGÜTÜ [WHO], 2012). Dolayısıyla, beslenme davranışlarını etkileyebilecek faktörleri ortaya çıkarmak çok önemlidir. İnsan davranışlarının psikolojik ve sosylojik yönlerini incelemek için birçok teorik çerçeve önerilmiştir. Bu etmenlerin insan davranışı üzerinde etkisini incelemek için yaygın olarak kullanan modellerden biri de Planlanmış Davranış Teorisi (PDT; Ajzen, 1991)'dir. Planlanmış Davranış Teorisi ampirik sonuçlarından dolayı birçok araştırmacının dikkatini çekmiştir (Notani, 1998). Bu teori atık yönetimi ve kompostlama (Taylor ve Todd, 1995a; 1995b), geri dönüşüm (Cheung, Chan, & Wong, 1999; Gamba, & Oskamp 1994; Hopper & Nielsen 1991), su tasarrufu (Lam, 2006), yenilenebilir enerji (Bang, Ellinger, Hadjimarcou & Traichal, 2000),çevre koruyucu davranışlar (Cheung, Chan & Wong, 1999; Stern, Dietz, Kalof & Guagnano, 1995; Taylor & Todd, 1995, 1997), avlanma (Hrubes, Ajzen & Daigle, 2001), boş zaman geçirme seçeneği (Ajzen & Driver, 1992), seyahat tercihi (Bamberg, Ajzen & Schmidt, 2003) sağlık davranışları (Armitage, & Conner, 1999; Conner, Bell, & Norman, 2002; Hagger ve diğerleri, 2002; McEachan ve diğerleri, 2011) ve kilo verme (Schifter ve Ajzen, 1985) gibi birçok davranışı açıklamak için güçlü ampirik destek sağlamıştır. Bundan dolayı, bu çalışma ortaokul öğrencilerinin sağlıklı beslenme niyetlerinin ve davranışlarının etmenlerini araştırmak için Planlanmış Davranış Teorisini (Ajzen, 1991) teorik çerçeve olarak kullanmaktadır.

Gerçeklendirilmiş Eylem Teorisinin (Ajzen & Fishbein, 1980) bir sonraki versiyonu olan PDT (Ajzen, 1988, 1991), insan davranışını incelemek için ortay çıkan en etkili ve popüler kavramsal çerçevedir (Ajzen, 2001). PDT insan eylemini güdüleyen üç ana etmen olduğunu öne sürmektedir;

> olası davranış sonuçları inançları ve sonuçların önemi (davranış inançları), başkalarının beklentileri ve bu beklentilerin önemi (normatif inançlar) ve davranışın olmasını sağlayan veya engel olan

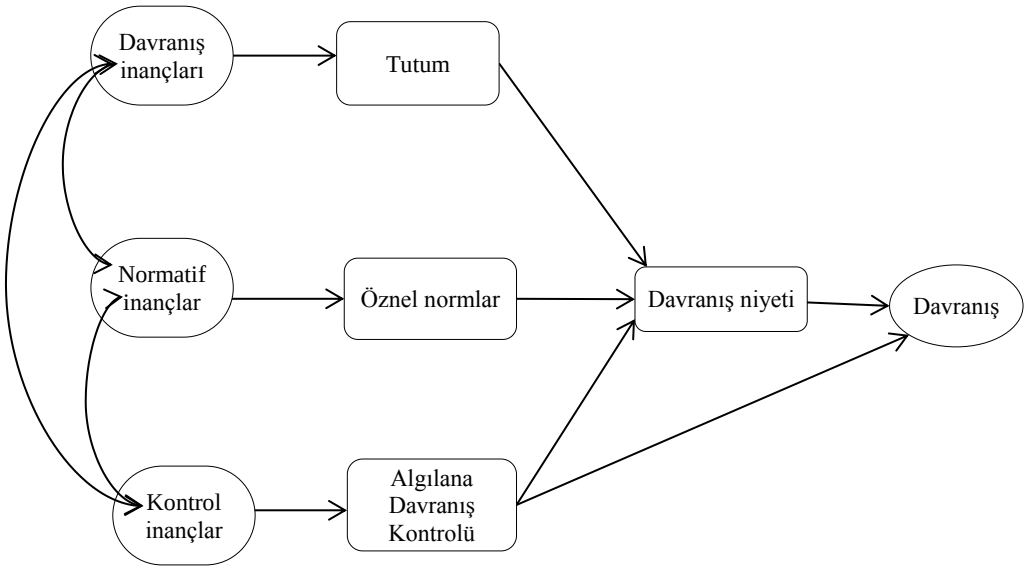
> faktörler hakkındaki inançlar ve bu faktörlerin gücü (kontrol inanç) (Ajzen, 2006, s. 1)

Yukarıda bahsedilen inançlar kişilerin davranışa yönelik olan tutumlarını, öznel normlarını ve algılanan davranış kontrollerini oluşturmaktadır. Bundan dolayı PDT insan davranışının, davranış ile ilgili inançların bir fonksiyonu olduğunu öne sürmektedir. Buna göre, davranış inançları, davranışa yönelik olan olumlu veya olumsuz tutumları, normatif inançlar öznel normları veya algılanan sosyal baskıyı, kontrol inançları ise algılanan davranış kontrolünü oluşturmaktadır (Ajzen, 2006). Davranışa yönelik olan tutum, öznel normlar ve algılana davranış kontrolü ile birlikte davranış niyetinin oluşmasına katkıda bulunmaktadırlar. Davranış niyeti ise, davranışı açıklayan en güçlü tahmin edici olarak kabul edilmiştir. Ajzen (1998), niyeti bireyin bir davranışı gerçekleştirmek için duyduğu arzu düzeyi ve ortaya koymayı planladığı çabanın yoğunluğu olarak tanımlar.

Genel kanı olarak, eğer bir birey ilgili davranışı olumlu olarak değerlendiriyorsa, kendisi için önemli olan insanların kendisinin bu davranışı ortaya koymasını desteklediğini düşünüyorsa ve ilgili davranışı gerçekleştirmek için kontrolün kendisinde olduğunu düşünüyorsa ilgili davranışı gerçekleştirecek niyete sahip olacak ve nihayetinde o davranışı gerçekleştirecek demektir. Bundan dolayı niyet davranışı tahmin eden birincil etmen olarak öngörülmüştür (Ajzen, 1991). Yani, kişilerin hedeflerindeki davranışı gerçekleştirme niyetleri ne kadar güçlüyse ilgili davranış o kadar başarılı tahmin edilebilir. Bununla birlikte, birbirinden bağımsız üç ayrı bileşen olan davranışa yönelik olan tutum, öznel normlar ve algılanan davranış kontrolü niyeti tahmin eder.

Birçok durumda davranış, sadece niyete bağlı olmanın dışında yeterli kontrole bağlı olduğu durumlarda vardır. Algılanan davranış kontrolü gerçek kontrolü temsil ettiği ölçüde davranış niyetinden bağımsız olarak ilgili davranışı tahmin etmemize yardımcı olabilir. Ajzen (2005), kişinin ilgili davranış üzerinde gerçek kontrolü olduğu durumlarda algılanan davranış kontrolünün gerçek kontrolü temsil ettiğini ve bu durumlarda davranış niyetini doğrudan tahmin edebileceğini öne sürmüştür. Başka bir deyişle, planlanmış davranış teorisi algılanan davranış kontrolü davranışı

dolaylı yoldan (niyetler üzerinden) tahmin etmesinin yanında doğrudan da tahmin edebileceğini öne sürer (Şekil 1).



Şekil 1. Planlanmış Davranış Teorisi (Ajzen, 2005)

Her ne kadar PDT, güçlü ampirik destek (Godin & Kok, 1996) ve farklı alanlardaki niyetleri ve davranışları açıklamadaki meta-analitik destek (Ajzen, 1991; Notani, 1998; Armitage & Conner, 2001; Hagger ve diğerleri, 2002; McEachan ve diğerleri, 2011) olması yönünden genel kabul görmüşse de bazı araştırmacılar PDT'nin genişletilebileceğini tartışmıştır. Bu araştırmacılar teorinin niyeti ve davranışı açıklamadaki etkinliğini arttırmak için PDT ye farklı bileşenler eklenmesi gerektiğini önermişlerdir (Conner & Armitage 1998; Rivis & Sheeran, 2003). Aslında, teorinin geliştiricisi olan Ajzen (1991)' de eğer niyet ve davranışı önemli ölçüde tahmin edecekse PDT'ye farklı bileşenlerin eklenebileceğini belirtmiştir. Bunula birlikte, Armitage ve Conner (1998) PDT'ye 6 farklı değişkenin ampirik ve teorik olarak eklenebileceğini kanıtlamışlardır. Bu kanıtlar çerçevesinde, sağlıklı beslenme davranışının doğasını derinlemesine anlamak için orijinal PDT model bileşenleri dışında farlı bileşenlerin sağlıklı beslenme niyeti ve davranışını incelemek için modele dâhil edilebileceği sonucuna varılabilir. Bu bağlamda, bu çalışmada kişisel normlar, öz-kimlikler be sürdürülebilir sağlıklı beslenme değişkenleri PDT'nin açıklayıcı gücünü arttırmak için kullanılmıştır.

Birçok araştırmacı PDT modelindeki öznel normlara alternatif olarak kişisel normları önermiştir (Beck & Ajzen, 1991; Raats ve diğerleri, 1995). Kişisel normlar, içselleştirilmiş değerlere dayanan öz beklentiler olarak tanımlanmakla birlikte, ilgili davranışı sergilemek için kişisel zorunluluk duygularını ifade etmektedir (Schwartz, 1968, 1977). Kişisel normlardaki zorunluluklar ve beklentiler özden gelmektedir fakat öznel normlardaki zorunluluklar ve beklentiler kişinin içinde yaşadığı sosyal gruba bağlı olarak şekillenmektedir (Schwartz, 1977; Schwartz & Howard, 1984). Bu yönüyle kişisel normlar öznel normlardan farklıdır. Birçok çalışma kişisel normların davranış niyeti ve davranış üzerinde etkili olduğunu belirtmiştir (Parker, Manstead & Stradling, 1995; Gorsuch & Ortberg, 1983; Budd & Spencer, 1985; Harland, Staats & Wilke, 1999; Nordlund & Garvill, 2003). Rivis ve diğerleri (2009) fiziksel aktivite, çevre koruyucu davranışlar, sağlık, sigara içme, kan bağışı ve etik karar verebilme gibi farklı çerçevedeki davranışları içeren meta-analizlerinde PDT bileşenlerinin kişisel normlar ile birlikte davranış niyetini ortalama %44 oranında açıkladığı sonucuna varmışlardır. Kişisel normlar bu çalışmada PDT bileşenlerinin davranış niyetlerinde açıklayamadığı %3 lük kısmı açıklamayı başarmıştır. Bu verilere dayanarak, kişisel normların sağlıklı beslenme davranışı niyetini açıklayabileceği öngörülmektedir.

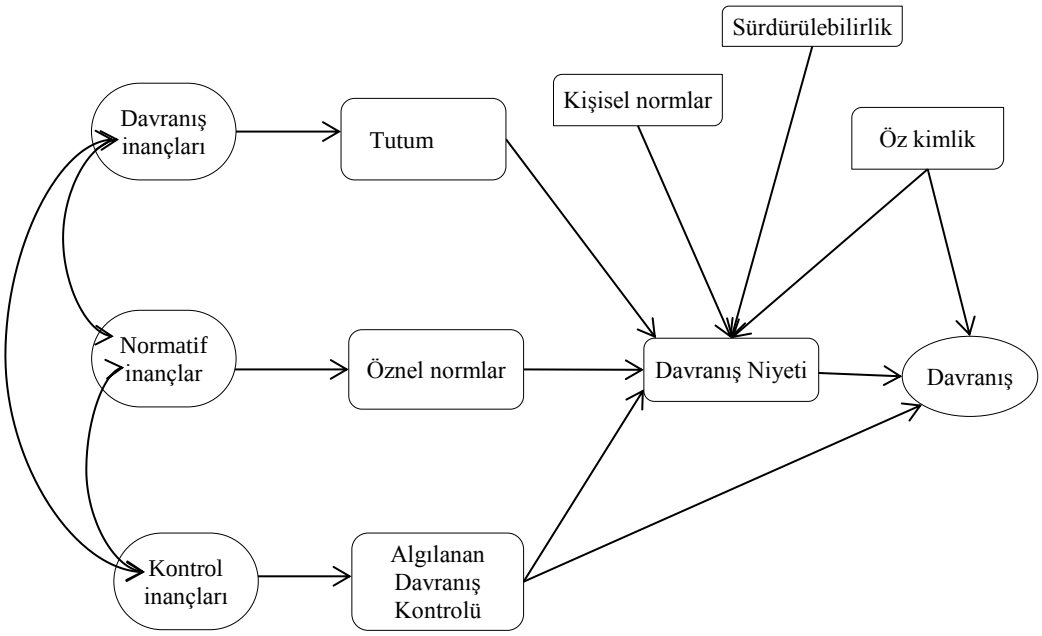
Öz kimlik davranış niyetini tahmin etmek için PDT modeline dâhil edilmesi önerilen başka değişkendir (Biddle, Bank, & Slavings, 1987; Sparks & Shepherd, 1992). Öz kimlik kişinin kendisini algılaması olarak tanımlanır (Sherwood, 1965, p. 66). Rise ve diğerleri, (2010) 40 PDT çalışmasını kapsadığı meta-analizlerinde öz kimliğin alkol tüketme, kan bağışı, hız yapma, fiziksel aktivite, ekolojik ürünler satın almak, geri dönüşüm, sigarayı bırakma ve sağlıklı beslenme gibi birçok sağlık davranışında niyeti önemli ölçüde tahmin ettiği sonucuna varmışlardır. Yapılan meta analiz çalışmasında, Öz kimliğin PDT bileşenlerinin davranış niyetinde açıklayamadığı %6'lık varyansı açıkladığı saptamıştır. Bunun dışında yapılan bazı çalışmalar öz benliğin davranış niyetinden ziyade davranışın kendisini de açıkladığı sonucuna varmışlardır (Bruijn & Putte, 2012; Ries, Pihu & Armenta, 2012). Sonuç olarak, öz benliğin sağlıklı beslenme davranışı niyetini ve davranışını tahmin edeceği öngörülmüştür.

Son olarak, yapılan çalışmalar bize sağlıklı beslenmenin genelde sürdürülebilirlik ile özelde ise sürdürülebilir yiyecek tüketimi ile bağlantılı olduğu ipuçlarını vermektedir (Foresight, 2011; IFR, 2012) Sürdürülebilir diyet kavramı;

> "çevreye zararı az olan şu andaki ve gelecek nesillerin sağlıklı yaşamlarına katkıda bulunan, biyo-çeşitlilik ve ekosistemi koruyan, kültürel olarak kabul edilen, ulaşılabilir, ekonomik olarak yöneliklanabilen, besin değeri olarak tatmin edici, güvenli ve sağlıklı" (Food and Agriculture Organization of the United Nations (2010, s.33)

olarak tanımlanmıştır. Bu tanım göz önüne alındığında, sürdürülebilir diyetin sadece çevre dostu değil ayrıca şu anki ve gelecek nesillerin sağlıklı olası gerektiği sonucuna varabilir. Bundan dolayı, sağlıklı beslenmenin sürdürülebilir çevreye de katkısı olduğu sonucuna varabiliriz. Yapılan çalışmalarda sağlıklı beslenmenin sürdürülebilir çevreye enerji kullanımı, biyo-çeşitlilik, su tüketiminin yanında ekonomik, sağlık ve refah boyutundaki etkilerinin olduğu ortay çıkmıştır (IFR, 2012; Garnett 2011; Scarborough, Allender, Clarke, Wickramasinghe & Rayner. 2012; Trichopoulou, 2012). Sonuç olarak, beslenme alışkanlığı ve sürdürülebilirlik PDT modeline sağlıklı beslenme davranışı niyetini tahmin eden değişken olarak dâhil edilmesi düşünülmüştür.

Yukarıda verilen kanıtlar göz önünde bulundurulduğunda, orijinal PDT modeli bileşenlerinin yanı sıra kişisel normlar, öz kimlik ve beslenme alışkanlığı ve sürdürülebilirliknın ortaokul öğrencilerinin sağlıklı beslenme niyetleri ve davranışlarını incelemenin etkili olacağı sonucuna varabiliriz. Bundan dolayı, bu çalışma literatüre sağlıklı beslenme davranışlarının PDT kapsamında bir model geliştirmesi yönüyle katkıda bulunacağı düşünülmüştür. Önerilen model Şekil 2'de resmedilmiştir.



Şekil 2. Önerilen Model

Bundan dolayı, bu çalışma aşağıdaki soruların cevaplarını aramaktadır.

Araştırmanın soruları;

1. 5, 6, 7 ve 8. sınıf öğrencilerinin sağlıklı beslenme davranışına yönelik olan tutumları, öznel normları, algılanan davranış kontrolü, sağlıklı beslenme niyetleri, sağlıklı beslenme davranışları, sağlıklı beslenmeye yönelik öz kimlikleri, sağlıklı beslenmeye yönelik kişisel normları ve beslenme alışkanlığı ve sürdürülebilirlik nelerdir?
2. Davranış inançları, normatif inançlar ve kontrol inançları tutum, öznel normlar ve algılanan davranış kontrolü ile nasıl ilişkilidir?
3. Sağlıklı beslenme davranışına yönelik olan tutum, öznel normlar, algılana davranış kontrolü, kişisel normlar, öz kimlikler ve beslenme alışkanlığı ve sürdürülebilirlik sağlıklı beslenme niyetleri ile nasıl ilişkilidir?
4. Sağlıklı beslenme niyetleri, algılanan davranış kontrolü ve öz-kimliğin sağlıklı beslenme davranışı ile nasıl ilişkilidir?

Yöntem

Çalışmanın örneklemini Ankara'nın Keçiören ilçesinde Devlet okullarındaki 5, 6, 7 ve 8. sınıf 1780 öğrenci oluşturmaktadır. Bu çalışma Keçiören'deki 5 farklı ortaokulda yürütülmüştür. Araştırmacı tarafından geliştirilen Sağlıklı Beslenme Davranışı Ölçeği (Ek B) araştırmacı tarafından sınıf ortamında öğrencilere uygulanmıştır. Tablo 1 de örneklemin özellikleri belirtilmiştir.

Tablo 1.
Örneklemin genel özellikleri

	Frekans (f)	**Yüzde (%)**
Cinsiyet		
Kız	929	52.2
Erkek	851	47.8
Toplam	1780	100
Sınıf Seviyesi		
5. Sınıf	353	19.8
6.Sınıf	409	23.0
7. Sınıf	538	30.2
8. Sınıf	480	27.0
Toplam	1780	100

Ana çalışmaya başlamadan önce Ajzen'nin (2002a) önerileri doğrultusunda öğrencilerin davranışa yönelik inançlarını ortaya çıkarmak için mülakat çalışması yürütüldü. Her ne kadar Ajzen (2002a) mülakat çalışmasının öneminden bahsetse de kaç kişi ile mülakat yapılacağını belirmemiştir. Mülakata ilk etapta 20 kolay ulaşılan örneklemle başlanmasına rağmen öğrencilerden gelen cevaplar tekrar edildiği için mülakat çalışması 15 öğrenci ile sonlandırılmıştır. Mülakatta öğrencilere sorulan sorular Ajzen'nin (2002a) önerileri doğrultusunda öğrencilerin sağlıklı beslenme davranışına yönelik inançları ile birlikte bu davranışa yönelik tutumlar, öznel normları ve algılanan davranış kontrollerini ortaya çıkarmayı amaçlamıştır. Mülakat çalışması sonucunda ortaya çıkan inançlar pilot bu çalışmada kullanılan anketi oluşturmada kullanılmıştır (Ek A). Bu anket Ajzen'nin (2002a) önerdiği kelime yapısında hazırlanmış olup PDT bileşenlerinin yanı sıra kişisel normlar, öz-kimlik ve beslenme alışkanlığı ve sürdürülebilirliknı ölçmek için geliştirilmiştir. Ankette

ölçülen boyutlar, boyutlarınların madde sayıları ve derecelendirme örneği Tablo 2 de verilmiştir.

Tablo 2.
Ana Çalışmada ölçülen kavramlar madde sayıları ve derecelendirme örneği

Boyutlar	**Madde sayısı**	**5-li Likert Ölçeği Örneği**
Davranışa yönelik tutum	11	Önemlidir - Önemsizdir
Davranışın Olası Sonuçları	16	*Kesinlikle katılıyorum–Kesinlikle Katılmıyorum*
Sonuçların Önemi	16	*Çok Önemli – Hiç Önemli Değil*
Öznel Normlar	4	*Kesinlikle katılıyorum–Kesinlikle Katılmıyorum*
Normatif Referanslar	7	*Kesinlikle katılıyorum–Kesinlikle Katılmıyorum*
Normatif Referansların Önemi	7	*Çok Önemli – Hiç Önemli Değil*
Algılanan Davranış Kontrolü	5	*Kesinlikle katılıyorum–Kesinlikle Katılmıyorum*
Kontrol İnançları Faktörleri	8	*Kesinlikle katılıyorum–Kesinlikle Katılmıyorum*
İnanç Faktörlerinin Gücü	8	*Kesinlikle katılıyorum–Kesinlikle Katılmıyorum*
Davranış Niyeti	9	*Kesinlikle katılıyorum–Kesinlikle Katılmıyorum*
Kişisel Normlar	4	*Kesinlikle katılıyorum–Kesinlikle Katılmıyorum*
Öz-Kimlikler	3	*Kesinlikle katılıyorum–Kesinlikle Katılmıyorum*
Beslenme alışkanlığı ve sürdürülebilirlik	9	*Kesinlikle katılıyorum–Kesinlikle Katılmıyorum*
Davranış	1	*Her gün- Hiçbir zaman*

PDT'ye göre inançlar tuttum, öznel normlar ve algılanan davranış kontrolünün etmenlerini oluşturmaktadır ve bu inançlar Beklenti-Değer Teorisi'ne (Frey ve diğerleri, 1993)göre belirlenir. Bu yaklaşıma göre PDT'nin davranış inançları davranışın olası sonuçları ve bu sonuçların çarpımı, normatif inançlar normatif referanslar ve bu referansların öneminin çarpımı ve kontrol inançları kontrol inançları faktörleri ve bu inanç faktörlerinin gücünün çarpımı yoluyla elde edilir. Tablo 4 çalışmada kullanılan her bir kavramdan madde örnekleri ile birlikte bu kavramların nasıl ölçüldüğünü göstermektedir.

Tablo 4.
Ana Çalışmada kullanılan kavramların değerlendirme metodu ve madde örnekleri

Kavramlar	**Madde Örneği**	**Madde değeri**
Davranışa yönelik tutum	"Benim için sağlıklı beslenme önemlidir (5) önemsizdir (1)"	1 - 5
Öznel Normlar	"Benim için önemli olan insanlar sağlıklı beslenmemi ister."	1 - 5
Algılanan Davranış Kontrolü	"Düzenli olarak sağlıklı beslenmek için gereken disipline sahibim"	1 - 5
Davranış Niyeti	"Önümüzdeki 2 hafta boyunca düzenli olarak sağlıklı beslenmeyi planlıyorum"	1 - 5
Davranış	"Ne kadar sıklıkla sağlıklı besleniyorsunuz?"	1 - 5
Davranış inançları	"Davranışın olası sonuçları **X** Bu sonuçların önemi " ile belirlenir. Örnek: Sağlıklı beslenirsem Kendimi zinde (daha iyi) hissederim (1 – 5) **X** Kendini zinde (daha iyi) hissetmek benim için önemlidir (1 - 5)	1 - 25
Normatif inançlar	"Normatif referanslar **X** bu referansların önemi" ile belirlenir. Örnek: Ailem sağlıklı beslenmemi bekler (1-5) **X** Ailemin sağlıklı beslenmek istemesi benim için çok önemlidir (1 - 5)	1 - 25
Kontrol inançları	"Kontrol inançları faktörleri **X** bu inanç faktörlerinin gücü" ile belirlenir. Örnek: Okulumun kantininde sağlıklı yiyecekler satılıyor (1-5) **X** Okulumun kantininde sağlıklı yiyecekler satılması sağlıklı beslenme yapmamı kolaylaştırır (1 - 5)	1 - 25
Kişisel Normlar	"Sağlıklı beslenmek zorunda olduğumu hissediyorum"	1 - 5
Öz-Kimlikler	"Kendimi sağlıklı beslenen biri olarak düşünüyorum"	1 - 5
Beslenme alışkanlığı ve sürdürülebilirlik	"Çevre sorunlarının çözülmesi, beslenme alışkanlıklarımızda önemli değişiklikler yapmamızı gerektirir."	1 - 5

Tablo 5.
Pilot çalışmasında ölçülen yapıların güvenirlik analiz sonuçları

Boyutlar ve alt boyutlar	**Madde sayısı**	**Güvenirlik Cronbach's Alpha**
Davranışa yönelik tutum	12	0.85
Davranış inançları	20	0.89
Davranışın Olası Sonuçları	20	0.84
Sonuçların Önemi	20	0.83
Öznel Normlar	4	0.80
Normatif inançlar	8	0.77
Normatif Referanslar	8	0.68
Normatif Referansların Önemi	8	0.75
Algılanan Davranış Kontrolü	8	0.72
Kontrol inançları	11	0.70
Kontrol İnançları Faktörleri	11	0.61
İnanç Faktörlerinin Gücü	11	0.75
Davranış Niyeti	9	0.92
Kişisel Normlar	4	0.82
Öz-Kimlik	3	0.90
Beslenme alışkanlığı ve sürdürülebilirlik	10	0.82
Davranış	1	-

Ana çalışmaya başlamadan önce Yenimahalle, Etimesgut ve Mamak olmak üzere Ankara'nın 3 farklı ilçesinde 475 ortaokul öğrencisi ile pilot çalışma yürütülmüştür. Pilot çalışmasının güvenirlik analizleri sonucunu Tablo 5'de gösterilmiştir. Pilot çalışması sonucunda güvenirlik analizleri daha güvenilir ölçek elde edebilmek için tutum boyutundan ATT12 maddesinin, algılanan davranış kontrolü boyutundan PBC1, PBC3_rec ve PBC8_rec maddelerinin ve beslenme alışkanlığı ve sürdürülebilirlik boyutundan SUS5_rec maddesinin çıkarılması gerektiğini önermektedir.

Ölçeğin geçerlilik yapısını test etmek amacıyla güvenirlik analizlerine ek olarak Doğrulayıcı Faktör Analizi (CFA) Lisrel 8.80 programın kullanılarak yürütülmüştür. Doğrulayıcı Faktör Analizi sonuçları Tablo 6 da belirtilmiştir. Tabloda belirtilen uyum indeks değerlerine göre Doğrulayıcı faktör analizi modeli ile elde edilen veri arasındaki uyum kabul edilebilir seviyededir (Jöreskog & Sörbom, 1993).

Tablo 6.
Madde çıkarımından önceki pilot CFA sonuçları

Uyumluluk indeksleri	RMSEA	SRMR	NFI	CFI
Değerler	0.06	0.07	0.90	.94

Uyum değerlerine ek olarak ölçekteki her bir maddenin ilgili boyutundaki yük değerleri incelenmiştir. Bu yük değerleri her bir maddenin ilgili boyut ile arasındaki ilişkiyi belirtir. Yük değeri ne kadar yüksekse maddenin ilgili boyut ile alakası o kadar yüksektir denilebilir (Pintrich ve diğerleri, 1991). Doğrulayıcı faktör analizindeki her bir maddenin yük değeri incelendiğinde analiz sonuçları güvenirlik sonuçları ile birlikte daha geçerli ve daha güvenilir bir ölçek elde edebilmek için tutum boyutundan ATT12, algılanan davranış boyutundan PBC8_rec, PBC3_rec ve PBC1 maddelerini, davranış inançları boyutundan bb5, bb4, bb19 ve bb20 maddelerini, normatif inançlar boyutundan nb5 maddesini, kontrol inançları boyutundan cb3, cb6, cb1 ve cb4 maddelerini, beslenme alışkanlığı ve sürdürülebilirlik boyutundan ise SUS5_ rec maddesinin çıkarılması gerektiğini önermektedir. Belirtilen maddeler ilgili boyutlardan çıkarıldıktan sonra ikinci doğrulayıcı faktör analizi yapılmış olup uyumluluk değerlerinin oldukça kabul edilebilir olduğu görülmektedir (Tablo 7 ye bakınız)

Tablo 7.
Pilot çalışmasının madde çıkarımından sonraki CFA sonuçları

Uyumluluk indeksleri	RMSEA	SRMR	NFI	CFI
Değerler	0.06	0.06	0.92	.95

Sonuç olarak, ana çalışma 10 boyut ve bu boyutlara yöneliklık gelen 71 madde ile yürütülmüştür. Tablo 8 de pilot çalışmada ve ana çalışmada kullanılan boyutların madde sayıları ve güvenirlik analiz sonuçları belirtilmiştir. Bu tablo incelendiğinde

kontrol inançları dışındaki bütün boyutların kabul edilebilir güvenirlik seviyesinde olduğu görülmektedir.

Tablo 8.
Pilot ve Ana Çalışmada ölçülen boyutların madde çıkarımından sonraki güvenirlik sonuçları ve madde sayıları

	Pilot çalışması		**Ana Çalışma**	
Boyutlar	**Madde sayısı**	**Cronbach's Alpha**	**Madde sayısı**	**Cronbach's Alpha**
Davranışa yönelik tutum	11	0.87	11	0.85
Davranış inançları	16	0.89	16	0.90
Öznel Normlar	4	0.80	4	0.80
Normatif inançlar	7	0.78	7	0.78
Algılanan Davranış Kontrolü	5	0.79	5	0.75
Kontrol inançları	7	0.69	7	0.67
Davranış Niyeti	9	0.92	9	0.92
Kişisel Normlar	4	0.71	4	0.76
Öz-Kimlik	3	0.90	3	0.90
Beslenme alışkanlığı ve sürdürülebilirlik	9	0.86	9	0.84
Davranış	1	-	1	-

Bulgular ve Tartışma

Ana çalışmada veri testi için Yapısal Eşitlik Modeli (YEM) tekniği kullanılmıştır. YEM analizinden önce verilerin doğruluğunu test etmek için veri giris hatalarını kontrol etmek, kayıp verileri belirlemek ve aykırı degerleri tespit etmek gibi çesitli veri eleme yöntemleri kullanılmıstır. Ardından çalısmadaki birtakım degiskenleri tanımlamak ve özetlemek için çesitli betimsel analizler yapılmıstır.

Tablo 9.
Çalışmada ölçülen boyutların betimsel analiz sonuçları

Boyutlar	*En düşük değer*	*En yğksek değer*	*Ortalanma*	*Standart Sapma*
Davranışa yönelik tutum	1.00	5.00	4.29	0.60
Öznel Normlar	1.00	5.00	4.42	0.73
Algılanan Davranış Kontrolü	1.00	5.00	4.08	0.77
Davranış Niyeti	1.00	5.00	4.04	0.93
Davranış	1.00	5.00	3.90	1.04
Öz-Kimlik	1.00	5.00	4.01	1.00
Kişisel Normlar	1.00	5.00	3.79	0.95
Beslenme alışkanlığı ve sürdürülebilirlik	1.00	5.00	3.98	0.80

Tablo 9 çalışmada kullanılan boyutların betimsel analiz sonuçlarını içermektedir. İlgili tablo incelendiğinde, ortaokul öğrencilerinin sağlıklı beslenme davranışına yönelik tutumlarının oldukça yüksek olduğu görülür. Bu da öğrencilerin sağlıklı beslenme davranışına yönelik genellikle pozitif tutum takındıkları sonucunu verir. Analiz sonuçları, öğrencilerin öznel normlarının diğer boyutlardan oldukça yüksek olduğunu göstermektedir. Bu sonuç bize ortaokul öğrencilerinin çevresel baskıyı yüksek oranda algıladıklarını belirtmektedir. Benzer şekilde, algılanan davranış kontrolünün ve niyetlerinin yüksek olması bize öğrencilerin sağlıklı beslenme davranışlarının kendilerinin kontrolünde olduğunu ve bu davranışı gerçekleştirmeye niyetlendiklerini göstermektedir. Betimsel analizler ayrıca bize öğrencilerin diğer boyutlarla yöneliklaştırıldığında, en az skoru kişisel norm boyutundan aldığını göstermektedir. Bu sonuç öğrencilerin sağlıklı beslenmeyle ilgili kişisel normlarının yüksek olmamakla birlikte orta düzeyin üstünde olduğunu belirtir. Sonuç olarak, çalışmaya katılan öğrencilerin genel olarak sağlıklı beslenmeyle ilgili tabloda belirtilen boyutlarda ortalamanın üstünde skor elde ettikleri görülmektedir.

Diğer araştırma sonuçlarını cevaplayabilmek için Yapısal Eşitlik Modeli (YEM) analizi sonuçlarının analiz edilmesi gerekmektedir. Bundan dolayı öncelikle önerilen YEM modelinin uyumluluğu ve bu modeldeki boyutlar arası ilişkiler belirtilecektir. Tablo 10 da önerilen YEM modelinin uyum indekslerinin sonuçları bulunmaktadır.

Bu tablo incelendiğinde Ki-Kare indeksi dışında diğer indekslerin değerleri ve kriterleri göz önü alındığında modelin eldeki veriye uyumluluğu gayet iyi derecede kabul edilebilir olmakla birlikte önerilen modelin örneklemden alınan veriyle desteklendiğinin sonucuna varabiliriz.

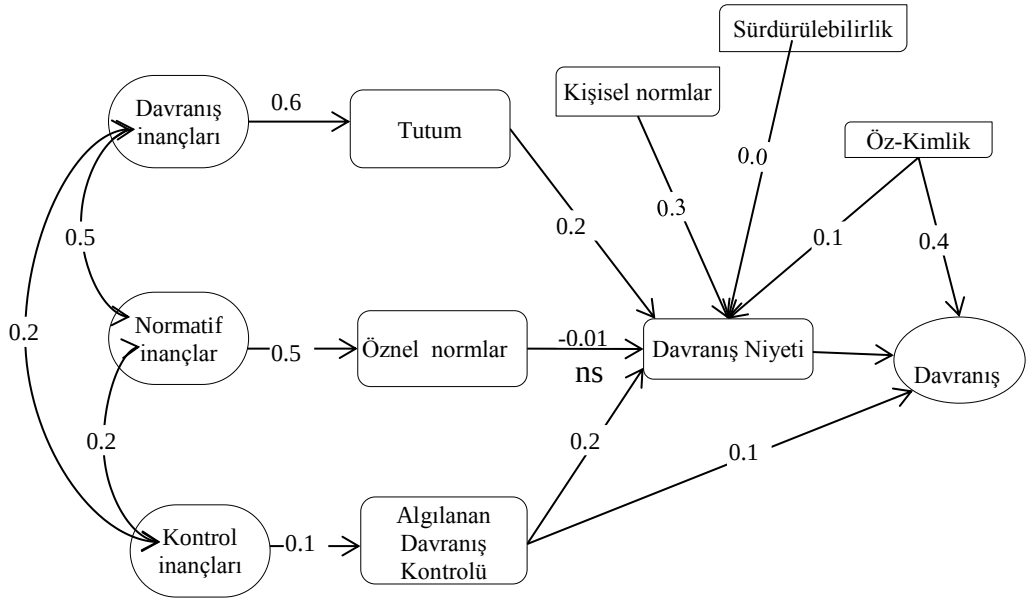
Tablo 10.
Önerilen YEM modelinin uyumluluk indeksleri

Uyum indeksleri	Tanım	Kriter	Ana Çalışma
X^2	Chi-square goodness-of-fit test	*p* >0.05	10835.49 (**p=0.00**)
X^2/df	Ratio of Chi-square to Degrees of Freedom	<5	3.97
RMSEA	Root Mean Squared Error of Approximation	<0.05: çok iyi uyum <0.08: orta derecede uyum	0.041
RMR	Root Mean Square Residual	<0.05	**0.10**
PNFI	Parsimony Normed Fit Index	Olabildiğince Yüksek	0.93
NFI	Normed fit Index	> 0.90	0.97
NNFI	Non-Normed fit Index	> 0.90	0.98
CFI	Comparative Fit Index	> 0.90	0.98
IFI	Incrimental Fit Index	> 0.90	0.98
RFI	Relative Fit Index	> 0.90	0.97

Şekil 3 de önerilen modelin boyutlar arasındaki ilişki resmedilmiştir. Inanç boyutları incelendiğinde, her bir inanç boyutunun yöneliklık geldiği yapı ile pozitif ve direkt bir ilişki olduğu sonucuna varabiliriz. Yani, davranış inançları ile davranışa yönelik olan tutum doğrudan bağlantılı olup bu bağlantı pozitif yöndedir. Bu sonuç bize öğrencilerin sağlıklı beslenme davranışını ile ilgili sahip oldukları inançları onların bu davranışa yönelik olan tutumlarının oluşturduğunu göstermektedir. Davranış inançlarının alt boyutları ele alındığında, öğrencilerin sağlıklı beslenme davranışının

olası sonuçları ve bu sonuçların kendileri için önemi onların tutumlarını belirlemektedir.

Şekil 3 incelendiğinde, davranışa yönelik olan tutumlarının, öznel normların, algılanan davranış kontrolünün, öz-benliklerin ve kişisel normların beslenme alışkanlığı ve sürdürülebilirlik ile birlikte öğrencilerin niyetlerini belirleyen faktörler olduğu sonucuna varabiliriz. Şekilde de belirtildiği gibi bu faktörlerden sadece öznel normların niyetler üzerinde istatistiksel olarak etkisinin önemsizdir. Sonuç olarak, eğer öğrenciler sağlıklı beslenme davranışına yönelik olumlu tutumları varsa, beslenme davranışının kendi kontrollerinde olduğunu düşünüyorlarsa, kendilerini sağlıklı beslenen biri olarak görüyorlarsa, kişisel olarak kendilerini sağlıklı beslenmek için sorumlu tutuyorlarsa ve beslenme alışkanlığı ve sürdürülebilirlik olumlu ise öğrenciler sağlıklı beslenmeye yönelik niyet oluşturacak ve nihayetinde bu davranışı gerçekleştireceklerdir.



Chi-Square = 10835.49, df = 2727, p-value = 0.00000, RMSEA = 0.041

Şekil 3. Standart Katsayılı Yapısal Eşitlik Modeli

Bununla birlikte, öğrencilerin davranış niyetlerinin, algılanan davranış kontrollerinin ve beslenme alışkanlığı ve sürdürülebilirliknın sağlıklı beslenme davranış boyutu ile bağlantısı vardır. Bu bağlantının Şekil 3 te de belirttiği gibi pozitif yönde olması, öğrencilerin sağlıklı beslenmeye yönelik besledikleri niyetlerinin, algılanan davranış kontrollerinin ve beslenme alışkanlığı ve sürdürülebilirliknın seviyesinin yüksek olması sağlıklı beslenme davranışını gösterme sıklıklarının da yüksek olacağı anlamını vermektedir.

Sonuç olarak, öğrencilerin sağlıklı beslenme ile ilgili sahip oldukları davranışsal, normatif ve kontrol inançları ilgili bulundukları davranışa yönelik olan tutum, öznel normlar ve algılanan davranış kontrolünü oluşturduğunu söyleyebiliriz. Bununla birlikte, öğrencilerin sağlıklı beslenme davranışına yönelik sahip oldukları tutumlarının, algılanan davranış kontrollerinin, kişisel normların öz-kimliklerinin ve beslenme alışkanlığı ve sürdürülebilirlik algılarının öğrencilerin bu davranış ile ilgili niyetlerinin güçlü olmasına ve bu davranışı daha sık göstermelerine katkıda bulunur.

Appendix G

TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü	☐
Sosyal Bilimler Enstitüsü	X
Uygulamalı Matematik Enstitüsü	☐
Enformatik Enstitüsü	☐
Deniz Bilimleri Enstitüsü	☐

YAZARIN

Soyadı : İbrahim
Adı : BİLİM
Bölümü : İlköğretim Fen ve Matematik Eğitimi

TEZİN ADI (İngilizce) : DETERMINANTS OF HEALTHY EATING BEHAVIOURS AMONG MIDDLE SCHOOL STUDENTS: THE THEORY OF PLANNED BEHAVIOUR APPROACH

TEZİN TÜRÜ : Yüksek Lisans [X] Doktora [ ]

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir. [ ]
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir. [ ]
3. Tezimden bir (1) yıl süreyle fotokopi alınamaz. [X]

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: