MEDIA USE AND AFFECTIVE STATE AS MEDIATORS OF HEALTH-PROMOTING BEHAVIORS IN SCHOOL-AGE CHILDREN

By

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ABSTRACT

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Background/Purpose: While children's health status in the United States differs from state to state, the health status of children is generally less than optimal. The contributions of healthpromoting behaviors (HPBs) and the factors influencing health behaviors in school-age children have rarely been reported in literature. The objective of this study is to assess whether exposure to television, video game, and computer (media use) mediates the relationships between peer social support and peer hostility and bullying at school (school context), parental emotional support, closeness and involvement (home context) and dietary intake and physical activity (HPBs) among school-age children. Framework: The conceptual framework used for this study is the Pender's Health Promotion Model (HPM). Research Questions: 1) Is there a direct relationship between events that occur in school and home contexts for school-age children and health-promoting behaviors? 2) To what extent does children's affective state and use of media mediate the relationship between school and home influences on health-promoting behaviors? 3) Is there a relationship between media use and affective state in school-age children? 4) Do mediation effects vary as a function of sex? Methods: The study is a secondary analysis of a deidentified longitudinal data set from the "Coordinated Community Assessment (CCA)." The sample consisted of 1,370 students. A cross-sequential design included respondents from the initial cohort recruited from primary school students who were in fourth to sixth grades at schools located in a Midwestern state. **Instrument:** The instrument used for measuring selected

variables was the *Coordinated Community Student Survey* (C^2S^2) and its subscales for measuring affective state, school context, home context, media use and health-promoting behaviors. **Procedure:** Analysis will involve descriptive statistics, and structural equation modeling (SEM) using Mplus. **Result:** Research Question 1: there is no direct effect of school context ($\beta = 0.000$, p=0.999) on HPBs two years after school context was assessed. Alternately, home context (β =0.179, p=0.000) had a significant direct effect on HPBs. **Research Question 2:** only children's affective state mediated the effects of school context on children's HBPs (100% mediation). Children's media use and affective state mediated the effects of home context on children's HPBs (14% mediation), although home context also independently contributed to HPBs. **Research Question 3:** affective state was found to be significant positively related with media use ($\beta < .091$, p=000). **Research Question 4:** For both boys and girls, home context independently contributed to HPBs while school context did not have a direct effect on HPBs. Media use was a significant predictor of HPB's for boys only. Affective state mediated the relationship between home and school contexts and HPBs for boys and girls. Alternatively, media use was a mediator in the relationship between home context and HPB for boys only. **Implication**: Nurses can provide specific information to enhance support from peers and parents, increased self-esteem for HPBs within the context of school-age children. Future research examining health-promoting behaviors in children should identify additional external and internal factors related to how children make decisions about dietary intake and physical activity. Policy can be better structured to induce the provision of behavior change interventions, by fostering linkages with supportive community based resources, and rewarding broad efforts to improve the population health and quality of life.

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DEDICATION

This dissertation is dedicated to the heroes in my life: My PhD Advisors, Dr. Hiram E. Fitzgerald and Dr. Barbara A. Given, who have been involved at various stages in my dissertation production process; my thesis advisor, Dr. Pikul Nantachaipan; my teachers; Mrs. Prarichat Wangpan; and my family: my beloved father, Mr. Boonsong Chenchob, my beloved mother, Mrs. Praneet Chenchob, my beloved sister, Mrs. Kanya Somsangaun and her family and my niece Panida Somsangaun, who provide me with unconditional love, encouragement, and support as I complete my doctoral degree.

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CHAPTER 1

INTRODUCTION

During the past several decades, approaches to health promotion have increasingly strived to align with ecological models designed to identify the set of variables that contribute to the etiology of poor health choices (Crawford, Story, Wang, Ritchie, & Sabry, 2001). Ultimately, the discovery of critical direct and indirect predictors of health-promoting behaviors (HPBs) will lead to more effective preventive intervention programs (Callaghan, 2006). To date, evidence exists to support four key domains where variables have been linked to dietary intake and physical activity (*HPBs*): self-esteem, depression (*affective state*), peer social support and peer hostility and bullying at school (*school context*), parental emotional support, closeness and involvement (*home context*) and television, video games and computer (*media use*). The declining status of children's health in the United States has occurred over a generation. Poor eating habits together with physical inactivity have been implicated as key risk factors for poor health during adolescence and into adulthood.

Studies of the factors influencing HPBs in school-age children are underrepresented in the literature, particularly studies involving longitudinal samples. Nursing interventions are needed to promote HPBs among school-age children. Therefore, the purpose of the current study is to assess predictors of HPBs in a longitudinal sample of children grade fourth to sixth (age 9-12 years) with specific attention to the extent to which exposure to media and/or affective state mediate the relationship between peer social support and peer hostility and bullying at school (school context) and parental emotional support, closeness and involvement (home context) on two indicators of dietary intake and physical activity (health-promoting behaviors).

Statement of the Problem

Even though children's health status in the United States varies from state to state, the health status of children is generally less than optimal (Fitzgerald, Lester, & Zuckerman, 2006; Villarreul & Luster, 2006). Eight percent of all eighth graders reported heavy drinking within the past 30 days, eight percent of all 12- to 17-year-olds have had a major depressive episode, 9 percent have asthma and incalculable others have behavioral disorders and are in less than good health (Fitzgerald, Puttler, Refior, & Zucker, 2007). Longitudinal studies have revealed that risk taking shows strong continuity from the pre-K and elementary school age into adolescence, and the risk taking in this time span is intensified among children who are raised in high-risk families (Fitzgerald et al., 2007). This is particularly true when children are exposed to neighborhood violence and family aggression (Buu, et al., 2009). This means that multiple factors affect the riskresilience continuum, including those that influence health-promoting behaviors. In current studies of parental emotional support, closeness and involvement, children reported their perception of their parents' response to their behaviors. The factors that influence health behaviors are multidimensional and systemically related. Some variables have a direct impact on health behavior; others are mediated or moderated by co-occurring factors.

Physical inactivity is increasing among school-age children, especially among those aged 11 to 14. The Youth Risk Behavior Surveillance System demonstrated that the percentage of students who attend physical education class daily decreased from 49% in 2010 to 39% in 2012 (Centers for Disease Control, 2012), despite the continued promotion of guidelines recommending that school-age children should participate in 60 minutes or more of moderate-to-vigorous physical activity daily (USDHSS, 2012). The majority of youth do not meet such recommendations (Eaton

et al., 2012). Dieting and weight concerns, particularly among young girls (Gardin & Hammarstrom, 2002), have also become public health problems because of their link to eating disorders such as bulimia and anorexia.

Social support has been defined in numerous ways, generally referring to any behavior that assists an individual in achieving a desired goal or outcome. In Pender's Health Promotion Model (HPM) (2002), social support is viewed as an interpersonal influence and is considered a protective mechanism for health-promoting and -maintaining behaviors. Conceptually, social support can create a growth-promoting environment, decrease stressful life events and provide feedback or confirmation of actions. When individuals believe that they have adequate social support, the resulting goals of health promotion and health maintenance are more likely to be achieved. Social support is considered the most established determinant in the literature reinforcing physical activity. Pender (1996) suggested that a number of possible sources of support for physical activity should be examined, such as parents, older children or siblings, and friends. A few studies have examined the impact of family and peer support on this influence (Higgins, Gaul, Gibbons, & Gyn, 2003; Sallis et al., 1992). As children age, they spend increasing amounts of time outside of the home, and peers become an important source of social support for physical activity (Pender, 1996).

Media and health-promoting behaviors. For the past 20 years the impact of media on children's behavior has drawn increasing attention. Initially, researchers and health professionals focused on the impact of television on children's aggressive behavior (Eron, 1982) and weight gain. Dietzand and Gortmaker (1985) concluded that there were positive and perhaps causal connections. Increasingly, such concerns have shifted beyond children's exposure to television to include time spent playing video games or texting on mobile devices. Studies have reported

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positive effects of computer-use on children's academic achievement (Jackson et al., 2006; Kulik, 1994; Wenglinsky, 1998), expansion of social networks (Jackson, Fitzgerald, VonEye, Zhao, & Whitt, 2010), or no effects (Jackson, 2008). Roschelle, Pea, Hoadley, Gordon, and Means (2000) note that based on the extent to which Information Technology (IT) use interferes with the four fundamentals of learning (active engagement, participation in groups, frequent interaction and feedback and connections to real-world contexts), use of computer-based instruction will likely be less effective. Indeed, investigators have shown that time on the Internet can be socially and psychologically isolating, resulting in feelings of depression and loneliness (Amichai-Hamburger & Ben-Artzi, 2003). With respect to video games, while they may enhance visual spatial skills (Subrahmanyam, Krant, Greenfield, & Gross, 2000), other evidence suggests that levels of aggression are higher in children who are heavy users of video games, particularly violent games, and that teacher ratings of their behavior in school are more negative when compared with children who use games less frequently (Anderson, Gentile, & Buckley, 2007).

Jackson, VonEye, Fitzgerald, Witt, & Zhao (2011) studied the effects of Internet use, video game playing and cell phone use on children's weight gain and self-esteem. Although ethnoracial group membership, age and income levels predicted grades in school and body mass index (BMI) or body weight, none of the IT indicators did. Conversely, IT use did predict children's social self-esteem. Children who played video games more had lower social self-esteem than children who played them less. On the other hand, children who used cell phones more had higher social self-esteem than those who used them less. Similar findings held for general self-esteem.

Children are exposed to an extraordinary amount of information about energy dense foods on television (Moore, 2008). Low levels of exercise, high consumption of energy dense foods and low affect expression all contribute to children's weight gain. With rare exceptions (e.g., Nintendo's Wii), screen time is a time of high caloric consumption and low physical activity (Jackson et al., 2010), contributing to weight gain and obesity (AOA, 2005). Finkelstein, Rhum, and Kosa (2005) note that of 10 or more food commercials per hour, most were for fast foods and soft drinks, adding to television's impact on children's weight gain. Adams (2006) specifically targets poor eating habits, soft drinks, lack of exercise and high amounts of time watching television or using a computer as major contributors to child obesity. Considering that 17% of 2-19 year olds and 10.4% of preschool-age children in the United States are obese (American Obesity Association, 2005; Ogden et al., 2006), examining the role of media use on children's weight gain is important.

Affective state. Physical activity may offer protective, buffering effects on mental health for youth prior to the onset of emotional problems (Dyck, 2000) by raising levels of self-esteem, body image and self-concept (Higgins et al., 2003). Indeed, regular exercise participation has been found to be associated with a decrease in state and trait anxiety, depression and stress (Dunn & Madhukat, 2001). In Pender's HPM, affective state reflects both self-esteem and depression, each of which can influence HPBs independently or in combination. Chenchob, Barnes, Fitzgerald, Lee, & Pandonu (2013) found that affective state mediated the effect of social support and neighborhood safety on children's HPBs. Many psychosocial models of health-promoting behavior suggest that children develop higher levels of self-esteem when they set and attain goals (Crawford et al., 2001), when they feel that others accept them and when they have positive loving relationships with caregivers (Bee, 2000). Because studies of Information Technology use suggest that high use of television and computers is linked to indictors of negative affective state, the current study will examine whether media use and affective state also mediates the relationship between school context, home context and HPBs in the sample of fourth to sixth graders.

More research is required regarding potential predictors for future health behavior, in relation to both individual and family oriented factors, including factors related to the school environment, such as teacher support (Gadin & Hammarstrom, 2002; Patnode et al., 2010). Although some studies have reported linkages between variables such as self-perception and health-promoting behaviors, none has assessed the inter-relationships among individual, school and family context and HPBs (Crocker et al., 2003; Peason, Ball, & Crawford, 2011).

As stated in the introduction, the health status of children in the United States has been below the average criteria, especially dietary intake and exercise. Crocker et al. (2003) suggested that physical self-perceptions are stronger predictors of change in physical activity and dietary restrain.

In summary, increasing HPBs must continue to have high priority. More research is required regarding potential predictors for future health behavior, in relation to both individual and family oriented factors, including factors related to the school environment. The current study seeks to identify predictors of HPBs not only at the individual level but also in home context and school context. The question of interest is whether affective state and media use mediate school or home context effects on health-promoting behaviors.

Purpose of the Study

The purpose of the current research is to assess predictors of HPBs in a longitudinal sample of children grade fourth to sixth (age 9-12 years) with specific attention to the extent to which exposure to media and/or affective state mediates the relationship between school context, home

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context and two indicators of health-promoting behaviors (dietary intake and physical activity). The proposed study will focus on continuing to identify direct and indirect effects of factors affecting HPBs, conceptualized within a systems framework and informed by Pender's HPM.

Significance of the Study

The prevention of risky health behaviors among school-age children has high priority in public health. It is important to find early predictors of poor health behavior because established health behaviors in school-age children can be difficult to change later in life (Gadin & Hammarstrom, 2002). Starting life in a suboptimal environment caused by poor diet, physical inactivity or other factors in the built, social, or natural environment does not support growth. These factors may also increase the risk of future chronic degenerative disease development (Dwyer, 2006). The factors that influence health behaviors are multidimensional and systemically related. Some variables have a direct impact on health behavior; others are mediated or moderated by co-occurring factors. Whether their impact is direct or indirect, such factors cooperatively support the processes that influence individuals to make decisions and participate in healthpromoting behaviors (Pender, Murdaugh, & Parsons, 2006; Wu & Pender, 2000). Early identification of these interrelationships and an understanding of the dynamics that facilitate health-specific behaviors can provide insight into health enhancing practices in early life, especially in school-age children. Most studies of health behaviors among school-age children have focused on individual factors rather than on the home and school contexts that are associated with HPBs (Trost et al., 2003). It is reasonable to posit that health promotion programs will be more effective if they are founded on evidence-based predictors that include the important personenvironment relationships that influence health behavior decisions (Gadin & Hammarstrom, 2002) as they are defined within particular developmental periods. Diet and exercise intervention can have a beneficial effect on body weight, BMI, serum cholesterol and fitness in children.

For school-age children, the main environment is not only their home but also their school. Both home and school are important arenas for HPBs among school-age children (Eccles, 1999; Gadin & Hammarstrom, 2002; Trost et al., 2003). However, in research on school-age children, school as a health-promoting setting has lagged far behind school as an environment for academic achievement and cognitive functioning. More research regarding the predictors of health behavior is required, particularly using approaches that allow for inclusion of variables from multiple contexts. Such an approach could ascertain how multiple risk factors coalesce in relation to both individual and family oriented factors and factors related to the school environment.

The study of factors that are reliable predictors of HPBs among school-age children is important for several reasons. First, it will provide a foundation for the development of intervention strategies for nurses, school nurses and other health care professionals to assist those children who are distressed or incapable of managing their health. Second, success of intervention efforts is dependent upon evidence that clearly implicates etiologic influences on desired outcomes linked to developmental age (Gadin & Hammars, 2002). For example, the interventions planned for early childhood would differ markedly from those planned for middle school because the causal variables influencing dietary intake and physical activity are markedly different. Because the proposed research focuses on the transition from elementary years to middle school years, findings may lead to new insights into the causal risk patterns associated with the development of poor health behavior. Third, understanding the relationship among influencing factors and HPBs may be beneficial in improving academic achievement and cognitive functioning in school-age children. Identifying sources of the predictors of HPBs will enhance the effectiveness of specific health promotion efforts because of the empirical link between predictors and desired outcomes (Gadin & Hammarstrom, 2002). Fourth, there is a need for empirical validation of models of HPBs. Improved theory in this area will lead to a better understanding of and fruitful insights into HPBs. Fifth, it is hoped that the findings in this study can be used as a basis for successful planning and provision of appropriate health care services for school-age children. Furthermore, these results can inform health care providers, teachers, parents and researchers interested in enhancing factors for promoting health behaviors for future interventions. Finally, rapid changes in food intake and lifestyle pattern demonstrate a significant impact on the shifting pattern of disease burden on the population (Dwyer, 2006). These changes should be monitored carefully and must be reversed through appropriate behavior modification and the promotion of appropriate eating practices and physical activities. Chronic diseases such as obesity, heart disease, osteoporosis, diabetes and cancer continue to be major health concerns that interfere with the quality of life in all life spans.

The factors that influence health behaviors are multidimensional and systemically related (Sallis, Owen, & Fisher, 2008; Spear & Kulbok, 2001). As Trost et al. (2003) stated, little is known about the factors that promote parental support. Whether their impact is direct or indirect, such factors cooperatively support the processes that influence individuals to make decisions and participate in health-promoting behaviors. Identification of the interrelationships and an understanding of the dynamics that facilitate health-specific behaviors can provide insight into HPBs.

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Few studies have combined media use, affective state, school context, home context to determine their unique and combined influences on health-promoting behaviors (Lowry, Wechsler, Galuska, Fulton, & Kann, 2002; Patnode et al., 2010). Few studies have been published that specifically concentrate on identifying predictors of HPBs among the relationships between individual, family, school and community contexts (Patnode et al., 2010). The research regarding school-age children and school as a health-promoting setting and an environment for development has seldom been targeted for HPBs (Gadin & Hammarstrom, 2002). More research is required to identify potential predictors of health behavior in relation to both individual and family oriented factors, including factors related to school environment, such as teacher support, etc. Some studies have reported on other variables such as self-perception and HPBs, but not specifically in regards to individual, school and family context (Gadin & Hammarstrom, 2002).

As stated in the introduction, health status in children in the United States has been below the average criteria, especially dietary intake and exercise. Crocker et al. (2003) suggested that physical self-perceptions are stronger predictors of change in physical activity and dietary restrain. This suggests that they have investigated health-related behaviors associated with dieting and physical activity. The decline in physical activity and increase in BMI are consecutive concerns. These findings strongly suggest that dietary intake and exercise are linked to body self-perceptions and dietary restrain. In summary, what is known to date is that researchers have not yet investigated the variables mentioned above.

The findings of this study will increase understanding about the predictors among media use, affective state, school context, home context, and health-promoting behaviors. Moreover, the findings from this study should provide essential knowledge concerning individual, school and community aspects affecting school-age children that can predict health-promoting behaviors.

Future research is needed to identify potential social factors that might contribute to changes in HPBs, especially given their role in predicting increases in healthy dietary intake and exercise. It has been reported that peers, parents and the media are potential socializing agents that could impact these observed changes in physical self-perceptions, and should therefore be investigated (Crocker et al., 2003).

In summary, in health promotion, the importance of early intervention should be addressed. This study will identify predictors not only on the individual level but also in home and school contexts. A more structural perspective on predictor analysis will predict future children's HPBs. Further study is required to investigate whether the above findings correlate with these variables, especially the potential individual, social, physical environment and mental factors as potential determinants of change in a range of school-age children (Pearson, Rall, & Crawford, 2010). The question remains whether or not media use mediates the relationship between school context, home context and health-promoting behaviors (dietary intake and physical activity), and if affective state mediates the relationship between media use and health-promoting behaviors. The proposed study will focus on filling the gap of knowledge to explain the causes and effects among these variables.

Significance to Nursing Science

The results of this study suggest that efforts designed to instill HPBs in school-age children must be based on public health models grounded in systemic approaches rather than one-solution causal models. Whether individual children will be responsive to attempts to instill HPBs will depend on the extent to which prevention efforts are capable of improving affective state. Nursing intervention approaches, therefore, should be multifaceted, focusing on enhancing self-esteem and reducing depression, while simultaneously working to build support systems that effectively enhance HPBs in children. These results can inform health care providers and researchers interested in enhancing factors for promoting health behaviors for future interventions. Nursing interventions should emphasize the importance of HPBs among school-age children. Strengthening the delivery of health knowledge pertinent to self-esteem and social support could enrich HPBs in school-age children. Nurses and other health care professionals can encourage and assist school-age children to practice healthy behaviors, emphasizing the impact they have upon their own health. The findings related to the importance of social support suggest nurses and other health care providers can positively influence health behavior.

Significance of School Context

Findings will increase understanding of the relationship between factors that may impact children's HPBs. Teachers and staff who need to understand effective strategies for enhancing HPBs can learn from these findings, allowing them to provide support and encouragement to school-age children. The results of the study may suggest that counseling and health promotion programs can be tailored to suit school-age children.

Such understandings provide a basis for reconstructing models of health promotion, such as Pender's HPM, to incorporate more dynamic frameworks for generating multiple pathways to HPBs. New community practice guidelines offer additional evidence-based recommendations for a wide array of school-, worksite-, and community-based programs and public policies to improve dietary intake and physical activity levels for children and reduce harmful behaviors such as smoke exposure, drug use and gun violence (Glanz, Rimer, & Viswanath, 2008). The current study may also have implications for educational workshops and counseling for individuals who are at risk for developing health problems, or those simply desiring more information about health and wellness. Interventions are needed to promote HPBs among school-age children. Researchers should consider using the significant relationships identified in this study to guide their future intervention development and promote HPBs for school-age children.

New strategies for promoting health efforts have shifted away from individual-level approaches toward systemic approaches that address socio-cultural, political, economic and physical environmental factors (Yancey, Olsen, Guyton, Bakst, & Westman, 2004). This demonstrates the importance of leadership within schools and communities to set priorities and direct local resources toward disease risk reduction.

Significance of Home Context

Researchers required to routinely assessing participation in health promotion lifestyle behaviors through familial and cultural values and beliefs can facilitate this process. The identification of health resources such as health education classes and sources of accessible, lowcost health screening services would be useful for increasing health. Moreover, researchers should determine which health-promoting behaviors to concentrate on for successful health promote on intervention.

Parents could help shape a positive behavioral history for the future by providing interventions that focus on the benefits and remove barriers to engaging in health-promoting behaviors (Smith & Bashore, 2006). Smith and Bashore (2006) suggest that providing care from a health promotion perspective may be useful in helping parents' survivors normalize and increase control over their lives. Parents should direct their conversation to adolescents or young adults, clarify any misinterpretations and encourage them to actively participate in decisions that will ultimately affect their health. These factors cooperatively support the processes that influence individuals to make decisions and participate in health-promoting behaviors. Identification of the interrelationships and an understanding of the dynamics facilitate health-specific behaviors. Moreover, parents can provide specific information to enhance social support for health-promoting behaviors within the context of the family. The importance of social support suggests that family members, peers and friends can influence positive health behavior. This finding can inform parents and children's family interested in enhancing factors for promoting health behaviors in their children.

Significant for Thailand

The findings from the current study may have potential importance for research on HPBs in Thailand, where obesity and other non-communicable diseases such as asthma, diabetes, and hypertension are significantly increasing in school-age children. Similarities and differences between Thailand and Western culturals s have not been fully explored with respect to factors that may influence health promoting behaviors among children and families. Nevertheless, the results of the current study in combination with those reported by (Chenchob et al., 2013), provide a starting point for additional research designed to understand the complex relationships that will lead to culturally appropriate evidence-based programs designed to enhance the health and wellness of children and families in Thailand. .

Research Questions

Research Question 1: Is there a direct relationship between events that occur in school and home contexts for school-age children and health-promoting behaviors?

Research Question 2: To what extent does children's affective state and use of media mediate the relationship between school and home influences on health-promoting behaviors?

Research Question 3: Is there a relationship between media use and affective state in school-age children?

Research Question 4: Do mediation effects vary as a function of sex?

Summary

The rationale for this chapter was to explore the statement of the problem, purpose, background, significance, research questions and specific aims of the current study. The proposed study is to examine and identify the predictive variables among media use, affective state, school and home contexts as predictors of HPBs among school-age children.

CHAPTER 2

CONCEPTUAL FRAMEWORK

Among various individual health approaches to enhancing health-promoting behaviors, Pender's health-promotion model (HPM) has been widely studied, particularly within nursing practice. According to Pender, Murdaugh, & Parsons (2002), individual characteristics and experiences (prior related behavior and personal characteristics) have direct effects on healthpromoting behavior, but also have mediated effects through behavior-specific cognitions and affects. Prior related behavior refers to an individual's presenting state characteristics, and their cumulative life-course experiences. Pender's HPM asserts that health-promoting behaviors are mediated by perceived benefits of action, perceived barriers to action, perceived self-efficacy and activity-related affect. The impact of personal factors is mediated by a set of interpersonal influences (family, peers, providers, norms, etc.) and situational influences (options, demand characteristics) (Pender et al., 2002).

Pender's Health Promotion Model

The revised version of Pender's HPM (2002) is depicted in Figure 1. The model addresses three major constructs: 1) individual characteristics and experiences, 2) behavior-specific cognitions and affect and 3) behavioral outcome. Pender's comprehensive model of health promotion is one of the explanatory nursing models that predict health behavior. A revised health promotion model (Pender et al., 2002), based upon social learning theory, was modified to identify the factors associated with exercise behavior. According to the revised health promotion model, exercise as a health-promoting behavior is influenced by personal and behavior-specific cognitions and affect (Pender et al., 2002). Behavior-specific cognitions and affect are the categories of major motivational significance and provide a useful perspective in explanation of the phenomena. These factors are critical for intervention, as they are subject to modification through nursing actions.

Individual Characteristics and Experiences

According to Pender, Murdaugh, & Parsons, et al. (2011), people have unique and individual characteristics. These unique characteristics will influence the way in which people engage in various behaviors. The individual characteristics or aspects of past experience allow the researcher to include variables that may be important for a particular health behavior rather than include all possible variables for all possible populations (Pender et al., 2002). All variables can be described as follows.

Prior related behavior. Pender et al. (2011) stated that prior experiences influence current behavior. Prior behavior is proposed as having both direct and indirect effects on engagement in health-promoting behaviors. Prior behavior is proposed to also have an indirect influence on health-promoting behavior because of self-efficacy, current actions, benefits and barriers. Activity-related affect may also influence current actions (Pender et al., 2011).

Personal factors. In the revised (Pender et al., 2002), personal factors include biological, psychological and sociocultural factors. Biological factors include variables such as age, body mass index, pubertal status, menopausal status, aerobic capacity, strength, agility or balance. Psychological factors may include self-esteem, self-motivation and perceived health status (Pender et al., 2002; 2011). Examples of sociocultural factors include race, ethnicity, acculturation, education and socioeconomic status.

Behavior-Specific Cognitions and Affect

Behavior-specific cognitions and affect are considered to be of major motivational

significance (Pender et al., 2011) Thus, perceived benefits of action, perceived barriers to action, perceived self-efficacy, activity-related affect, interpersonal influences and situational influences serve a vital role in interventions, because they are modifiable through nursing actions. Six components in behavior-specific cognitions and affect have been identified and are discussed as follows.

Perceived benefits of action. These perceived benefits directly motivate behavior. Indirectly, perceived benefits influence behavior through commitment to the plan of action. One's plan to engage in a particular behavior is based on benefits or positive outcomes that will occur (Pender et al., 2006). Individuals tend to take action if that action is likely to bring about positive and desired outcomes (Pender et al., 2002; 2011).

Perceived barriers to action. Barriers consist of perception of Unavailability, inconvenience, cost, difficulty and time constraints are frequently viewed as barriers to action, which affect health-promoting behaviors (Pender et al., 2011). Perceived barriers to action affect health-promoting behavior directly by hindering action and indirectly by decreasing one's commitment to a plan of action. Barriers can be real or imagined (Pender et al., 2002). The more a person perceives barriers in practicing a particular behavior, the more likely that person will not be committed to engage in the behavior (Pender et al., 2002).

Perceived self-efficacy. Perceived self-efficacy is a judgment of one's abilities to perform specific behaviors in certain situations (Bandura, 1997; Pender et al., 2011). This perception is not necessarily based on the person's actual skills but their perceptions of their abilities (Pender et al., 2011). Self-efficacy is influenced by prior experiences or behavior. A person with high self-efficacy is more likely to adopt health-promoting behaviors than a person with low self-efficacy.

According to Pender's HPM, "perceived self-efficacy motivates health-promoting behavior directly by efficacy expectation and indirectly by affecting perceived barriers and determining the level of commitment or persistence in pursuing a plan of action" (Pender et al., 2011, p. 47).

Activity-related affect. Three components of activity-related affect are affects related to the activity itself, affects related to the self and affects related to the environment or context in which the behavior takes place (Pender et al., 2011). Activity-related affect, which is one's subjective feeling state, may change as a result of stimulus properties of the behavior itself. This change may occur at three different times: before, during and after a behavior (Pender et al., 2002). These emotional reactions may be either positive or negative. This resulting feeling is likely to influence whether a person will repeat a behavior or maintain the behavior long term (Pender et al., 2011).

Interpersonal influences. Interpersonal influences are cognitions or perceptions concerning the behaviors, beliefs or attitudes of others, including expectations of significant others (social norms), instrumental and emotional support (social support), and vicarious learning experiences (modeling) (Pender et al., 2002; 2006; 2011). These sources of interpersonal influences may affect health-promoting behaviors directly or indirectly through social pressure or encouragement to commit to a plan of action (Pender et al., 2011). Social support networks including family, peers and health care providers are primary sources of interpersonal influence.

Situational influences. Situational influences include perceptions of available options, demand characteristics and pleasing features of the environment in which a given behavior is proposed to take place (Pender et al., 2011). This variable may impede or facilitate health behaviors depending on how the person reacts to the environment or situation (Pender et al., 2011). Individuals are more likely to adopt in health-promoting behaviors in an environment in which they feel compatible, reassured, safe, and related (Pender et al., 2011). Situational factors have both direct and indirect influences on health behavior.

Commitment to a Plan of Action

Commitment to a plan of action initiates a behavioral event (Pender et al., 2011). "This commitment will propel the individual into and through the behavior unless a competing demand that the individual cannot avoid, or a competing preference that the individual does not resist, intervenes" (Pender et al., 2011, p. 49). Commitment to a plan of action in the HPM implies the following underlying cognitive processes: 1) commitment to carry out a specific action at a given time and place and with specified persons or alone, irrespective of competing preferences and 2) identification of definitive strategies for eliciting, carrying out and reinforcing the behavior (Pender et al., 2011).

Immediate competing demands and preferences. Immediate competing demands and preferences represent "alternative behaviors that intrude into consciousness as possible courses of action immediately prior to the intended occurrence of behavior" (Pender et al., 2011, p. 49). Competing demands are alternative or unanticipated behaviors, over which a person has little or no control, but he or she must respond to, such as work and family care responsibilities (Pender et al., 2011).

Behavioral outcome. Health-promoting behavior is the outcome of the HPM (Pender et al., 2002; 2006; 2011). The behavior is directed towards gaining positive health outcomes, including improved health (Pender et al., 2011).



Figure 1. Pender's Health Promotion. Model Source: Pender, N. J., Murdaugh, C. L., & Parsons, M. A. (2002). Health promotion in nursing practice (4th ed.). Prentice-Hall: New Jersey.

A modified framework based on Pender's HPM is proposed for this study. A schematic is shown in Figure 2. The modified model is comprised of three constructs: 1) individual characteristics and experiences, 2) behavior-specific cognitions and affect (depression, self-esteem, support from parents, peers at school) and 3) behavioral outcome (health-promoting behavior: dietary intake and physical activity) (Pender et al., 2006). Pender (1996) postulated that personal factors such as gender and race affect HPBs directly, as well as indirectly, through interpersonal influences. Because of the large number of potential personal factors, Pender (1996) suggested that factors be limited to the few that are theoretically relevant to the explanation or prediction of a given target behavior. According to the HPM, inherited and acquired characteristics influence beliefs, affect and enactment of health-promoting behaviors (Pender et al., 2002; Chen, 1995; Garcia et al., 1995; Gillis, 1993; Martinelli, 1999; Stutts, 1997). Although self-efficacy is one of the major motivational factors in Pender's HPM, the data set analyzed for the current study does not contain a measure of that important variable. Instead, the current study focuses on the extent to which internalized aspects of affective state, as measured by self-esteem and depressive symptoms, mediate the relationship between contextual factors and children's dietary intact and physical activity.

In Pender's health-promotion model, social support is viewed as peer social support and parental emotional support and is considered a protective mechanism for health-promoting and health-maintaining behaviors. Conceptually, social support can create a growth-promoting environment, decrease stressful life events and provide feedback or confirmation of actions. When individuals believe that they have adequate social support, the resulting goals of health promotion and health maintenance are more likely to be achieved. Interpersonal influences, including social support, are also posited to have a direct influence on the individual's plan of action and healthpromoting behaviors. Health-promoting efforts have the potential long-term benefits of enhancing the quality of life from childhood through the adult years, increasing longevity, reducing health care costs and increasing national productivity through reduced illness and absenteeism. School may be an important context for health promotion practices to the extent that it provides students with feelings of safety and positive affect.

Health promotion is defined as specific behaviors that individuals perform on a daily basis to improve or preserve their health and well-being (Pender, 1996). Pender (1996) proposed that a person's behavioral outcome does not rely only on the person's perceptions as a primary source of health motivation, but also on individual characteristics and experiences, as well as on cognitive and affective factors. Furthermore, the model addresses three major constructs: 1) individual characteristics and experiences, and experiences, 2) behavior-specific cognitions and affect and 3) behavioral outcome.

Study Framework

This modified model proposes a process consisting of concepts that influence healthpromoting behavior. The factors that influence health behaviors are multidimensional. All factors are interrelated and therefore produce results that exert both direct and indirect influences on health-promoting behaviors. These factors cooperatively support the processes that influence individuals to make decisions and participate in health-promoting behaviors. Their proposed relationships are described in detail below and hypothesized functional relationships between each concept are schematically illustrated in Figure 1.

Pender (1996) developed the Health Promotion Model (HPM) in 1982 and revised it in

1987, then again in 1996. The HPM is an attempt to depict the multifactorial dimensions of people interacting with the environment as they pursue health. The model incorporates concepts from expectancy value theory and social learning theory.

In the early 1980s, the initial version of the HPM first appeared in nursing literature. However, since the late 1980s, when public attention focused more readily on health promotion, the demand for information to explain the factors that motivate people to seek their health potential has risen (Pender, 1982). The model is organized similarly to the Health Belief Model and the modified Health Belief Model (Becker, 1974), which were categorized into individual perceptions, modifying factors and variables affecting likelihood of action. The HPM is also similar to healthprotecting behavior since it consists of a decision-making phase and an action phase.

The health promotion model was revised by removing some concepts including selfawareness and self-esteem because the problems associated with measuring such concepts are formidable. For example, self-awareness is a general and rather ambiguous personal characteristic that is not well operationalized. Furthermore, there is only limited empirical evidence that selfesteem affects level of participation in health-promoting behavior (Pender, 1987). According to this model (Figure 1), health promotion entails activities directed toward developing resources that maintain or enhance a person's well-being. The HPM encompasses two phases: a decision making phase and an activity phase. The model emphasizes seven cognitive/perceptual factors that compose motivational mechanisms for acquiring and maintaining health-promoting behaviors, including importance of health, perceived control of health, perceived self-efficacy, definition of health, perceived health status, perceived benefits of health-promoting behaviors and perceived barriers to health-promoting behaviors, and five modifying factors, including demographic
characteristics, biologic characteristics, interpersonal influences, situational factors and behavioral factor that indirectly influence patterns of health behavior. In the action phase, barriers and cues to action trigger activity in health-promoting behavior.

The current research tests a model derived from Pender et al. (2002) (see Figure 2). The importance of health, perceived control of health and definition of health were deleted from the revised model due to lack of sufficient empirical evidence of explanatory or predictive power, particularly in studies of specific health behaviors.

Pender defined health promotion as specific behaviors that individuals perform on a daily basis to improve or preserve their health and well-being and actualize human health potential (Pender et al., 2002; 2011). She proposed that a person's behavioral outcome does not rely only on the person's perceptions as a primary source of health motivation, but also on individual characteristics and experiences, as well as on cognitive and affective factors (Pender, 1996). Furthermore, Pender (1987) suggested that it is necessary to give attention to the environmental, cultural and social conditions that affect health and HPBs of individuals and groups, because the factors that influence healthful behaviors are interrelated and multidimensional.

Health-promoting behavior is the continuing behavioral, cognitive and emotional efforts of school-age children to sustain and improve health and well-being. Health-promoting behavior is mediating the effects of the antecedent variables such as interpersonal influences. The model proposes that a combination of interpersonal influences, situational influences and affective state for health behaviors directly influence the frequency of health-promoting behaviors. Therefore, it is important to identify factors that predict HPBs, and may directly or indirectly influence HPBs among school-age children, in order to help policy makers and public health professionals

develop and implement policies and programs that enhance HPBs.

The main reasons for modifying Pender's HPM include the following: 1) the relationship between situational/interpersonal influences on self-efficacy is not clearly understood and 2) the theoretical model fails to account for a relationship between health-promoting behavior and health outcomes. In the current healthcare arena, with emphasis on evidence-based practice, the relationship between behavior and outcomes should be made precise (Srof & Velsor-Fried, 2002). The model is based on a synthesis of research findings from studies of health promotion and wellness behavior and serves three important functions: 1) the model introduces order among concepts that may explain the occurrence of health-promoting behavior, 2) the model provides for the generation of hypotheses to be tested empirically and 3) the model integrates disconnected research findings into a coherent pattern (Pender, 1987). To develop more effective HPBs interventions for school-age children, it is important for interventions to be based on theoretical models that adequately explain and predict HPBs. A greater understanding of the mediating mechanisms underlying HPBs may help researchers to develop and implement more effective interventions.

When Pender's model was developed, children's use of digital devices was of little interest in respect to HPBs. A great deal of attention was directed toward the effects of television violence on aggression in children (Bandura, 1977) and the promise of developments of literacy and social behavior from children's television shows. But the effects of children's use of media on healthpromoting behaviors have surfaced within the past decade with the surge in mobile devices, games, available computers, iPods and the like and the possibility that such use was related to reduction in physical activity and exposure to advertising. Therefore, the current study will examine the direct and indirect influences on health-promoting behaviors via school context,

home context, media use and affective state.



Figure 2. Model of health-promoting behaviors in school-age children.

As shown in the model, *school context* and *home context* were measured in wave one of the study. *Affective state* and *media use* were measure in wave two. *Health-promoting behaviors* were assessed from students' report of their dietary intake and physical activity in wave three of the study.

In the current study involving a school-age longitudinal sample, the relative impacts of school-based and home-based factors that influence HPBs are explored. The school-based domain focuses on peer social support (Chenchob, Barnes, Fitzgerald, Lee, & Pandonu, 2011; 2012) but adds school safety; whereas the home context domain focuses exclusively on parent variables (parent emotional support, closeness and involvement). For example, the result of a longitudinal sample of fourth- to sixth- grade students (Chenchob et al., 2013) provided evidence that affective state (self-esteem, depression) mediated the relationship between social support (teachers, parents) and neighborhood safety on two indicators of health-promoting behaviors (children's dietary intake and exercise). In the current study involving the same school-age longitudinal sample, the researcher will be unpacking the social support domain to more directly assess the relative impacts of school-based and home-based influences on HPBs. The current study will examine the extent to which children's involvement with media (television viewing, video games and computer use) mediates school-based and home-based predictors of HPBs that were identified by Chenchob et al. (2013) and many others in the HPM literature (e.g., Callaghan, 2006; Garcia, Pender, Antonakos, & Ronis, 1998; Garcia et al., 1995; Robbins, Pis, Pender, & Kazanis, 2004). However, these results have not been linked to HPBs, especially dietary intake and physical activity. Studying children's use of media in relation to HPBs has received strong support from extensive studies that have implicated exposure to television advertising and similar Web-based messages as detrimental to health in children (Moore, 2008).

In summary, the specific aims in the proposed research were influenced by Pender et al. (2002) multivariate and social learning approach. Moreover, researchers represent a continuation of this investigation of the factors that influence health-promoting behaviors during the transition from elementary to middle school. A modified version of Pender's HPM (2002) guides the models to be tested in this study, a continuation of our investigation of the factors that influence healthpromoting behaviors during the transition from elementary to middle school. Pender's HPM helps healthcare professionals understand health behaviors from a broader perspective by examining the factors that affect the choices people make about their health behavior rather than relying solely on factors within the individual. Indeed, the HPM posits that health behavior is influenced by multiple factors that are both internal and external to the individual. The HPM also identifies relationships among those factors, and provokes awareness of those relationships to enhance our understanding of the complex influences on HPBs in school-age children. Finally, Pender's HPM has been effectively used to guide several cross-cultural studies of health-promoting behavior in school-age children (Robbins, Pis, Pender, & Kazanis, 2004; Wu & Pender, 2002), providing evidence of the usefulness of this model. It has the potential to influence nursing practice, education and administration. In nursing practice, nurses can use the health promotion model to provide a coherent and organized framework for intervening with clients to increase health-promoting behaviors.

Definitions of the Variables under Study

For the purpose of this study, the following definitions are used:

School-age children are fourth to sixth grade boys and girls from a Midwestern state.

School context was defined by children's reports of the extent to which they perceived their peers as supportive and by children's exposure to hostile peer behaviors, such as bullying.

Home context is defined as children's perceptions of the emotional support they receive from their parents as well as the degree to which parents are involved in child-rearing activities. Media use is defined as how often school-age children use television, video games and computers.

Affective state is defined as self-esteem (a stable sense of personal worth or worthiness as measured by self-report) and depression (feeling sad, blue, unhappy, miserable, or down in the dumps).

Health-promoting behaviors are assessed as dietary intake and physical activity. These behaviors serve to help school-age children sustain and improve health and well-being.

Summary

The purpose of this study is to examine the extent to which media use and affective state mediates the relationships between selected variables from the school and home context and HPBs in children. Moreover, based on the prior work (Chenchob et al, 2011; 2012; 2013), the researcher will assess the extent to which children's affective state mediates the relationship between media use and HPBs.

Research regarding HPBs has typically been more focused on specific health-related supports and influences. For example, when examining interpersonal influences, researchers generally examine how interpersonal relationships are supportive of or discouraging for an individual's engagement in healthy behavior. One's friends might encourage eating either healthy or unhealthy food. The current study is examining how the more broadly defined school and home contexts are related to health behaviors. The findings of this study may assist nurses and other health care professionals in learning more about factors contributing to HPBs in school-age children. The current study will enhance knowledge to guide effective nursing interventions aimed at helping school-age children improve their HPBs.

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CHAPTER 3

LITERATURE REVIEW

The purpose of this chapter is to synthesize the literature relevant to the ideas, theories, and research related to health-promoting behaviors in school-age children and factors influencing health-promoting behaviors, in relation to contextual and personal predictors. The chapter presents relevant literature research findings that used Pender's HPM as a theoretical perspective to explain health behaviors and factors that may be predictors of an individual's decision to participate in health-promoting practices.

Health-Promoting Behavior and School-Age Children

The increasing prevalence of being overweight among children and adolescents highlights the need for physical activity and effective dietary strategies for weight management (Davies, Fitzgerald, & Mousouli, 2008; Fitzgerald & Mousouli, 2008). The prevalence of overweight and obesity among children and adolescents has increased dramatically during the past 20 years, and is more pronounced in children from private schools and urban communities than in those from public schools or rural areas (Kosulwat, 2002). Contextual or social factors such as access to recreational facilities or safety of neighborhood environments influence how individuals engage in leisure physical activity.

Physical activity is an important component in overall approaches to the prevention of chronic illness in children. Considering current evidence on the etiologic and epidemiologic characteristics of illness and disease in the Western world, the most important problems in the United States are non-communicable chronic diseases, such as heart disease, obesity, osteoporosis, diabetes, and cancer. Many studies find that regular physical activity is a contributing health care practice that promotes healthy behaviors. Physical activity benefits chronically ill patients by improving their symptoms or their health conditions, and their quality of life. It also is beneficial to psychological well-being, decreasing stress, anxiety, and anger and improving children's academic performance (Filed, Diego, & Sanders, 2001; Sallis, Prochaaka, & Taylor, 2000; Strong et al., 2005)

Research has shown that there is a high dropout rate from programs designed to increase and maintain physical activity. Structured exercise programs have reported dropout rates that range from 9% to 87%. Excluding active participation in sports, girls tend to be less active in physical exercise than boys (Berg et. al., 2009; Biddle, Gorely, & Stensel, 2004; Charoneying, 2005). Therefore, investigators have examined programs designed to enhance efforts to involve more girls in active exercise. Programs have demonstrated that when girls are involved in such programs their physical activity and fitness is associated with perceived self-efficacy (Teerarungsikul et al., 2009). However, the positive effects of the health promotion program were not sustained after 12 weeks in the program (Teerarungsikul et al., 2009).

The challenge for physical activity planning; therefore, is to translate the beliefs and intentions of adolescents into action, and to provide the support and encouragement needed to create physically-active communities. However, most studies of health behaviors in children have focused primarily on individual factors with less attention given to contextual factors that may alter individual predictors of health promotion (Gardin & Hammarstrom, 2002).

It is important to find early predictors for two main reasons. First, identified risk factors can be changed to create a more supportive environment for school-age children and individuals at risk so that they can have special support and help. Second, home and school environment can produce both risk and resilience factors that influence individual personal characteristics.

Pender et al. (2011) defined health promoting behaviors as those "activities motivated by the desire to increase well-being and actualize human potential" (p. 5). Rather than stabilization and avoidance of disease, health promotion behaviors develop the tension necessary to increase sustained practices that improve health (Pender et al., 2006).

Health-promoting behaviors, especially dietary intake and physical activity, when instilled during childhood and adolescence, tend to continue into adulthood. Physical activity, nutrition, social support, life appreciation, health responsibility, and stress management are all important components of models used in health promotion for adolescents (11 - 20 years). Physical activity and nutrition are recognized as health behaviors associated with home and school-context (Goodman, Dolan, Morrison, & Daniels, 2005; Goodman, Daniels, & Dolan, 2007). Although adopting healthy behavior is recognized as one of the best approaches to avoid obesity, strategies to promote HPBs in relation to obesity reduction have not been adequately addressed in the literature (Ogilvie et al., 2007).

Emphasis on health promotion has been an integral part of nursing practices for so long that it is foundational to the discipline of nursing. Evidence has shown that HPBs have been successful in helping people improve their health practices and health conditions (Stuifbergen & Rogers, 1997; Stuifbergen & Timmerman, 2003). Pender (1996) posited that by engaging in healthpromoting lifestyles, individuals could maintain and enhance their well-being and prevent the early onset of disabling health conditions. Adoption of healthy lifestyles could slow physical decline from a chronic health problem and even improve general physical and mental well-being in children. Additionally, there are indications in the health care literature that when identified early, risky factors could be postponed through lifestyle changes and those health-promoting behaviors in particular could benefit children. Although there is awareness of the need for health promotion in school-age children, it is essential to better understand the factors that may contribute to decisions of school-aged children to actually practice healthy lifestyles.

Some researchers have examined how diet, physical activity, and sedentary behaviors relate to overweight status in young children. Studies in adolescents have shown a significant association between physical activity and weight status (Patrick et al., 2004; Sallis, Prochaska, & Taylor, 2000). However, the evidence linking eating and physical activity pattern with overweight in youth is contradictory and inconclusive. Most previous studies have examined nutrition or physical activity factor, but few have examined both. Although most research on children's dietary and physical activity behaviors involve self report, more experimental studies including self-report data can continue to help inform etiologic concepts about the system influences that affect children's practices related to health promotion (Patrick et al., 2004).

Mediating Influences on Health-Promoting Behaviors

One of the under-studied questions flowing from Pender's HPM concerns the extent to which predictors have direct or indirect influences on children's health-promoting behavior. Chenchob et al. (2011; 2012; 2013) derived a mediational model based on Pender et al. (2006) approach in order to examine the extent to which affective state mediated the relationship between indicators of social support and neighborhood context on diet and exercise. Neighborhood safety and social support were both significant predictors of affective state but only when mediated through the child's affective state. The results of Chenchob et al. (2011; 2012; 2013) found that children's affective state mediated the relationship between indicators of social support and perceived neighborhood safety and children's HPBs. Efforts designed to instill HPB in school-age children must be based on public health models grounded in systemic approaches rather than one-solution causal models.

School Context and Health-Promoting Behaviors

School context is defined as children's reports of their parents' emotional support and involvement in the subjects' everyday lives (sometimes referred to as parental monitoring). This variable facilitates health behaviors depending on how reacts to the environment or situation (Pender et al., 2002).

Situational influences included perceptions of available options, demand characteristics, and pleasing features of the environment in which a given behavior is proposed to take place (Pender et al., 2002). Situational factors have both direct and indirect influences on health behavior. Individuals may want to behave in the ways that promote health, but the environmental constraints may prevent healthy actions (Pender et al., 2011). Social support looms as one source of resilience, particularly when such support occurs in the early years of social and neurobiological development.

Social support has been defined in numerous ways, and generally refers to any behavior that assists an individual in achieving a desired goal or outcome. Pender et al.(1994) suggested that a number of possible sources of support for physical activity should be examined, such as parents, older children or siblings, and friends. A few studies have examined the impact of family and friend support for this influence (Sallis et al.,1992; Sallis, & Keating, 1994). In particular, peers are potentially important source of social support for adolescent physical activity (Pender et al., 1994). Conceptually, social support could promote environment, decrease stressful life events, and provide feedback or confirmation of actions (Pender et al., 2002). When individuals believe that they have adequate social support, the resulting goals of health promotion and health maintenance are more likely to be achieved. Social support is considered the most established determinant reinforcing physical activity and the most established determinant reinforcing physical activity (Tinsley, 2007; Duncan, Duncan & Strycker, 2005). Both parents and peers play a crucial role in supporting youths' physical activity (Higgins, Gaul, Gibbons, & Gyn, 2003; Duncan, Duncan & Strycker, 2005; Voorhees et al., 2005).

Perceived importance of school environment is a key environmental component in explaining physical activity behavior among youth (Fein, Plotnikoff, Wild, & Spence, 2004). Fein et al. (2004) examined physical environments to explain and promote physical activity, with home, neighborhood, and school as significant domains. The results showed that perceived importance of the school environment was the only environmental variable significantly associated with physical activity ($\beta = .14$; *p*<.05). This finding needs to provide and support school physical environments related to physical activity. Gadin and Hammarstrom (2002) conducted a three-year prospective study in grade six and grade nine. The objective of this study was to find predictors among young children for later risky heath behaviors with special focus on school-related factors. The results indicated that school-related factors could predict future health behaviors, especially in relation to low physical activity among girls. Low physical activity among girls could best be predicted by school-related factors such as classmate problems, teasing others, rowdiness in the class.

Empirical evidence supports the observation that health-promoting behaviors in schoolage children is affected by valuing peer friendship and other relationships, especially peer social support, and peer hostility and bulling at school. Studies have demonstrated that physical activity environmental characteristics in the school setting have the ability to influence students' activity level (Baranowski, 2004; Sallis,Conway, Prochaaka, Mckenzie, Marshall, & Brown, 2001; Sallis,Conway, Elder, Prochaaka, Brown, Zive, Marshall, & Alcaraz, 2003; Verstraete, Cardon, De Clercq, & De Bourdeaudhuij, 2006). These findings suggest that the increased likelihood of being active in school with rich facilitated environments could be attributed to several factors which are related to children health-promoting behaviors (Salmon et al., 2007).

To our knowledge, no studies have combined affective state (self-esteem, depression), social support (peer social support, parents support (parents emotional support and closeness, parents involvement), situational influence (school safety) to determine their unique and combined contributions to understanding health-promoting behaviors. Few researchers specifically concentrate on predictors in the relationship among individual, family, school, and community context (Higgins, Gaul, Gibbons, & Gyn, 2003). However, the research regarding school-age children, school as a health-promoting setting and as an environment for children's development and behavior has seldom been focused on HPBs. Some studies have reported regarding other variables such as self-perception and health-promoting behaviors (dietary intake and exercise), but not specified in individual, school and family context (Sallis et al., 2001). The relationship between school context and health-promoting behaviors from this study cannot be generalized to the population at large. However, the majority of evidence favors a relationship between school context and health-promoting behaviors. Less peer social support may have a significant direct negative effect on school-age children. Hence, it is essential to explore how school context plays a role in health-promoting behaviors among school-age children.

Home Context and Health-Promoting Behaviors

Home context is defined as children's perceptions of the emotional support they receive from their parents as well as the degree to which parents are involved in child rearing activities.

Parents managed their children's health behaviors (Srof, & Velsor-Friedrich, 2006). Parents also shape the lives of their children from birth through adulthood (Bayers, Bates, Pettit, & Dodge, 2009). Among children, the influence of friends and peers takes on greater importance, but the research clearly demonstrates the continued significance of parents in shaping behaviors and choices of teens as they faced the challenges of growing up and health-promoting behaviors (Borkowsky, Ramey, & Bristol-Power, 2002). There is also clear evidence from longitudinal studies that parenting practices are intergenerational (Kerr, Capaldi, Pears, & Owens, 2009).

Interpersonal influences are cognitions or perceptions concerning the behaviors beliefs or attitudes of others including expectations of significant others (social norms), instrumental and emotional support (social support), and vicarious learning experiences (modeling) (Pender et al., 2002). Interpersonal influences may affect health-promoting behaviors directly or indirectly through social pressure or encouragement to commit to a plan of action (Pender et al., 2002; 2011). Social support networks including family are primary sources of interpersonal influence. According to the HPM, these influences could be sources of encouragement for compliance with health-promoting behaviors and/or the cessation of negative health behaviors.

Parents and children relationships, shared family activities, good parenting skills and positive parental role modeling all have well-documented effects on children's health behaviors and development. Parenting has been shown to play a substantial role in socialization, and more specifically, in the physical and emotional development of youth (Bayers et al., 2009). In some areas, parents could make choices to make positive changes for their children (Bayers et al., 2009). Close relationships between parents and their children including healthy open communication, and perceived parental support are especially important during childhood, as they experience many physical and emotional transitions from childhood to adolescence (Aufseeser et al., 2006). Children are also less likely to report symptoms of depression and more likely to report high levels of perceived well-being when children have parent support and parent involvement (Mounts, 2001). However, it is difficult to interpret the direction or the causal ordering of the association between support from parent, children's affective state and health-promoting behaviors because of lack of longitudinal studies.

Parental monitoring involves knowing the children's situation after school, as well as knowing children's friends, peers and activities (Bayers et al., 2009). Parental monitoring combined with parental support has demonstrated a positive relationship to children's higher self-esteem, and academic accomplishment (Mounts, 2001). In addition, parental monitoring has been associated with fewer internalizing behaviors such as depression and withdrawal, and externalizing behavior problems such as disturbing others and fighting (Barber et al., 1994; Brody, et al., 2002) as well as a lower chance of drinking (Stephenson, Quick, & Atkinson, 2005), and engaging in other risky behaviors. Low parental monitoring, low positive parental involvement consistently, and lack of adult supervision, predict greater levels of conduct problems and delinquency in youth (Bayers et al., 2009). The majority of evidence favors parental monitoring as a predictor of health-promoting behaviors.

Although it is significant, parental involvement is not the only context that can affect influence on children's physical and emotional development. Parents may be considerably

affected by specific characteristics of the neighborhoods in which their families reside (Bayers et al., 2009). Parental intake and children's fat, fruit and vegetable intake have a consistent relationship to their children's health-promoting behaviors. A positive association was found for the relationship between these behaviors and the availability and accessibility of fruit and vegetables. All other associations studied between dietary behaviors and potential environmental factors were inconsistent, appeared non-existent or were not replicated (Host et al., 2006). Parents should support healthy food environments for their children (Jenkins, & Hormer, 2005,; Patrict, & Nicklas, 2005; Ritchie et al., 2005; Story, Neumark-Sztainer, & French, 2004). Research needs to warrant the direction of home context on health-promoting behaviors.

Family meals serve as an important time for children to communicate with and spend time with their parents, which has been associated with fewer depressive symptoms and suicide attempts, and better academic performance (Eisenberg, Neumark-Sztainer, & Bearinger, 2004). Children who eat meals regularly with their parents are also more likely to eat fruits, vegetables, and dairy foods and less likely to skip breakfast (Bayers et al., 2009). More frequent family meals, a more structured family meal environment and a positive atmosphere at family meals are associated with a lower likelihood of disordered eating (Neumark-Sztainer, Wall, Story, & Fulkerson, 2004).

Parents' health-related behaviors could influence children's health-promoting behaviors in several ways including providing positive (or negative) role models and by contributing to healthy or unhealthy physical and social environments. Parental behavior could also shape children's risky behaviors by increasing simple access to cigarettes or alcohol in the home, or, on the positive side, increasing access to healthy foods (Aufseeser et al., 2006). Moore and Harre (2007) examined the

eating behaviors, physical exercise and television viewing of secondary school students and investigated their relationship with parental monitoring and family cohesion. The results showed that parental monitoring and family cohesion were significant positively related to participants' report of eating breakfast and eating healthy food, and significant negatively related to reports of buying one's own food and eating unhealthy food. Exercise rates were moderately correlated with eating healthy food and weakly related to parental monitoring and family cohesion. Television viewing was related to eating unhealthy food.

The family environment could be a strong source of support for developing adolescents, providing close relationships, strong parenting skills, good communication, and modeling positive behaviors models (Borkowsky, Ramey, & Bristol-Power, 2002). For example, research shows teens who have positive relationships with their parents are less likely to engage in various risk behaviors, including smoking, fighting, and drinking (Aufseeser et al., 2006). Both parents and peers play an essential role in supporting youths' physical activity experience (Kremarik, 2000; Sallis et al., 2000; Okun, Karoly, & Lutz, 2002).

In summation, home context and and health-promoting behaviors have been investigated in the literature regarding school-age children and supports the linkage among the current study variables. For school-age children, parents play an important role in managing their children's health behaviors. Research on the influence of parents on health-promoting behaviors has been consistent (Aufseeser et al., 2006; Kremarik, 2000; Sallis et al., 2000; Okun et al., 2002). Positive parental involvement may also decrease risk for deviance by promoting competence and the internalization of parental values.

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In conclusion, the studies discussed in this literature review reflect the variables included in the proposed study. In addition, the research supports the contention that these variables have an impact on the practice of health-promoting behaviors among school-age children. The findings are consistent; however, regarding the relationships between home context (parent emotional support and closeness, and parent involvement) and health-promoting behaviors.

Media Use and Health-Promoting Behaviors

Media use is defined by how often school-age children use television, video games, and computers. During the past 40 years, the impact of media on children's behavior has garnered increased attention. Initially, researchers and health professionals focused on the impact of television on children's aggressive behavior (Eron, 1982) and weight gain. Dietz and Gortmaker (1985) concluded that there were positive and perhaps causal connections. Increasingly, such concerns have shifted beyond children's exposure to television to include time spent playing video games or texting on mobile devices. Studies have reported positive effects of computer-use on children's academic achievement (Jackson et al., 2006; Kulik, 1994; Wenglinsky, 1998), and expansion of social networks (Jackson et al., 2010), or no effects (Jackson, 2008). Roschelle, Pea, Hoadley, Gordon, and Means (2000) noted that due to the extent to which IT use interferes with the four fundamentals of learning (active engagement, participation in groups, frequent interaction and feedback, connections to real-world contexts), use of computer-based instruction will likely be less effective. Computer use can be socially and psychologically isolating, resulting in feelings of depression and loneliness (Amichai-Hamburger, & Ben-Artzi, 2003). With respect to video games, while video games may enhance visual spatial skills (Subrahmanyam et al., 2000), other evidence suggests that levels of aggression are higher in children who are the heavy users of video games,

particularly violent games (Anderson, Gentile, & Buckley, 2007). Teacher ratings of children's behavior in school are more negative when compared with children who play games less frequently (Anderson et al., 2007).

Jackson et al. (2011) studied the effects of internet, video game, and cell phone usage on children's weight gain and self-esteem. Although ethno-racial group membership and age and income levels predicted grades in school and body mass index (BMI) or body weight, none of the IT indicators did. Conversely, information technology use did predict children's social self-esteem (Jackson et al., 2011). Children who played video games more had lower social self-esteem than children who played them less. On the other hand, children who used cell phones more had higher social self-esteem than those who used them less.

Children are exposed to an extraordinary amount of information about energy dense foods on television (Moore, 2008). Low levels of exercise, high consumption of energy-dense foods, and low affect entirely contribute to children's weight gain. With rare exception (e.g., Nintendo's Weii), screen time is the time of high caloric consumption and low physical activity (Jackson et al., 2010), contributing to weight gain and obesity (AOA, 2005). Finkelstein, Rhum and Kosa (2005) note that there are 10 or more food commercials per hour, most of which are for fast foods and soft drinks, adding to televisions impact on children's weight gain. Adams (2006) specifically targets poor eating habits, soft drinks, lack of exercise, and high amounts of time spent watching television or on a computer as major contributors to child obesity. In the United States, 17% of 2-19 year olds and 10.4% of pre-school age children are obese (American Obesity Association, 2005; Ogden et al., 2006). Therefore, examining the role of media use on children's weight gain is a vital issue. Media use should include in assessments of children, and reinforce efforts of parents to monitor and restrain TV viewing. Schools and community organizations could offer youth comprehensive media education programs and promote local TV turnoff week project (Lowry, Wechsler, Galuska, Fulton, & Kann, 2002). Decreasing the time spent on watching TV creates chances for activity and many shift dietary intake away from high-calorie, high-fat foods incidence advertised on television (Dietz & Gortmaker, 2001).

Assessments of children should include media use, and should reinforce efforts of parents to monitor and restrain TV viewing. Schools and community organizations could offer youth comprehensive media education programs and promote local TV turnoff week projects (Lowry et al., 2002). Decreasing time spent watching TV creates increased chances for activity and may shift dietary intake away from high-calorie, high-fat foods advertised on television (Dietz, 2001).

Previous research has shown a complex interaction between time spent watching television, physical activity level and body fat level (Proctor et al., 2003; Biddle et al., 2004). Even if television does not reduce exercise time, it may still be problematic by increasing and promoting snack advertisements. To help develop effective interventions to reduce television viewing and increase physical activity, a consistent correlation between TV viewing and negative health behaviors needs to be identified (Gorely, Simon, Marshall, Stuart, & Biddle, 2004). TV viewing appears to increase between-meal snacking and was inconsistently related to children asking for and choosing TV-advertised foods, and actual dietary fat intake (Gorely et al., 2004). Also, TV viewing in children is positively associated with parental viewing habits. Some studies reported that no relationship was found between TV viewing and physical activity (Gorely et al., 2004; Sallis et al., 2000). In summary, children's media use may influence their health-promoting behaviors. It is a factor encouraging expose to risky behaviors and healthy behaviors. The media influences children's perspectives depending on the media quality.

In conclusion, the studies discussed in this literature review reflect the variables included in the proposed study. In addition, the research supports the contention that these variables have an impact on the practice of HPBs among school-age children. The findings are not consistent; however, regarding the relationships between children's media use and HPBs, the studies conflict or the findings are weak, therefore, further research is warranted in these areas.

Affective State and Health-Promoting Behaviors

Affective state is defined as *self-esteem* (a stable sense of personal worth or worthiness as measured by self-report), and *depression* (feeling sad, blue, unhappy, miserable, or down in the dumps).

Multiple factors including psychological attributes, HPBs and biological factors influence on an individual's ability to make required lifestyle changes. An absence of depression could be influenced by physical activity because physical activity may offer protective, buffering effects on mental health for youth prior to the onset of emotional problems (Dyck, 2000) by raising levels of self-esteem, body image and self-concept (Higgins et al., 2003). Regular exercise participation has been found to be associated with a decrease in state and trait anxiety, depression, and stress (Dunn & Madhukat, 2001). Chenchob et al., (2011; 2012; 2013) found that affective state mediated the effect both the relationship of social support and neighborhood safety on children's healthpromoting behavior. Social support and neighborhood safety are indirectly affected on HPB. Health-promoting behavior models suggest that children develop higher levels of self-esteem when they set and attain goals (Crawford, et al., 2001), when they feel that others accept them, and when they have positive loving relationships with caregivers (Bee, 2000). Children's affective state characteristics predict their high risk behavior from early childhood into the elementary years. Because studies of information technology usage suggest that high use of television and computers is linked to indictors of loss of affective state (depression, loneliness) (Jackson et al., 2006), the current study examines whether media use and affective state also mediates the relationship between school, home context and HPBs.

Sex differences in self–esteem have been noted with higher self–esteem commonly identified in males and decreasing self–esteem in females as they enter adolescence (Hendricks et al., 2001). Across culture and gender, abilities were valued as a promoting self–esteem (Guinn, Vincent, Semper, & Jorgensen, 2000; Hendrickset et al., 2000). Studies revealed that self–esteem might be influenced by a variety of factors including environment, culture and social support (Mahat et al., 2002; Schmitz, 2006; Swaim & Wayman, 2004). Regardless of the antecedents to self–esteem, the direct relationship to HPBs remains.

Positive Self–esteem promoting positive behavior is generally viewed in adolescent studies (11 – 20 years) as global self–esteem rather than self–esteem garnered from past accomplishments (Rosenberg et al., 1995). Self–esteem directly kindles HPBs decreasing the likelihood of health–risk behavior (Hendricks et al., 2001; Riesch, Anderson, & Krueger, 2006; Torres & Fernández, 1995). Self–esteem was not significantly associated with nutritional health behavior (Torres & Fernández, 1995). Nelson and Gordon–Larsen (2006) investigated relationships among self–esteem and HPBs in almost 12,000 adolescents (11% Hispanic) using data from a national longitudinal study with mean age of 15. Cluster analysis of this data revealed patterns of HPBs

associated with higher self–esteem. This finding raises a question about the influence of selfesteem on health-promoting behaviors two years later in school-age children.

In the current study, researcher hypothesize that school-age children who have greater selfesteem are more likely to practice the HPBs. Self-esteem represents a motivational force that influences perceptions and coping behavior (Mann, Hosman, Schalma, & Vries, 2004). Therefore, school-age children with high self-esteem are likely to select appropriate health activities, and have greater commitment to pursue anticipated outcomes.

Mann et al. (2004) found that a high self-esteem score was a significant predictor of engaging in HPBs in school-age children, and schools need to aim at helping children develop a healthy sense of self-esteem as part of the development of their intra-personal intelligence. In those studies, findings showed that self-esteem had a significant, direct effect on HPBs. Many psychosocial models of health behaviors also suggest that children develop higher levels of selfesteem when they set and attain goals to succeed (Crawford et al., 2001). Children, who feel that others accept them, and they are unconditionally loved and respected, will report a higher selfesteem (Bee, 2000). Also, self-esteem is critical to school-age children in making positive health decisions (Davis et al., 1999). In the current study, it is possible that school-age children having high level of self-esteem may have tendency to engage in the activities needed to enhance their health and well-being, which may explain why school-age children who had greater self-esteem are more likely to practice HPBs. Megel et al. (1994) examined relationships among self-esteem, health promotion, nutrition, and weight in 57 female college freshmen (mean age 18.5 years). The results indicated that positive correlations were identified among health promotion behaviors, selfesteem, and nutrition. Self-esteem, self-efficacy and hope, have been demonstrated to be strong predictors of HPBs in adolescents (Yarcheski et al., 2004).

Garcia et al. (1995) examined gender and developmental differences in exercise-related beliefs and exercise behaviors of 286 racially diverse youth and found that female reported less prior and current exercise, lower self-esteem, poorer health status, and lower exercise self-schema than men. More active parents had more active children, indicating the importance of positive parental role models. Ease of access to exercise facilities was related to the level of physical activity in adults and also may affect exercise patterns of youth.

Research has shown significant relationships between depression and health behaviors among adolescents, particularly regarding the use of tobacco, alcohol, and other drugs use among adolescents. Less is known about the relationships between depression or depressive symptoms and other health behaviors such as eating, nutrition, and physical activity among adolescents in nonclinical settings. Depressive symptoms can be associated with lower rates of "healthpromoting" behaviors and may inhibit full-health potential across multiple domains of health (Fulkerson, Sherwood, Perry, & Neumark-Sztainer, 2003).

In population-based male and female adolescent samples, depression or negative mood has also been linked with health-compromising attitudes and behaviors such as weight dissatisfaction (Tomori & Rus-Makovec, 2000), negative body image (Stice, Presnell, & Spangler, 2002), disordered eating (Neumark-Sztainer et al., 2000). Samples limited to female adolescents have also shown higher rates of binging (Ackard, Neumark-Sztain, Story, & Perry, 2003) purging, and dieting (Pesa, 1999) among girls who reported depressed mood. One study illustrated a significant negative relationship between depressed mood and health-promoting eating behaviors such as eating breakfast and lunch (Kaplan, Landa, Weinhold, & Shenker, 1984). Skipping meals, particularly breakfast, may affect concentration and learning. Fulkerson et al. (2004) described associations between depression symptoms and nutritional intake or physical activity among adolescents in a nonclinical trial. The results showed that depressive symptoms were positively associated with health-compromising attitudes such as perceived barriers to healthy eating and weight concerns, such as unhealthy weight-control behaviors. However, depressive symptoms were negatively associated with health-promoting behaviors such as eating breakfast, lunch, and dinner.

An absence of depression could influence physical activity because physical activity may offer protective, buffering effects on mental health for youth prior to the onset of emotional problems (Dyck, 2000) by raising levels of self-esteem, body image and self-concept (Higgins, et al., 2003). Indeed, regular exercise participation has been found to be associated with a decrease in state and trail anxiety, depression, and stress (Dunn, & Madhukat, 2001). Higgins et al. (2003) reported that female youth were found to be less physically active and more concerned about being overweight, and more depressed. However, females were more likely to report greater social support than males and to be more socially involved.

A review of the literature reveals that self-esteem is consistently identified as a significant predictor of health-promoting behaviors within a variety of groups, including children, and adolescents (Bee, 2000; Davis et al., 1999; Mann, Hosman, Schalma, & Vries, 2004; Megel et al, 2004; Swaim & Wayman, 2004; Nelson & Gordon–Larsen, 2006; Yarcheski, 2004). Only one study was demonstrated that self-esteem was not significantly associated with nutrition health behavior (Torres & Fernández, 1995). Research on the influence of gender on health-promoting behavior found that males reported higher self-esteem and higher exercise level than females (Garcia et al., 1995). The gender difference in school-age children specifically requires further exploration. Although self-esteem has been examined and its potential impact on health-promoting behaviors in several health promotion studies has been consistently reported, no studies have included in school-age children. Self-esteem among school-age children needs to be studied, because the results may prove useful in enhancing the health of this population. Self-esteem and health-promoting behaviors have been investigated in literature on school-age children that supports the linkage among the current study variable.

Depressive mood were negatively associated with health-promoting behaviors, especially in health-promoting eating behaviors such as binge eating (Stice, Presnell, & Spangler, 2002), disordered eating (Neumark-Sztainer et al., 2000), and bulimic symptoms (Roew, Pickles, Simonoff, Bulik, & Silber, 2002). Studies revealed that regular exercise has been shown to decrease in depression (Dunn, & Madhukat, 2001; Higgins et al., 2003). There is insufficient knowledge to identify whether depressed mood continued to influence health-promoting behaviors two years later in school-age children.

Previous cross-sectional studies revealed that predictors of health-promoting behaviors are associated more with family and school. There is a substantial literature base examining factors associated with physical activity (PA) among youth (Crocker et al., 2003). Such factors could be organized according to Pender's HPM (2002) which suggest that affective state (self-esteem, depression), social support (peer support, parents support (parents emotional support and closeness, parent involvement), situational influence (school safety and neighborhood safety) are crucial considerations when attempting to understand health-promoting behaviors. Studies examined the relationship between the home and neighborhood environment and PA (Ferrial et al., 2007; Kligemam, Sallis, Ryan, Frank, & Nader, 2007; Norman et al., 2006).

Srof and Velsor-Friedrich (2006) used Pender's HPM to investigate in relation to adolescent health. The HPM variables that did not demonstrate significance on the regression model were entered into an exploratory path analysis equation in order to examine the indirect effects of self-efficacy, grades, perceived health, social support, and exercise norms as modulated by the overall perceived benefits-barriers differential. This study implied that home context in which person live their lives can either sustain and expand their health potential or inhibit the emergence of health and well-being. Cartland and Ruch-Ross (2006) found that older children scored higher than younger ones on factors generally associated with improved health behaviors (such as health knowledge and refusal skills). Older children scored lower than younger children on healthy behaviors, especially risk behaviors. As health knowledge, refusal skills and other protective factors increased, health behaviors improved slightly. Especially for gender, Garcia et al. (1995) demonstrated that background characteristics, specifically gender, played a significant role in determining exercise behavior. The study also supported the HPM as a useful model for explaining physical activity and health-promoting behavior among teens. This study demonstrated an indirect effect of self-efficacy and social support on physical activity behavior that may contribute to adolescent health-promoting behavior. Also, girls scored significantly lower than boys in terms of exercise, self-esteem, perceived health status, previous exercise experience, and self-schema for exercise. However, there were no significant gender differences for self-efficacy, social support, the benefits-barriers differential, or access to exercise facilities.

The results of previous studies (Garcia et al., 1995, 1998; Wu & Pender, 2002) supported

the theoretical propositions of the HPM. The studies provided evidence that age/grade and gender are an important background characteristics influencing physical activity behavior. Frenn and Malin (2003) used a combined the HPM and transtheoretical model (TM) approach to examine diet and physical activity behaviors across stages of change in middle school students. The findings demonstrated a significant difference in behavior across stages of change. The percentage of dietary fat content and the temptation to consume high fat foods declined, and access to low fat food increased. Physical activity behavior also increased overall across the stages of change. There is insufficient knowledge to identify whether school context and home context influence HPBs in school-age children. The study is particularly interested in individual context, including selfesteem and depression, which are believed to have a potential influence on HPBs. Both school and home context may be an especially crucial factor for certain groups of school-age children, and indeed physical limitations and the lack of accessibility, time, and resources have recently been found in the literature on Western subjects to be barriers to HPBs.

Those variables may be barriers to engaging HPBs among school-age children as well. For that reason, the proposed study investigates the relationship between variables as previous mentioned among school-age children and HPBs. In addition, numerous studies have shown selfesteem to be a significant predictor of HPBs; therefore, this study addresses the linkage between self-esteem, and media use as a determinant of HPBs among school-age children. Finally, a number of studies have shown that interpersonal influences, defined as social support from parents and peers, could affect individuals' predispositions to engage in HPBs, and this variable is included in the proposed study.

Summary

In summary, all of the studies cited above suggest the usefulness of the HPM in explaining the occurrence of health-promoting behaviors. A review of the research literature indicates that the HPM has been used in relation to various populations to study variables that could impact healthpromoting behaviors in school-age children. The results from previous studies could not be generalized to school-age children, however, because of the different nature of school context, home context, individual context, and exposure to media. In addition, some studies have been limited by small sample sizes, convenience of sample selections, and the use of cross-sectional designs.

The contributions of health-promoting behaviors and the factors influencing these healthpromoting behaviors in school-age children have few reports in the literature. In addition, there are no current studies assessing the influence of those factors as mentioned above in school-age children. To broaden our knowledge of health-promoting behavior and its related factors, research is required to apply Pender's HPM (2002) to a sample of school-age children. Such research could provide data regarding the benefits of the HPM in understanding health-promoting behaviors. In addition, the research could provide a foundation for the development of appropriate intervention techniques to help school-age children increase their health-promoting behaviors and guide research related to health-promotion activities.

CHAPTER 4

METHODS

Chapter four focuses on the research methods, including research design, sample, data collection procedures, instruments, protection of human subjects, and data analysis strategy.

Design of the Original Coordinated Community Assessment Study

The Coordinated Community Assessment (CCA) was a longitudinal study designed to conduct community needs assessment and evaluate student outcomes based on school program participation in youth development programs. The guiding questions underlying CCA are: 1) What are student needs and strengths, and do these needs and strengths differ across communities, 2) What are the critical times to begin prevention activities across different domains of student outcomes, 3) What are the differences in needs and strengths for boys and girls, 4) How do home, school, and neighborhood environments influence student outcomes, and how do these influences change over time and, 5) How does participation in school-based support services influence student outcomes. The primary assessment instrument used in the study, the Community Student Survey (C^2S^2) is a survey designed to assess student outcomes related to health, safety, and nutrition programs and services provided by schools to students from 4th to 12th grade throughout Genesee County. The C^2S^2 was designed in collaboration with multiple community partners.

The C^2S^2 survey was administered in the spring of 2006, 2007, 2008, 2009, and 2010. A total of 32,210 students completed the survey at least one time during the five years of the study. Of these students, 12,450 students completed the survey in 2006. In 2007, 10,145 students completed the survey. In 2008, 11,597 students completed the survey. In 2009, 12,175 students

completed the survey, and in 2010, 8,107 students completed the survey.

Procedure for Data Collection. Students completed the Coordinated Community Student Survey (C^2S^2)-208 items, a 45-minute self-report questionnaire comprised of 208 items and designed to assess student's attitudes, beliefs, and behaviors about physical, social and mental health as well as school, home, and neighborhood environments. Consent forms were distributed to the parents of all students in participating school via student backpacks and home mailings. Approximately 40% of all parents provided consent for students to participate in the study. Signed parental consent forms and student assent forms were collected prior to data collection. University research staff administered surveys at each participating school during school hours. Personal identifying data were obtained for the purpose of connecting survey data across the years to build a longitudinal database. Each student was assigned an identifying code in the database so that researchers using the data set would have de-identified data.

Design of Current Study.

The present study uses a secondary data analysis using a de-identified longitudinal dataset from the CCA. The current study involved one cohort (three waves) of elementary students in a Midwest area comprised of over 100 urban, suburban, and rural schools (Barnes, Almerigi, & Hsu, 2010).

A cross sequential design was used to track children on a period (grades 4-6; grades 5-7, and grades 6-8) (see Table 1).

Table 1

Child Grade	Wave 1 2006 (n)	Wave 2 2007 (n)	Wave 3 2008 (n)
4^{th} 5^{th} 6^{th} 7^{th} 8^{th}	424 472 474	(424 (472 (474)	424 472 474
Total N	1370	1370	1370

The Cross-Sequential Design of the Study by Grade and Wave

Note: Wave 2 included eight students who repeated a grade between wave 1 and wave 2

<1%; Wave 3 included 11 students who repeated a grade between wave 2 and wave 3 < 1% 560 malas 810 females

<1%. 560 males, 810 females

Note, Students at each beginning grade were assessed at each of the next two grades.

Sample and Sampling Procedures

The sample consisted of all 1,370 students who were in the 4^{th} to 6^{th} grade in the first year

of the study (2005), and who also completed the survey in 2006 and 2007. The mean number of students per school was 16.70 (SD= 22.28, Range= 1-156). Data from the full study indicate that of the 32,210 who completed the survey, three or more consecutive waves of data were obtained for 4,048 students (12.6%).

Table 2

	Demographic characteristics	Ν	Percentage
Sex	Boys	560	41%
	Girls	810	59%
Race	African American	223	16%
	American Indian	24	2%
	Asian	7	Less than 1%
	Hispanic	23	2%
	Multiracial	100	7%
	White	990	72%
	Not reported	3	Less than 1%

The Percentage of Sexual and Racial of the Sample (n = 1370)

Approximately 59% of the sample were girls (n=810) and 41% were boys (n=560). Seventy-two percent (n=990) of the students self-identified as White, and 16% (n=223) of students self-identified as African American. A small percentage identified as another ethnicity (2% American Indian, n=24; <1% Asian, n=7; 2% Hispanic, n=23; and 7% multiracial, n=100).

Sampling Procedures

The sample selection from the original data set for this study were obtained by the one-

step procedure that selected all of the school-age children in the original data set.

Inclusion criteria. Selection criteria are based on all 4th grade to 6th grade children and *no*

missing data at any of the three waves of data collection.

Exclusion criteria. Only children who did not have parental consent or those with parental consent who refused to sign an assent form were excluded from the original study.

Instrument

The demographic questionnaire consisted of five questions. The data collector asked common demographic questions such as name, birth date, gender, and race.

Scale Descriptions

Data from four broad domains and ten constructs were utilized for this study:

1. *School context*: Peer social support at school (4 items), peer hostility and bullying at school (9 items),

2. Home context: Parent involvement (9 items), parent emotional support and closeness (8 items)

3. Affective state: Depression (13 items) and self-esteem (8 items)

4. *Health-promoting behavior*: Dietary intake (6 items), physical activity (2 items), Media use (3 items).

School context and home context were measured in *wave 1* of the study. School context was comprised of three variables: peer social support at school, peer hostility and bullying at school. Students self-reported their experience of peer social support at school on six items scored on a Likert scale ranging from "Strongly Disagree," "Disagree," "Agree" to "Strongly Agree" (α =.75). Students self-reported their experience of peer hostility and bullying at school on 9 items scored on a Likert scale ranging from "Never," "Not much,""Sometimes" to A lot (α =.87). A standardized factor score was computed for *school context* using at least square regression approach. All scale scores loaded strongly onto the single factor with evidence of correlational relationships between the factor scores and factors. A high score in school context indicates a student perceives greater risk in his or her peer in school.

Home context was comprised of two variables: parent emotional support and closeness, and

parent involvement. Students self-reported their experience of parent emotional support and closeness on nine items scored on a Likert scale ranging from "Strongly Disagree," "Disagree," "Agree" to "Strongly Agree" (α =.90). Students self-reported their experience of parent involvement on 9 items scored on a Likert scale ranging from "Never," "Not much," "Sometimes" to A lot (α =.79). A standardized factor score was computed for *school context* using at least square regression approach. All scale scores loaded strongly onto the single factor with evidence of correlational relationships between the factor scores and factors. A high score in home context indicates greater levels of support from parents in the child's life.

Affective state was measured at *wave 2* of the study, approximately one year after Wave 1 data were collected. Students self-reported their experience of depression on 13 items scored on a Likert scale ranging from "Not at all like me," "Not much like me," "Kind of like me" to "A lot like me" (α =.90). The depression scale score was recoded to represent a lack of depression symptoms. Students self-reported their experience of self-esteem on seven items scored on a Likert scale ranging from "Not at all like me," "Not much like me," "Kind of like me" to "A lot like me" (α =.78). A standardized factor score was computed for affective state using a least squares regression approach with Varimax rotation. Both scale scores loaded strongly onto the single factor with evidence of correlational relationships between the factor scores and factors. A high score in affective state indicates a positive emotional state.

Media use was measured at *wave 2* of the study, approximately one year after Wave 1 data were collected. Student self-reported their experience of exposed to media on three items scored on a Likert scale ranging from "Less than 1 hour a week," "1-3 hours a week," "4-6 hours a week," "7-9 hours a week," "10-12 hours a week," "13-15 hours a week" to 16⁺ hours a week".

Item responses were dichotomized into two categories: "healthy" and "at risk". Item responses of less than 1 hour a week, to 7-9 hours a week, were categorized as healthy. Item responses of 10 or more hours a week were categorized as "at risk". The dichotomized variables were then summed to create a total health-promoting behavior score reflecting cumulative risk (ranging from 0 = healthy response to 3 = at risk on all 3 items). A high score in media use indicates a student perceives greater risk in his or her the exposed media.

Health-promoting behaviors at Wave 3 were assessed from students' report of their dietary intake (six items) and physical activity (two items). Dietary intake items included self-report of frequency of intake of healthy and unhealthy foods in the past year on a scale of "Never," "Not much," "Sometimes" to "A lot". Item responses were dichotomized into two categories: "healthy" and "at risk". A "Never" or "Not much" response to healthy food items was categorized as "healthy for healthy food items and "at risk" for unhealthy items. Physical activity items included self-reported engagement in physical activity "during and average week" on a scale of "Never," "1 or 2 days a week," "3 or 4 days a week" and "5 to 7 days a week". Item responses were dichotomized into two categories: "healthy" and "at risk". Item responses of "Never" or "1 or 2 days a week" were categorized as "healthy". The dichotomized variables were then summed to create a total health- promoting behavior score reflecting cumulative risk (range from 0 = at risk response on all 8 items to 8 = healthy on all eight items). A high score in HPBs indicates a student perceives more involvement in his or her HPBs. The C^2S^2 subscales and their alpha reliability indices are presented in Table 3.
Construct	Items	Rating Scale	Reliability
1.Affective State -Depression	 During the PAST YEAR, how often did the following things happen? a. I felt good. b. I felt upset. c. I felt that I could not stop being sad. d. I felt good about the future. e. I had a hard time sleeping. f. I was happy. g. I talked less than usual. h. I felt lonely. i. I felt sad. j. I was bothered by things that usually don't bother me. k. I felt down and unhappy. l. I felt like I was too tired to do things. m. I felt like crying 	-Not at all -A little -Some -A lot	.89
-Self-esteem	 How well do the following statements describe you? a. I think I am good looking. b. I think I'm pretty good at figuring out problems at school. c. I think I am very smart. d. I have lots of friends. e. I get along well with other kids. f. I like who I am. g. I am good at sports. h. I think I am a good person. 	-Not at all like me -Not much like me -Kind of like me -A lot like me	.75
2.School environment - Peer hostility and bullying at school	In the PAST YEAR, how often did the following things happen a. I felt safe at my school. b. A kid at my school hit or pushed me when they were not playing around. c. A kid at my school said he or she was going to hurt me.	-Never -Not much -Sometimes -A lot	

The C^2S^2 Subscales Constructs, Items, Rating Scale and alpha reliability indices

Table 3 (cont'd)

Construct	Items	Rating Scale	Reliability
	 d. A kid at my school told lies or false rumors about me. e. I skipped class or school without permission because I was afraid of being hurt by another student. f. I have been left out or ignored by kids at my school. g. My money was taken away by a kid at my school. h. My things were taken away or broken by a kid at my school. i. I saw violence in my school (for example, bullying, hitting, kicking, punching) 		
-Peer social support at school,	How much do you agree or disagree with the following statements?a. There are students at my school who really care about me.b. I feel alone when I'm at my school.c. It is hard to make friends at my school.d. I usually spend lunch and/or recess time alone at my school.	-Strongly disagree -Disagree -Agree -Strongly agree	.75
3.Home environment - Parent emotional support and closeness	 How much do you agree or disagree with the following statements? Your parents / caregivers a. enjoy spending time with you. b. listen to you. c. spend time reading with you. d. know your friends. e. do fun things with you. How much do you agree or disagree with the following statements? a. I like to talk to my parents / caregivers. b. I like to spend time with my parents / caregivers. c. I try to make my parents / caregivers happy 	Strongly disagree -Disagree -Agree -Strongly agree	.90

Table 3 (cont'd)

Construct	Items	Rating Scale	Reliability
- Parent involvement	How often do your parents / caregivers (whoever takes care of you) a. ask about what you've been doing in school? b. check whether you have done your homework? c. see if your homework is correct? d. come to your school's activities or help in your classroom? e. talk to you about your problems? f. limit the amount of time you can watch TV? g. limit the amount of time you can play video games? h. tell you that you shouldn't drink alcohol or use drugs? i. let you stay home alone with no adults around?	-Never -Not much -Sometimes -A lot	.79
4. Health behaviorsDietary Intake	In the PAST YEAR, how often did you drink or eat a. soda pop? b. milk, cheese, or yogurt? c. 100% fruit juice? (such as orange juice,? apple juice, grape juice) d. French fries, potato chips, or other fried potatoes e. fruit? f. vegetables?	-Never -Not much -Sometimes	
- Physical activity	During an AVERAGE WEEK, how often do youa. exercise or play for 30 or more minutes where you were sweating and breathing hard?b. lift weights or do strength training?,	-A lot -Never -1to2 day a week -3-4 days a week -5to7days a week	

Table 3 (cont'd)

Construct	Items	Rating Scale	Reliability
-Media use	During an AVERAGE WEEK, how often do you a. watch TV? b. play video games? c. surf the internet (not for homework)?	-Less than 1 hour a week -1-3 hours a week -4-6 hours a week -7-9 hours a week -10-12 hours a week -13-15 hours a week -16 ⁺ hours a week	

Note. C2S2 = Genesee County Coordinated Community Student Survey, 2004. © Jessica Barnes-Najor. Questions reproduced by permission. For access to the questionnaire contact Dr. Jessica Barnes-Najor (<u>barnes33@msu.edu</u>).

Data from four broad domains and eight constructs were utilized for this study:

In its final form, the survey assessed 24 constructs, each comprised of a minimum of four items.

Data from four broad domains and nine constructs were utilized for this study.

Data Management

Data provided for this study were fully cleaned and no missing data were present.

Plan for Data Analysis

Research questions were identified and addressed through data analysis using the Statistical

Package for Social Sciences (SPSS) and Mplus. Data analysis strategies included computation of

descriptive statistics, Cronbach's alpha coefficient, and structural equation modeling (SEM). SEM

was used to examine the hypothesized relationships between HPBs in school-age children that

could be explained by school context, home context and media use, and the extent to which media

use mediated other effects. Maximum likelihood (ML) estimation is a normal theory and full-

information method set and is the default in most SEM programs.

All of the estimates of model parameters could be tested statistically in a simultaneous analysis of the entire system of variables, maximizing the likelihood (the continuous generalization) that the data (the observed covariance) were drawn from the population (Kline, 2011). To perform the ML estimation method, the following assumptions need to be met: independence of the scores, multivariate normality of the endogenous variables, and independence of the exogenous variables and error terms.

In order to evaluate the model fit, multiple fit indicators should be used to examine the model fit, including the Chi-square (χ^2), the root mean square error of approximation (RMSEA), the Bentler's Comparative Fit Index (CFI), the Tucker Lewis Index (TLI), the standardized root mean square residual (SRMR). The Chi-square (χ^2) and RMSEA were all essentially used to report the model fit. A Chi-square (χ^2) test, which results in the indication that something was not statistically significant, is preferable to determine the acceptability of model fit (Kline, 2011).

The RMSEA values less than .06 are typically indicative of a good fit (Hu, & Bentler, 1999). Values between .08 and .10 are generally indicative of a mediocre fit (MacCallum, Browne, & Sugawara, 1996) and values greater than .10 are usually considered to be indicative of a poor fit (Siedlecki, et al., 2010). The CFI and TLI were also used to identify the fit statistics; values closer to 1.0 indicate a better fit (Hu, & Bentler, 1999). The value of these indicators greater than .95 is considered to signify a good fit (Hu, & Bentler, 1999). However, sometimes a cut-off of greater than .90 is also used (Bentler, 1992). Finally, the SRMR was also used to determine the model fit. The combination threshold for concluding *acceptable fit* is based on the following indicators: (a) the CFI is greater than or equal to .95 and (b) the SRMR is less than or equal to .08

(Hu, & Bentler, 1999).

Analytic procedures are described below for each research specific research questions: *Research Questions 1: Is there a direct relationship between events that occur in school and home contexts for school-age children and health-promoting behaviors?* The SEM analysis was conducted to determine the contributions of each individual variable to the total variance of the HPB's and the mediation effects of media.

Research Questions 2: To what extent does children's affective state and use of media mediate the relationship between school and home influences on health-promoting behaviors? A SEM analysis was used to assess the mediation effects.

Research Question 3: Is there a relationship between media use and affective state in school-age children? A SEM analysis was used to assess the relation between these two variables. Research Question 4: Do mediation effects vary as a function of sex? A Stacked SEM analysis was used to examining gender difference in the model and model paths.

Protection of Human Subjects

This study received approval from the Michigan State University Institutional Review Board overseeing protection of human subjects. Dr. Jessica V. Barnes-Najor, the principal investigator of the research project, approved access to the database. The data set obtained from the parent study was de-identified so there was no contact with the original participants. The dataset was encrypted and saved electronically on a secure server and the password-protected.

CHAPTER 5

RESULTS

Descriptive Statistics. Descriptive statistics were used to describe the variables by the range, means and standard deviations. A SEM) analysis was used to describe the relationships between the variables.

Table 4 presents the mean scores, standard deviations and range of scores for the study variables. Examination of individual scale scores provided evidence that the range of scores was acceptable for every variable measured in this study. Adequate variance existed in student responses to survey items.

As shown in Table 5, statistical comparisons for sex differences indicate that boys perceive greater risk related to peer relationships than girls, as indicated by peer social support (t = 2.44, p=.014) and peer hostility and bulling (t=4.021, p=.000). Girls report greater support from parents than did boys as indicated by parent emotional support (t = -.3389, p=.001) and parent involvement (t=-2.018, p=.044). Consistent with similar studies, girls report more depressive symptoms than boys (t=-3.953, p=.000). Finally, girls report lower use of media than boys (t=4.413, p=.000). There are no significant differences between boys and girls in the measurement of self-esteem (t=-1.269, p=.205), and HPBs (t=-1.54, p=.122).

Pearson's correlation analyses revealed parent emotional support and involvement and selfesteem were all positively correlated with HPBs. Peer social support, peer hostility and bulling at school, media use and depression were all negatively correlated with HPBs. Self-esteem was found to be negatively correlated with media use (p<.001). Depression was found to be positively correlated with media use (p<.001).

Constructs	Variables	Sex	Range	Mean	Standard Deviation
	Peer social support at school	Boy	1 to 4	1.70	0.65
Sahaal aantant ¹		Girl	1 to 4	1.62	0.62
School context		Total	1 to 4	1.65	0.63
	Peer hostility and bulling	Boy	1 to 4	1.78	0.60
		Girl	1 to 4	1.66	0.53
		Total	1 to 4	1.70	0.56
	Parent emotional support	Boy	1 to 4	3.23	0.65
Home context ²		Girl	1 to 4	3.35	0.57
Home context		Total	1 to 4	3.30	0.60
	Parent involvement	Boy	1 to 4	2.95	0.55
		Girl	1 to 4	3.02	0.53
		Total	1 to 4	2.99	0.54
Media use ³	Media use	Boy	0 to 3	0.70	0.91
		Girl	0 to 3	0.80	0.98
		Total	0 to 3	0.81	0.98
	Depression	Boy	1 to 4	1.89	0.64
4	-	Girl	1 to 4	2.04	0.68
Affective state		Total	1 to 4	1.97	0.67
	Self-esteem	Boy	1 to 4	3.34	0.53
		Girl	1 to 4	3.38	0.49
		Total	1 to 4	3.36	0.52
HPBs ⁵	HPB Sum	Boy	0 to 8	2.98	1.44
		Girl	0 to 8	4.90	1.28
		Total	0 to 8	4.94	1.35

The Mean, Range, Standards Deviation, Construct, Variables and Scale Score Characteristics by Sex (N=1,370)

Note, ¹A high score in school context indicates a student perceives greater risk in his or her peer in school, ²A high score in home context represents greater levels of support from parents in the child's life, ³A high score in media use indicates a student perceives greater risk in his or her exposure to media, ⁴A high score in affective state indicates a positive emotional state, ⁵A high score in HPBs indicates a student perceives more involvement in his or her HPBs.

Variables	t-test for Equality of Means				95% Confider of the Dif	nce Interval ference	
	Т	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Peer social support	2.449	1364	.014	.08592	.03509	.01710	.15475
Peer hostility and bulling	4.021	1363	.000	.12442	.03094	.06372	.18511
Parent emotional support	-3.389	1368	.001	10166	.03000	16051	04281
Parent involvement	-2.018	1367	.044	06023	.02985	11879	00167
Self-esteem	-1.269	1368	.205	03562	.02807	09069	.01944
Depression	-3.953	1366	.000	14464	.03659	21642	07286
Media use	4.413	1357	.000	.23800	.05394	.13220	.34381
HPBs	-1.547	1368	.122	11510	.07438	26101	.03081

Sex Difference Comparisons Mean Difference on Variables Used in the Study

Note. p<.05

	Parent emotional support	Parent involvement	Peer hostility and bulling	Peer social support	Self- esteem	Depression	Media use HPB
Parent emotional support	1	.485**	348**	368**	.347**	269**	073** .218**
Parent involvement	.485**	1	173**	169**	.247**	156**	126** .224**
Peer hostility and bulling	348**	173***	1	.491**	296**	.420***	.110**083**
Peer social support	368**	169**	.491**	1	320**	.337**	.022196**
Self-esteem	.347**	.247**	296***	320***	1	377**	087*** .229***
Depression	269**	156***	.420**	.337**	377**	1	.135**131**
Media use HPB	073 ^{**} .218 ^{**}	126 ^{**} .224 ^{**}	.110 ^{**} 083 ^{**}	.022 196 ^{**}	087^{**} .229 ^{**}	.135 ^{**} 131 ^{**}	1134 ^{**} 134 ^{**} 1

The Correlation Matrix for All Study Variables.

Note. ***p*< 0.01; **p*<.05

Result and Analysis

The SEM equation models specifying the relationships between variables in this study were estimated using Mplus Version 7. SEM represents a synthesis of path analysis, involving the comparison of hypothesized model covariance with observed covariance (see Appendix A). Advantages of this procedure include the generality and flexibility of model specification and the ability to assess fit of the hypothesized model to the observed data (Kline, 2011)

A SEM analysis was computed to determine the amount of variability of HPBs in schoolage children that could be explained by school context (peer social support, peer hostility and bulling at school), home context (parent emotional support and parent involvement), media use (television, video games and computers), and affective state (self-esteem and depression). The SEM analysis was conducted to determine the contributions of each individual variable to the total variance of the HPBs.

The initial model was specified based upon the relationships among variables that were hypothesized to exist or not to exist (see Appendix B). This distinction is important because any unspecified relationships among variables were assumed to be equal to zero. After specification of the initial model was completed, the alternative model was tested. In testing the alternative model, the following steps were followed: 1) Evaluation of paths by examining significance of parameter estimates, 2) consideration of the change in explained variance for health-promoting behaviors, and 3) testing significant improvement in model fit by fixed parameters. Upon completion of these steps, it was found that the paths between school context and media use and school context and HPBs should be set to 0. As presented in Table 7, when these paths were set to 0 the model provided a good fit as indicated by the fact that the chi-square became insignificant $(\chi^2(df=2)=$ 2.318, p=0.313). Additional indices indicated that the alternative model fit the data (Tucker-Lewis Index=0.997, Comparative Fit Index=0.999, Root Mean Square Error of Approximation=0.011 and Standardized Root Mean Square Residual=0.009). The alternative model restricted the paths from school context to HPBs to 0, thereby providing a better fit than the initial model which assumed these relationships existed.

		Fit indices			
Models				Chi-square (χ^2)	
	CMIN	DF	Р	Δ	
Initial model Alternative model	0.000 2.318	0 2	0.000 0.313	$\Delta \text{DF=2; } \Delta \chi^2 = 2.318$	

The Comparison of the Model Fit Indices between the Initial and the Alternative Model



Figure 3. Path Model 1 for School Context, Home Context, Affective State and Media Use with Standardized Coefficients

*p < 0.05, **p < .01, ***p < .001; solid line represent = p < .0.05.

Research Question 1: Is there a direct relationship between events that occur in school and home contexts for school-age children and health-promoting behaviors?

As described above, in order to obtain a model that fit the data the paths leading from

school context to media use and to HPBs were restricted to 0. This indicates no direct effect of

school context ($\beta = 0.000$, p = 0.999) on HPBs. Alternately, home context ($(\beta = 0.179, p = 0.000)$ had

a significant direct effect on HPBs.

Table 8

Mediation, Effect Size, Direct Effect and Indirect Effects of School Context on HPBs

Mediation	β
Direct effect	0.000
Indirect effects	-0.042
Through media use	0.000
Through affective state	-0.042
Total effect	-0.042
Percentage of indirect effects	-0.042/-0.042=100%

Table 9

Mediation, Effect Size, Direct Effect and Indirect Effects of Home Context on HPBs

Mediation	β
Direct effect	0.179
Indirect effects	0.030
Through media use	0.008
Through affective state	0.022
Total effect	0.209
Percentage of indirect effects	0.030/0.209= 14%

Research Question 2: To what extent does children's affective state and use of media mediate the relationship between school and home influences on health-promoting behaviors?

The SEM analysis indicated that only children's affective state mediated the effects of school context on children's HBPs (Table 8; 100% mediation with 4.2% effect size). Children's media use (.8% effect size) and affective state (2.2% effect size) mediated the effects of home context on children's HPBs (Table 9; 14% mediation with 3% total indirect effect), although home context also independently contributed to HPBs (17.9% effect size).

Research Question 3: Is there a relationship between media use and affective state in school-age children? As shown in Figure 3, the result in this current study indicate that affective state is significantly positively related with media use ($\beta < .091$, p=000); the covariance among the matrices for media use and affective state, within the larger model, were significantly positively related.

Research Question 4: Do mediation effects vary as a function of sex? Following the same procedure used to test the hypothesized model to examine the direct and indirect effects of the study variables on HPBs, a stacked SEM analysis, using the alternative model was conducted to examine sex differences in the model and model paths.

The test of the stacked models indicated that the overall model fit was good. The Chi-Square test of model fit was not statistically significant, indicating a good-fitting model (χ 2 (df=4) =5.432, p=0.254). The Tucker-Lewis Index (TLI=0.989), Comparative Fit Index (CFI=0.998), Root Mean Square Error of Approximation (RMSEA=0.022) and Standardized Root Mean Square Residual (SRMR=0.013) all indicated a good-fitting model.

The results from the stacked SEM analysis are shown in Figures 4 and 5. For both boys and girls, home context independently contributed to HPBs (effect size for boys: 18.6%, effect size for girls: 18.4%) while school context did not have a direct effect on HPBs. Media use was a significant predictor of HPBs for boys only. As shown in Tables 11 and 12, affective state mediated the relationship between home and school contexts and HPBs for both boys (effect size for home mediation: 1.7%; effect size for school mediation: -4.4%) and for girls (effect size for home mediation: 2.5%; effect size for school mediation: -3.8%). Alternatively, media use was a

mediator in the relationship between home context and HPB for boys only, although this effect

was small at 1.1%.

Table 10

The Comparison of the Model Fit Indices between the Initial Model and the Alternative Model for Sex Differences

				Fit indices
Model			Chi-	square (χ^2)
-	CMIN	DF	Р	Δ
Initial model	0.000	0	0.000	
Alternative model	5.342	4	0.254	$\Delta DF = 4\Delta \chi^2 = 5.342$

Table 11

Mediation, Effect Size, Direct Effect and Indirect Effects of School Context on HPBs by Sex Differences

Mediation	Boys	Girls
	β	β
Direct effect (1)	0.000	0.000
Indirect effects	-0.044	-0.038
Through Media Use	0.000	0.000
Through Affective State	-0.044	-0.038
Total effect	-0.044	-0.038
Percentage of indirect effects	-0.044/-0.044=1=100%	-0.038/-0.038=1=100%

Table 12

Mediation, Effect Size, Direct Effect and Indirect Effects of Home Context on HPBs by Sex Differences

Mediation	Boys	Girls
	β	β
Direct effect (1)	0.186	0.184
Indirect effects	0.028	0.031
Through Media Use	0.011	0.006
Through Affective State	0.017	0.025
Total effect	0.214	0.147
Percentage of indirect effects	0.028/0.214=0.130=13.0%	0.031/0.147=0.210=21.0%



Figure 4. Path Model 2 in **Boys** for School Context, Home Context, Affective State and Media Use with Standardized Coefficients p<0.05; p<0.05; p<0.01; p<0.01; p<0.01; p<0.05.



Figure 5. Path Model 3 in **Girls** for School Context, Home Context, Affective State and Media Use with Standardized Coefficients *p<0.05; **p<.01; ***p<.001; solid line represent =p<.0.05.

Summary

This chapter presented the results from quantitative analysis. There is no direct effect of school context on HPBs two years after school context was assessed. Alternately, home context had a significant direct effect on HPBs. Only children's affective state mediated the effects of school context on children's HPBs. Children's media use and affective state mediated the effects of home context on children's HPBs, although home context also independently contributed to HPBs. Affective state is significantly positively related with media use; the covariance among the matrices for media use and affective state, within the larger model, were significantly positively related. For both boys and girls, home context independently contributed to HPBs while school context did not have a direct effect on HPBs. Media use was a significant predictor of HPBs's for boys only. Affective state mediated the relationship between home and school contexts and HPBs for boys only.

CHAPTER 6

DISCUSSIONS AND IMPLICATIONS

This study has been designed to assess predictors of HPBs in fourth to sixth grade children using a cross-sequential longitudinal design to track predictors over a three-year period. Specific attention has been given to the extent to which children's use of media and/or their affective state mediate the relationship between peer (school context) and parent (home context) predictors of dietary intake and physical activity (HPBs). The study has been designed as an addition to existing literature investigating direct and indirect effects of factors influencing HPBs, conceptualized within the historical context of Pender's HPM (2002).

Descriptive analyses for sex differences across all variables produced effects that are consistent with similar studies. The boys in this study reported greater risk in peer relationships, primarily in the reporting of hostile and aggressive behaviors, as well as greater use of media than the participating girls. The girls in this study reported receiving greater emotional support from parents and reported more depressive symptoms than the boys. There were no significant sex differences regarding measures of self-esteem.

Analyses based on the study's research questions generally support mediational effects. For each of the research questions, SEM analyses indicated:

Research Question1: Only parent variables of home context had direct effects on HPBs. Research Question 2: Only children's affective state mediated the effects of school context (peers) on HPBs. Although media use and affective state mediated the effects of home context, home context also independently contributed to predicting HPBs.

Research Question 3: Affective state and media use were positively related.

Research Question 4: For both boys and girls, affective state completely mediated the relationship between school context and HPBs, though affective state and media use only partially mediated the effects of home context and HPBs.

Discussion of Research Question 1

The first question asked whether there was a direct relationship between school and home context and children's health-promoting behaviors. Results indicated that only parent variables (home context) had direct effects on HPBs.

Home Context and HPBs. Only parent variables of home context had direct effects on HPBs. This observation is consistent with those found in studies of parental influence on HPBs in school-age children (Borkowsky et al., 2002; Mounts, 2001). In these studies, parent emotional support and parent closeness demonstrated significant, direct effects on the HPBs of their children. In the current study, it is possible that children experiencing risky health behaviors and having high levels of parental emotional support, involvement and closeness may be more likely to engage in activities which enhance their HPBs. If so, it may explain why children who have reported perceived emotional support they receive from their parents, as well as the degree to which parents are involved in child rearing activities, are more likely to engage in HPBs. Children's perception of support from their parents significantly predicted their engagement in HPBs.

Studies of parental influences on HPBs clearly point to the importance of parental monitoring for promoting healthy behavior in children (Aufseeser et al., 2006; Kremarik, 2000; Sallis et al., 2000; Okun et al., 2002). Such studies suggest that positive parent involvement in children's HPBs decreases risk for deviance by promoting competence and the internalization of parental values.

Moore and Harre (2007) examined the eating behaviors, physical exercise and television viewing of secondary school students and investigated their relationship with parental monitoring and family cohesion. The results of their studies showed that parental monitoring and family cohesion were positively related to participants' reports of eating breakfast and healthy foods. These results also showed a negative relationship in the participants' reports of buying their own food and eating unhealthy foods. Exercise rates were moderately correlated with eating healthy foods and weakly related to parental monitoring and family cohesion. Television viewing was related to eating unhealthy foods.

Findings demonstrated that parents play a critical role in shaping the behaviors of teens as they face the challenges of growing up and engaging in HPBs (Borkowsky et al., 2002). Close relationships between parents and their children, such as healthy open communication and perceived parental support, are especially important during childhood, as children experience many physical and emotional transitions from childhood to adolescence (Aufseeser et al., 2006). Children are less likely to report symptoms of depression and are more likely to report high levels of well-being when they have parent support and parent involvement in their activities (Mounts, 2001). Parental monitoring, combined with parental support, has been demonstrated to be positively related to higher self-esteem, academic accomplishment and greater academic success in school (Mounts, 2001). Parental monitoring has also been associated with fewer internalizing behaviors, such as depression and withdrawal, as well as with externalizing behaviors such as disturbing others and fighting (Barber al., 1994; Brody et al., 2002).

School Context and HPBs. The current study studied one aspect of school context. Contrary to expectations, school context did not predict HPBs. This contrasts with numerous studies (Baranowski, 2004; Sallis et al., 2001; Sallis et al., 2003; Verstraete et al., 2006). As school context in these studies was conceptually defined as physical activity environment characteristics (see Table 13).

Two key factors may account for these differences. As indicated previously, school context was *defined* by children's reports of the extent to which they perceived their peers as supportive and by children's exposure to hostile peer behaviors, such as bullying.

Table 13

Researcher	Defined School Context	
Baranowski, 2004;	Physical activity environmental characteristics in the school	
Fein et al., 2004	Perceived importance of school environment is a key environmental component in explaining physical activity	
	behavior among youth	
Gadin & Hammarstrom, 2002	School-related factors could predict future health behaviors,	
Sallis et al., 2001	Physical activity environmental characteristics	
Sallis et al., 2003	School with rich facilitated environments	
Salmon et al., 2007	School with rich facilitated environments could be attributed to several factors which are related to children health-promoting behaviors	
Verstraete et al., 2006	Physical activity environmental characteristics	

Defined School Context

Peer relations and close friendships play extremely important roles in children's emotional development. Children spend most of their daytime hours engaged in academic and leisure activities with peers and close friends, and these relationships provide a critical source of emotional support (Prochaaka et al., 2001). Peers influence children's and adolescents' diet and exercise in many positive and negative ways. Positive peer relationships may promote physical activity by boosting adolescents' mood and physical self-esteem (Sallis, et al., 2003). Also, close

friends are a primary source of companionship for the exercise aspects of a chronic disease regimen and can support healthy eating habits in children (Verstraete et al., 2006), as perceived support by classmates and close friends (Sallis, et al., 2003). According to Verstraete et al. (2006), children who spend time with a close friend in the school context may also prevent feeling different or left out by peers. HPBs in school-age children are affected by valuing peer friendship and other relationships; especially peer social support at school (Greca, Bearman, & More, 2002). Fein et al. (2004) examined physical environments to explain and promote physical activity, with home, neighborhood and school as significant domains. Home context was defined by researchers as how children perceived neighborhood safety. School context was defined as the importance of the school environment that supports school physical environment.

Gadin and Hammarstrom (2002) conducted a three-year prospective study of children enrolled in grade six through grade nine. The objective of this study was to identify predictors among young children for later risky heath behaviors with special focus on factors unique to the school environment. The investigators assessed the importance of following school related factors, such as classmate problems (having many friends as wanted, feeling left out of the peer group and being called rude words), low teacher support, teasing classmates, difficulties sitting still in class and students' relation to physical education at school. The results of this study identified numerous negative health behavioral outcomes such as depression, anxiety, difficulty falling asleep and feeling sad at school.

Parenting process, neighborhood structure and the development of youths' externalizing behaviors were investigated in a longitudinal sample (Beyers et al., 2003). Neighborhood structure was defined as adolescent perceived neighborhood safety. Parenting process was defined as

adolescent perceived their positive involvement with their parents and parental monitoring.

The prevention of unfavorable health behaviors among children become a high priority in public health. It is important to identify early predictors of HPBs, as established health behaviors in childhood can be difficult to change later in life. Most of the studies performed on health behaviors in children have focused only on individual factors without any connection to subjects' environments. Health promotion will be more effective if it is based on a program that changes the environment in which people make decisions that affect their HPBs choices.

The second factor affecting this study's conclusion that school context did not predict HPBs is the difference in *research design* between this and similar studies. The current study used a longitudinal approach to assess the extent to which events that occurred in the 4th, 5th, or 6th grade predicted HPBs over a three year period. In short, it examined the extent to which distal events in children's lives predicted proximal health behaviors, either directly or as mediated by factors distal to the predictors (media use or affective state).

Children who reported experiencing an unsafe school environment were less likely to experience support from parents and positive affect. Correlations between HPBs and direct and indirect influences were as expected: children who experience safe school context, have more parental support and experience more positive affect were shown to be at lower risk for not engaging in healthy behaviors.

Parental emotional involvement, parent support and self-esteem were all positively correlated with health-promoting behaviors. Peer social support, peer hostility and bulling at school, media use and depression were all negatively correlated with health-promoting behaviors. Although home, school context and health-promoting behaviors have been examined in several studies, almost all such studies are cross-sectional and involve self-reported data (Aufseeser et al., 2006; Kremarik, 2000; Sallis et al., 2000; Okun et al., 2002; Greca et al., 2002; Lohaus et al., 2004).

Cross-sectional design limits the interpretation of study findings to the relationships among selected variables that occur in the same time context. As all measures are proximal, no change can be assessed; that is, the descriptive nature of the design does not allow for a strong causal relationship between study measures.

A longitudinal study found that substance use established at ages 14 to 15 could be predicted by educational performance and social behavior at school displayed at ages seven to nine (Hops, Davies, & Lewin, 2000). A study of neighborhood effects on children that includes repeated measurement of both parenting process and youth outcomes could investigate change across time in the effects of neighborhood on parenting, as well as change across time independent effects of parenting (Beyyers et al., 2003). It is difficult to determine whether school and home context have changed HPBs due to the lack of longitudinal studies. More research is needed about possible predictors for future health behaviors, in relation to both individual and family oriented factors and factors related to the school environment, such as classmate relations, teacher support. The relationship between school context and health-promoting behaviors from this study cannot be generalized to the population at large. However, the majority of evidence favors a relationship between school context and health-promoting behaviors. Less peer social support may have a significant direct negative effect on school-age children. Hence, it is essential to explore how school context plays a role in health-promoting behaviors among school-age children. In conclusion, only parent variables of home context had direct effects on HPBs. As mentioned before, most studies of HPBs among school-age children have focused on individual factors rather than on home and school contexts that are associated with HPBs. Parents could help shape a positive their children's HPBs. For school-age children, the main environment is not only their home but also their school. This current study studied one aspect of school context (peer). Such an approach could ascertain how multiple factors coalesce in relation to both individual and family oriented factors and factors related to school context. Researchers should determine which HPBs to concentrate on for successful HPBs intervention.

Discussion of Research Question 2

Mediational Effects of School and Home. The analysis of question 2 provided evidence that school contextual influences on HPBs are fully mediated by children's affective states. Although both affective state and media use mediated home context influences on children's HPBs, home context also has direct effects. These findings extend prior work investigating mediational influences on children's HPBs (Chenchob et al., 2013) which indicate that affective state mediates the relationship between social support and neighborhood context on dietary intake and physical activity. Neighborhood safety and social support are both significant predictors of HPBs, but only when mediated through the child's affective state. Accordingly, individuals are more likely to engage in HPBs when they are exposed to multiple interacting influences. Individuals may want to behave in the ways that promote health, but the environmental constraints may prevent healthy decision choices (Pender et al., 2002).

In the present study, children's media use influenced HPBs. Media use is a factor encouraging exposure to both risky behaviors and healthy behaviors. Parents who are likely to also provide poor emotional support in addition to the content of show networks.

Initially, researchers and health professionals focused on the impact of television on children's aggressive behavior (Eron, 1982) and weight gain. Dietz and Gortmaker (1985) concluded that there were positive and perhaps causal connections. Increasingly, such concerns have shifted beyond children's exposure to television to include time spent playing video games or texting on mobile devices. Studies have reported positive effects of computer use on children's academic achievement (Jackson et al., 2006; Kulik, 1994; Wenglinsky, 1998) and expansion of social networks (Jackson et al., 2010), though others have demonstrated no effect at all (Jackson, 2008). Computer use can be socially and psychologically isolating, resulting in feelings of depression and loneliness (Amichai-Hamburger & Ben-Artzi, 2003). While video games may enhance visual spatial skills (Subrahmanyam et al., 2000), other evidence suggests that levels of aggression are higher in children who are heavy users of video games, particularly violent games (Anderson, Gentile & Buckley, 2009). Teacher ratings of these children's behavior in school are more negative when compared with children who play games less frequently (Anderson et al., 2007).

Children are exposed to an extraordinary amount of information about energy-dense foods on television (Moore, 2008). Low levels of exercise, high consumption of energy-dense foods and low affect contribute to children's weight gain. With rare exceptions, screen time is a time of high caloric consumption and low physical activity (Jackson et al., 2010), contributing to weight gain and obesity (AOA, 2005). Finkelstein et al.(2005) note that children watch ten or more food commercials per hour, most of which are for fast foods and soft drinks, adding to television's impact on children's weight gain. Adams (2006) specifically targets poor eating habits, soft drinks, lack of exercise and high amounts of time spent watching television or using a computer as major contributors to child obesity. Therefore, examining the role of media use on children's weight gain is important.

Previous research has shown complex interactions between the time children spend watching television, physical activity level and body fat level (Proctor et al., 2003; Biddle et al., 2004). Even if television does not reduce exercise time, it may still be problematic by increasing and promoting snack advertisements. To help develop effective interventions to reduce television viewing and increase physical activity, a consistent correlation between TV viewing and negative health behaviors needs to be identified (Gorely et al., 2004). TV viewing appears to increase between-meal snacking and was inconsistently related to children asking for and choosing TVadvertised foods and actual dietary fat intake (Gorely et al., 2004). Also, TV viewing in children is associated with parental viewing habits.

Study findings indicated that affective state and media use are important mediators of HPBs in school-age children. A better understanding of factors influencing their HPBs may lead to more effective health promotion programs aimed at maximizing the health potential of school-age children. The results of the current study, in combination with those reported by Chenchob et al. (2013), provide a starting point for additional research designed to understand the complex relationships that link children's affective states and media use, as well as peer, parent and neighborhood influences on children's HPBs. These factors cooperatively support the processes that influence individuals to make decisions regarding HPBs. Identification of the interrelationships and an understanding of the dynamics can facilitate health specific and health enhancing behaviors.

In conclusion, research supports the contention that these variables (meditational effects of school and home) have an impact on the practice of HPBs among school-age children. It is interesting to note that this current study is handful that examined internal indicators (affective state) of well being as a predictor of HPBs. Affective state was both a direct predictor of engagement HPBs and a significant mediator between external influential factors and children's HPBs. Moreover, one such variable is children's media use. Media use contributed to children's HPBs. Studying children's use of media in relation to HPBs receives strong support from the extensive studies that implicate exposure to television advertising and similar Web-based message as detrimental to health in children. The findings are not consistent howeverthe regarding , relationships betweenchildren's media use and HPBs. Further research is warranted in these areas.

Discussion of Research Question 3

Relationship of Affective State and Media Use. Affective state and media use are positively related.

In this study, frequent exposuree to media use was associated with higher depression and lower self-esteem. This finding is consistent with a longitudinal study of youth aged 11 to16 years of age conducted by Witt et al. (2011) which indicated that self-esteem was negatively associated with playing videogames and positively associated with general computer use. Children who play video games more have lower social self-esteem than children who play them less frequently. Conversely, children who use cell phones frequently have higher social self-esteem than those who use them less often. Similar findings hold for general self-esteem (Means, 2000).

Jackson et al. (2011) studied the effects of internet use, video game playing and cell phone

on children's weight gain and self-esteem. Although ethno-racial group membership, age and income levels predict academic achievement and body mass index (BMI), none of the information technology (IT) indicators do. Conversely, information technology accurately predicts children's social self-esteem.

While video games may enhance visual spatial skills (Subrahmanyam et al., 2000), other evidence suggests that levels of aggression are higher in children who are heavy users of video games, particularly violent games (Anderson et al., 2009). Teacher ratings of children's behavior in school are more negative when compared with children who play games less frequently (Anderson et al., 2009). An absence of depression could influence physical activity because physical activity may offer protective, buffering effects on mental health for youth prior to the onset of emotional problems (Dyck, 2000) by raising levels of self-esteem, body image and selfconcept (Higgins et al., 2003). Indeed, regular exercise participation has been found to be associated with decreases in state and trait anxiety, depression, and stress (Dunn & Madhukat, 2001).

The results of this study suggest that whether individual children will be responsive to attempts to instill HPBs will depend on the extent to which prevention efforts are capable of improving affective state (self-esteem and depression) so that children can be receptive to HPBs messages. Children who get their health behaviors and live in supportive environments that enable proactive health behaviors tend to be more active.

Discussion of Research Question 4

Sex Differences. The fourth aim was to determine whether there are sex differences in the relationships among variables.

Sex differences in self–esteem have been noted with higher self–esteem commonly identified in boys and decreasing self–esteem in females as they enter adolescence (Hendricks et al., 2001). Across culture and gender, abilities were valued as promoting self–esteem (Guinn et al., 2000; Hendrickset et al., 2000). Gadin and Hammarstrom (2002) conducted a three-year prospective study in grade six and grade nine. The objective of their study was to find predictors among young children for later risky heath behaviors with special focus on school-related factors. The results indicated that school-related factors could predict future health behaviors, especially in relation to low physical activity among girls. Low physical activity among girls could best be predicted by school-related factors such as classmate problems, teasing others, rowdiness in the class and having difficulties sitting still.

Sex differences are often discussed relative to media use. Research indicates that males use computers to search the internet for information and to play videogames, while females use computers for communication such as e-mail (Jackson, Ervin, Gardner, & Schmitt, 2001). However, Ohannessian (2009) found no gender differences in how adolescents use computers, but did find that anxiety levels between males and females differed and also that males used technology as an escape. Pierce (2009) found that girls tend to be more self-conscious in social settings, often relying on technology such as texting, instant messaging and social websites to communicate with their peers. Using technology for social communication may make individuals less self-conscious than in face-to-face communication. Willoughby (2008) used a two-wave study to discover changes in technology use during high school; boys maintained the same general computer use whereas girls' use declined from over the same period.

Consistent with previous research (Gross et al., 2002), gender differences in technology use

were observed in this research. Girls reported less videogame playing and more communication technology use than boys (Papacharissi & Rubin, 2000). These gender differences are relatively stable over time at least between the ages of 12 and 15.

In conclusion, this current study examined media use and affective state as mediators between internal, external factors and HPBs. For both boys and girls, affective state completely mediated the relationship between school context and HPBs, though affective state and media use only partially mediated the effects of home context and HPBs. The finding from the current study provided a foundation for the development of appropriate intervention strategies for boys and girls. Success of intervention efforts is dependent upon evidence that linked to sex differences. The causal variables (media use) influencing HPBs are markedly sex differences.

Pender's Conceptual Model of HPM Revisited

HPBs are vital to maintaining and improving people's health. Pender's HPM (2006) is a helpful model to enhance understanding of human behaviors because the model incorporates internal and external factors that influence human behaviors. The findings of the current study support Pender's HPM (2006) that individual characteristics and experiences, behavior-specific cognitions and affect are related to explain HPBs among school-age children.

The findings of this study support some aspects of Pender's HPM model. For example, data showed that home context, including parent emotional support, parent involvement and closeness directly influenced children's HPBs. However, the data did not support relationships between school context and HPBs. Further research is required to clarify and understand these associations.

Such understandings provide a basis for re-constructing Pender's HPM and to incorporate more dynamic systems frameworks for generating multiple pathways to health-promoting behaviors. For example, when Pender's HPM was developed, children had little exposure to media, including the internet, with respect to HPBs. Since then, children's exposure to and use of such media has increased. Media use cooperatively supports the processes that influence individuals to make decisions and participate in health-promoting behaviors. Another example, the prior study involving the longitudinal sample, Chenchob et al. (2013) found that children's affective state mediated the relationship between indicators of social support and perceived neighborhood safety and children's HPBs. Identification of the interrelationships and an understanding of the dynamics that facilitate health specific behaviors provide insight into health enhancing behaviors, making the model useful to researchers to further study the improvement of health care in school-age children.

Study Limitations

The study was limited by the particular sample characteristics. Although the sample was representative of the population, it was not representative of the various ethnic groups that comprised the minority population of the United States. Most participants were Caucasian American boys and girls from one geographical region; factors that limit the applicability of the results in other populations.

The major disadvantage of the secondary data analysis was that the data was originally obtained for another purpose, so the researcher using secondary analysis infrequently knows about the data collection procedures. As the researcher has worked closely with the original investigators and has completed one study from the current data set, the effect of this limitation was minimized. An additional disadvantage to secondary analysis is that data may be out-of-date, or the quality of the data may be so large that statistical results may be significant but the results are less meaningful (Caslte, 2003). Calculating effect sizes and adjusting for sample size by increasing significance levels for accepting findings as significant are often used to counter this issue.

This study is limited by the method used to measure engagement in HPBs. Using selfreports of children's engagement in physical activity and dietary intake does not provide the most accurate assessment of children's actual behaviors. However, self-report is appropriate to utilize evaluation an internal self-perception on HPBs.

These findings may reflect a response bias that parents who are interested in health promotion issues may be more likely to grant permission for their children to participate in such studies.

Strength of the Study

Strengths of the study include its longitudinal design, the large region of school-age children, a range of theoretically-derived predictors from Pender's HPM and the fact that one attempt at model testing involving Pender's model was successful (Chenchob et al., 2013).

Implication for Nursing Practice

Nursing intervention approaches should be multifaceted, focusing on enhancing selfesteem and reducing depression, while simultaneously working to build support systems that effectively enhance HPBs in children. These results can inform health care providers and researchers interested in enhancing factors for promoting health behaviors for future interventions. Nursing interventions should emphasize the importance of HPBs among school–age children. Enhancing the teaching and strengthening the delivery of health knowledge pertinent to selfesteem and social support could enrich the HPBs for school-age children. Nurses and other health care professionals can encourage and assist school-age children to practice healthy behaviors with emphasis on the impact and control children have upon their own health.

Nurses should direct their conversation about HPBs directly to adolescents and young adults, clarify any misinterpretations and encourage them to actively participate in decisions that will ultimately affect their health. Studies are needed to examine interventions that will be most effective in helping adolescent and young adults both maintain and engage in HPBs (Smith & Bashore, 2006). Thus, nurses can use the Health Promotion Model (HPM) to intervene in children's HPBs, but the HPM needs to modify the appropriate contact with children's context both at home and school.

In nursing practice, nurses can use HPBs as a framework to provide a coherent and organized framework for intervening with clients to increase HPBs. For example, nurses can develop interventions that address school context, home context, affective state and media use relevant to a particular health behavior. In addition, understanding participants' knowledge of risk factors and health promoting strategies is crucial because school-age children may be prevented or delayed from risky health behaviors if they practice appropriate risk factor modifications.

Implication for Research

HPBs in school-age children require long-term management and can result in changes over time Thus, findings from this cross-sequential study could serve as a baseline for further longitudinal studies of HPBs and factors that influence HPBs in school-age children. The use of longitudinal study designs would be helpful in identifying predictors of HPBs over time and ascertaining relationships among factors influencing HPBs. Future research examining HPBs in children should identify changes over time in media use and HPBs by utilizing a growth curve model.

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This study examined the relationships between school context, home context, affective state, media use and HPBs in school-age children. In light of the epidemic rates of obesity and obesity related health problems in children, research in children's health is growing. Future research examining health-promoting behaviors in children should identify additional external and internal factors related to how children make decisions about dietary intake and physical activity. Also, examining these processes in populations of children who are at particularly high risk for obesity is also recommended for nurses, other health care providers and researchers.

Researchers should consider using the significant variables from this study to guide their development of future interventions to promote HPBs for school-age children. For instance, researchers may develop an intervention which promotes physical activity and social support from parents and peers for school-age children. Additionally, research to develop interventions which enhance self-esteem and decreases depression is highly recommended.

Future qualitative research studies are needed to explore children's subjective perception of HPBs, as well as internal and external factors influencing HPBs in school-age children. Published research may be useful in identifying variables that enhance HPBs of children who have specific risky health behaviors.

Implication for Policy

The emphasis in the health care system is shifting from the treatment of illness to the prevention of disease, and ultimately to the promotion of health. New strategies for promoting health efforts have shifted away from individual-level approaches toward population-based approaches that address socio-cultural, political, economic and physical environmental factors (Yancey et al., 2004). This demonstrates the important of leadership within local government

agencies and communities to set priorities and direct local resources toward reducing risky health behaviors.

Public policies addressing health promotion must be worked in complex environments of influence in children's lives (Mcgininis, Russo, & Knickman, 2002). Initiatives for healthier lifestyles, environments and social conditions should be built into these policies. Further, public policy interventions are available to improve population health. These can take many forms, from advertising the identity of restaurants in violation of food-safety protocols to grants that encourage communities to build bike paths. The surface transportation policy project to set aside highway trust fund resources for community initiatives for side walking trails, and bike paths could be one of our most important steps to better health (Pender et al., 2002).

A research agenda should focus on the relationships between social factors associated with poor health outcomes and the mechanisms that lead to poor health. In HPBs, the highest research priority may be to better understand how social marketing and behavior changing interventions can be designed and implemented to work at the population level. Ultimately, success at engaging HPBs opportunities in school depend on the reliability of the ways these complex interactions. The policy plans encouraged walking, bicycling, nutrition information campaigns for children (Adler & Newman, 2002; Mcgininis et al., 2002).

The main question facing policy makers is what if anything can be done to promote children's HPBs. Because school context and home context is changeable and provider support appears to be a factor, incentivizing or holding providers accountable for children's adoption of HPBs is a possible policy direction. In particular, some models of health care are more amendable to supporting children's HPBs. For example, in the Pender's HPM, where children behaviors is the focus and where a functioning health care team provides coordinated care, customizing care to support children's HPBs is possible.

Implication for Nursing Practice in Thailand

The results of this study suggest that counseling and health promotion programs should be tailored to suit school-age children. These findings will increase the understanding of the relationship among factors that may impact children's HPBs. Teachers and staffs need to understand effective strategies for enhancing HPBs, allowing them to provide support and encouragement to school-age children. However, most studies investigating health promotion to date have been conducted in Western countries. Western cultural values are different from the cultural values held by the Thai population. Diversity in health-promoting behavior across cultures could assist nurses in providing more culturally appropriate interventions to Thai children. Thus, cross-cultural studies of health-promoting behaviors would provide valuable information about cultural differences that may lead to diverse variations in beliefs concerning the benefits of HPBs. Further research is required to clarify such associations.

In addition, health promotion must move beyond individuals, to families and their communities. Identification of the factors that predict both external and internal positive health outcomes in children is valuable. Additionally, health-promoting behavior and related variables are important for managing health.

There are potential sex differences with respect to influences of peers and parents on children's health behaviors. To promote physical activity and prevent overweight or obesity among Thai children and pre-adolescents, providers must recognize that children's contexts and meditational effects of school and home are related to dietary intake and physical activity.

Achieving and maintaining one's own health is the overall benefit of social marketing communication between children, their parents, teachers, peers, community organization leaders, community stakeholders and healthcare providers.

In Thailand, new community practice guidelines offer additional evidence-based recommendations for a wide array of school-, worksite-, and community-based programs and public policies to improve dietary intake and physical activity levels for children and reduce children' risky behaviors (Glanz, Rimer, & Viswanath, 2008). The present study may also have implications for interventions such as educational workshops and counseling for individuals whom are at risk for developing health problems, or those simply desiring more information about health and wellness.

Interventions are needed to promote HPBs among school-age children. Researchers should consider using the significant relationships identified in this study to guide their future intervention development to promote HPBs in school-age children. New strategies for promoting health efforts have shifted away from individual-level approaches toward systemic approaches that address socio-cultural, political, economic and physical environmental factors (Yancey et al, 2004). This demonstrates the need for leadership within school and communities to set priorities and direct local resources toward disease risk reduction.

There is a dearth of studies exploring HPBs from the perspective of school-age children, and, consequently, little is known about these phenomena in Thailand. Examining these processes in populations of children who are at particularly high risk for obesity is also recommended. Likewise, HPBs and factors that are related to HPBs in school-age children have not been clearly identified. It is noted that there is a need for empirical studies of the HPBs and factors related to HPBs in this age group. Factors influencing HPBs in this population should be further clarified. Furthermore, increased use of objective measurement of some of variables such as physical activity would help to explore the extent to which children engage in HPBs.

A study in Thailand showed obesity is increasing significantly in school- aged children in Thailand (Thai Health Promotion Foundation, 2013). To improve this condition in school-aged children, the Department of Health, in collaboration with the Thai Health Promotion Foundation, has launched a project to reduce obesity in school-age children by promoting balanced diet and lifestyle. However, this alone may not lower the rate of obesity in this population, as support from parents, teachers and peers, along with mediational effects of school and home, are essential to maintain the program.

To promote healthy lifestyles are recommended to use policy tools. In particular, groups are focusing on the role of healthy food and exercise in reducing obesity and preventable chronic diseases in children. Suggestions include providing healthier food at home and in schools; improving the clarity of nutrition labels eliminating agriculture tax subsidies for unhealthy products; taxing unhealthy products and promoting physical fitness. School lunches should be part of the learning curriculum, and not sold for profit. Unhealthy foods should be removed from institutions such as schools. Thailand needs to treat obesity as an epidemic taking over the nation.

Public policy can promote healthier lifestyles by promoting the practice of eating unprocessed foods, healthy nutrition beyond the standard food pyramid, exercise in homes and schools and the concept that children are responsible for their health. Financial incentives for healthy behaviors and for the use of proven prevention methods should be provided to local governments.

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Summary

This chapter has presented a summary and discussion of the study findings. Additionally, this chapter included the implications of this study and recommendations regarding three areas: nursing practice, research and policy. Overall, the study has added to the knowledge of HPBs and factors influencing HPBs in school-age children. The study findings support the existence of relationships between school context, home context, affective state, media use and HPB in school-age children. From those findings, interventions may be designed to help improve HPBs for this population.

APPENDICES

APPENDIX A: COVARIANCE MATRIX

Table 14

Covariance Matrix

	HPBs	AFFECT	MEDIA	SCH_C	HOME_C
HPBs	1.833				
AFFECT	-0.238	0.996			
MEDIA	-0.137	0.116	0.967		
SCH_C	- 0.158	0.478	0.041	0.998	
HOME_C	0.304	-0.357	-0.114	-0.359	0.998

APPENDIX B: INITIAL MODEL



Fiqure 6. Initial Model for school context, home context, affective state, and media use with standardized coefficients

p*<0.05; *p*<.01; ****p*<.001; solid line represent =*p*<.0.05.

APPENDIX C: MSU IRB APPROVAL LETTER

MICHIGAN STATE

October 24, 2012

Dr. Jessica Barnes 22 Kellogg Center Michigan State University East Lansing, MI 48824

Dear Dr. Barnes,

The IRB has received your protocol application titled "Media Use as a Mediator of Health-Promoting Behaviors in School-Age Children., IRB#12-1091" After reviewing your information, it has been determined that your study does not involve human subjects, as defined in 45 CFR 46.102(f):

"*Human subject* means a living individual about whom an investigator conducting research obtains: (1) Data through intervention or interaction with the individual or (2) Identifiable private information."

You have indicated that you would like to utilize a data set that has been deidentified. Therefore, you are not obtaining data about human subjects through interaction or intervention with an individual, nor are you obtaining identifiable private information about living persons.

Since your study does not involve human subjects you do not need further review or approval by the MSU IRB to proceed with this research.

Feel free to contact Tonya Jamison in the IRB office at 884-0397 if you have any questions.

Sincerely,

H. Mcley

Harry McGee, MPH Chair, Social Science/Behavioral/Education Institutional Review Board (SIRB) Human Research Protection Program

CF: Panarat Chenchob

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